Atlantic Richfield Company

BASIS OF DESIGN REPORT FOR OLD MARINA AND KINNALLY COVE DREDGING AND RESTORATION

Harbor at Hastings Site
(Former Anaconda Wire & Cable Plant Site)
Hastings-On-Hudson, New York
NYSDEC SITE #3-60-022

Revised June 23, 2021

Certification Statement:

I, Mark O. Gravelding, certify that I am currently a New York State registered Professional Engineer and that this Basis of Design Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation (DER-10).

Mark O. Gravelding, P.E. Date: 6/23/21
Engineer-of-Record/Senior Vice President

Lance S. Ketcham, PE
Principal Design Engineer

Raymond M. Kapp
Project Manager/Principal Scientist

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Prepared for:
Atlantic Richfield Company
Remediation Management
150 W Warrenville Road
MC 200 1E
Naperville, Illinois 60563

Prepared by:
Arcadis of New York, Inc.
One Lincoln Center
110 West Fayette Street
Suite 300
Syracuse
New York 13202
Tel 315 446 9120
Fax 315 449 0017

Our Ref:
30059751

Date:
Revised June 23, 2021

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ACRONYMS AND ABBREVIATIONS

BODR	Basis of Design Report
FD	Final Design
mg/kg	milligrams per kilogram
NEA	Northeastern Area
NTUs	Nephelometric Turbidity Units
NW38	Nationwide 38
NYSDEC	New York State Department of Environmental Conservation
OM/KC	Old Marina/Kinnally Cove
OU	Operable Unit
PCB	polychlorinated biphenyl
PDI	pre-design investigation
ppm	parts per million
RA	remedial action
Site	NYSDEC Site #360022 located in Hastings-on-Hudson, New York
TSCA	Toxic Substances Control Act
USACE	United States Army Corps of Engineers
WQC	Water Quality Certification

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1 INTRODUCTION

On behalf of Atlantic Richfield Company, Arcadis of New York, Inc. (Arcadis) has prepared this Basis of Design Report (BODR) for review pursuant to New York State Department of Environmental Conservation (NYSDEC) requirements for Remedial Design (6NYCRR Part 375). This Report provides a summary of guidance and assumptions for design of dredging and restoration of the Old Marina and Kinnally Cove (OM/KC) within Operable Unit 2 (OU2) at the Harbor at Hastings Site (former Anaconda Wire & Cable Plant Site), NYSDEC Site #360022 located in Hastings-on-Hudson, New York (Site). NYSDEC has reviewed and approved certain design concepts for OM/KC (Appendix A - Correspondence) and continues to review additional interim submittals.

Design assumptions presented in this BODR will be incorporated into the Final Design (FD). For simplicity, the term Final Design or FD used throughout this BODR includes the 95% Design submittal for stakeholder review, complete with all design elements and drawings, as well as the Final Design submittal that will certified in accordance with DER-10 and prepared for public distribution, following any revisions to the 95% Design based on stakeholder review.

Design assumptions are based on existing remedial investigation and pre-design reports, laboratory data, and in-situ testing data. The extent of the OM/KC remediation area was established and approved by NYSDEC based on the Preliminary Design Report (Arcadis 2017), pre-design investigation (PDI) reports and figures (2018-2020), including:

- Pre-Design Investigation Data Summary Report Amendment (Sovereign 2018)
- Supplement to the Pre-Design Investigation Data Summary Report Amendment (Sovereign 2019a)
- Additions to the Supplement to the Pre-Design Investigation Data Summary Report Amendment (Sovereign 2019b)

The extent of the OM/KC remediation area was documented by Arcadis in the Revised Removal Limits for OU-1 and OU-2 (June 5, 2019) and was approved by NYSDEC in a letter dated June 26, 2019. Construction sequencing and work window (fish window) assumptions are based on the following correspondence provided in Appendix A – Construction Methods Memorandum:

- Construction Methods Related to In-Water Work (June 22, 2020)
- DEC Response Letter Construction Methods Related to In-Water Work Harbor at Hastings, NYSDEC Site #360022 (September 24, 2020)

1.1 Document Organization

The remainder of this BODR is organized as follows:

- **Section 2 – Key Design Elements**. Discusses design elements and supporting basis of the design elements to be incorporated into the Final Design (FD).
- **Section 3 – Path Forward**. Discusses descriptions for additional drawings, technical specifications, and support plans to be prepared during the FD. In addition, this section includes descriptions related

to regulatory/permitting and access requirements to be completed prior to construction. Design documents listed in this section are not included in this BODR.

- **Section 4 – References.** Lists documents and references cited in this BODR. References cited in attached figures and appendices are provided in those documents and are not repeated in this section.

2 KEY DESIGN ELEMENTS

The key elements and considerations anticipated in the OM/KC dredging and restoration design that are addressed in this document include:

- Construction sequencing plan
- Identification of existing structures
- Identification and potential removal of existing debris
- Potential Dredging/Removal Methods
- Requirements during dredging/removal operations
- Engineering controls and monitoring
- Dredging and backfilling plan
- Dredged sediment and debris material handling plan

2.1 Construction Sequencing Plan

A proposed construction sequence will be presented in the plans and specifications of the FD based on the project objectives, remedial approach, site constraints tides/weather/climatic conditions and any permit/regulatory requirements. The following sequencing has been assumed for the BODR.

- Mobilization and site preparation
- Erosion and sedimentation control and resuspension control installation for dredging
- Dredging/isolation cap and sloped shoreline
- Final site restoration

Additional construction sequence considerations will be evaluated during the FD, and subsequently the contractor's work plan submittal will be reviewed in compliance with the specifications.

Activities that could disturb the river bottom outside of the installed Nearshore and OM/KC turbidity curtain or cofferdams/berms will be performed during the work window (September 1 through January 15) established by the NYSDEC and in accordance with the outcomes established during the May 15, 2020 meeting with the NYSDEC regarding proposed construction sequencing and methods of in-water remedial construction work activities (NYSDEC 2020), with the following exceptions, as provided in the Construction Methods Memorandum:

- Staging and installation of turbidity curtain piles can be performed between August 1 and August 31.
- Barges can be mobilized to the Site and spudded in at offshore locations at any time. However, pre-dredging to provide additional draft for barges will not be permitted outside the work window and turbidity curtain.
- Temporary floating docks can be spudded in to prepare for the dredging and upland work at any time.
- Barge transport and loading/offloading of materials and waste can be performed at any time.
- Depth sounding for survey can be performed at any time.
- Barges and temporary floating docks can be demobilized at any time.
- Upland work can be performed at any time.

Once the turbidity curtain and/or or cofferdams/berms are installed across the access to the Hudson River in Construction Season 1 and managed, work within the turbidity enclosures can proceed independent of the work window, year-round. Such activities may include but not limited to:

- Removal of existing dock piles and other obstructions to remedial dredging.
- Demolition and removal of bulkheads, piles, foundations, and platforms along the site shoreline, as necessary.
- Installation of measures to temporarily stabilize shorelines adjacent to targeted dredging in OM/KC, such as establishing offsets and/or pre-excavation, as necessary.
- Dredging and backfilling of the OM/KC remedial areas.

2.2 Identification of Existing Structures

The OM/KC area, as shown on Figure 2-1 (in Section 2.3), contains a visible array of timber piles and wooden dock remnants bordering the northern side of the OU1 Site and extending into the OM/KC remediation area. In addition, the remnants of two boat houses are located near the center of the OM/KC remediation area. There is also a sunken wood-framed vessel partially visible just north of the tennis courts. The sediment removal near the pile supported docks of the tennis facility will be evaluated for protection during final design.

Based on available historic aerial photographs, prior surveys completed in OU2, and interviews with individuals familiar with this portion of the Site, it is likely the remnants of the structures observed in the Old Marina and part of Kinnally Cove may be present below the mud line and at depths associated with the proposed remedy for this area of the Site. A majority of these former structures were constructed of wood, such as large timbers and docking, and as confirmed by the companies with expertise in surveying river bottoms, wood is not readily detected using the survey techniques described above.

Other unknown debris could include rock, metal, brick, concrete, rope, wood/timbers, wire, and other miscellaneous debris from former activities. If there is other evidence of potential metal present in this part of the Site, magnetometers could provide additional information. However, the benefits of such an investigation would likely be minimal based on past surveys and based on what is anticipated to be found. Additionally, these techniques might detect the presence of a metallic object, but not necessarily its size

and shape. Intrusive probing is an option but would be limited to the first object encountered for each probe location, preventing a full understanding of the profile to the depth of the proposed remedy.

The contractor may elect to perform a pre-dredging evaluation to the extent practicable, if needed for their approach to debris removal. Any further evaluations of existing structures at the Site will be performed in coordination with NYSDEC.

A review of utilities in the area will be performed with a combination of historic research, contacting 811 One Call, and non-destructive testing, if deemed necessary, to locate known utilities in the area. If the research shows unknown or unlocated utilities/debris, further field investigation could include sonar, magnetometer, or ground penetrating radar, as applicable to define the location of materials in the sediment.

It is assumed that the sunken vessel and boat house structures will remain in-place. It is assumed that sediment comingled with debris and structures that remain in-place will be removed to the extent practicable. Select timber piles may be removed within the dredge area of the Old Marina to a minimum of 2 feet below removal elevations to the extent necessary to support dredging and backfill placement.

Shoreline structures north of OU1 may fall within the protective offset and slope area and therefore may not need to be removed. Further geotechnical and structural methods will be used to protect timber pile-supported docks to the east adjacent to the tennis courts. Methods will include offsetting and sloping of the dredge prism in these areas. A study will be undertaken in the FD to determine a safe distance to dredge near these usable structures.

2.3 Identification and Potential Removal of Existing Debris

If debris is encountered during dredging operations, such obstructions may consist of metal/wood or other unnatural materials submerged beneath the sediment surface. The debris will be removed to the extent practicable, or removal will be terminated upon refusal. The equipment and techniques used to remove timbers and similar large debris must be used on a manner that effectively minimizes resuspension of sediments to the extent practicable. Vibratory removal methods may also be considered.

It is anticipated that the potential equipment and methods could include long-reach excavators or cranes fitted with a hydraulically actuated bucket, shear cutter or grapple attachment. The equipment could be aboard a spud barge or on swamp mats, with support by transport barges, trucks, or similar equipment. Removed debris would be placed in an upland staging area for processing and sizing. Sediment and water retrieved with the debris will be contained and managed for off-site disposal. If debris removal is performed in the wet, the contractor will be required to install necessary turbidity controls and perform turbidity monitoring as described in Section 2.6. Debris removed during construction will be managed as described in Section 2.8.1.

The FD specifications will require the contractor to have contingency measures in place during dredging operations to facilitate removal of unknown debris. Removal techniques encountering refusal on hard substrate, such as the historical jetty, will terminate removal activities in those areas.

As shown in Appendix C – Sediment Removal Evaluation, evidence of debris fields located in the central portion of OM/KC and along the southeastern shoreline can be identified by the irregular contour lines

within the dredge extents. In addition, these debris fields can be viewed through satellite imagery at low tide as shown on Figure 2-1 below.

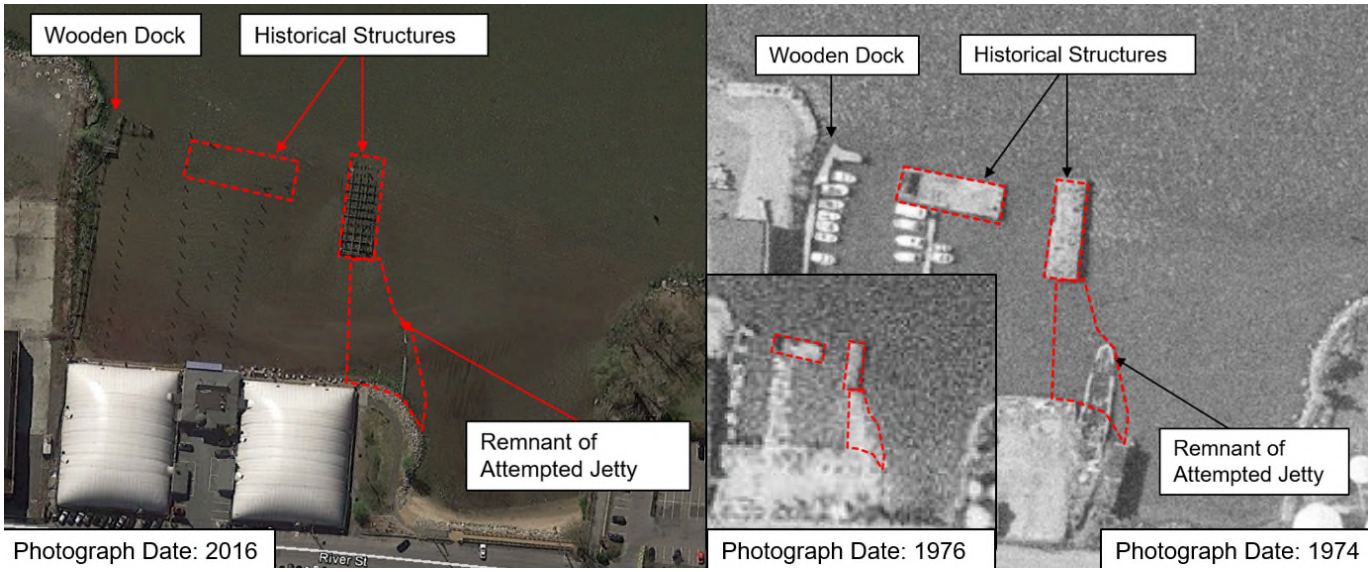


Figure 2-1: Visible debris in Old Marina/Kinnally Cove at Low Tide 1974, 1976 and 2016

2.4 Potential Dredging/Removal Methods

A variety of potential methods or a combination thereof could be used to remove sediments from the OM/KC area. The objective is to safely remove material while controlling disturbance of this area below the target elevations. Potential removal methods may include:

- Mechanical dredging (e.g., without dewatering); and/or
- Temporary dewatering and removal of sediment in the dry

Due to the shallow mudline in the OM/KC area, it is anticipated that removal of sediment in select areas may require a combination of methods described herein. If the contractor elects to perform removal of sediment in the dry, the contractor will be required to submit the design of temporary dewatering methods and appurtenances (e.g., cofferdams and/or berms) to the Engineer for approval. Additionally, the contractor may propose alternate methods not presented in this BODR for Engineer approval.

Further evaluation of limitations related to dredge access and methods will be evaluated in the FD. An overview of the dredging methods that will be evaluated in the FD are presented in the sections below.

2.4.1 Mechanical Dredging (without dewatering)

Mechanical dredging would require removal within OM/KC following the installation of turbidity curtain(s). Removal methods within the turbidity curtain could include:

- Mechanical dredging with long reach excavators and/or amphibious excavators along the shoreline and in shallow mudflat areas
- Barge or crane/swamp mat-mounted excavators for in-river areas
- Environmental bucket mounted on a wireline crane

If a traditional dredge and scow operation is selected, it would need to work its way into the shoreline from the Hudson River before offloading any material from the OM/KC area, which would result in reduced process efficiency. This could also result in over-dredging of the OM/KC sediments that are already designated for remedial dredging due to the clearance required for boat/barge draft. Another goal is to minimize the disturbance of sediment by the removal operations.

Installation of temporary ramps, access roads, and crane mats or dewatering of select areas of OM/KC may be required if the dredge area cannot be accessed by barge due to draft limitations or if the area cannot be reached with equipment from the shoreline. Further evaluation of limitations related to dredge access will be evaluated in the FD.

Water quality requirements must be maintained as monitored outside the turbidity curtain to the river. Methods to minimize turbidity could include environmental buckets used for dredging unless debris or sediment conditions prevent their effective use. The FD specifications will require that the contractor provide alternative methods in a Turbidity Mitigation and Control Plan. Acceptable alternatives include removal of obstructions with excavator or crane fitted with grapple and shear cutting or vibratory removal of existing wood piles. A digging bucket (aka a hinged clamshell bucket with teeth) will be used in difficult conditions and will be replaced by an environmental bucket as soon as practicable.

Following removal of sediment from OM/KC, the material will be staged and handled as described in Section 2.8.

2.4.2 Temporary Dewatering and Removal of Sediment in the Dry

Temporary dewatering and removal in the dry may help facilitate removal in areas that cannot readily be accessed by barge due to draft limitations, debris, or if the area cannot be reached with equipment from the shoreline. Temporary dewatering and removal of sediments in the dry would require installation of temporary dewatering structures prior to removal of the sediment in OM/KC. Temporary dewatering could be implemented with the use of cofferdams and berms. Following installation of these structures, sediment can then be removed in the dewatered condition. Given that the removal of sediments under this approach would be performed in the dry, no turbidity monitoring would be required after the placement of the cofferdams and berms. In addition, it is understood that once the cofferdam/berms are installed work could proceed outside of the work windows required for dredging in the wet.

Installation of temporary ramps, access roads, and swamp/crane mats within OM/KC may also be required to access and remove sediment in the dewatered area. Sediment can be removed from the dewatered area using excavators, articulating low ground pressure dump trucks, tracked dump trucks and other ancillary equipment. Following removal of sediment from OM/KC, the material will be staged and handled as described in Section 2.8.

2.5 Requirements During Dredging/Removal Operations

During dredging/removal operations, the following minimum requirements will be provided in the FD specifications:

- Dredge operations will be executed such that disturbance is minimized (e.g., removal from the top of slope to toe of slope and removal of dredged material in one continuous motion through the water column).
- Dredge equipment specifications will promote the use of closed buckets or acceptable alternatives to limit the creation of turbidity. Acceptable alternatives will be used under circumstances when environmental bucket use is not considered feasible. Alternatives could include a fixed arm hydraulic excavator dredge, clamshell bucket controlled either hydraulically or via wire line and a bucket ladder dredge. Although unlikely, hydraulic types of dredge equipment could be operated in this area for removal, however the material handling may require additional consideration.
- Decanting of the dredge bucket will be minimized and will be within the turbidity curtain. Material will be immediately loaded into a truck, scow, or other conveyance to be brought to an upland staging area for gravity dewatering and subsequent water treatment. Free water from the sediments will flow by gravity to a sump in the staging area and sent to the on-site water treatment plant or a publicly owned treatment works (POTW). Further details of the water handling and treatment for the entire project will be addressed in the FD.
- Decanting of barges is an activity that may be allowed under certain circumstances. In practice, barges that have been allowed to sit overnight or for a period to account for settlement of turbid waters may be carefully decanted within a curtain if the water is visibly clear or below specified turbidity limits.
- Qualification requirements for equipment operators will be submitted by the Contractor prior to the start of construction.
- Maintaining pollution prevention and waste minimization programs from initiation of mobilization activities to project close out.
- Maintaining good site housekeeping practices.
- Utilization of low emission diesel equipment and fuel.
- Reducing project emissions by minimizing idle time for equipment by shutting down equipment not being actively used.
- Using environmentally acceptable lubricants for oil-water interfaces, to the extent practicable.

2.6 Engineering Controls and Monitoring

Engineering Controls includes the installation of a turbidity control system and water quality monitoring for sediment resuspension and COCs during construction.

The turbidity control system design will be developed in the FD and will consist of a turbidity curtain extending across the opening to the Hudson River from OM/KC for the completion of dredging in the wet.

In the event that cofferdams/berms are used to allow for dredging in the dry, no turbidity control system or monitoring would be required for these areas.

Design of the turbidity curtain will consider but not limited to the following parameters:

- Water depth
- River velocity
- Location and orientation to tidal flow
- Anchoring

Turbidity controls will be maintained, and additional methods may include but may not be limited to additional turbidity curtains to meet the turbidity limits in the river as established in the FD. Measures considered in the FD and incorporated into the contractor specifications to minimize disturbance of sediment within the OM/KC area will include establishing temporary structures to dewater select areas for removal with conventional equipment, and/or use of contractor specific alternative construction methods to be reviewed by the Engineer.

Draft limitations in shallow portions of OM/KC may result in additional disturbance and sediment resuspension due to propeller wash. To mitigate resuspension in these areas, a second offloading structure will be considered within the OM/KC area to limit travel times from the removal areas and prop wash disturbance from longer travel distances. In addition, the second offloading structure will limit the need to modify the turbidity curtains (e.g., gate installation). The proposed offloading area is further described in section 2.8.3.

2.6.1 Plan View

The proposed location of the turbidity control system is presented in the Appendix B – OU2 OM/KC Drawings. It is anticipated that a turbidity curtain will be fixed with the use of pipe or H-piles within the river and anchored to the shoreline at the southern end of the Old Marina near the Northeastern Area (NEA) bulkhead and the public park area north of Kinnally Cove.

2.6.2 Curtain Type Specifications

The turbidity control system will consist of a floating turbidity curtain that will accommodate the water depths in the OM/KC area. Due to the tidal conditions present at the Site, it is assumed that a Type 3 DOT turbidity barrier will be required. A Type 3 turbidity or silt curtain is suitable for use in tidal zones, rivers, and bays. Filter cloths will be specified in the design relative to the type of sediment present. Relative permeability of the fabric will also be considered in the FD. Additionally, the following minimum requirements for turbidity controls will be provided in the FD specifications:

- Turbidity curtains will be in place during activities that may disturb the sediment surface in the Nearshore and Backwater areas of OU2.
- Turbidity curtains will be designed long enough to cover the full length of the water column, while allowing for accommodation of tidal fluctuations.
- Oil booms will be added, as necessary, to address potential sheens.

- Turbidity curtains will be anchored such that movement is minimized in the presence of tidal action and vessel wakes.

2.6.3 Turbidity Monitoring and Methods

A Water Quality Monitoring Plan will be developed during the FD that will include monitoring activities for turbidity and other NYSDEC-specified parameters outside the curtain including required constituents, frequencies, and the corresponding action levels for the entire project. Turbidity monitoring, including baseline monitoring before the initiation of in-water construction activities, will be performed based on the Plan requirements during dredging and cover placement activities. It is anticipated that stationary and mobile turbidity monitoring will be performed before the start of construction activities to capture changing flow directions.

The location, equipment for, and frequency of monitoring will be indicated by the specifications in compliance with Plan requirements. Construction activities that are subject to monitoring requirements include dredging activities, removal of large debris fields, backfilling, armoring, cofferdam construction, or any activity that may cause resuspension of bottom sediments. Construction activities will be routinely monitored in accordance with the FD specifications, agency permitting requirements, supplemental plans, and contractor work plans.

The FD design specifications will require the contractor to provide the following for areas to be dredged in the wet:

- A Turbidity Mitigation and Control Plan for the shoreline and OM/KC areas. The plan will include specific information on the turbidity curtain and temporary pile types and design, materials list, installation methods, navigational safety devices, and best management practices. Turbidity curtains shall at a minimum comply with Type 3 curtain specifications for deployment in tidal rivers.
- A contractor based or third-party company to operate the monitoring equipment, record the results and report information to the construction team (Engineer, owner and NYSDEC).
- A Monitoring and Maintenance Plan for the turbidity curtains. The plan shall include regular inspection for damage or potential compromise due to impacts such as debris, wake damage, and storm surge. The turbidity curtain system shall be inspected at the start of the workday and a minimum of once per shift, and material shall be removed whenever debris appears to have fouled the curtain. Inspection shall include but not be limited to the fabric, floats, seams, and anchors for integrity. Dredging and related turbidity generating work shall stop until repairs are completed.

A comprehensive water quality monitoring program including contingency measures will be developed based on environmental monitoring performed at similar remediation sites in the lower Hudson River region for areas to be dredged in the wet. Turbidity contingency measures related to draining over the water column will be based on requirements in the Water Quality Monitoring Plan and Turbidity Mitigation and Control Plan. Based on our call with DEC on October 29, 2020, it is understood that the water quality monitoring program will be based on the following:

- Water quality monitoring outside of the turbidity curtain will be required at the edge of the 500-foot mixing zone.

- Contingency measures will be implemented if elevated water quality readings exceed action levels provided in the Water Quality Plan.
- A sampling program for water column sampling for constituents of concern will be developed in the FD.

Further, comments received from NYSDEC on March 15, 2021 (Appendix A), stated that "while developing the monitoring plan please note that the Department uses total suspended solids, polychlorinated biphenyl (PCB) and metals monitoring, in addition to turbidity, for determining compliance." In our April 14, 2021 meeting with NYSDEC, AR agreed to provide NYSDEC with an early submittal of the monitoring plan framework, with proposed parameters and action levels, prior to submittal of the FD.

Typical contingency measures, in increasing levels of response; could include revisions to production, revisions to the construction methods, changes to construction sequencing, implementation of additional engineering controls or stoppage of work until the readings comply. General contingency measures could include options to modify dredge operation, such as fall height, cycle time, bucket handling procedures, or use of a rinse tank. The Contractor will be required to have contingency measures on site and will be prepared and have equipment readily available to implement additional engineering controls.

2.7 Dredging and Backfilling Plan

2.7.1 Purpose

Dredging and backfill of approximately 4.1 acres in the OM/KC area will be performed, as shown in Appendix C. Based on the historical documents and the pre-design sampling, additional confirmatory sampling will not be required following dredging. Boundary confirmation will rely on existing data and any additional pre-dredging boundary verification survey that may be performed at the discretion of the Engineer during the construction phase. Dredge prism slopes will be determined during the FD.

2.7.2 Dredge Extents and Elevations

Sediment will be removed from areas that contain PCB concentrations greater than 1 mg/kg, to a maximum excavation depth of 6 feet. In general, sediment will be removed to depths ranging from 3 to 6 feet below sediment surface based on surface elevations documented during the Pre-Design Investigations. This area generally corresponds to a water depth of less than 15 feet and a distance from the shoreline into the river of approximately 250 to 350 feet. Dredge extents and removal depths are presented in Appendix C.

2.7.2.1 Removal of Sediment in the Wet

During the FD, removal extents will be developed in the form of dredge prisms based on removal methods performed in the wet, existing sample data and corresponding elevations at the time of sampling. For construction, the contractor will be provided with a set of removal grades to be achieved as part of the RA in the form of electronic x, y, z dredge prism files. The existing bathymetric data and survey will be used to develop a dredge prism for construction using the following procedures:

- Evaluate dredging stability.
  - Incorporate the proposed dredge prism, including an assumed approximately 6-inch overdredge.
  - Adjust horizontal boundaries of removal areas where setbacks are required due to structural considerations (e.g., existing slopes and structures).
  - Estimate the slope anticipated during dredging between dredge cells based on the natural angle of repose of the material.
- Apply sloping to perimeter of dredge areas.
  - The preferred dredge slope will be determined as part of the final geotechnical evaluation to minimize the potential for sloughing and destabilization of the removal areas prior to backfill. The final geotechnical evaluation of slope stability during dredging will be completed in the FD phase. Backfilling to a stable elevation will be performed prior to demobilization of a given construction season.
  - Adjust removal grades within the areas for constructability (i.e., smooth dredge prism contours).
- Once the above procedures are implemented, select cross-sections will be cut through the dredge areas to create construction cross-section drawings for inclusion in FD.

2.7.2.2 Removal of Sediment in the Dry

For removal of sediments in the dry, through the use of cofferdams/berms, the contractor will be provided with the same set of removal grades to be achieved as part of the RA. The existing bathymetric data and survey will be used to determine the elevations of the cuts in the respective areas while accounting for the following:

- Adjust horizontal boundaries of removal areas where setbacks are required due to structural considerations (e.g., existing slopes and structures).
  - Apply sloping to perimeter of removal areas, as necessary, to achieve removal depth requirements. The preferred slope for removal areas will be determined as part of the final geotechnical evaluation to minimize the potential for sloughing and destabilization of the removal areas prior to backfill. The final geotechnical evaluation of slope stability during dredging will be completed in the FD phase. Backfilling to a stable elevation will be performed prior to demobilization of a given construction season.
  - Estimate the slope anticipated during dredging between dredge cells based on the natural angle of repose of the material.
- Adjust removal grades within the areas for constructability.
- Have dredged areas surveyed to confirm minimum depths are achieved.
- Contractor to provide plan with surveyed elevations of final dredging that is signed and sealed by a professional Surveyor.

2.7.2.3 Approved Consolidation of Dredged Sediments in OU1

In a Beneficial Use Determination (BUD) request provided by ARCO on March 11, 2020, and revised on August 14, 2020, dredged sediments exhibiting concentrations of PCBs equal to or less than 10 ppm have been proposed for use as subgrade backfill material in OU1. NYSDEC reviewed the memos and agreed with the proposed separation and subsequent placement of this material but will not be issuing a BUD. However, the Department approved the materials described in the BUD request to be consolidated within the OU1 remedial boundary of the site and placed beneath a demarcation layer. This material will still need to be evaluated for constructability (NYSDEC March 15, 2021). The combined dredging subareas identified for on-site material consolidation as presented in the August 14, 2020 Beneficial Use Evaluation Memorandum (Appendix D; Sovereign 2020) equal approximately 28,000 cubic yards of dredge sediment within a total of 3 acres of OM/KC. Dredge prism boundaries will be finalized in the FD and will delineate dredge areas containing sediments that meet the segregation criterion of ≤ 10 ppm PCBs. In addition, the FD will specify constructability requirements for these materials.

2.7.3 Shoreline Protection

Shoreline stability, particularly for shoreline areas with existing structures and bulkheads adjacent to the dredge areas, will require geotechnical evaluation. The FD will apply setbacks based on the dredge and backfill extents defined in Appendix C and protection of shoreline structures, where applicable, to avoid creating shoreline instability as a result of dredging. Figure 1 presents conceptual cross-sections with shoreline protection by incorporating dredging offsets and approximately 3:1 (H:V) slopes along the perimeter of the removal areas adjacent to the shoreline. Anticipated structures to be addressed in place include the eastern shoreline bulkhead and pile-supported concrete slab adjacent to the tennis courts in the southeastern portion of the Old Marina, northern shoreline of OU1 and structures within the public park on the northern shore of Kinnally Cove.

Additional analyses will be performed during the FD to establish the final slopes along dredge cuts and final dredging offsets adjacent to shoreline structures. Figure 1 presents the anticipated dredging and backfill scenarios along the OM/KC shoreline. Additional investigations and data analysis related to shoreline stability may be required prior to implementation of construction activities. In addition, the contractor may propose alternate shoreline protection methods not presented in this BODR for Engineer approval.

2.7.4 Backfilling Plan Assumptions

The proposed backfill plan is presented in Appendix C and Figure 1 and assumes one of the following backfill options will be used based on underlying PCB concentrations:

- Habitat layer
- Isolation/armoring layer with a habitat layer

Based on the findings of the hydrodynamic study and morphodynamic modeling (Stantec 2018), the remedial area is within a depositional zone. According to the hydrodynamic study, “The model predicts that one foot of deposition will occur in under two years in most areas, and that one foot of deposition will occur in less than one year in Old Marina and Kinnally Cove” (Stantec Consulting Services Inc. 2018).

As agreed to in correspondence from the NYSDEC on February 4, 2020, backfill may be placed to within 1 foot of pre-dredge grades pending input from the Village. However, Atlantic Richfield has assumed herein, and will propose to the Village, that backfill will be placed to within 2 to 5 feet of pre-dredge elevations, which will allow restoration to continue via natural deposition. The FD will specify final backfill grades following engagement with the Village and subsequent NYSDEC approval. Monitoring of depositional areas will be performed at regular intervals following completion of the RA. Monitoring details will be included in the FD. Specifically, it is assumed that the remedial areas will be backfilled based on underlying post-dredge PCB concentrations and includes the following:

- Underlying PCB concentrations less than or equal to 1 mg/kg total PCBs – Backfill with 12 inches of habitat layer
- Underlying PCB concentrations greater than 1 mg/kg total PCBs – Backfill with 12 inches of isolation/armoring layer and 12 inches of habitat layer

This approach will be discussed with the Village and will require NYSDEC approval.

The design basis for the selection and placement of underwater capping materials will consider the following geotechnical and hydrodynamic parameters:

- Consolidation
- Cover Stability
- Scour
- Mud-waving

Materials that are compatible with the aquatic habitat and resistant to scour will be evaluated in the FD and specified based on the data obtained during the hydrodynamic study and morphodynamic modeling (Stantec 2016 and 2018), and the pending Biological Assessment and Essential Fish Habitat Reports.

The isolation cap material will be placed over the area as measured by a bathymetric survey for backfill placed in the wet and topographic survey, for backfill placed in the dry, following placement. It is assumed that the cover will be placed mechanically; however, hydraulic equipment may provide increased control of material placement. Cap placement may occur with the same equipment used for dredging following decontamination of the equipment. Construction activities and equipment operation will be managed to minimize resuspension during placement.

2.8 Dredged Sediment and Debris Material Handling Plan

It is projected that dredge material will contain sediment, debris, and water. Depending on whether the work is performed in the wet or dry, the dredged/excavated material will be collected with an environmental/closed bucket, excavator or other approved methods and directly loaded onto barges/ dump trucks. The application of water treatment for water available from the sediment will be evaluated during the FD. Debris will be sorted from the remaining sediment. The remaining sediment will be allowed to gravity dewater for a period of time, and then will likely need to be blended with stabilizing agents or drier soils from the upland excavation to meet transport and disposal requirements (e.g., paint filter test). Sediment will be segregated for handling by the following categories, Toxic Substances Control

Act (TSCA) classified non-TSCA classified and onsite consolidation material. Further evaluation of material classification will be performed during the FD and will be based on existing sample data and the approval, referenced above, of the on-site consolidation material plan. Supporting documents will be prepared to delineate areas containing material that can be used for on-site reuse and areas containing material that will need to be disposed of off-site.

It is anticipated that sediments will be delineated based on the following segregation classifications:

- TSCA for Off-site disposal: PCB concentrations greater than or equal to 50 ppm
- Non-TSCA for Off-site disposal: PCB concentrations less than 50 ppm and greater than or equal to 10 ppm
- Consolidation in OU1: PCB concentrations less 10 ppm

Following delineation of material based on the above classifications, depth and sequencing of removal will be evaluated in the FD to prevent cross contamination between material classes during handling operations.

TSCA classified sediment will be stabilized before transport and disposal to the selected permitted disposal facility. Non-TSCA classified sediment with be separately stabilized before transport and disposal to an appropriately permitted disposal facility. Sediments with pre-confirmed levels of PCBs less than or equal to 10 parts per million have been delineated in the Beneficial Use Evaluation (Sovereign 2020) provided in Appendix D. These materials are approved by NYSDEC for consolidation as backfill in OU1 below the demarcation barrier and cover system (NYSDEC March 15, 2021). Handling of dredge sediment and debris material will be performed in a manner that will avoid comingling of separately profiled waste material and on-site consolidation material.

2.8.1 Management of Debris

It is assumed that debris that will be encountered within the dredge area may include woody vegetation, scrap metal, rubbish, and other items typically found in an industrial waterway. Based on the quantity of debris anticipated, the contractor will perform debris removal prior to and concurrently with dredging operations. Debris will be sized and segregated prior to disposal to meet transport and disposal facility requirements.

It is assumed that non-porous debris will be decontaminated to the extent required for offsite recycling or non-TSCA disposal based on cost and practical handling considerations. The primary objective of debris decontamination is to allow debris disposal as a non-TSCA waste. Debris decontamination can also allow the materials to meet requirements for recycling and avoid the need for landfill disposal. Only non-porous debris will be considered for decontamination and recycling because porous debris, such as wood, concrete, pitted metals, and fibrous material, cannot be readily decontaminated due to its porous or irregular surface. Ferrous materials are generally the most common debris materials likely to be effectively segregated for decontamination and subsequent recycling. Other recyclable materials, such as glass, tend to be too small to segregate effectively. As a result, segregation of these smaller materials is not anticipated.

Debris is planned to be initially classified consistent with the surrounding sediment; however, additional waste characterization may be required by the proposed receiving facility before being accepted and

approved for transportation and disposal. Under circumstances when additional waste characterization data are necessary to support completion and approval of a waste profile(s) before off-site transportation and disposal, removed debris would require staging at a designated upland area of the Site. Existing waste characterization data at the time of removal will be used to the extent possible. Additionally, if debris is generated that is potentially TSCA-regulated or does not conform to the waste characterization of the surrounding sediment, that debris will be segregated, additional debris decontamination and waste characterization of the debris will be performed. Upon characterization, the debris will be managed in accordance with applicable solid waste regulations (including, but not limited to; storage, labeling, and manifesting).

2.8.2 Management and Stabilization of Dredge Sediments

The contractor will be required to segregate TSCA-regulated material (>50 ppm PCBs), non-TSCA-regulated material >10ppm PCBs, and on-site consolidation material ≤10 ppm PCBs, including equipment used to handle such material, throughout the removal and handling processes.

Previous bench-scale testing performed for OU1/OU2 soils and sediment showed that gravity dewatering alone will not be sufficient, and additional stabilization will be required with the potential for additional stabilizing agent (Arcadis 2017). Stabilization testing conducted with on-site sediment indicated the following:

- Wet soils from selected locations can be stabilized with Portland cement for use as on-site fill.
- Sediments were successfully stabilized with several agents (including Portland cement, cement kiln dust, and lime kiln dust) for off-site disposal.
- The addition of similarly classified drier on-site soils to dewatered sediment at rates of approximately 1:1 will allow the mixture to be transported off site for disposal without the need for additional stabilization agents.
- Stabilization agent rates can be eliminated or reduced with the addition of on-site soils.
- Materials handling for on-site consolidation will be based on the final location and method of placement with required properties developed in the FD.

Management of OM/KC sediments assumes that the dredge material will require stabilization methods similar to those identified during the OU1/OU2 bench scale testing. Additional treatability studies may be performed during construction to determine other options related to management and stabilization of dredged material.

Dredge material will be stabilized in a designated staging area where it will be blended with stabilizing agents and/or upland soils before transport and off-site disposal. Temporary controls (e.g., odor control) related to dredge material management will be included in the FD. It is anticipated that the stabilized materials will be transported off site for disposal via barge. Trucking may be limited to normal refuse, plastic and paper for recycling, and non-hazardous scrap metal and debris. Potential processing and disposal facilities will be evaluated in the FD.

2.8.3 Offloading Area on North Shore of Site

The offloading area for OM/KC is being considered at the northern end of OU1 near the former Building 52 location, as shown on Figure 2. Construction of the offloading area would be similar to that used to offload debris from the Building 52 demolition and could consist of the following:

- Spudded Flexifloats
- Temporary ramps/Access roads
- Crane mats for truck access
- Staging of a crane with direct loading into trucks/barges and/or
- Other structures to allow transfer of the dredged material and placement of backfill materials

It is anticipated that this offloading area will be used during construction activities in OM/KC, regardless of whether removal is performed in the wet or the dry. It is assumed that material will be loaded onto trucks at the north shore offloading area for transfer of material to upland locations for staging and handling.

Barge access to a temporary bulkhead on the north shore may be limited due to shallow water depths in the Old Marina. If barges are utilized, the area will likely require dredging and removal or cutting of existing timber piles prior to offloading activities to accommodate the drafts of barges and support vessels. In addition, resuspension due to propeller wash from barges and support vessels would need to be controlled to limit resuspension of sediment within the work area.

If ramps, access road, and crane mats are utilized, the transfer of dredge material and imported backfill, may require the contractor to sequence construction activities such that work can be adjusted during low and high tides. Additionally, the contractor may propose to dewater select areas within OM/KC. If dewatering prior to dredging is performed, the tidal fluctuations would have minimal impacts to activities within the work area.

In all cases, the goal is to maintain operational efficiency and safely remove material while controlling disturbance of the area. Further evaluation of the specifics of the offloading procedures will be performed during the FD.

2.8.4 Waste Transportation and Disposal

Waste generated from the RA includes TSCA-regulated and non-TSCA-regulated waste and will be classified as follows:

- Non-TSCA - PCB concentrations less than 50 milligrams per kilogram (mg/kg); and
- TSCA - PCB Remediation Waste – PCB concentrations greater than or equal to 50 mg/kg

An evaluation of off-site transportation and disposal options for the remedial soils and sediments was performed during preliminary design for OU1 and OU2. It is assumed that the transportation and disposal options for OM/KC will be consistent with the OU1/OU2 assessment. Based on that assessment, the FD will provide plans and performance specifications for transport of sediments in covered containers, loaded at the site waterfront onto barges, and offloaded to rail cars for transportation to waste management facilities permitted and approved for the particular waste streams. This method was successfully used for

removal of PCB-contaminated building materials and other demolition waste from Building 52 in 2017. Lessons learned from that process will be used to frame the FD details and performance specifications for off-site transportation and disposal of soil and sediment remediation waste.

2.8.5 Materials for On-site Consolidation

Appendix D provides the basis for segregating sediments from OU2 for subsequent consolidation as on-site fill to be placed under a demarcation barrier in OU1. As noted in Section 2.7.2.3, this consolidation strategy was approved by NYSDEC (March 15, 2021).

The evaluation in Appendix D was based on individual laboratory results for each sediment sample in 1-foot depth intervals. Areas that qualified for potential use as OU1 fill only included sediment where all overlying PCB concentrations were below 10 ppm. Individual cells and depths proposed for OU1 fill are presented in Appendix D. As shown in Appendix D - Table 2, depths of removal related to proposed OU1 fill material range from 2 to 6 feet and terminate where PCB detections are at or above 10 ppm. As shown in Appendix D - Table 1, the average PCB concentration of OM/KC sediments proposed as OU1 fill is 2.68 ppm with an estimated total quantity of 28,000 cubic yards. The extents containing this qualifying material within OM/KC are shown in green in Appendix D – Figure 4.

(Please note, as provided in correspondence to the NYSDEC dated May 6, 2021, Figure 5 in Appendix D has been revised to include 7 additional small concrete removal areas within the Building 52 concrete pad that were inadvertently omitted previously. These materials are not relevant to Old Marina and Kinnally Cove sediments, but the revision is noted).

3 PATH FORWARD – FINAL DESIGN

3.1 Design Drawings

The additional RA in OM/KC will require modifications to the OU1/OU2 Preliminary Design Drawings previously submitted in November 2017. The additions to drawings anticipated for OM/KC FD will include:

D-1 Site Layout Plan – OU2

D-2 Turbidity Controls Layout

D-3 Old Marina and Kinnally Cove Turbidity Controls Layout

D-4 Dredge Extents

D-10 Dredging Depths – Old Marina and Kinnally Cove

D-11 Restoration Elevations

D-17 Restoration Plan – Old Marina and Kinnally Cove

D-21 OM/KC Cross Sections

D-22 OM/KC Cross Sections

3.2 List of Technical Specifications

The technical specifications that are applicable to the dredging and restoration for OM/KC, will include but not limited to the following:

Section	Specification Title
Division 01 - General Requirements	
01 12 13 (01 11 00)	Summary of Work, Multiple Prime/Single Prime (Summary of Work)
01 14 00	Work Restrictions
01 30 53 (01 30 00)	Site Security
01 31 19.13 & 01 31 19.23 (01 31 19)	Project Meetings
01 33 00	Submittal Procedures
01 35 29	Contractors Health and Safety Plan (Health, Safety and Emergency Response Procedures)
01 35 43.14	Environmental Procedures for Hazardous Materials
01 35 43.18	Sustainability Requirements
01 41 00	Regulatory Requirements
01 45 00	Quality Control
01 51 05 (01 51 00)	Temporary Utilities
01 52 11	Engineer's Field Office
01 52 13	Contractor's Field Offices and Sheds
01 55 13	Access Roads and Parking Areas
01 55 26	Maintenance and Protection of Traffic (Traffic Control)
01 57 05	Temporary Controls (Odor Control, Noise Control, Erosion and Sedimentation Controls)
01 71 13	Mobilization/Demobilization
01 71 23	Field Engineering
01 71 33	Protection of Adjacent Construction
01 74 19	Construction Waste Management and Disposal
01 77 19	Closeout Requirements
Division 02 - Existing Conditions	
02 41 00	Demolition and GIB for Demolition
02 51 29	Surface Cleaning Decontamination
02 71 00	Water Treatment (Temporary Water Management System)
02 81 00	Handling, Transportation, and Disposal of Impacted Material

Section	Specification Title
Division 31 – Earthwork	
31 05 19	Geosynthetics for Earthwork
31 22 00	Grading
31 23 16	Excavation
31 23 19	Dewatering
31 23 23	Fill Materials (includes Compaction)
31 25 00	Erosion and Sedimentation Controls
31 50 00	Excavation Support and Protection
Division 32 – Exterior Improvements	
32 72 00	Wetland Restoration
Division 35 - Waterway and Marine Construction	
35 53 23	Dredging and In-Water Fill

3.3 Remedial Design/Remedial Action Supporting Plans

The 95 percent design submittal (Draft Final Design) will also include the OM/KC elements as follows:

- Community Air Monitoring Plan
- Community and Environmental Response Plan
- Remedial Action Monitoring Plan
- Health and Safety Plan
- Construction Quality Assurance Project Plan
- Beneficial Use Determinations
- Marine Assurance Plan
- Implementation Schedule
- Site Management Plan:
    - Institutional/Engineering Control Plan
    - Monitoring Plan
    - Operations & Maintenance Plan
    - Contingency Plan.

3.4 Regulatory/Permitting and Access Requirements

The RA will require consultation and coordination with the United States Army Corps of Engineers (USACE) and NYSDEC to obtain applicable permits prior to construction activities. It is assumed that implementation of the overall site remedy will require a USACE Nationwide 38 (NW38) permit and the NYSDEC Section 401 Water Quality Certification (WQC) and will include the following permits/authorizations:

- Joint Permit application submittal (USACE NW38 permit and NYSDEC WQC)
- Consultation with National Oceanic Atmospheric Administration
- Essential Fish Habitat assessment
- Section 7 Endangered Species Act consultation from the U.S. Fish and Wildlife Service
- New York Natural Heritage Program project screening
- New York State Historic Preservation Office project review
- New York State Office of General Services request and review of the Water Index Grant
- New York State Department of State review of Coastal Zone Management forms
- Federal Consistency Assessment
- State Environmental Quality Review (SEQR) form.
- TSCA – Application and associated Approvals

4 REFERENCES

Arcadis U.S., Inc. 2017. Preliminary Design Report - Harbor at Hastings Site (Former Anaconda Wire & Cable Plant Site) – Hastings-on-Hudson, New York – NYSDEC Site #3-60-022. November

Consent Decree. 2016 (Pending Signature). 2016 Modification to the 2003 Consent Decree: Hudson

Riverkeeper Fund, Inc. Plaintiff, and Village of Hastings-On-Hudson, Plaintiff, Intervenor, v. Atlantic Richfield Company, Defendant; United States District Court for the Southern District of New York, Civil Action No. 94-2741.

NYSDEC. 2012b. Record of Decisions, Harbor at Hastings, Operable Unit Number 02: Hudson River Sediments, State Superfund Project, Hastings- on-Hudson, Westchester County, Site No. 360022. March.

NYSDEC 2015. Welcome Harbor at Hastings Project Update, June. Public Presentation at Village of Hastings on Hudson, New York, June 25.

NYSDEC. 2020. Construction Methods Related to In-Water Work. Harbor at Hastings Site - NYSDEC Site #3-60-022 - Hastings-on-Hudson, New York. June.

NYSDEC. 2021. Basis of Design Submittal for Old Marina/Kinnally Cove in OU-2. Former Anaconda Plant (a.k.a. Harbor at Hastings Site) Site No. 3-60-022. Hastings-on-Hudson, New York. March 15. Sovereign 2018. Pre-Design Investigation Data Summary Report Amendment. May.

Sovereign 2019a. Supplement to the Pre-Design Investigation Data Summary Report Amendment. February.

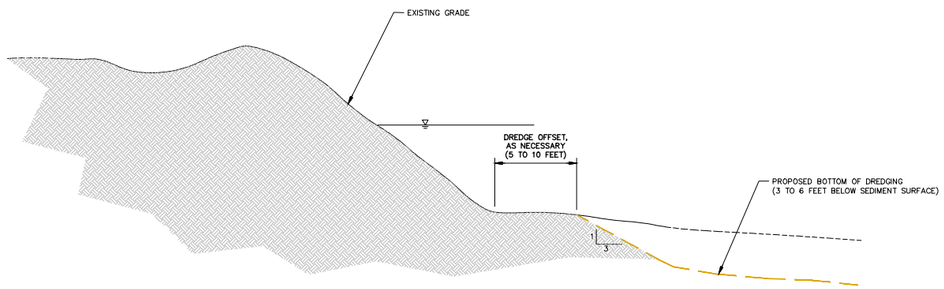
Sovereign 2019b. Additions to the Supplement to the Pre-Design Investigation Data Summary Report Amendment. March.

Sovereign. 2020. Beneficial Use Evaluation Memorandum - Former Anaconda Wire & Cable Co., Hastings-on-Hudson, NY. March.

Stantec Consulting Services Inc. 2016. Hydrologic and Hydraulic Computer Model Development. February.

Stantec Consulting Services Inc. 2018. Hastings on Hudson Hydrodynamic Study Part 2 – Morphodynamic Modeling Technical Report. December.

FIGURES



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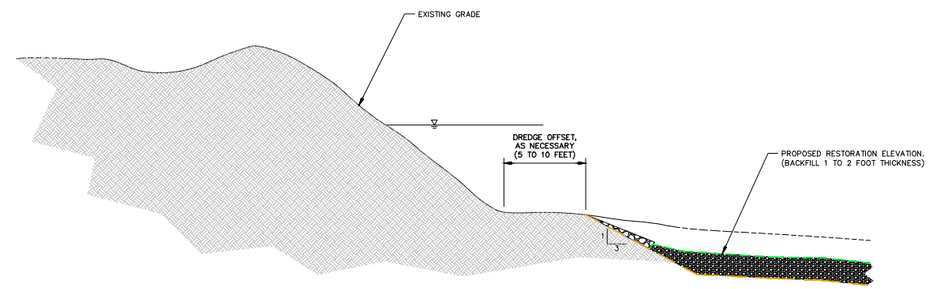

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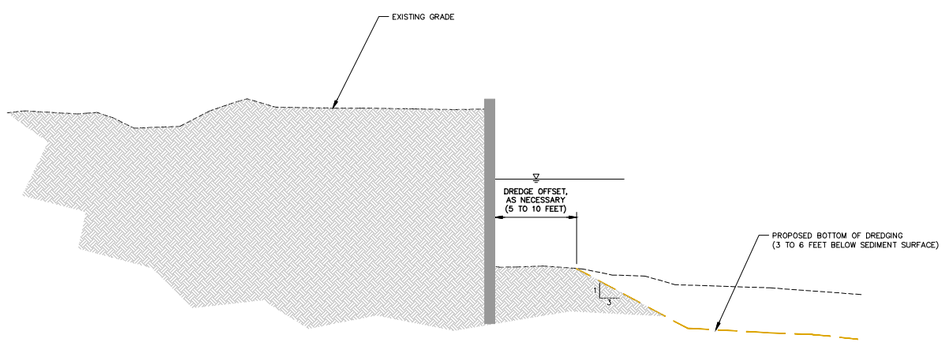

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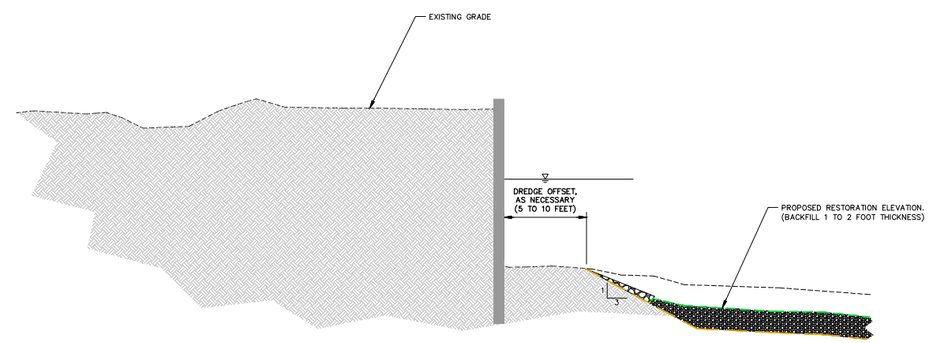

PROPOSED SHORELINE BACKFILL WITH STRUCTURES PRESENT

NOT TO SCALE

ATLANTIC RICHFIELD COMPANY HASTINGS-ON-HUDSON, NEW YORK

BASIS OF DESIGN FOR OLD MARINA AND KINALLY COVE

DREDGING AND RESTORATION

ARCADIS Design & Consultancy for natural and built assets

FIGURE

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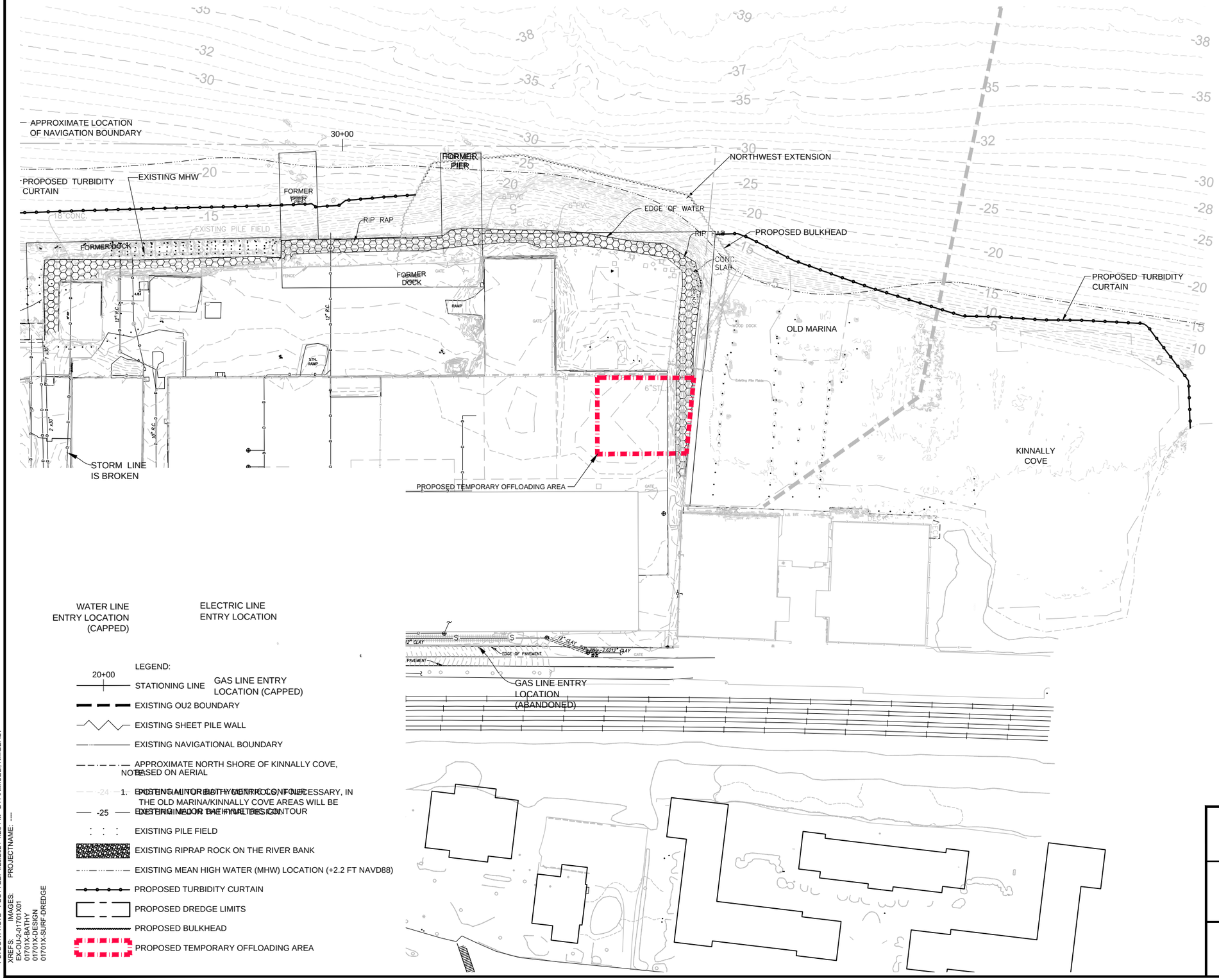

ATLANTIC RICHFIELD COMPANY
HASTINGS-ON-HUDSON, NEW YORK

BASIS OF DESIGN FOR OLD MARINA AND KINALLY COVE

PROPOSED NORTH SHORE OFFLOADING AREA

ARCADIS Design & Consultancy for natural and built assets

FIGURE

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01701X-SURF-DREDGE

APPENDIX A

Correspondence

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Remedial Bureau D
625 Broadway, 12th Floor, Albany, NY 12233-7013
P: (518) 402-9676 I F: (518) 402-9773
www.dec.ny.gov

March 15, 2021

Mr. Paul Johnson
Operations Project Manager
Atlantic Richfield Company
Remediation Management
150 W. Warrenville Road
MC 200 1E
Naperville, IL 60563

Re: Basis of Design Submittal for Old Marina/Kinnally Cove in OU-2
Former Anaconda Plant (a.k.a. Harbor at Hastings Site) Site No. 3-60-022
Hastings-On-Hudson, New York

Dear Mr. Johnson:

The Department of Environmental Conservation has reviewed the draft Basis of Design (BOD) for Old Marina/Kinnally Cove in OU-2 dated December 22, 2020 for the Harbor at Hastings site. The BOD report for the Old Marina and Kinnally Cove includes a summary of assumptions for design of dredging and restoration of the Old Marina and Kinnally Cove areas. The extent of the Old Marina and Kinnally Cove remediation area was determined based on supplemental pre-design investigation reports generated between 2018 and 2019. The Department has the following comments:

1. General Comment – Please provide the draft Turbidity, Mitigation and Control Plan and the Water Quality and Monitoring Plan to the Department as soon as possible for review prior to the 95% Final Design Report submittal. While developing the monitoring plan please note that the Department uses Total Suspended Solids (TSS), polychlorinated biphenyl (PCB) and metals monitoring, in addition to turbidity, for determining compliance.
2. Section Outcome of May 15, 2020 Meeting, last bullet - When dredging within the turbidity curtain, the practice of draining over the water column would need to be evaluated based on results of water quality monitoring outside the curtain.
3. Section 2.2 Identification of Existing Structures - Please notify the Department when preliminary evaluation of the submerged structures is scheduled to begin.
4. Section 2.3 Identification and Potential Removal of Existing Debris – If temporary dewatering and removal of sediment in the dry is a possibility, then details of the cofferdam and/or berm need to be provided to the Department prior to the 95% Final Design Report.
5. Section 2.7.2.1 – Removal of Sediment in the Wet – Provide a site plan with the area showing where the 3H:1V slope cannot be achieved and explain why those areas need a 2H:1V slope.

6. Section 2.7.2.3 Beneficial Use Considerations and Section 2.8 Dredged Sediment and Debris Material Handling Plan – The Department has reviewed the information provided in the Beneficial Use Determination request provided by ARCO on March 11, 2020 and revised on August 14, 2020. The Department will not be issuing a BUD for the reuse of these materials as backfill on the site. However, the Department approves the materials described in the BUD request to be consolidated within the OU-1 remedial boundary of the site and placed beneath a demarcation layer. This material will still need to be evaluated for constructability.
7. Section 2.7.4 Backfilling Plan Assumptions – Backfilling should be to within 1 foot of pre-dredge depths. This requirement will not change unless the Village specifically requests less backfill in the Kinnally Cove area and provides their reasoning.
8. Appendix D – Beneficial Use Evaluation Memorandum, Tables – There is an error that occurred with the tables when the pdf files were merged. The error left the tables unreadable.

Taking into consideration the comments above, please finalize the BOD report and submit for review. If you have any questions, please feel free to contact me at (518)402-9821.

Sincerely,

Jessica La Clair

Jess LaClair
Project Manager

ec: Mayor Armacost
Village Manager
Trustee Fleisig
S. Edwards, DEC-DER
J. Armitage, DEC-DER
A. Guglielmi, DEC-OGC
H. Gierloff, DEC – Region 3
A. Schimizzi, DEC – Region 3
M. Schuck, DOH
J. Nealon, DOH

MEMO

Arcadis of New York, Inc.
One Lincoln Center
110 West Fayette Street
Suite 300
Syracuse
New York 13202
Tel 315 446 9120
Fax 315 449 0017

To:
Paul Johnson,
Remediation Management (RM)

Copies:
L. Littrell
M. Gopal, Sovereign
M. Gravelding, Arcadis

From:
Lance Ketcham,
Raymond Kapp,
Arcadis of New York, Inc.

Date:
June 22, 2020

Arcadis Project No.:
30039767

Subject:

DRAFT FOR DISCUSSION PURPOSES ONLY

Construction Methods Related to In-Water Work,
Harbor at Hastings Site, NYSDEC Site# 3-60-022
Hastings-on-Hudson, New York

INTRODUCTION

This memorandum is being presented to summarize discussions and document the agreements that were clarified during our WebEx meeting with the New York State Department of Environmental Conservation (NYSDEC) on May 15, 2020 regarding proposed construction sequencing and methods of in-water remedial construction work activities at the Hastings-on-Hudson site. Prior to the May 15, 2020 meeting with NYSDEC, we provided them with a draft memorandum for discussion dated February 20, 2020 which outlined the activities, including the allowable work window during which certain site remediation activities in the Hudson River will be permitted to be performed, and measures to be performed to protect fish and wildlife during in-water work activities (Arcadis 2020). NYSDEC provided comments to the discussion memorandum via email on March 30, 2020 (NYSDEC 2020). The subject matter of the memorandum and the comments from NYSDEC were discussed during the May 15th meeting, and the conclusions are presented here for concurrence by NYSDEC. In response to a request made by NYSDEC, additional detail is presented regarding the sequencing of the Northwest Extension Area (NEA) construction and how that construction timeline affects the in-water work sequencing, and the potential methods for dredging and other remediation work within the Old Marina and Kinnally Cove (OM/KC) Area.

OUTCOME OF MAY 15, 2020 MEETING WITH NYSDEC

Several figures were presented to NYSDEC in our February 20th memorandum to generally outline the level of work that could be completed in water during several work window scenarios. Figure 2A (attached) shows the expected in-water work sequence that can be undertaken based on the amount of time agreed to in this meeting. The following is a summary of the work window clarification that was agreed to in the meeting, and details are further clarified in this memo:

- The work window will be from September 1st through January 15th. Activities subject to the work window (allowed only during the work window) are:
    - Deepwater Area dredging and backfilling, without a turbidity curtain.
    - Installation of the NEA sheet pile wall, without a turbidity curtain.
    - Any activities that could disturb the river bottom outside of the installed nearshore and Old Marina/Kinnally Cove turbidity curtains, with the following exceptions:
        - Staging and installation of turbidity curtain piles can be performed between August 1 through August 31.
        - Barges can be mobilized to the site and spudded in at offshore locations at any time. However, pre-dredging to provide additional draft for barges will not be permitted outside the work window.
        - Temporary floating docks can be spudded in, to prepare for the dredging and upland work at any time.
        - Barge transport and loading/offloading of materials and waste at any time.
        - Depth sounding for survey.
        - Demobilization of barges and temporary floating docks.
- Once the turbidity curtains are installed in Construction Season 1 and managed, all work within the turbidity enclosures can proceed independent of the work window, year-round. Such activities include:
    - Removal of existing dock piles and other obstructions to remedial dredging.
    - Demolition and removal of bulkheads, piles, foundations, and platforms along the Site shoreline.
    - Installation of measures to temporarily stabilize shorelines adjacent to targeted dredging in OM/KC, such as temporary sheeting and/or pre-excavation, as necessary.
    - Dredging and backfilling of the Nearshore and OM/KC remedial areas,
    - Completion of the NEA sheet pile wall and tiebacks within the shoreline (land-based components).
    - Construction of the intertidal marsh, including protective wave barrier.
    - Construction of the sloped shoreline, including rip-rap placement, shoreline plantings and in-river habitat enhancements such as boulders in the South Boat Slip Area.
    - All upland work.

- The turbidity curtain layout line will be as shown in the Preliminary Design (PD) at a water depth of approximately 15 feet.
- A turbidity curtain monitoring and maintenance program will be developed and implemented, as discussed in this memorandum.
- Decanting of dredge water will not be allowed outside of a turbidity curtain. Decanting may be performed within a turbidity curtain, subject to turbidity limits with necessary controls and contingency measures, as discussed in this memorandum.

NEA CONSTRUCTION SEQUENCING

Per the preliminary design plan as outlined in Appendix B of the November 2017 Preliminary Design Report (Arcadis 2017), Deepwater Area dredging adjacent to the NEA (this adjacent area is defined as the Northwest Area in Pre-Design Investigation reports) should not take place until the NEA bulkhead is installed. In developing a construction sequencing strategy for work window restrictions in the Hudson River for this project, Arcadis determined that completion of the NEA construction will require more than one work window to complete. As such, the sequencing of pile installation for the NEA sheet wall and adjacent dredging requires partial installation of the NEA wall during Construction Season 1 followed by dredging on the river side during Construction Season 2. Specifically, the river will continue to equilibrate through the open ends of the NEA wall to maintain similar water column levels on either side of the bulkhead during the Construction Season 2 dredging. This will be accomplished by leaving the ends near the existing land open after Season 1. The final NEA bulkhead sheet piles at each end of the wall would not be installed until after the adjacent Deepwater Area dredging is completed and the required excavation, backfilling and tie-back installation on the land side is ready to be begin.

Following isolation of the NEA from the river, OU1 backfill and tie-back installation is proposed to be performed, followed by three lifts of backfill placement and consolidation periods, installation of tiebacks, and construction of the groundwater treatment funnel and gate systems. Details will be included in the Final Design; however, the concept is that consolidation of each lift will be achieved by application of a surcharge load. Due in large part to the extended period of consolidation specified for each lift, at approximately 1.2 to 1.4 years each, NEA construction activities will require a minimum of approximately 4 years to complete using this technique. Below is a summary of the installation steps:

1. Install upland isolation slurry wall.
2. Install cantilever steel sheet pile wall along the bulkhead alignment, except for those areas left uninstalled to allow water to freely travel on either side of the bulkhead.
3. Install monitoring points along the NEA for survey monitoring of sheet pile positioning and allowable deflection during construction.
4. Dredge down to 6 ft below sediment surface (bss) in areas with impacted sediment on the riverside of the bulkhead.
5. Backfill dredged areas in front of the NEA.
6. Install remaining sheet piles to isolate NEA from the Hudson River.
7. Fill behind sheet pile wall with lightweight aggregate lifts and allow for monitored consolidation.
8. Monitor consolidation to determine the timing of the next lift of backfill.

9. Add additional fill to account for settlements and to reach elevations to facilitate tieback installation.
10. Install tie-rods connected to anchor wall on existing upland portion of the site.
11. Fill behind bulkhead to proposed final elevation with lightweight aggregate.

The turbidity curtains for the Nearshore and OM/KC areas will terminate near the NEA bulkhead walls. Upon completion of step 2 (above) and installation of the turbidity curtains, the open ends of the bulkhead will be isolated from the Hudson River by the turbidity curtains.

OM/KC DREDGING AND WORK ACTIVITIES

A variety of potential methods or combination thereof could be used to remove sediments from the OM/KC Area. The objective in all cases is to safely remove material while controlling disturbance of this area below the target elevations and maintaining turbidity levels outside the main turbidity curtain in the river.

Due to the shallow mudline in the OM/KC Area, if a traditional dredge and scow operation was selected, it would need to work its way into the shoreline from the Hudson River before offloading any material from OM/KC Area onto the Old Marina shoreline, resulting in reduced process efficiency. This could also result in over-dredging of the OM/KC sediments already designated for remedial dredging due to the clearance required for boat draft. Other concerns include disturbance of sediment by operations.

Measures will be considered in the final design and incorporated into the contractor specifications to minimize disturbance of sediment within the OM/KC Area, including dredging accessible areas from the shoreline, establishing temporary structures to dewater select areas for removal with conventional equipment and/or use of contractor specific alternative construction methods to be reviewed. Turbidity controls will be maintained, and additional methods may include but may not be limited to more turbidity curtains to meet the turbidity limits established in the final design. A second offloading structure will be considered within the OM/KC Area to limit disturbance and travel times from the removal areas.

MONITORING CONTROL MEASURES

Construction activities will be monitored in accordance with the Final Design specifications, agency permitting requirements, supplemental plans, and contractor work plans. Additional detail regarding monitoring and control measures, as discussed during the May 15th meeting, are presented below:

- Piles will be driven with a vibratory hammer to the extent practical to reduce underwater sound energy. It is anticipated that limited use of an impact hammer may be necessary to drive piles to design depth to overcome obstructions or refusal to vibratory methods. Mitigation measures for hammer driving may include limiting the hours-per-day of hammering.
- Monitoring for deflection along the NEA bulkhead shall be performed. Bulkhead monitoring requirements will be specified during Final Design and included in the Remedial Action Monitoring Plan.
- Deepwater Area dredging and backfilling will be performed without a turbidity curtain but with best management practices (BMPs) implemented, including but not limited to an environmental bucket, no decanting, and control of the bucket position passing through the water column.
- In the design specifications, the construction contractor will be required to provide:

  - A Turbidity Mitigation and Control Plan for the Deepwater Area consisting of specific BMPs to be implemented to mitigate turbidity during dredging.
  - A Turbidity Mitigation and Control Plan for the shoreline and OM/KC areas. The Plan shall include turbidity curtain and temporary pile types and design, materials list, installation methods, navigational safety devices, and BMPs. Turbidity curtains shall at a minimum comply with Type 3 curtain specifications for deployment in tidal rivers.
  - A Monitoring and Maintenance Plan for the turbidity curtains. The plan shall include regular inspection for damage or potential compromise due to impacts such as debris, wake damage, and storm surge. The turbidity curtain system shall be inspected at the start of the workday and a minimum of once per shift, and material removed whenever debris appears to have fouled the curtain. Inspection shall include but not limited to the fabric, floats, seams, and anchors for integrity. Dredging and related turbidity generating work shall stop until repairs are completed.

- Contingency measures shall be implemented if elevated turbidity readings are noted at a monitoring location. All monitoring locations will be outside the main turbidity curtain in the river. Typical actions could include reduced production rate, addition of engineering controls or stoppage of work until the readings are complying. If decanting is occurring in the OM/KC area, contingency measures may include installation of additional turbidity curtain(s). General contingency measures could include options to modify to dredge operation, such as fall height, cycle time, bucket handling procedures, or use of a rinse tank. Contractor will be required to have contingency measures on-site and be prepared to implement additional engineering controls immediately.
- Environmental buckets shall be used for dredging within and outside of the turbidity curtain unless debris or sediment conditions prevent their effective use. Alternative methods shall be included in the contractor's Turbidity Mitigation and Control Plan. Acceptable alternatives include removal of rock obstructions with excavator or crane fitted with grapple and shear cutting or vibratory removal of existing wood piles. Use of a digging bucket or clamshell will only be used in difficult conditions and will be replaced by an environmental bucket as soon as practicable.
- In general, BMPs consistent with NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 5.1.9 (NYSDEC 2004), as well as applicable USEPA and US Army Corps of Engineers' guidelines and manuals, will be employed to mitigate environmental impacts from construction activities. Examples of BMPs include:
  - Dredge buckets (where applicable):
    - Must be equipped with monitoring capabilities to inform the dredge operator if the bucket is not completely closed.
    - Shall be designed to maintain enclosure of sediments when the bucket is being raised through the water column; minimize, to the maximum extent practical, the generation of suspended sediments during bucket lowering, closing, and raising in the water column; and minimize the amount of water contained in the dredge bucket as it is closed. The bucket shall include features designed by the bucket's manufacturer that allow sediment to be removed at near in-situ densities and to allow free water overlying the sediment in the bucket to drain once the dredge bucket has been raised above the water surface.

- Collection and on-site treatment of water from scows supporting dredging operations outside the turbidity curtain, as well as water from dredge spoil piles staged and processed on land within the site.
- Maintaining pollution prevention and waste minimization programs from initiation of mobilization activities to project close out.
- Maintaining good site housekeeping practices.
- Utilization of low emission diesel equipment and fuel.
- Reducing project emissions by minimizing idle time for equipment by shutting down equipment not being actively used.
- Using environmentally acceptable lubricants for oil-water interfaces, to the extent practicable.

- The Remedial Action Monitoring Plan will include the required turbidity action levels outside the main turbidity curtain and at appropriate distances from active Deepwater Area dredging. Response actions will be developed by the Engineer for review by NYSDEC and inclusion in the Final Design.

REFERENCES

NYSDEC 2004. NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 5.1.9, In-water and Riparian Management of Sediment and Dredged Material, November 29, 2004.

Arcadis. 2017. Preliminary Design Report; Harbor at Hastings Site (Former Anaconda Wire & Cable Plant Site) Hastings-On-Hudson, New York; NYSDEC Site #3-60-022. Prepared for Atlantic Richfield. November.

Arcadis. 2020. Construction Sequencing Related to Work Window Time Restrictions. Memorandum to Paul Johnson, Remediation Management from Lance Ketcham and Raymond Kapp, Arcadis of New York, Inc., DRAFT FOR DISCUSSION PURPOSES ONLY, February 20, 2020.

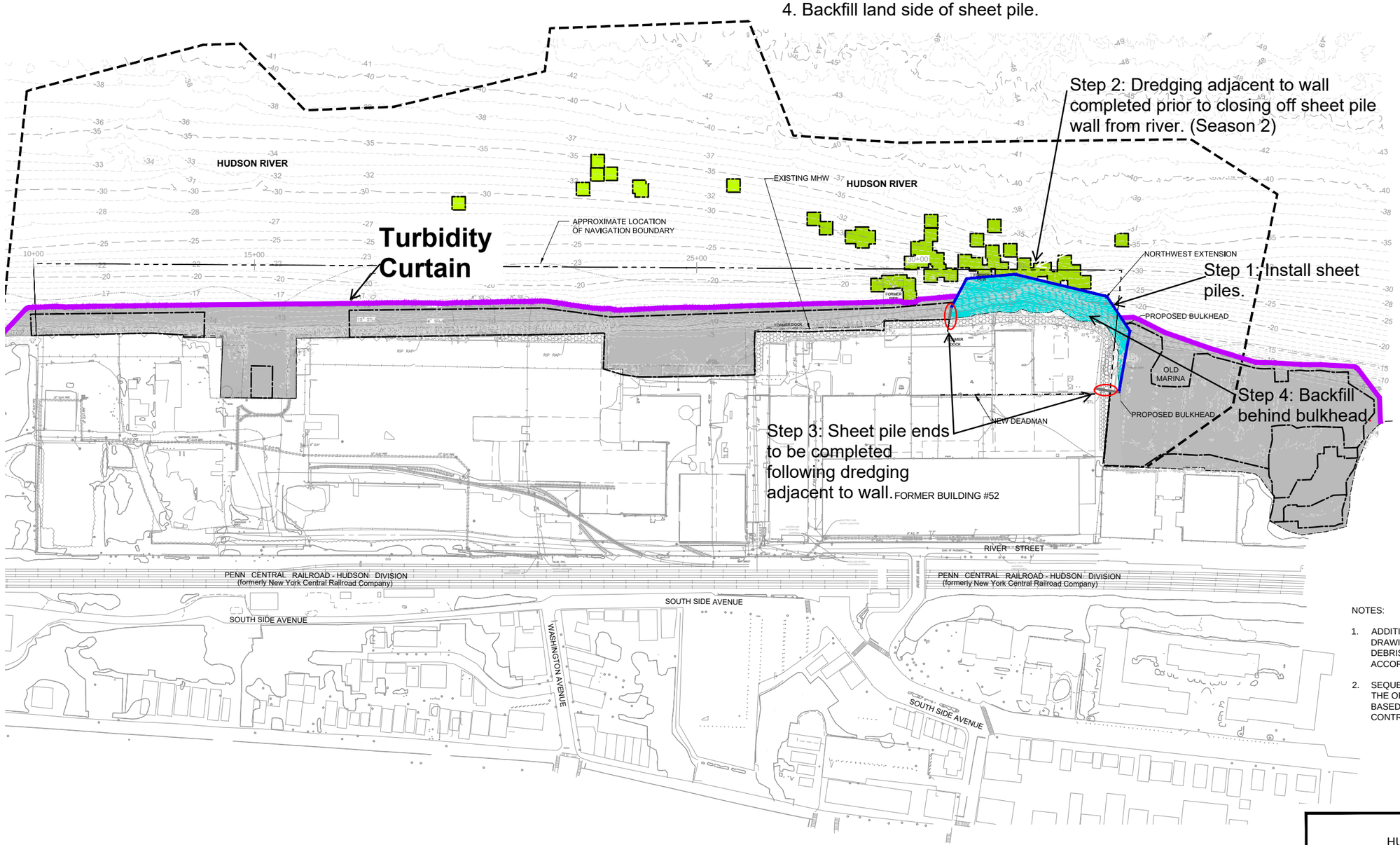
NYSDEC. 2020. Email from Angela E. Schimizzi (NYSDEC) to Paul Johnson (BP), Jess LaClair (NYSDEC), and Martha Gopal (Sovereign) re: Hastings Final Natural Deposition Memo. March 30.

ATTACHMENTS

Figure 2A. Preliminary In-Water Construction Sequencing Layout, 4.5-Month Work Window Scenario

NEA bulkhead construction steps

1. Install sheet piles, leaving out sheets and at ends. (Season 1)
2. Complete dredging and backfilling adjacent to bulkhead. (Season 2)
3. Install remaining sheet piles on ends. (Inside turbidity curtain)
4. Backfill land side of sheet pile.



LEGEND:

- STATIONING LINE
- EXISTING OU2 BOUNDARY
- EXISTING SHEET PILE WALL
- EXISTING NAVIGATIONAL BOUNDARY
- EXISTING MINOR BATHYMETRIC CONTOUR
- EXISTING MAJOR BATHYMETRIC CONTOUR
- EXISTING PILE FIELD
- EXISTING MEAN HIGH WATER (MHW) LOCATION (+2.2 FT NAVD88)
- EXISTING RIPRAP ROCK ON THE RIVER BANK
- PROPOSED DREDGE LIMITS
- PROPOSED BULKHEAD
- SEASON 1
- SEASON 2
- SEASON 3
- SEASONS 1 THROUGH 8 (TURBIDITY CURTAIN INSTALLATION AND REMOVAL, RESPECTIVELY)
- AREA BEHIND TURBIDITY CURTAIN TO BE COMPLETED YEAR ROUND UPON INSTALLATION OF THE TURBIDITY CURTAIN (OU-1 SHORELINE AND PROPOSED WETLAND NOT SHOWN)
- WORK BEHIND NORTHWEST EXTENSION AREA BULKHEAD TO BE COMPLETED YEAR ROUND UPON COMPLETION OF BULKHEAD.

NOTES:

1. ADDITIONAL DEBRIS IS PRESENT BEYOND THAT SHOWN ON THE DRAWINGS. IN ADDITION TO MAPPED DEBRIS, HISTORICAL DEBRIS SHOULD BE EXPECTED AND WILL BE REMOVED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
2. SEQUENCING PRESENTED FOR ILLUSTRATION PURPOSES ONLY. THE ORDER OF OPERATIONS IS ANTICIPATED BE REFINED BASED ON CONTRACTOR INPUT DURING CONSTRUCTION CONTRACTING AND REMEDIAL IMPLEMENTATION.

0 120' 240'
GRAPHIC SCALE

ATLANTIC RICHFIELD CO. HASTINGS-ON-HUDSON, NEW YORK
CONSTRUCTION SEQUENCING OU2

PRELIMINARY IN-WATER CONSTRUCTION SEQUENCING LAYOUT 4.5-MONTH WORK WINDOW SCENARIO

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2A

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X-BASE-FOLIAGE
X-BASE-DESIGN
X-BASE-SURF-DREDGE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Remedial Bureau D
625 Broadway, 12th Floor, Albany, NY 12233-7013
P: (518) 402-9676 I F: (518) 402-9773
www.dec.ny.gov

September 24, 2020

Mr. Paul Johnson
Operations Project Manager
Atlantic Richfield Company
Remediation Management
150 W. Warrenville Road
MC 200 1E

Re: Construction Methods Related to In-Water Work
Harbor at Hastings, NYSDEC Site #360022

Dear Mr. Johnson:

The Department of Environmental Conservation has reviewed the draft memo dated June 22, 2020 regarding the proposed construction sequencing and methods of in-water remedial construction work activities at the Harbor at Hastings site. The following is a list of items the Department would like addressed in future design and monitoring submittals:

1. Please use an environmental bucket that can be closed completely to minimize resuspension of sediments and decanting of water whenever possible.
2. The turbidity curtains will not sufficiently contain dissolved PCBs, therefore initial water quality monitoring must be conducted to determine whether or not the site PCBs are in the dissolved form and have potential to leave the work enclosure at levels of concern.
3. For work in the Old Marina and Kinnally Cove strong consideration should be given to having a double turbidity curtain system.
4. A Total Suspended Solid (TSS) action level outside the main turbidity curtain should be 100ppm over ambient and a PCB action level of 0.2ppb per Aroclor.
5. Water quality monitoring for metals will also be required.
6. For areas of dredging without a turbidity curtain, water quality monitoring will be required at the edge of the 500-foot mixing zone. Concentrations of PCB, metals and TSS must meet water quality standards at this location. Attached is guidance to use during design and while drafting the water quality monitoring program.
7. Decanting of barges outside of the turbidity curtain will not be allowed without adhering to specific requirements. The Department will provide these requirements if needed.

The Department finds the construction methods acceptable. The Department approves a work window for in-water work outside of a turbidity curtain to begin September 1st and ending January 15th. If you have any questions, please feel free to contact me at (518)402-9821.

Sincerely,

Jessica LaClair

Jessica LaClair
Project Manager
Bureau D, Section A
Division of Environmental Remediation

Attachment

ec: J. Armitage, DEC
B. Conlon, DEC
S. Edwards, DEC
H. Gierloff, DEC Region 3
A. Schimizzi, DEC Region 3
K. Woodfield, DEC
J. Nealon, DOH
M. Schuck, DOH
M. Gopal, Sovereign Consulting Inc.

Dredging Conditions for the Harbor at Hastings project

Turbidity curtains will be in place during any activities that may disturb the sediment surface in the near shore area.

Silt curtains will be long enough to cover the full length of the water column, with an allowance for tidal flux (approximately 2-4 feet off of the bottom). The curtains will be adjusted such that they are not in contact with the sediment surface in an effort to minimize the resuspension of Site sediments.

Silt curtains will be anchored using a multi-point anchoring system and affixed to a mechanical winch system to ensure that they are not moved out of position by tidal action, vessel wakes, etc.

Barges will be watertight and regularly inspected to confirm water-tightness during dredging operations and dredged material transport.

Barge overflow is prohibited.

Dredging must be conducted using a closed clamshell dredge. Drawings and specifications of the closed clamshell bucket and other dredging equipment, including specifications demonstrating that appropriate design considerations are incorporated in the equipment, must be provided to the Department at least 45 days before dredging related activities start.

Smoothing with the dredging bucket to contour the dredge cut will not be permitted during dredging impacted sediments. Smoothing during cover placement is allowed.

Work on slopes will proceed from top of slope to toe of slope, where practical.

Utilization of precision dredge and bucket guidance systems (e.g. integrated with real-time kinematic differential global positioning systems, will allow the operator to deploy/retrieve the dredge bucket with a high level of operational accuracy.

Dredging equipment must be operated in a manner that minimizes the resuspension of sediments in the Hudson River. Dredging operations may not cause turbidity that results in a substantial visible contrast to the Hudson River outside of the 500-foot mixing zone as set forth in the Water Quality Monitoring section below.

The bucket must be lifted in a continuous motion through the water column and into the barge. Bucket decanting and loss of dredged material into the River during barge loading will be minimized to the maximum extent practicable.

The dredge operator will not be permitted to drain the dredge bucket over the water column.

Use of an experienced environmental dredging operator capable of implementing appropriate BMPs to limit re-suspension will be required.

The operator will optimize the rate of bucket descent and retrieval during operations in order to reduce sediment re-suspension.

The dredge operator will not fill the dredge bucket beyond its stated capacity.

The dredge operator will perform single “bites” with the bucket, and each bucket will be brought to the surface and emptied into the watertight barge between “bites”.

The operator will not overfill barges with the dredged sediments and oil absorbent booms will be available for deployment in an emergency situation. Additionally, oil absorbent booms will be available for deployment should sheens be observed, particularly in the areas where TSCA level PCBs are being dredged.

Best management practices include lowering the bucket to the level of the barge gunwales prior to release of the load and placing the dredged material in the barge in a controlled manner. Excessive loss of material from the bucket should be investigated and repaired. Bucket retrieval rates will be controlled to minimize turbidity.

If decanting of barges is necessary, a detailed plan must be submitted to the Department for review and approval before decanting may start. The Department will have additional requirements to follow.

All side slopes of the dredged channel will have a maximum 1:3 slope.

All sediment transporting barges must be inspected and certified as properly sealed.

Loss of material during transport is prohibited.

If material is transferred between barges, measures must be implemented to minimize the potential for discharge to the river.

Sidecasting of dredged sediment is prohibited.

Water Quality Monitoring Conditions in the Harbor at Hastings Permit

Collect routine data to document that there is no downstream transport of constituents at concentrations greater than NYSDEC Water Quality Standards.

At least 45 days before starting dredging activities; decanting activities; removal of large debris fields; channel armoring; cofferdam construction; or any activity that may cause resuspension of bottom sediments, Permittee must submit a water quality monitoring plan to the Department. If activities occur concurrently in multiple locations, each activity that may cause resuspension of bottom sediments must be monitored separately. The Plan must be in effect at all times during these activities. The above activities may start when the Department has given written approval of the plan.

The plan shall include monitoring for total suspended solids (TSS), turbidity (visual monitoring) and the following contaminants: total mercury, dissolved arsenic, cadmium, chromium, nickel, copper, lead, zinc, PCB and naphthalene and benzo(a)pyrene. The plan must: (i) describe procedures for background sampling, and sampling at the edge of a 500-foot mixing zone around the above identified activities (ii) include daily sampling during each tidal cycle; (iii) use an Acoustic Doppler Current Profiler to locate the plume; (iii) require whole water samples in the vertical water column (from at least 3 depths) along a transect within the plume; and (iv) include upstream transect. When silt curtains are deployed, monitoring should take place immediately outside the confines of the silt curtain.

The following Water Quality Standards must be achieved immediately outside of the silt curtain or at the edge of the 500-foot mixing zone around the above identified activities subject to the monitoring requirements. When a Detection Limit listed below is greater than the listed Water Quality Standard, the Water Quality Standard will be presumed to be met when analytical results demonstrate compliance with the Detection Limit. Where background concentrations exceed the Water Quality Standard, the limit at the edge of the mixing zone is 30% over background, with the exception of TSS which shall be 100 mg/l above ambient conditions.

Contaminant	Water Quality Standard (ppb)	Detection Limit* (ppb)
Total Mercury	0.0007 – H(FC)	0.050
Dissolved nickel	8.2 – A(C)	
Dissolved copper	3.4 – A(C)	
Dissolved lead	8.0 – A(C)	
Dissolved zinc	66 – A(C)	
Dissolved arsenic	63 – A(C)	
Dissolved cadmium	7.7 – A(C)	
PCB	1.0x10-6	
Aroclor 1242		0.2
Aroclor 1248		0.2
Aroclor 1254		0.2
Aroclor 1260		0.2
Aroclor 1268		0.2
Naphthalene	16	
Benzo(a)pyrene	0.0006	0.1
TSS	None from sewage, industrial waste or other wastes that will cause deposition or impair the waters for their best usages	100 mg/l above ambient[1]
*Using EPA analytical method with the lowest possible detection limit as promulgated under 40CFR Part 136.		

Results will be reported in the daily reports by the Site environmental staff. If there is an exceedance as described above, Site environmental staff will get notified immediately by the laboratory. After review and verification, the Department will be notified within 24 normal business hours with additional documentation of corrective action or reanalysis. The Permittee and the Department will determine if there is a need for procedural changes.

Water quality monitoring must be conducted daily at the start of each of the above identified activities. If there are no water quality exceedances during the first two weeks of an in river Authorized Activity water quality monitoring for contaminants for that activity may be reduced. Daily TSS and turbidity monitoring must continue through the duration of the in-river operation. If during the reduced sampling, there is an exceedance of 100 ppm above ambient TSS value, monitoring shall return to daily for all parameters until such time as TSS concentrations are less than 100 ppm above ambient values.
The initial phase of the monitoring program an intensive data collection effort to: a) verify the turbidity/TSS relationship and develop a “calibration curve”; and b) collect adequate data to

document that COCs are not being transported downstream at concentrations greater than NYSDEC Water Quality Standards.

If exceedances occur dredging will be paused in order to adjust the operations and potentially modify BMPs.

If exceedances of NYSDEC Water Quality Standard occur, the following contingency BMPs may be implemented:

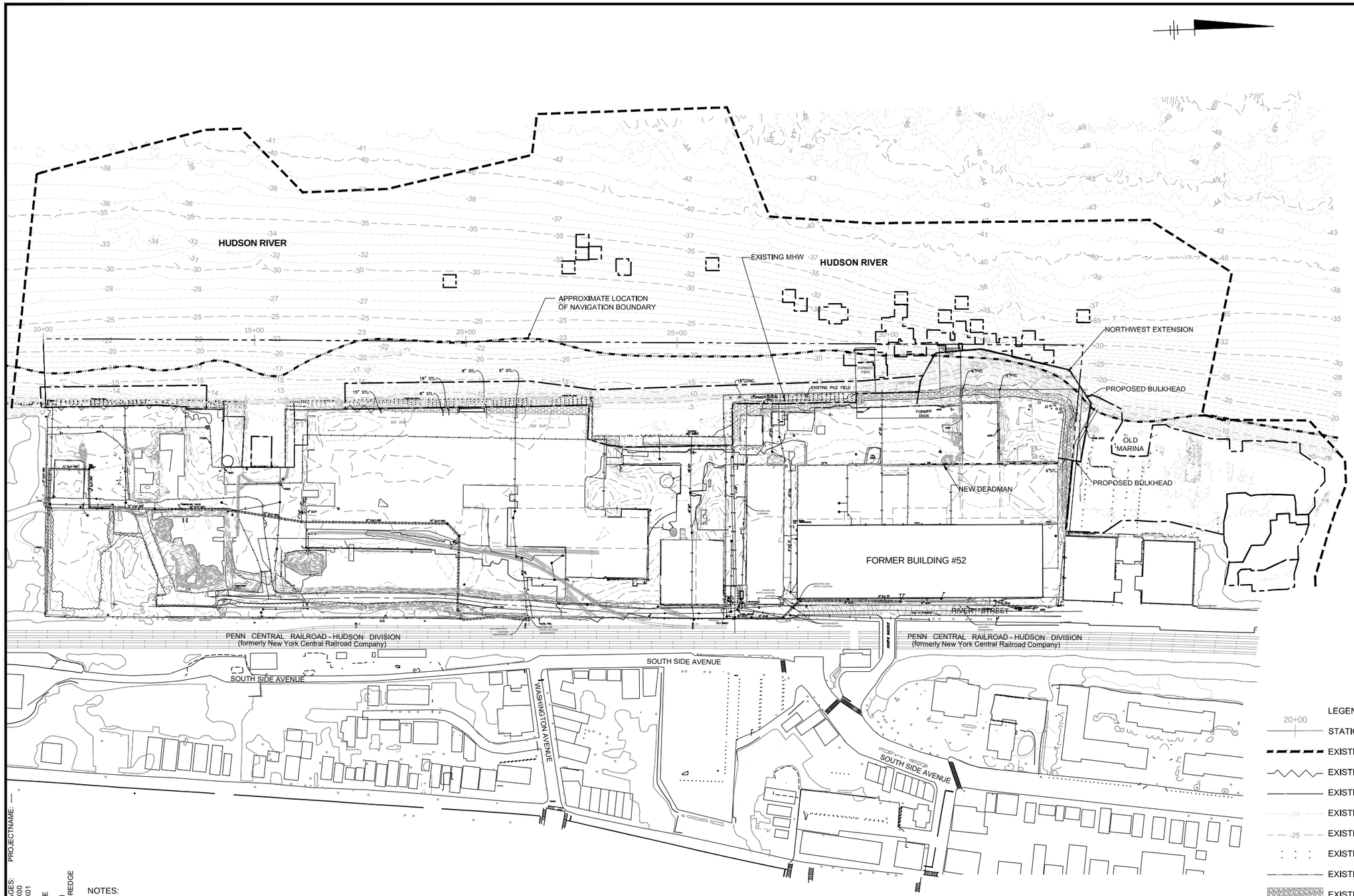
- Adjusting the sequence of dredging to include areas with a low potential for suspending Chemicals of Concern (COCs) (i.e., areas with lower concentrations and velocities) at the same time as high potential areas.
- Use of smaller equipment (e.g., shallower draft or less powerful engines).
- Reducing the removal rate or temporarily suspending dredging if necessary.

All laboratory ana lyses required by this permit must be conducted by a laboratory certified by the New York State Department of Health.

Nothing contained in this Permit shall be construed as authorizing a violation of Water Quality Standards.

APPENDIX B

Drawings of OM/KC from the Preliminary Design



LEGEND:

- 20+00 — STATIONING LINE
- EXISTING OU2 BOUNDARY
- EXISTING SHEET PILE WALL
- EXISTING NAVIGATIONAL BOUNDARY
- -24 — EXISTING MINOR BATHYMETRIC CONTOUR
- -25 — EXISTING MAJOR BATHYMETRIC CONTOUR
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- EXISTING MEAN HIGH WATER (MHW) LOCATION (+2.2 FT NAVD88)
- EXISTING RIPRAP ROCK ON THE RIVER BANK
- PROPOSED DREDGE LIMITS
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CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER LD: G. STEINBERGER PIC: K. G. DIAS PM: R. KAPP TM: R. KAPP TR: S. McGOWAN LYR:ON=*;OFF=*REF*
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01701X-BATHY
01701X-FOUIAGE
01701X-CONT
01701X-DESIGN
01701X-SURF-DREDGE

1"=120' 120' 0 120' 240'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1
State: NY | Date Signed: | Project Mgr.: LSK
Designed by: SM | Drawn by: MW | Checked by: ESD

NOT FOR CONSTRUCTION

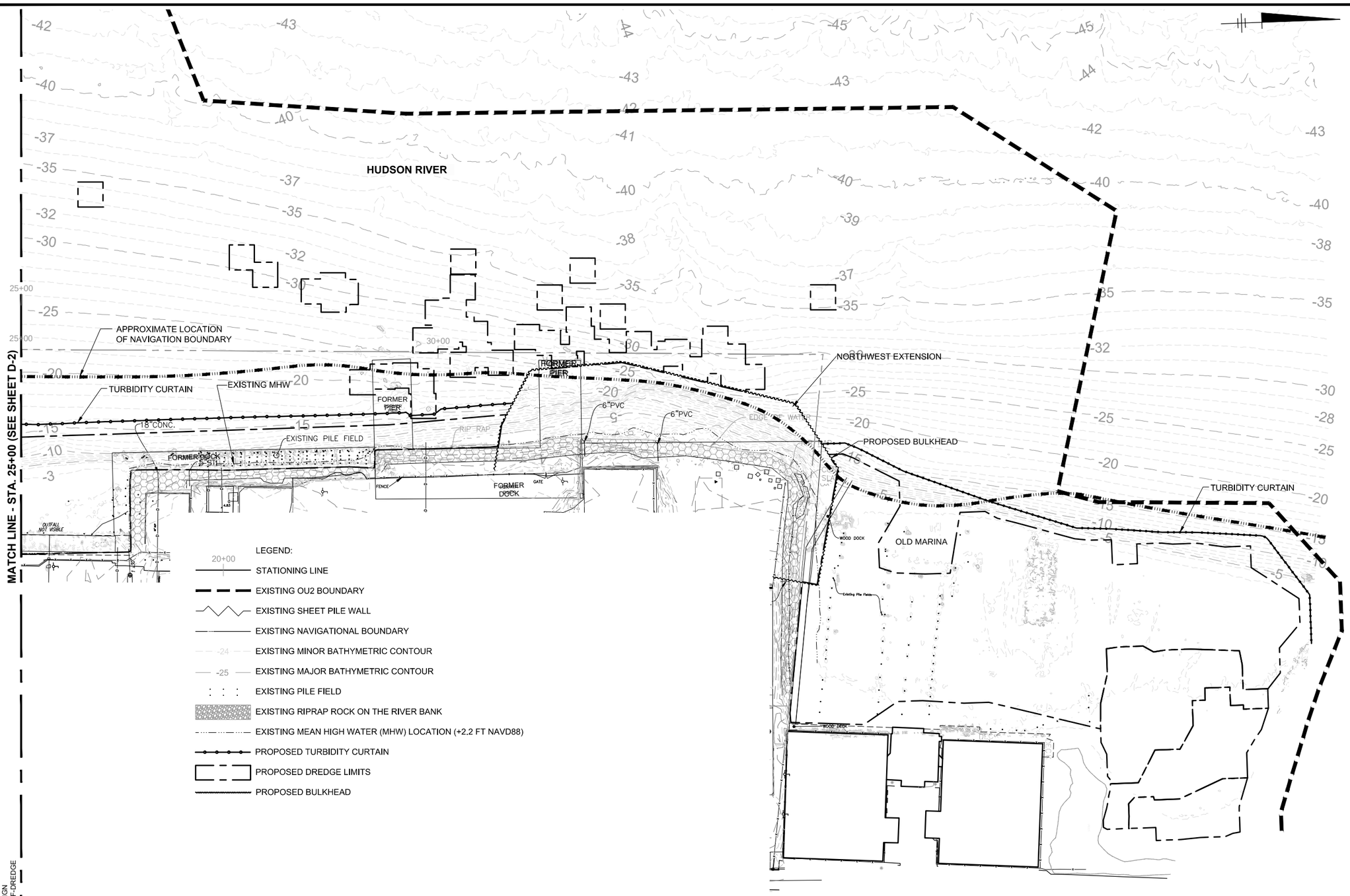
ARCADIS Design & Consultancy for natural and built assets
ARCADIS OF NEW YORK, INC.
NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

ATLANTIC RICHFIELD CO. • HASTINGS-ON-HUDSON, NEW YORK
HARBOR AT HASTINGS SITE PRELIMINARY DESIGN, OU1 AND OU2

SITE LAYOUT PLAN - OU2

ARCADIS Project No. B0001701.0002.00134
Date MAY 2019
ARCADIS of NY, Inc.
One Lincoln Center
110 W. Fayette St., Suite 300
Syracuse, NY 13202
Tel: 315-446-9120

D-1



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01701X-BATHY
01701X-DESIGN
01701X-SURF-DREDGE

CITY: SYRACUSE NY DIV/GROUP:ENV/CAD DB: E. KRAHMER LD: G. STEINBERGER PIC: K. G. DIAS PM: R. KAPP TM: R. KAPP TR: S. McGOWAN LYR:ON=*;OFF=*REF*
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1"=60' 60' 0 60' 120'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1
State: NY | Date Signed: | Project Mgr.: LSK
Designed by: SM | Drawn by: MW | Checked by: ESD

NOT FOR CONSTRUCTION

ARCADIS Design & Consultancy for natural and built assets
ARCADIS OF NEW YORK, INC.

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

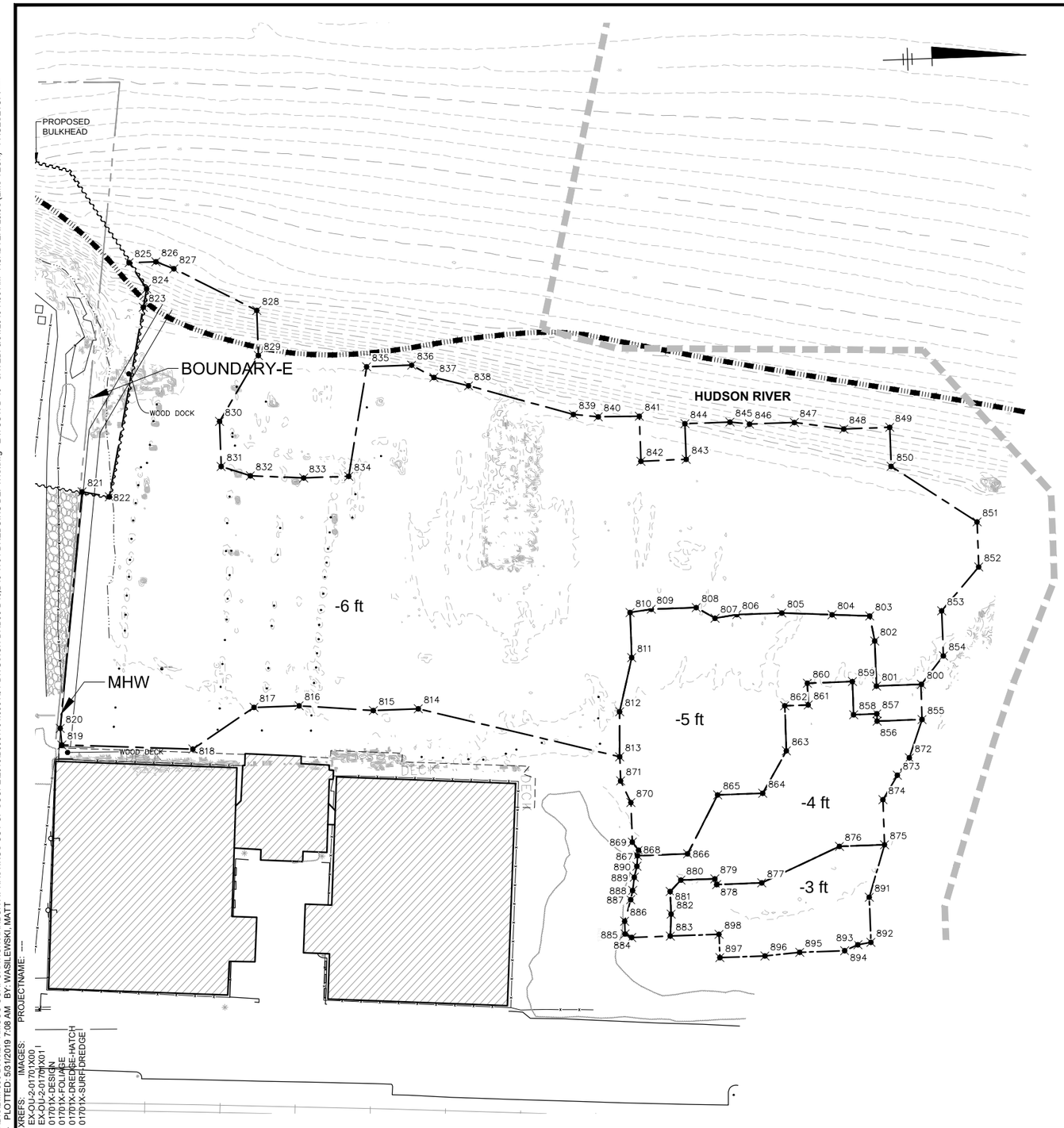
ATLANTIC RICHFIELD CO. • HASTINGS-ON-HUDSON, NEW YORK
HARBOR AT HASTINGS SITE PRELIMINARY DESIGN, OU1 AND OU2

OLD MARINA AND KINNALLY COVE TURBIDITY CONTROLS LAYOUT

ARCADIS Project No. B0001701.0002.00134
Date MAY 2019

ARCADIS of NY, Inc.
One Lincoln Center
110 W. Fayette St., Suite 300
Syracuse, NY 13202
Tel: 315-446-9120

D-18



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800	788962.24	661787.97
801	788932.24	661787.97
802	788932.24	661757.97
803	788929.52	661741.27
804	788904.49	661739.46
805	788871.12	661737.12
806	788841.12	661737.12
807	788826.60	661738.98
808	788814.36	661731.43
809	788784.36	661731.43
810	788770.25	661733.11
811	788770.25	661763.11
812	788760.84	661798.78
813	788759.83	661828.78
814	788627.11	661792.03
815	788597.11	661792.03
816	788547.90	661787.11
817	788517.90	661787.11
818	788476.13	661813.32
819	788389.20	661807.39
820	788388.49	661796.28
821	788408.70	661639.58
822	788426.70	661643.49
823	788453.91	661518.32
824	788456.57	661506.09
825	788445.60	661488.32
826	788463.44	661488.32
827	788475.22	661493.41
828	788529.27	661523.18
829	788529.27	661553.18
830	788501.90	661596.08
831	788501.90	661626.08
832	788521.00	661633.00
833	788556.42	661635.70
834	788586.42	661635.70
835	788600.99	661563.33
836	788630.99	661563.33
837	788645.54	661572.02
838	788668.34	661578.37
839	788737.32	661600.06
840	788753.84	661602.18
841	788781.11	661602.77
842	788781.11	661632.77
843	788811.25	661632.59
844	788811.25	661608.90
845	788841.25	661608.90
846	788854.21	661610.71
847	788884.08	661610.71
848	788916.76	661616.28
849	788947.34	661616.28

CONTROL POINT	NORTHING	EASTING
850	788947.34	661642.27
851	789003.15	661681.27
852	789003.15	661711.27
853	788977.47	661739.54
854	788977.47	661769.54
855	788961.79	661811.34
856	788931.84	661811.34
857	788931.84	661806.46
858	788916.40	661806.46
859	788916.40	661784.42
860	788886.40	661784.42
861	788886.40	661798.87
862	788870.83	661798.87
863	788870.83	661828.87
864	788854.07	661856.51
865	788824.07	661856.51
866	788802.62	661894.98
867	788769.28	661894.98
868	788770.07	661891.30
869	788766.13	661885.84
870	788766.13	661859.47
871	788759.83	661844.86
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876	788903.77	661893.72
877	788851.20	661916.13
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880	788797.52	661912.26
881	788790.14	661919.64
882	788790.14	661934.70
883	788789.12	661949.26
884	788763.40	661949.26
885	788759.12	661946.76
886	788759.12	661938.25
887	788763.67	661924.14
888	788765.17	661918.02
889	788766.63	661909.28
890	788768.63	661902.00
891	788922.34	661928.27
892	788922.34	661958.27
893	788913.61	661959.58
894	788904.76	661963.18
895	788874.76	661963.18
896	788851.56	661964.78
897	788821.56	661964.78
898	788821.56	661949.26

LEGEND:

- 20+00 — STATIONING LINE
- EXISTING OU2 BOUNDARY
- EXISTING NAVIGATIONAL BOUNDARY
- -24 — EXISTING MINOR BATHYMETRIC CONTOUR
- -25 — EXISTING MAJOR BATHYMETRIC CONTOUR
- EXISTING PILE FIELD
- EXISTING MEAN HIGH WATER (MHW) LOCATION (+2.2 FT NAVD88)
- EXISTING RIPRAP ROCK ON THE RIVER BANK
- PROPOSED DREDGE LIMITS
- PROPOSED BULKHEAD
- 58 — CONTROL POINTS
- VC-102A — SAMPLE ID
- -6 ft — REMOVAL DEPTH BELOW SEDIMENT SURFACE

CITY: SYRACUSE NY DIV/GROUP:ENV/CAD DB: E. KRAHMER LD: G. STEINBERGER PIC: K. G. DIAS PM: R. KAPP TM: R. KAPP TR: S. McGOWAN LYR:ON=*;OFF=*REF*
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EX-OU-2-01701X01
0170 1X-DESIGN
0170 1X-FOLIAGE
0170 1X-DREDGE-HATCH
0170 1X-SURF-DREDGE

1"=40' 40' 0 40' 80'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1
State: NY | Date Signed | Project Mgr.: LSK
Designed by: SM | Drawn by: MW | Checked by: ESD

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ARCADIS Design & Consultancy for natural and built assets
ARCADIS OF NEW YORK, INC.
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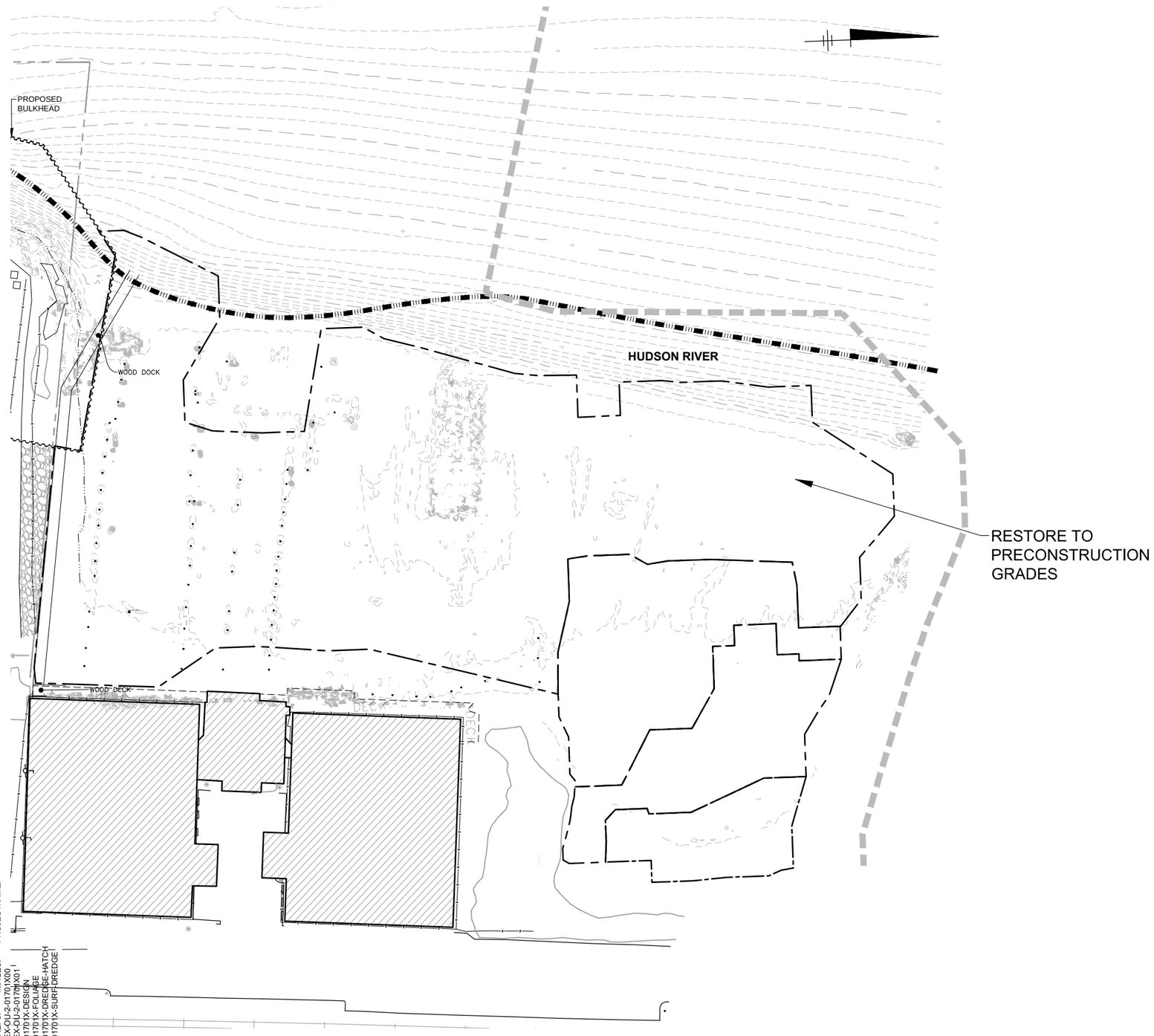
ATLANTIC RICHFIELD CO. ● HASTINGS-ON-HUDSON, NEW YORK
HARBOR AT HASTINGS SITE PRELIMINARY DESIGN, OU1 AND OU2

DREDGING DEPTHS - OLD MARINA AND KINNALLY COVE

ARCADIS Project No. B0001701.0002.00134
Date MAY 2019
ARCADIS of NY, Inc.
One Lincoln Center
110 W. Fayette St., Suite 300
Syracuse, NY 13202
Tel: 315-446-9120

D-19



LEGEND:

- 20+00 STATIONING LINE
- EXISTING OU2 BOUNDARY
- EXISTING NAVIGATIONAL BOUNDARY
- -24- EXISTING MINOR BATHYMETRIC CONTOUR
- -25- EXISTING MAJOR BATHYMETRIC CONTOUR
- EXISTING PILE FIELD
- EXISTING MEAN HIGH WATER (MHW) LOCATION (+2.2 FT NAVD88)
- EXISTING RIPRAP ROCK ON THE RIVER BANK
- PROPOSED DREDGE LIMITS
- PROPOSED BULKHEAD

CITY: SYRACUSE NY DIV/GROUP:ENVCAD DB: E. KRAHMER LD: G. STEINBERGER PIC: K. G. DIAS PM: R. KAPP TM: R. KAPP TR: S. McGOWAN LYR:ON=*;OFF=*REF*
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1"=40' 40' 0 40' 80'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MARK O. GRAVELDING
Professional Engineer's No.: 069985-1
State: NY | Date Signed: | Project Mgr.: LSK
Designed by: SM | Drawn by: MW | Checked by: ESD

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ARCADIS Design & Consultancy for natural and built assets
ARCADIS OF NEW YORK, INC.

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ATLANTIC RICHFIELD CO. ● HASTINGS-ON-HUDSON, NEW YORK
HARBOR AT HASTINGS SITE PRELIMINARY DESIGN, OU1 AND OU2

RESTORATION PLAN - OLD MARINA AND KINNALLY COVE

ARCADIS Project No. B0001701.0002.00134
Date MAY 2019
ARCADIS of NY, Inc.
One Lincoln Center
110 W. Fayette St., Suite 300
Syracuse, NY 13202
Tel: 315-446-9120

D-20

APPENDIX C

Sediment Removal Evaluation

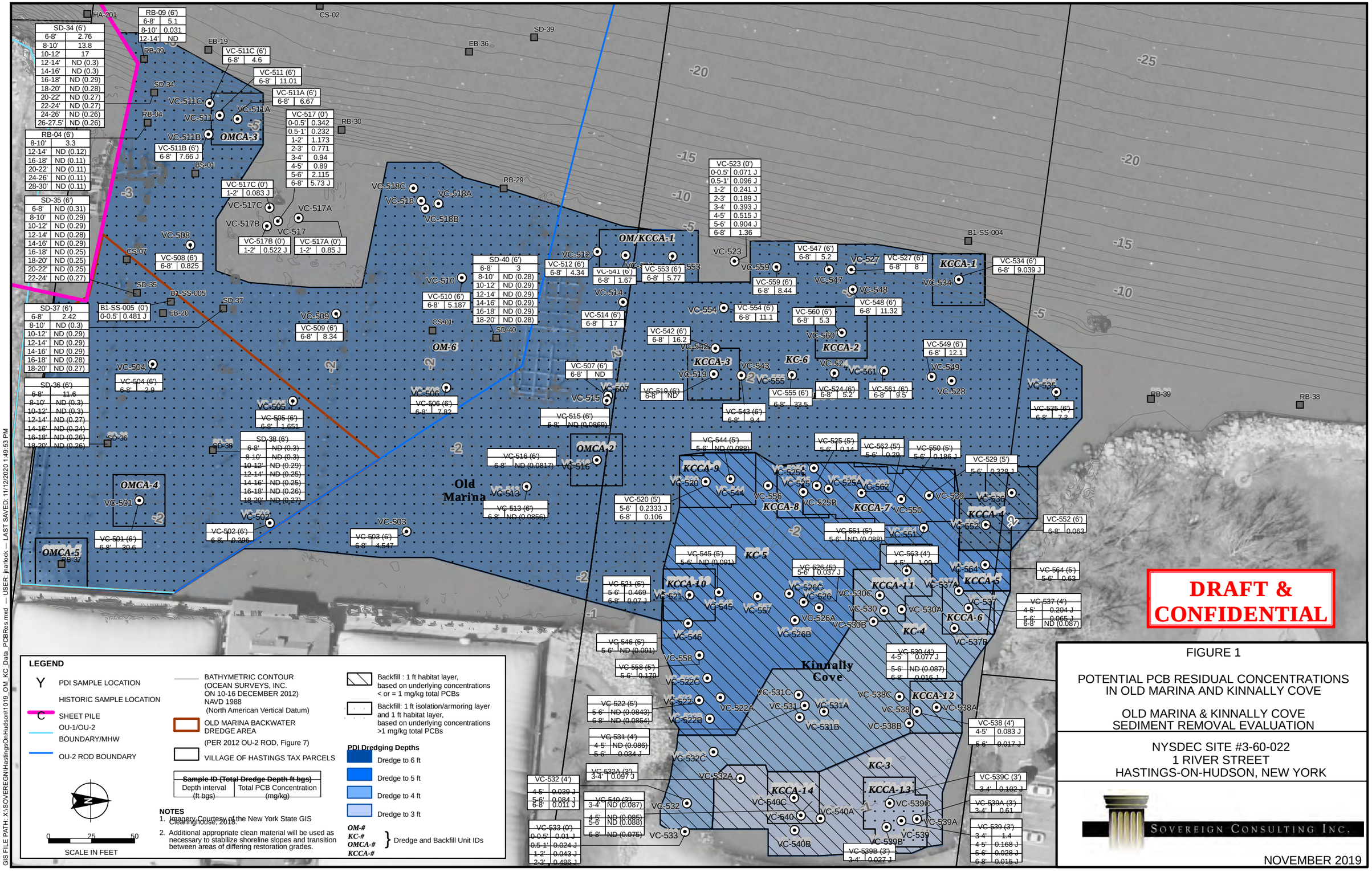

FIGURE 1

POTENTIAL PCB RESIDUAL CONCENTRATIONS IN OLD MARINA AND KINNALLY COVE

OLD MARINA & KINNALLY COVE SEDIMENT REMOVAL EVALUATION

NYSDEC SITE #3-60-022
1 RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

SOVEREIGN CONSULTING INC.

NOVEMBER 2019

DRAFT AND CONFIDENTIAL

TABLE 1. POTENTIAL RESIDUAL TOTAL PCB CONCENTRATIONS IN OLD MARINA AND KINNALLY COVE
FORMER ANACONDA WIRE AND CABLE COMPANY
1 RIVER STREET, HASTINGS-ON-HUDSON, NEW YORK

Sample ID	Sample Date	Site Area	Dredge Depth (ft.)	Remediation Cell	Beneficial Use Cell	Restoration Layer Thickness (ft.)	Depth to Top of Restoration Layer (ft.)	0-0.5'	0.5-1'	1-2'	2-3'	3-4'	4-5'	5-6'	6-8'	8-10'	10-12'	12-14'	14-16'	16-18'	18-20'	20-22'	22'+
VC-523	11/16/16	Kinnally Cove						0.071 J	0.096 J	0.241 J	0.189 J	0.393 J	0.515 J	0.904 J	1.36								
VC-533	11/16/17	Kinnally Cove						0.01 J	0.024 J	0.043 J	0.486 J												
VC-532A	09/27/18	Kinnally Cove	3	KC-3	KC-3	1	2					0.097 J											
VC-540A	09/26/18	Kinnally Cove	3	KC-3	KC-3	1	2																
VC-540B	09/26/18	Kinnally Cove	3	KC-3	KC-3	1	2																
VC-539	11/15/17	Kinnally Cove	3	KC-3	KCHS-13	2	1					1.4	0.168 J	0.028 J	0.015 J								
VC-539A	09/27/18	Kinnally Cove	3	KC-3	KCHS-13	2	1					0.61											
VC-539B	09/27/18	Kinnally Cove	3	KC-3	KCHS-13	2	1					0.027 J											
VC-539C	09/27/18	Kinnally Cove	3	KC-3	KCHS-13	2	1					0.102 J											
VC-540	11/15/17	Kinnally Cove	3	KC-3	KCHS-14	1	2					ND (0.087)	ND (0.085)	ND (0.088)	ND (0.075)								
VC-540C	09/26/18	Kinnally Cove	3	KC-3	KCHS-14	1	2																
VC-531	11/15/17	Kinnally Cove	4	KC-4	KC-4	1	3						ND (0.086)	0.034 J									
VC-531A	10/02/18	Kinnally Cove	4	KC-4	KC-4	1	3																
VC-531B	10/02/18	Kinnally Cove	4	KC-4	KC-4	1	3																
VC-531C	10/02/18	Kinnally Cove	4	KC-4	KC-4	1	3																
VC-532	11/16/17	Kinnally Cove	4	KC-4	KC-4	1	3						0.039 J	0.084 J	0.011 J								
VC-532C	09/27/18	Kinnally Cove	4	KC-4	KC-4	1	3																
VC-537	11/15/17	Kinnally Cove	4	KC-4	KCHS-10	1	3						0.204 J	0.065 J	ND (0.087)								
VC-537B	10/02/18	Kinnally Cove	4	KC-4	KCHS-10	1	3																
VC-530	11/15/17	Kinnally Cove	4	KC-4	KCHS-11	1	3						0.077 J	ND (0.087)	0.016 J								
VC-530A	10/01/18	Kinnally Cove	4	KC-4	KCHS-11	1	3																
VC-530B	10/01/18	Kinnally Cove	4	KC-4	KCHS-11	1	3																
VC-530C	10/01/18	Kinnally Cove	4	KC-4	KCHS-11	1	3																
VC-563	10/02/18	Kinnally Cove	4	KC-4	KCHS-11	1	3						1.09										
VC-538	11/15/17	Kinnally Cove	4	KC-4	KCHS-12	1	3						0.083 J	0.017 J									
VC-538A	10/02/18	Kinnally Cove	4	KC-4	KCHS-12	1	3																
VC-538B	10/02/18	Kinnally Cove	4	KC-4	KCHS-12	1	3																
VC-538C	10/02/18	Kinnally Cove	4	KC-4	KCHS-12	1	3																
VC-522	11/16/16	Kinnally Cove	5	KC-5	KC-5	1	4							ND (0.0843)	ND (0.0854)								
VC-522A	10/02/18	Kinnally Cove	5	KC-5	KC-5	1	4																
VC-522B	10/02/18	Kinnally Cove	5	KC-5	KC-5	1	4																
VC-522C	10/02/18	Kinnally Cove	5	KC-5	KC-5	1	4																
VC-526	11/16/16	Kinnally Cove	5	KC-5	KC-5	1	4							0.037 J									
VC-526A	09/27/18	Kinnally Cove	5	KC-5	KC-5	1	4																
VC-526B	09/27/18	Kinnally Cove	5	KC-5	KC-5	1	4																
VC-526C	09/27/18	Kinnally Cove	5	KC-5	KC-5	1	4																
VC-545	09/26/18	Kinnally Cove	5	KC-5	KC-5	1	4							ND (0.091)									
VC-546	09/26/18	Kinnally Cove	5	KC-5	KC-5	1	4							ND (0.091)									
VC-551	09/25/18	Kinnally Cove	5	KC-5	KC-5	1	4							ND (0.088)									
VC-556	10/03/18	Kinnally Cove	5	KC-5	KC-5	1	4																
VC-557	10/03/18	Kinnally Cove	5	KC-5	KC-5	1	4																
VC-558	10/03/18	Kinnally Cove	5	KC-5	KC-5	1	4							0.179									
VC-537A	10/02/18	Kinnally Cove	5	KC-5	KCHS-10	1	4																
VC-564	10/03/18	Kinnally Cove	5	KC-5	KCHS-5	1	4							0.63									
VC-525	11/16/16	Kinnally Cove	5	KC-5	KCHS-6	1	4							0.14									
VC-525A	09/27/18	Kinnally Cove	5	KC-5	KCHS-6	1	4																
VC-525C	09/27/18	Kinnally Cove	5	KC-5	KCHS-6	1	4																
VC-529	11/15/17	Kinnally Cove	5	KC-5	KCHS-6	1	4							0.328 J									
VC-550	09/25/18	Kinnally Cove	5	KC-5	KCHS-6	1	4							0.186 J									
VC-562	10/02/18	Kinnally Cove	5	KC-5	KCHS-6	1	4							0.29									
VC-525B	09/27/18	Kinnally Cove	5	KC-5	KCHS-7	1	4																
VC-520	11/16/16	Kinnally Cove	5	KC-5	KCHS-8	1	4							0.2333 J	0.106								
VC-544	09/26/18	Kinnally Cove	5	KC-5	KCHS-8	1	4							ND (0.088)									

DRAFT AND CONFIDENTIAL

TABLE 1. POTENTIAL RESIDUAL TOTAL PCB CONCENTRATIONS IN OLD MARINA AND KINNALLY COVE
FORMER ANACONDA WIRE AND CABLE COMPANY
1 RIVER STREET, HASTINGS-ON-HUDSON, NEW YORK

Sample ID	Sample Date	Site Area	Dredge Depth (ft.)	Remediation Cell	Beneficial Use Cell	Restoration Layer Thickness (ft.)	Depth to Top of Restoration Layer (ft.)	0-0.5'	0.5-1'	1-2'	2-3'	3-4'	4-5'	5-6'	6-8'	8-10'	10-12'	12-14'	14-16'	16-18'	18-20'	20-22'	22'+
VC-521	11/16/16	Kinnally Cove	5	KC-5	KCHS-9	1	4							0.469	0.07 J								
VC-524	11/16/16	Kinnally Cove	6	KC-6	KC-6	2	4								5.2								
VC-527	11/14/17	Kinnally Cove	6	KC-6	KC-6	2	4								8								
VC-528	11/16/17	Kinnally Cove	6	KC-6	KC-6	2	4																
VC-535	11/16/17	Kinnally Cove	6	KC-6	KC-6	2	4								7.3								
VC-543	09/26/18	Kinnally Cove	6	KC-6	KC-6	2	4								9.4								
VC-547	09/26/18	Kinnally Cove	6	KC-6	KC-6	2	4								5.2								
VC-548	09/25/18	Kinnally Cove	6	KC-6	KC-6	2	4								11.32								
VC-549	09/25/18	Kinnally Cove	6	KC-6	KC-6	2	4								12.1								
VC-555	10/03/18	Kinnally Cove	6	KC-6	KC-6	2	4								33.5								
VC-559	10/03/18	Kinnally Cove	6	KC-6	KC-6	2	4								8.44								
VC-561	10/02/18	Kinnally Cove	6	KC-6	KC-6	2	4								9.5								
VC-536	11/16/17	Kinnally Cove	6	KC-6	KCHS-1	1	5																
VC-552	09/26/18	Kinnally Cove	6	KC-6	KCHS-1	1	5								0.063 J								
VC-534	11/14/17	Kinnally Cove	6	KC-6	KCHS-2	2	4								9.039 J								
VC-560	10/02/18	Kinnally Cove	6	KC-6	KCHS-3	2	4								5.3								
VC-519	11/16/16	Kinnally Cove	6	KC-6	KCHS-4	2	4								ND (0.0864)								
VC-542	09/26/18	Kinnally Cove	6	KC-6	KCHS-4	2	4								16.2								
VC-554	10/03/18	Kinnally Cove	6	KC-6	KCHS-8	2	4								11.1								
VC-553	10/03/18	Kinnally Cove	6	KC-6	OM/KCHS-1	2	4								5.77								
VC-517	09/25/15	Old Marina						0.342	0.232	1.173	0.771	0.94	0.89	2.115	5.73 J								
VC-517A	10/02/18	Old Marina								0.85 J													
VC-517B	10/02/18	Old Marina								0.522 J													
VC-517C	10/01/18	Old Marina								0.083 J													
VC-541	09/26/18	Old Marina	6	OM-6	OM/KCHS-1	2	4								1.67								
B1-SS-005	10/20/13	Old Marina	6	OM-6	OM-6	2	4																
BS-01	10/01/99	Old Marina	6	OM-6	OM-6	2	4																
CS-01	10/01/99	Old Marina	6	OM-6	OM-6	2	4																
CS-07	10/01/99	Old Marina	6	OM-6	OM-6	2	4																
EB-20	05/23/01	Old Marina	6	OM-6	OM-6	2	4																
RB-04	06/01/98	Old Marina	6	OM-6	OM-6	2	4									3.3		ND (0.12)		ND (0.11)		ND (0.11)	ND (0.11) @ 24-26', ND (0.11) @ 28-30'
RB-09	06/01/98	Old Marina	6	OM-6	OM-6	2	4								5.1	0.031		ND (0.1)					
SD-34	07/13/05	Old Marina	6	OM-6	OM-6	2	4								2.76	13.8	17	ND (0.3)	ND (0.3)	ND (0.29)	ND (0.28)	ND (0.27)	ND (0.27) @ 22-24',ND (0.26) @ 24-26', ND (0.26) @ 26-27.5'
SD-35	07/22/05	Old Marina	6	OM-6	OM-6	2	4								ND (0.31)	ND (0.29)	ND (0.29)	ND (0.28)	ND (0.29)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.27) @ 22-24'
SD-36	07/26/05	Old Marina	6	OM-6	OM-6	2	4								11.6	ND (0.3)	ND (0.3)	ND (0.27)	ND (0.24)	ND (0.26)	ND (0.26)		
SD-37	07/26/05	Old Marina	6	OM-6	OM-6	2	4								2.42	ND (0.3)	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.28)	ND (0.27)		
SD-38	07/26/05	Old Marina	6	OM-6	OM-6	2	4								ND (0.3)	ND (0.3)	ND (0.29)	ND (0.25)	ND (0.25)	ND (0.26)	ND (0.27)		
SD-40	07/21/05	Old Marina	6	OM-6	OM-6	2	4								3	ND (0.28)	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.29)	ND (0.28)		
VC-502	09/30/14	Old Marina	6	OM-6	OM-6	2	4								0.296								
VC-503	10/30/14	Old Marina	6	OM-6	OM-6	2	4								4.547								
VC-504	09/11/14	Old Marina	6	OM-6	OM-6	2	4								2.9								
VC-505	10/02/14	Old Marina	6	OM-6	OM-6	2	4								1.651								

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TABLE 1. POTENTIAL RESIDUAL TOTAL PCB CONCENTRATIONS IN OLD MARINA AND KINNALLY COVE
FORMER ANACONDA WIRE AND CABLE COMPANY
1 RIVER STREET, HASTINGS-ON-HUDSON, NEW YORK

Sample ID	Sample Date	Site Area	Dredge Depth (ft.)	Remediation Cell	Beneficial Use Cell	Restoration Layer Thickness (ft.)	Depth to Top of Restoration Layer (ft.)	0-0.5'	0.5-1'	1-2'	2-3'	3-4'	4-5'	5-6'	6-8'	8-10'	10-12'	12-14'	14-16'	16-18'	18-20'	20-22'	22'+
VC-506	10/30/14	Old Marina	6	OM-6	OM-6	2	4								7.82								
VC-507	10/02/14	Old Marina	6	OM-6	OM-6	2	4								ND (0.086)								
VC-508	09/11/14	Old Marina	6	OM-6	OM-6	2	4								0.825								
VC-509	10/21/14	Old Marina	6	OM-6	OM-6	2	4								8.34								
VC-510	10/29/14	Old Marina	6	OM-6	OM-6	2	4								5.187								
VC-511B	10/01/18	Old Marina	6	OM-6	OM-6	2	4								7.66 J								
VC-511C	10/01/18	Old Marina	6	OM-6	OM-6	2	4								4.6								
VC-512	10/21/14	Old Marina	6	OM-6	OM-6	2	4								4.34								
VC-513	10/21/14	Old Marina	6	OM-6	OM-6	2	4								ND (0.0856)								
VC-514	10/24/14	Old Marina	6	OM-6	OM-6	2	4								17								
VC-515	10/24/14	Old Marina	6	OM-6	OM-6	2	4								ND (0.0869)								
VC-518	09/28/15	Old Marina	6	OM-6	OM-6	2	4																
VC-518A	10/01/18	Old Marina	6	OM-6	OM-6	2	4																
VC-518B	10/01/18	Old Marina	6	OM-6	OM-6	2	4																
VC-518C	10/01/18	Old Marina	6	OM-6	OM-6	2	4																
VC-516	10/24/14	Old Marina	6	OM-6	OMHS-2	2	4								ND (0.0817)								
VC-511	10/01/14	Old Marina	6	OM-6	OMHS-3	2	4								11.01								
VC-511A	10/01/18	Old Marina	6	OM-6	OMHS-3	2	4								6.67								
VC-501	09/11/14	Old Marina	6	OM-6	OMHS-4	2	4								30.6								
RB-37	09/15/98	Old Marina	6	OM-6	OMHS-5	2	4																

Notes & Abbreviations

Concentrations shown are in milligrams per kilogram (mg/kg) Total PCBs.

ND - Not detected above detection limit shown.

Depths shown are feet below ground surface.

Orange shading indicates potential backfill layer(s)

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TABLE 2. POTENTIAL TOTAL PCB CONCENTRATIONS IN OLD MARINA AND KINNALLY COVE
FORMER ANACONDA WIRE AND CABLE COMPANY
1 RIVER STREET, HASTINGS-ON-HUDSON, NEW YORK

Sample ID	Sample Date	Site Area	Dredge Depth (ft.)	Remediation Cell	Beneficial Use Cell	Restoration Layer Thickness (ft.)	Depth to Top of Restoration Layer (ft.)	0-0.5'	0.5-1'	1-2'	2-3'	3-4'	4-5'	5-6'	6-8'	8-10'	10-12'	12-14'	14-16'	16-18'	18-20'	20-22'	22'+
VC-523	11/16/16	Kinnally Cove						0.071 J	0.096 J	0.241 J	0.189 J	0.393 J	0.515 J	0.904 J	1.36								
VC-533	11/16/17	Kinnally Cove						0.01 J	0.024 J	0.043 J	0.486 J												
VC-532A	09/27/18	Kinnally Cove	3	KC-3	KC-3	1	2		0.209 J	5.8	1.72	0.097 J											
VC-540A	09/26/18	Kinnally Cove	3	KC-3	KC-3	1	2			2.1	7.1												
VC-540B	09/26/18	Kinnally Cove	3	KC-3	KC-3	1	2			5.9	6.5												
VC-539	11/15/17	Kinnally Cove	3	KC-3	KCHS-13	2	1	0.392 J	1.69	1.82		1.4	0.168 J	0.028 J	0.015 J								
VC-539A	09/27/18	Kinnally Cove	3	KC-3	KCHS-13	2	1		0.536 J	2.8 J	3	0.61											
VC-539B	09/27/18	Kinnally Cove	3	KC-3	KCHS-13	2	1		0.48	3.99	4.14	0.027 J											
VC-539C	09/27/18	Kinnally Cove	3	KC-3	KCHS-13	2	1		0.533 J	2.76 J	14.7	0.102 J											
VC-540	11/15/17	Kinnally Cove	3	KC-3	KCHS-14	1	2	0.411 J	0.51	3.32	5.8	ND (0.087)	ND (0.085)	ND (0.088)	ND (0.075)								
VC-540C	09/26/18	Kinnally Cove	3	KC-3	KCHS-14	1	2			3.52	11.5												
VC-531	11/15/17	Kinnally Cove	4	KC-4	KC-4	1	3	0.222 J	0.484 J	4.18	8	2.6	ND (0.086)	0.034 J									
VC-531A	10/02/18	Kinnally Cove	4	KC-4	KC-4	1	3			2.53	3.88	9.2											
VC-531B	10/02/18	Kinnally Cove	4	KC-4	KC-4	1	3			5.13	4.92 J	2.33											
VC-531C	10/02/18	Kinnally Cove	4	KC-4	KC-4	1	3			2.78	4.33	5.2											
VC-532	11/16/17	Kinnally Cove	4	KC-4	KC-4	1	3	0.248 J	5.13	4.24	4.9	2.28	0.039 J	0.084 J	0.011 J								
VC-532C	09/27/18	Kinnally Cove	4	KC-4	KC-4	1	3		0.399 J	5.61	2.24	2.3											
VC-537	11/15/17	Kinnally Cove	4	KC-4	KCHS-10	1	3	0.407 J	0.493 J	1.059 J	0.93	10.7	0.204 J	0.065 J	ND (0.087)								
VC-537B	10/02/18	Kinnally Cove	4	KC-4	KCHS-10	1	3			3.92		7.7											
VC-530	11/15/17	Kinnally Cove	4	KC-4	KCHS-11	1	3	0.429 J	0.54	1.263 J	1.22	3.88	0.077 J	ND (0.087)	0.016 J								
VC-530A	10/01/18	Kinnally Cove	4	KC-4	KCHS-11	1	3			1.341 J	2.88	9.3											
VC-530B	10/01/18	Kinnally Cove	4	KC-4	KCHS-11	1	3			6.77	3.89	6											
VC-530C	10/01/18	Kinnally Cove	4	KC-4	KCHS-11	1	3			0.613	4.76	28.9											
VC-563	10/02/18	Kinnally Cove	4	KC-4	KCHS-11	1	3				4.19 J	21.4	1.09										
VC-538	11/15/17	Kinnally Cove	4	KC-4	KCHS-12	1	3	0.27 J	0.742 J	2.14	3.43	0.76	0.083 J	0.017 J									
VC-538A	10/02/18	Kinnally Cove	4	KC-4	KCHS-12	1	3			2.44	15.3												
VC-538B	10/02/18	Kinnally Cove	4	KC-4	KCHS-12	1	3			1.97	4.01 J												
VC-538C	10/02/18	Kinnally Cove	4	KC-4	KCHS-12	1	3			2.88	3.26												
VC-522	11/16/16	Kinnally Cove	5	KC-5	KC-5	1	4	0.62	0.2602 J	1.767	2.034	1.932	3.231	ND (0.0843)	ND (0.0854)								
VC-522A	10/02/18	Kinnally Cove	5	KC-5	KC-5	1	4			5.89	4.51	5.2	5.1										
VC-522B	10/02/18	Kinnally Cove	5	KC-5	KC-5	1	4			1.67	4.23	4.08	8.4										
VC-522C	10/02/18	Kinnally Cove	5	KC-5	KC-5	1	4			1.23	4.4	5.22	5.63										
VC-526	11/16/16	Kinnally Cove	5	KC-5	KC-5	1	4	0.101 J	0.068 J	0.142 J	0.94	0.84	1.3	0.037 J									
VC-526A	09/27/18	Kinnally Cove	5	KC-5	KC-5	1	4						ND (0.087)										
VC-526B	09/27/18	Kinnally Cove	5	KC-5	KC-5	1	4						9.9										
VC-526C	09/27/18	Kinnally Cove	5	KC-5	KC-5	1	4						ND (0.089)										
VC-545	09/26/18	Kinnally Cove	5	KC-5	KC-5	1	4			1.78	4.27	2.41	2.87	ND (0.091)									
VC-546	09/26/18	Kinnally Cove	5	KC-5	KC-5	1	4			1.231 J	6.7	1.94 J	8	ND (0.091)									
VC-551	09/25/18	Kinnally Cove	5	KC-5	KC-5	1	4				3.51	8.4	8.1	ND (0.088)									
VC-556	10/03/18	Kinnally Cove	5	KC-5	KC-5	1	4				5.1	9.8	0.77										
VC-557	10/03/18	Kinnally Cove	5	KC-5	KC-5	1	4			0.93	2.15	5.5	0.219										
VC-558	10/03/18	Kinnally Cove	5	KC-5	KC-5	1	4			0.71	1.93	1.92	6.8	0.179									
VC-537A	10/02/18	Kinnally Cove	5	KC-5	KCHS-10	1	4			0.301		7.8											
VC-564	10/03/18	Kinnally Cove	5	KC-5	KCHS-5	1	4			1.68	25.7	4.4	39.8	0.63									
VC-525	11/16/16	Kinnally Cove	5	KC-5	KCHS-6	1	4	0.083 J	0.061 J	0.35	0.38	1.1	1.2	0.14									
VC-525A	09/27/18	Kinnally Cove	5	KC-5	KCHS-6	1	4					3.68	35.5										
VC-525C	09/27/18	Kinnally Cove	5	KC-5	KCHS-6	1	4					5	8.2										
VC-529	11/15/17	Kinnally Cove	5	KC-5	KCHS-6	1	4	0.746 J	0.626 J	0.54 J	2.93	4.9	17.6	0.328 J									
VC-550	09/25/18	Kinnally Cove	5	KC-5	KCHS-6	1	4				3.54	6.3	22.8	0.186 J									
VC-562	10/02/18	Kinnally Cove	5	KC-5	KCHS-6	1	4				1.96	4.3	36.1	0.29									
VC-525B	09/27/18	Kinnally Cove	5	KC-5	KCHS-7	1	4					15.6 J	1.17										
VC-520	11/16/16	Kinnally Cove	5	KC-5	KCHS-8	1	4	0.175 J	0.324	0.603 J	6.23 J	3.08	18.17 J	0.2333 J	0.106								

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TABLE 2. POTENTIAL TOTAL PCB CONCENTRATIONS IN OLD MARINA AND KINNALLY COVE
FORMER ANACONDA WIRE AND CABLE COMPANY
1 RIVER STREET, HASTINGS-ON-HUDSON, NEW YORK

Sample ID	Sample Date	Site Area	Dredge Depth (ft.)	Remediation Cell	Beneficial Use Cell	Restoration Layer Thickness (ft.)	Depth to Top of Restoration Layer (ft.)	0-0.5'	0.5-1'	1-2'	2-3'	3-4'	4-5'	5-6'	6-8'	8-10'	10-12'	12-14'	14-16'	16-18'	18-20'	20-22'	22'+
VC-544	09/26/18	Kinnally Cove	5	KC-5	KCHS-8	1	4				3.62	3.98	18	ND (0.088)									
VC-521	11/16/16	Kinnally Cove	5	KC-5	KCHS-9	1	4	0.48 J	0.431	1.431	4.16	3.71	11.25	0.469	0.07 J								
VC-524	11/16/16	Kinnally Cove	6	KC-6	KC-6	2	4	0.086 J	0.099 J	0.132 J	0.331 J	0.91	0.57	0.94	5.2								
VC-527	11/14/17	Kinnally Cove	6	KC-6	KC-6	2	4	0.506 J	0.487 J	0.47 J	2.31	3.621 J	3.68	8.381 J	8								
VC-528	11/16/17	Kinnally Cove	6	KC-6	KC-6	2	4	0.567 J	0.95	3.032 J	3.17	2.01	6.24	9.4									
VC-535	11/16/17	Kinnally Cove	6	KC-6	KC-6	2	4	0.482 J	0.687 J	1.439 J	2.47	2.39	3.33	5.4	7.3								
VC-543	09/26/18	Kinnally Cove	6	KC-6	KC-6	2	4					6.8	9.7	3.24	9.4								
VC-547	09/26/18	Kinnally Cove	6	KC-6	KC-6	2	4				2.114 J	2.2	5.331 J	7.17	5.2								
VC-548	09/25/18	Kinnally Cove	6	KC-6	KC-6	2	4				2.784 J	4.492 J	6.788 J	4.13	11.32								
VC-549	09/25/18	Kinnally Cove	6	KC-6	KC-6	2	4			0.892 J	2.39	2.51	1.42	3	12.1								
VC-555	10/03/18	Kinnally Cove	6	KC-6	KC-6	2	4					0.88	1.93		33.5								
VC-559	10/03/18	Kinnally Cove	6	KC-6	KC-6	2	4				1.775 J	2.29	4.55	8	8.44								
VC-561	10/02/18	Kinnally Cove	6	KC-6	KC-6	2	4				5.15	3.1	4.3	4.2	9.5								
VC-536	11/16/17	Kinnally Cove	6	KC-6	KCHS-1	1	5	0.55 J	0.25 J	1.076 J	1.79	4.08	12.5	13									
VC-552	09/26/18	Kinnally Cove	6	KC-6	KCHS-1	1	5			2.1	2.48	4.13	12.4	16.8	0.063 J								
VC-534	11/14/17	Kinnally Cove	6	KC-6	KCHS-2	2	4	0.299 J	1.392 J	2.36	3.54	3.46	4.96	10.01	9.039 J								
VC-560	10/02/18	Kinnally Cove	6	KC-6	KCHS-3	2	4				11.37	7.2	1.63	2.84	5.3								
VC-519	11/16/16	Kinnally Cove	6	KC-6	KCHS-4	2	4	0.37 J	0.121	0.26	0.907	1.971	10.12	5.88	ND (0.0864)								
VC-542	09/26/18	Kinnally Cove	6	KC-6	KCHS-4	2	4					1.38	1.48	6.5	16.2								
VC-554	10/03/18	Kinnally Cove	6	KC-6	KCHS-8	2	4					8.452	3.47	3.19	11.1								
VC-553	10/03/18	Kinnally Cove	6	KC-6	OM/KCHS-1	2	4						6.271 J	12.99	5.77								
VC-517	09/25/15	Old Marina						0.342	0.232	1.173	0.771	0.94	0.89	2.115	5.73 J								
VC-517A	10/02/18	Old Marina								0.85 J													
VC-517B	10/02/18	Old Marina								0.522 J													
VC-517C	10/01/18	Old Marina								0.083 J													
VC-541	09/26/18	Old Marina	6	OM-6	OM/KCHS-1	2	4						16.42	3.67	1.67								
B1-SS-005	10/20/13	Old Marina	6	OM-6	OM-6	2	4	0.481 J															
BS-01	10/01/99	Old Marina	6	OM-6	OM-6	2	4	0.585															
CS-01	10/01/99	Old Marina	6	OM-6	OM-6	2	4	ND (2.5)		ND (2.4) @ 0.5-2'													
CS-07	10/01/99	Old Marina	6	OM-6	OM-6	2	4	ND (2.2)		ND (2.4) @ 0.5-2'	ND (2.5) @ 2-2.7'	ND (2.8) @ 2.7-3.2'											
EB-20	05/23/01	Old Marina	6	OM-6	OM-6	2	4			1.5													
RB-04	06/01/98	Old Marina	6	OM-6	OM-6	2	4			0.46 @ 0-2'				1.4 @ 4-6'		3.3		ND (0.12)		ND (0.11)		ND (0.11)	ND (0.11) @ 24-26', ND (0.11) @ 28-30'
~~RB-09~~	~~06/01/98~~	~~Old Marina~~	~~6~~	~~OM-6~~	~~OM-6~~	~~2~~	~~4~~			~~2.01 @ 0-2'~~				~~6'~~	~~5.1~~	~~0.031~~		~~ND (0.1)~~					
SD-34	07/13/05	Old Marina	6	OM-6	OM-6	2	4			1.13 @ 0-2'		3.75 @ 2-4'		1.06 @ 4-6'	2.76	13.8	17	ND (0.3)	ND (0.3)	ND (0.29)	ND (0.28)	ND (0.27)	ND (0.27) @ 22-24',ND (0.26) @ 24-26', ND (0.26) @ 26-27.5'
~~SD-35~~	~~07/22/05~~	~~Old Marina~~	~~6~~	~~OM-6~~	~~OM-6~~	~~2~~	~~4~~			~~5.1 @ 0-2'~~		~~6.8 @ 2-4'~~		~~2.56 @ 4-6'~~	~~ND (0.31)~~	~~ND (0.29)~~	~~ND (0.29)~~	~~ND (0.28)~~	~~ND (0.29)~~	~~ND (0.25)~~	~~ND (0.25)~~	~~ND (0.25)~~	~~ND (0.24)~~
~~SD-36~~	~~07/26/05~~	~~Old Marina~~	~~6~~	~~OM-6~~	~~OM-6~~	~~2~~	~~4~~			~~1.75 @ 0-~~		~~0.84 @ 2-4'~~		~~3.29 @ 4-6'~~	~~11.6~~	~~ND (0.3)~~	~~ND (0.3)~~	~~ND (0.27)~~	~~ND (0.24)~~	~~ND (0.26)~~	~~ND (0.26)~~		
~~SD-37~~	~~07/26/05~~	~~Old Marina~~	~~6~~	~~OM-6~~	~~OM-6~~	~~2~~	~~4~~			~~2'~~		~~2.95 @ 2-4'~~		~~2.95 @ 4-6'~~	~~2.42~~	~~ND (0.3)~~	~~ND (0.29)~~	~~ND (0.29)~~	~~ND (0.29)~~	~~ND (0.28)~~	~~ND (0.27)~~		
~~SD-38~~	~~07/26/05~~	~~Old Marina~~	~~6~~	~~OM-6~~	~~OM-6~~	~~2~~	~~4~~			~~0.37 @ 0-2'~~		~~7.17 @ 2-4'~~		~~5.95 @ 4-6'~~	~~ND (0.3)~~	~~ND (0.3)~~	~~ND (0.29)~~	~~ND (0.25)~~	~~ND (0.25)~~	~~ND (0.26)~~	~~ND (0.27)~~		
~~SD-40~~	~~07/21/05~~	~~Old Marina~~	~~6~~	~~OM-6~~	~~OM-6~~	~~2~~	~~4~~			~~2.54 @ 0-2'~~		~~2.08 @ 2-4'~~		~~2.22 @ 4-6'~~	~~3~~	~~ND (0.28)~~	~~ND (0.29)~~	~~ND (0.29)~~	~~ND (0.29)~~	~~ND (0.29)~~	~~ND (0.28)~~		
										0.47 @ 0-2'													
VC-502	09/30/14	Old Marina	6	OM-6	OM-6	2	4		1.919	1.295	2.25	3.412	5.341	3.952	0.296								
VC-503	10/30/14	Old Marina	6	OM-6	OM-6	2	4	0.0911	1.604	2.43	3.74	4.619	5.109	5.772	4.547								

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TABLE 2. POTENTIAL TOTAL PCB CONCENTRATIONS IN OLD MARINA AND KINNALLY COVE
FORMER ANACONDA WIRE AND CABLE COMPANY
1 RIVER STREET, HASTINGS-ON-HUDSON, NEW YORK

Sample ID	Sample Date	Site Area	Dredge Depth (ft.)	Remediation Cell	Beneficial Use Cell	Restoration Layer Thickness (ft.)	Depth to Top of Restoration Layer (ft.)	0-0.5'	0.5-1'	1-2'	2-3'	3-4'	4-5'	5-6'	6-8'	8-10'	10-12'	12-14'	14-16'	16-18'	18-20'	20-22'	22'+
VC-504	09/11/14	Old Marina	6	OM-6	OM-6	2	4	1.067	1.683	1.661	2.45	3.705	5.03	4.6	2.9								
VC-505	10/02/14	Old Marina	6	OM-6	OM-6	2	4	0.414	1.59	1.69	4.117	5.663	6.05	4.57	1.651								
VC-506	10/30/14	Old Marina	6	OM-6	OM-6	2	4	0.131	0.213	0.777	2.396	3.295	4.754	5.35	7.82								
VC-507	10/02/14	Old Marina	6	OM-6	OM-6	2	4	0.3342	0.258	0.4554	1.028	3.89	6.31	3.221	ND (0.086)								
VC-508	09/11/14	Old Marina	6	OM-6	OM-6	2	4	0.186	0.274	1.402	0.786	1.635	7.76	5.19	0.825								
VC-509	10/21/14	Old Marina	6	OM-6	OM-6	2	4	0.767	1.6	2.594	3.373	5.451	6.797	7.019	8.34								
VC-510	10/29/14	Old Marina	6	OM-6	OM-6	2	4	0.457	0.208	0.32	0.726	1.587	3.006	4.9	5.187								
VC-511B	10/01/18	Old Marina	6	OM-6	OM-6	2	4							6.14	7.66 J								
VC-511C	10/01/18	Old Marina	6	OM-6	OM-6	2	4							4.9	4.6								
VC-512	10/21/14	Old Marina	6	OM-6	OM-6	2	4	0.272	0.302	0.3437	0.74	0.511	9.91	0.4935	4.34								
VC-513	10/21/14	Old Marina	6	OM-6	OM-6	2	4	0.309	0.65	3.215	4.11	5.11	2.58	5.45	ND (0.0856)								
VC-514	10/24/14	Old Marina	6	OM-6	OM-6	2	4	0.307	0.325	0.243	0.759	1.972	1.752	1.73	17								
VC-515	10/24/14	Old Marina	6	OM-6	OM-6	2	4	0.254	0.289	0.654	1.249	3.154	9.78	0.0924	ND (0.0869)								
VC-518	09/28/15	Old Marina	6	OM-6	OM-6	2	4	0.258	0.0951	0.457	0.127	0.8673	1.196										
VC-518A	10/01/18	Old Marina	6	OM-6	OM-6	2	4						4.26										
VC-518B	10/01/18	Old Marina	6	OM-6	OM-6	2	4						2.88										
VC-518C	10/01/18	Old Marina	6	OM-6	OM-6	2	4						6.089 J										
VC-516	10/24/14	Old Marina	6	OM-6	OMHS-2	2	4	0.389	0.243	0.818	2.221	3.15	13.66	ND (0.0852)	ND (0.0817)								
VC-511	10/01/14	Old Marina	6	OM-6	OMHS-3	2	4	0.239	0.347	0.748	0.522	0.553	0.8019	4.117	11.01								
VC-511A	10/01/18	Old Marina	6	OM-6	OMHS-3	2	4							12.76	6.67								
VC-501	09/11/14	Old Marina	6	OM-6	OMHS-4	2	4	4.483	2.56	1.513	2.097	2.82	3.98	165.3	30.6								
RB-37	09/15/98	Old Marina	6	OM-6	OMHS-5	2	4	22															

APPENDIX D

Beneficial Use Evaluation

Technical Memorandum – Beneficial Use
DRAFT – For Discussion Purposes

TO: Jess LaClair, New York State Department of Environmental Conservation

FROM: Paul Johnson, AR; Martha Gopal, Sovereign Consulting Inc. (Sovereign)

CC: Lori Littrell, AR; Marc Cicalese, Douglas Stout, Sovereign; Ray Kapp, Arcadis

DATE: August 14, 2020

RE: Revised Beneficial Use Evaluation Memorandum
Former Anaconda Wire & Cable Co., Hastings-on-Hudson, NY

Background

The proposed remedy for the Hastings-on-Hudson Site is estimated to remove approximately 65,500 cubic yards (neat volume) of soil from Operable Unit Number 1 (OU-1) and approximately 63,000 cubic yards (neat volume) of sediments from OU-2. Atlantic Richfield Company (AR) proposes to use a portion of the removed OU-2 sediments as beneficial fill in the excavated areas of OU-1. AR also proposes to break up a portion of the existing concrete pads in OU-1 excavation areas, which concrete is not identified for removal, and use this concrete as beneficial fill in the excavated areas of OU-1. Concrete overlying soil remedial areas will be removed and disposed off-site. Finally, AR proposes to break up existing concrete outside of the OU-1 excavation areas and outside of the concrete beneficial use areas and leave this concrete in place to allow proper settlement and regrading to install the required protective cover and possible additional backfill. The beneficial use described in this memo is expected to reduce the project's carbon footprint and the need to transport and landfill the material.

The total polychlorinated biphenyls (PCBs) remedial criteria for OU-1 is 10 mg/kg, to specific maximum depths identified in the OU-1 Record of Decision (ROD). After removal of the identified PCB-containing soils in OU-1, the proposed beneficial fill will be placed in the OU-1 excavations, and a protective cover will be installed over areas with total PCB detections greater than 1 mg/kg as required in the ROD.

Based on the remedial criteria for OU-1, total PCB detections in the removed OU-2 sediments and OU-1 concrete were reviewed for beneficial use. Additionally, although institutional controls will be in place to prevent exposure to groundwater, NYSDEC has requested that sediments with concentrations of contaminant of concern (COC) metals (copper, lead, and zinc) above the NYSDEC Protection of Groundwater Restricted Use Soil Cleanup Objective[1] (referred to herein as SCO) be excluded from beneficial use sediments. To that end, total copper, lead, and zinc detections in OU-2 sediments also were reviewed in the evaluation of sediments for beneficial use.

Based on the evaluation described below, the areas of OU-2 proposed for potential beneficial use include portions of the Old Marina, Kinnally Cove, the North Boat Slip, Nearshore, the Deepwater Northwest Area, and the Deepwater Area. These general remediation areas include removal subareas and cells identified in the attached tables and evaluated for potential beneficial use.

[1] 6 NYCRR Part 375-6.8: Table 375-6.8(b): Restricted Use Soil Cleanup Objective.

The areas of OU-1 concrete proposed for potential beneficial use include concrete slabs in portions of Former Buildings 22, 51A, 52, and 72A.

The data evaluation process and results are described in detail below, first for sediments and then for concrete.

Beneficial Use Data Evaluation - Sediments

The following provides the criteria and process used to evaluate and select sediments for beneficial use:

- Within each subarea or cell of an OU-2 removal area, the PCB results were reviewed in a downward direction from the mudline (surface) to the subsurface. The maximum depth of the sediments for beneficial use from each subarea or cell was selected to be the depth interval where total PCB detections were observed to be less than 10 mg/kg. Once a total PCB concentration greater than 10 mg/kg was encountered, the evaluation relative to PCBs stopped and only the shallower sediments were selected for beneficial use.

- To perform the remedial work in OU-2 in a practical manner, any PCB detections below the proposed beneficial use depth interval were not considered for beneficial use, even if specific depth intervals below this depth contained total PCB detections below 10 mg/kg.

- Based on the pre-design investigation sampling interval of 1 foot throughout most of OU-2, the data were evaluated in one foot depth increments, and the maximum depth of sediment for beneficial use was selected in one-foot increments.

- The above selection criteria used individual laboratory results for each PCB sediment sample, and did not use an average of the laboratory results by depth, subarea or cell.

- For the Old Marina, Kinnally Cove, North Boat Slip, and Nearshore OU-2 removal areas, a 30 by 30-foot cell was centered on each sample location that contained PCB detections greater than 10 mg/kg at depth, to assist in the evaluation of the shallower sediment layer(s). The remedial cells in the Deepwater Northwest and Deepwater Areas were already developed using 30 by 30-foot cells.

Based on the above beneficial use selection criteria, Table 1 provides the total PCB results for OU-2 areas proposed for beneficial use; results are organized by beneficial use cell, then by site area and sample ID. The depth intervals shaded in green are the OU-2 sediments requiring removal that are proposed for beneficial use in OU-1. The depth intervals shaded in gray are the sediments requiring removal that will be segregated for off-site disposal.

Once OU-2 beneficial use materials were identified based on PCB detections, the OU-2 COC metals analytical results within these areas were compared to their respective SCO in the same manner as described above for PCBs. These results are provided in Table 2, which is arranged in the same manner as Table 1. As a result of this evaluation, the beneficial use depths were reduced as necessary in five areas in the Nearshore. These include NSCA-M1 through NSCA-M4 and NSCA-11. These revisions were made to Table 1 as well. No adjustments were made to proposed Deepwater or Northwest Deepwater beneficial use cells because the COC metals concentrations in these beneficial use sediments are below SCO.

Figures 1 through 4 provide the locations of the OU-2 remediation cells, including the remediation cell areas ("CA") that contained PCB detections greater than 10 mg/kg. The proposed beneficial use areas are shaded green on these figures, with the beneficial use depths provided in Tables 1 and 2. The beneficial use areas that were adjusted based on metals concentrations are outlined in orange in Figure 3.

Table 3 provides the estimated quantity of sediments for beneficial use, the number of samples in the proposed beneficial use areas, the average total PCB concentrations in the beneficial use material, and the quantity of cubic yards represented by a sample. In our review of 6CNRR-NY 360.12, it is our understanding that the NYSDEC uses a minimum of 1,000 cubic yards per sample as the characterization criteria for quantities under 5,000 cubic yards, and a proportionally lower sample density as the proposed total quantity for beneficial use increases. Table 3 also provides an estimate of samples collected per 1,000 cubic yards, recognizing that a lower frequency is required in areas with greater than 5,000 cubic yards.

Based on the information presented in Table 3, the proposed sediments for beneficial use represent a range of 16.5 to 172.0 cubic yards per sample, with an overall average of 84.7 cubic yards per sample. The sampling results provided in Table 1 and summarized in Table 3 provide sufficient data to satisfy the required sample density in 6CNRR-NY 360.12, and it is apparent that no additional PCB characterization of the beneficial use material will be required prior to use in OU-1.

Beneficial Use Quantity - Sediments

Based on the criteria used to select sediments for beneficial use, approximately 53,676 cubic yards (neat volume) would be available, as summarized in Table 3. It is anticipated this quantity would increase by a small percentage as the result of using dredging prisms for slope stability in OU-2. AR also notes that debris in some of the OU-2 areas may reduce the total quantity of sediments available for beneficial use.

As noted in the pre-design studies, it is also recognized that the sediment materials will have to be dewatered and amended in order to be used as backfill.

Beneficial Use Data Evaluation - Concrete

AR applied the above concentration criteria to the concrete (10 mg/kg) for beneficial use, and the same sampling frequency requirement at 6CNRR-NY 360.12 (a minimum of 1,000 cubic yards per sample) to determine which concrete is appropriate for beneficial use. In applying the beneficial use criteria, it was determined that along with investigation samples, concrete slab sample locations collected in 2009 as part of waste characterization efforts should be considered in this evaluation. These locations are provided in Table 4 and can be identified by sample IDs not including the prefix "FLR-CON-".

As indicated in Table 4, most of the concentrations above 10 mg/kg are within the first half-inch or inch of the concrete pads. The average concentration over all concrete depth intervals at each location was calculated and compared to the beneficial use criteria of 10 mg/kg. These averages are provided in Table 4. As shown in Table 3, the average Total PCB concentrations for all of the concrete samples within a given slab used for the beneficial use evaluation are well below the 10 mg/kg criteria, ranging from 0.08 to 3.60 mg/kg for each building concrete slab area considered for beneficial use.

Beneficial Use Quantity – Concrete

Based on this evaluation, approximately 3,400 cubic yards of concrete would be available for beneficial use. The concrete areas evaluated for beneficial use are the remaining concrete slabs from former Buildings 22, 22B, 51A, 52, 72, and 72A. The beneficial use areas are shown in green shading in Figure 5 and supporting data are provided in Table 4. Beneficial use material from the former Building 52 slab will used only within that building footprint. Table 3 summarizes the quantities of concrete for beneficial use from each area and provides the calculated sampling density for each of these areas. The quantities are based on the average thickness of each slab; the total quantity may increase or decrease based on the actual slab thickness.

The sampling densities in the concrete areas proposed for beneficial use average 32.9 cubic yards per sample, with the lowest density at approximately 159 cubic yards per sample. The sampling densities and sampling results provide sufficient data to satisfy the required sample density in 6CNRR-NY 360.12, and it is apparent that no additional PCB characterization of this beneficial use material will be required prior to use in OU-1.

AR also proposes to break up the existing concrete outside of the OU-1 excavation areas and outside of the proposed concrete beneficial use areas, and leave this concrete in place to allow proper settlement and regrading to install the required protective cover and possible additional backfill. It is our understanding that concrete broken up and left in place is not considered beneficial use.

During design and construction, concrete sampling may be conducted to identify additional concrete for beneficial use, utilizing the same criteria.

Beneficial Use Elevation Verification

NYSDEC indicated potential scour areas in the hydrodynamic study may experience erosion between the completion of the investigation and the start of dredging, and that dredging for beneficial use materials may collect materials deeper than planned, potentially with PCB concentrations greater than 10 mg/kg or COC metals concentrations greater than their respective SCO. The design specifies the actual elevation for each dredge area. The elevations for the recovery of beneficial use materials will be established using the design elevation datum, thereby eliminating this potential concern.

Additionally, dredging will be managed to ensure that higher concentration sediments from adjacent areas do not slough into beneficial use areas, or from beneficial use areas into other dredge areas.

Conclusion

AR intends to utilize this memo for design/construction purposes and looks forward to NYSDEC's review and approval. The beneficial use described in this memo is intended to provide flexibility for reuse of material from OU-1 and OU-2 for OU-1, thereby reducing the project's carbon footprint and the need to transport and landfill the material.

			TABLES				

DRAFT - FOR DISCUSSION PURPOSES ONLY

TABLE 1. OU-2 SEDIMENTS PROPOSED FOR BENEFICIAL USE - PCB EVALUATION

FORMER ANACONDA WIRE AND CABLE COMPANY

1 RIVER STREET, HASTINGS-ON-HUDSON, NEW YORK

Beneficial Use Cell	Sample ID	Site Area	Dredge Depth (ft.)	Beneficial Use Depth (ft.)	Total PCB Results by Depth Intervals (feet below mudline)							
					0 - 0.5	0.5 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 8
	VC-123	Deepwater Area	6	3	0.322 J	0.163 J	0.446 J	2.328 J	377.4		ND (0.0925) @ 4-6'	
DW-1	VC-123A	Deepwater Area	6	3				1.813	3,150		0.45 @ 4-6'	
	VC-123C	Deepwater Area	6	3				2.12	335.6		428.7 @ 4-6'	
DW-2	VC-123B	Deepwater Area	4	3				4.46	558		0.567 @ 4-6'	
	VC-144	Deepwater Area	4	3					124.4		0.497 @ 4-6'	
DW-3	VC-103	Deepwater Area	4	3	0.75 J	0.797 J	1.722 J	1.312	70.6		9.9 @ 4-6'	
DW-4	VC-103B	Deepwater Area	6	3		0.646	0.55	2.5	69.8		95.2 @ 4-6'	
DW-5	VC-102A	Deepwater Area	4	3		0.231	0.338	1.057	90.7		ND (0.0882) @ 4-6'	
	VC-130	Deepwater Area	4	2	0.795 J	0.247	0.362	0.974 J	1,090		31.6 @ 4-6'	
DW-6	VC-130A	Deepwater Area	4	2				11.6	1.1954		ND (0.0861) @ 4-6'	
	VC-130B	Deepwater Area	4	2				1.477	1.317		0.062 @ 4-6'	
	VC-130C	Deepwater Area	4	2				1.26	189		ND (0.0837) @ 4-6'	
	VC-139	Deepwater Area	4	2	0.172 J	0.203 J	0.3271 J	1.455 J	857		0.1106 J @ 4-6'	
DW-7	VC-139A	Deepwater Area	4	2				6.28	0.44		0.144 @ 4-6'	
	VC-139B	Deepwater Area	4	2				1.028	18.81		ND (0.0853) @ 4-6'	
	VC-139C	Deepwater Area	4	2				12.5	ND (0.0956)		ND (0.0847) @ 4-6'	
	VC-186	Deepwater Area	4	2					183		ND (0.0613) @ 4-6'	

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Beneficial Use Cell	Sample ID	Site Area	Dredge Depth (ft.)	Beneficial Use Depth (ft.)	Total PCB Results by Depth Intervals (feet below mudline)							
					0 - 0.5	0.5 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 8
DW-9	VC-108	Deepwater Area	3	2	0.153 J	0.193 J	0.407 J	492	10.8			
	VC-108A	Deepwater Area	3	2			2.51	5.79	0.161			
	VC-108B	Deepwater Area	3	2			0.3959	3.621	49.3			
	VC-108C	Deepwater Area	3	2			1.858	0.749	3.417			
DW-10	VC-101	Deepwater Area	4	3	0.46 J	0.187	0.3584 J	0.5896 J	1.741			
	VC-101B	Deepwater Area	4	3		0.311	0.566	0.719	69.5		ND (0.0821) @ 4-6'	
NW-1	RB-19	Deepwater Northwest Area	2	1								ND (0.12)
	VC-383	Deepwater Northwest Area	2	1	0.514 J	0.268 J	416 J	ND (0.0778)				
NW-2	SD-50	Deepwater Northwest Area	4	2			ND (0.4) @ 0-2'		ND (0.36) @ 2-4'		9.1 @ 4-6'	ND (0.33)
	VC-302	Deepwater Northwest Area	4	2	0.214 J	0.288 J	0.7749 J	58.1 J	128.7	23.05		
NW-3	RB-23	Deepwater Northwest Area	5	1	0.72							
	VC-303	Deepwater Northwest Area	5	1	0.274 J	4.726 J	1.729 J	1,048	43.8	336	31	
	VC-305	Deepwater Northwest Area	5	1	0.791 J	2.059 J	24.01	558	6,190	5,916	48.9	
	VC-335	Deepwater Northwest Area	5	1	0.289 J	0.345 J	0.6208 J	32.06 J	0.0563 J	ND (0.0923)	ND (0.0864)	
NW-5	VC-336	Deepwater Northwest Area	2	1	0.299 J	1.858 J	869	0.227 J	ND (0.0936)	ND (0.0779)	ND (0.089)	
NW-6	VC-304	Deepwater Northwest Area	6	1	3.412 J	4.45 J	12.35	334.7	6,374	251.1	3.317	1.062
	VC-306	Deepwater Northwest Area	6	1	0.227 J	0.462 J	11.42 J	1,517	562.6	112.87	204.8	0.92
NW-9	VC-371	Deepwater Northwest Area	3	2	0.4405 J	6.07 J	1.744 J	3,069	14.09	3.081 J		
NW-11	VC-313	Deepwater Northwest Area	6	6	0.135 J	0.569 J	1.08 J	5.18	ND (0.0856)		ND (0.0862)	

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					0 - 0.5	0.5 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 8
NW-12	VC-361	Deepwater Northwest Area	2	1	0.508 J	0.2155 J	1,170	3.295 J				
NW-13	VC-338	Deepwater Northwest Area	5	3	0.394 J	ND (0.0871)	ND (0.0834)	9.88 J	0.634 J	0.168 J	ND (0.0772)	697.3
	VC-370	Deepwater Northwest Area	5	3	0.391 J	0.207 J	0.53 J	0.779 J	57.8 J	92.7 J		
NW-14	VC-321	Deepwater Northwest Area	2	1	0.288 J	0.266 J	126	12.8 J				
	VC-351	Deepwater Northwest Area	2	1	0.277 J	0.372 J	7.937					
NW-15	VC-318	Deepwater Northwest Area	6	2	2.108 J	0.263 J	0.4388 J	723.6	12.77	0.198	110	995.6
NW-17	VC-316	Deepwater Northwest Area	3	2	0.83 J	1.429 J	9.37	771.2	12.43	3.13 J	0.909 J	46.1
	SD02-GB	Deepwater Northwest Area	5	3	0.415 @ 0-0'							
NW-18	VC-315	Deepwater Northwest Area	5	3	4.288 J	1.12 J	1.138 J	3.158 J	61.1 J	85.1	0.107	ND (0.0941)
	VC-317	Deepwater Northwest Area	5	3	1.09 J	0.462 J	3.65 J	1.034 J	19.92 J	527	0.0679 J	ND (0.0873)
NW-19	VC-322	Deepwater Northwest Area	2	1	0.334 J	0.349 J	57.1	ND (0.0856)				
NW-21	VC-363	Deepwater Northwest Area	5	3	3.196 J	0.978 J	0.747 J	0.559 J	10.86 J	198.4 J	0.2059 J	
NW-23	VC-396	Deepwater Northwest Area	2	1	0.233 J	0.812 J	114.3	ND (0.0907)	ND (0.0902)			
NW-25	SD05-CS	Deepwater Northwest Area	3	2	0.4 @ 0-0'							
	VC-327	Deepwater Northwest Area	3	2	1.229 J	0.5398 J	3.734 J	310.6	0.376	1.82	ND (0.0839)	1.29

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					0 - 0.5	0.5 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 8
	~~VC-344~~	~~Deepwater Northwest Area~~	~~5~~	~~2~~	~~0.164 J~~	~~0.333 J~~	~~1.04 J~~	~~4.12~~	~~6.09 J~~	~~101~~		
	~~VC-347~~	~~Deepwater Northwest Area~~	~~5~~	~~2~~	~~0.867 J~~	~~0.3461 J~~	~~1.238 J~~	~~22.67 J~~	~~0.72 J~~	~~1,206~~	~~0.1393 J~~	
NW-26	VC-358	Deepwater Northwest Area	5	2	0.3051 J	0.235 J	0.304 J			37.11 J		
	~~VC-385~~	~~Deepwater Northwest Area~~	~~5~~	~~2~~	~~0.274 J~~	~~0.852~~	~~0.6588 J~~	~~1,111~~	~~900 J~~	~~13,700~~		
NW-27	~~VC-329~~	~~Deepwater Northwest Area~~	~~4~~	~~3~~	~~0.149 J~~	~~0.203 J~~	~~0.397 J~~	~~0.4659 J~~	~~53.07~~	~~5.617~~	~~0.274 J~~	~~ND (0.0882)~~
	~~VC-345~~	~~Deepwater Northwest Area~~	~~2~~	~~1~~	~~0.79 J~~	~~9.12 J~~	~~215.4~~	~~19.54 J~~	~~17.55 J~~	~~11.32 J~~		
NW-28	VC-348	Deepwater Northwest Area	2	1	0.3417 J	0.416 J	0.872 J	0.4152 J	0.5797 J			
	~~VC-357~~	~~Deepwater Northwest Area~~	~~2~~	~~1~~	~~0.3586 J~~	~~0.218 J~~	~~1.64 J~~					
NW-30	VC-359	Deepwater Northwest Area	3	2	0.272 J	1.551 J	2.927 J	82.64	15.55 J			

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Beneficial Use Cell	Sample ID	Site Area	Dredge Depth (ft.)	Beneficial Use Depth (ft.)	Total PCB Results by Depth Intervals (feet below mudline)							
					0 - 0.5	0.5 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 8
NS-1	~~B1-SS-007~~	~~Nearshore~~	~~6~~	~~6~~	~~4.022 J~~							
	BS-03	Nearshore	6	6	1.457							
	CS-20	Nearshore	6	6	4.2		ND (1.2) @ 0.5-1.3', 3.6 @ 0.5-2'		4 @ 2-3.6'	ND (5.8) @ 3.6-4.3'		
	~~CS-20A~~	~~Nearshore~~	~~6~~	~~6~~	~~4.2~~							
	~~CS-32~~	~~Nearshore~~	~~6~~	~~6~~	~~2.4~~		~~7.8 @ 0.5-2'~~		~~ND (2.3) @ 2-4'~~	ND (2.4) @ 4-4.5'		
	~~CS-35~~	~~Nearshore~~	~~6~~	~~6~~	~~ND (2.7)~~		ND (2.4) @ 0.5-2'		~~ND (2.3) @ 2-4'~~	ND (2.2) @ 4-4.8'	~~3.9 @ 4.8-5.3'~~	
	~~HA-214~~	~~Nearshore~~	~~6~~	~~6~~								
	~~HA-215~~	~~Nearshore~~	~~6~~	~~6~~								ND (0.016) @ 5-7'
	HA-216	Nearshore	6	6			1.12 @ 0-2'		1.93 @ 2-4'		2 @ 4-6'	2.1
	HA-216A	Nearshore	6	6								
	HA-221	Nearshore	6	6								
	HA-221A	Nearshore	6	6								
	HA-222	Nearshore	6	6								
	HA-223	Nearshore	6	6								
	~~B1-SS-008~~	~~Nearshore~~	~~6~~	~~6~~	~~0.287 J~~							
	~~BS-04~~	~~Nearshore~~	~~6~~	~~6~~	~~2.678~~							
	~~VC-403~~	~~Nearshore~~	~~6~~	~~6~~	~~0.111 J~~	~~0.3598 J~~	~~1.925~~	~~2.397~~	~~4.8 J~~	~~7.31 J~~	~~1.549~~	~~1.485~~
	~~VC-405~~	~~Nearshore~~	~~6~~	~~6~~	~~0.471~~	~~0.954~~	~~5.9~~	~~2.711~~	~~5.085~~	~~5.403~~	~~6.246~~	~~0.842~~
	CS-25	Northern Boat Slip	6	6	ND (0.9)	~~ND (0.88) @ 0.5-0.8'~~						
NS-2	CS-26	Northern Boat Slip	6	6	ND (2.7)		~~ND (2.5) @ 0.5-2'~~		ND (2) @ 2-4'	~~ND (2.4) @ 4-4.7'~~		
	~~SD-03~~	~~Northern Boat Slip~~	~~6~~	~~6~~	~~1.08~~							
	~~SD-48~~	~~Northern Boat Slip~~	~~6~~	~~6~~			~~0.4 @ 0-2'~~		~~2.83 @ 2-4'~~		~~5.69 @ 4-6'~~	~~7.7~~
	~~VC-601~~	~~Northern Boat Slip~~	~~6~~	~~6~~	~~0.601~~	~~2.285~~	~~3.22~~	~~1.061~~	~~3.85~~	~~3.125~~	~~4~~	~~7.25~~
	~~VC-602~~	~~Northern Boat Slip~~	~~6~~	~~6~~	~~0.411~~	~~0.1542~~	~~0.455~~	~~1.044~~	~~2.202~~	~~1.764~~	~~2.643~~	~~4.55 J~~
	~~VC-603~~	~~Northern Boat Slip~~	~~6~~	~~6~~	~~0.36~~	~~0.42~~	~~0.548~~	~~0.797~~	~~0.99~~	~~2.064~~	~~2.279~~	~~6.085 J~~
	~~VC-605~~	~~Northern Boat Slip~~	~~6~~	~~6~~	~~0.241~~	~~0.21~~	~~0.272~~	~~1.141~~	~~1.341~~	~~3.38~~	~~8.77~~	~~3.517 J~~

TABLE 1. OU-2 SEDIMENTS PROPOSED FOR BENEFICIAL USE - PCB EVALUATION

FORMER ANACONDA WIRE AND CABLE COMPANY

1 RIVER STREET, HASTINGS-ON-HUDSON, NEW YORK

Beneficial Use Cell	Sample ID	Site Area	Dredge Depth (ft.)	Beneficial Use Depth (ft.)	Total PCB Results by Depth Intervals (feet below mudline)							
					0 - 0.5	0.5 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 8
NS-3	VC-406	Nearshore	6	6	0.32	0.132	0.33	ND (0.0694)	ND (0.0621)	ND (0.0567)	ND (0.0685)	ND (0.0678)
	VC-407	Nearshore	6	6	0.107 J	ND (0.0942)	ND (0.0801)	ND (0.0736)	ND (0.0824)	ND (0.0775)	ND (0.0797)	ND (0.0824)
	VC-410	Nearshore	6	6	0.4	1.56	3.11	3.67	6.64	1.171	0.1292 J	ND (0.0837)
NS-5	BS-07	Nearshore	6	6	0.705							
	CS-43	Nearshore	6	6	2.2		ND (1.3) @ 0.5-2'	2.8 @ 2-2.5'				
	RB-31	Nearshore	6	6	1.62							
	RB-32	Nearshore	6	6	0.386		1.1 @ 0.5-2'					
	RB-33	Nearshore	6	6	7.5		2.5 @ 0.5-2'	1.72				
NSCA-9	SD-01	Nearshore	6	6	0.37							
	BS-05	Nearshore	6	1	2.229							
	VC-409	Nearshore	6	1	0.356	5.69	28.17	1.712	2.857	0.2539	ND (0.0859)	0.0811 J
NSCA-10	CS-33	Nearshore	6	4	ND (2.7)		ND (2.6) @ 0.5-1.6', ND (2.2) @ 1.6-2.1'					
	VC-411	Nearshore	6	4	0.319	0.611	1.392	3.46	1.736	58.33	ND (0.0907)	ND (0.0905)
NSCA-11	VC-412	Nearshore	6	4	0.207	0.761	1.031	5.58	3.96	5.64	10.58	13.24
NSCA-14	VC-420	Nearshore	6	4	0.684	1.358	0.865	2.875	4.15	21.58	0.175	0.0813 J
NSCA-15	RB-25	Nearshore	6	2	0.66		2.1 @ 0.5-2'		22 @ 2-4'			
	VC-421	Nearshore	6	2	0.888	2.003	4.866	13.34	4.73	22.91	0.103	ND (0.0832)
NSCA-M1	VC-406	Nearshore	6	1	0.32	0.132	0.33	ND (0.0694)	ND (0.0621)	ND (0.0567)	ND (0.0685)	ND (0.0678)
NSCA-M2	VC-407	Nearshore	6	1	0.107 J	ND (0.0942)	ND (0.0801)	ND (0.0736)	ND (0.0824)	ND (0.0775)	ND (0.0797)	ND (0.0824)
NSCA-M3	VC-410	Nearshore	6	1	0.4	1.56	3.11	3.67	6.64	1.171	0.1292 J	ND (0.0837)
NSCA-M4	CS-43	Nearshore	6	0	2.2		ND (1.3) @ 0.5-2'	2.8 @ 2-2.5'				

TABLE 1. OU-2 SEDIMENTS PROPOSED FOR BENEFICIAL USE - PCB EVALUATION

FORMER ANACONDA WIRE AND CABLE COMPANY

1 RIVER STREET, HASTINGS-ON-HUDSON, NEW YORK

Beneficial Use Cell	Sample ID	Site Area	Dredge Depth (ft.)	Beneficial Use Depth (ft.)	Total PCB Results by Depth Intervals (feet below mudline)							
					0 - 0.5	0.5 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 8
	B1-SS-005	Old Marina	6	6	0.481 J							
	BS-01	Old Marina	6	6	0.585							
	CS-01	Old Marina	6	6	ND (2.5)		ND (2.4) @ 0.5-2'					
	CS-07	Old Marina	6	6	ND (2.2)		ND (2.4) @ 0.5-2'	ND (2.5) @ 2-2.7'	ND (2.8) @ 2.7-3.2'			
	EB-20	Old Marina	6	6			1.5					
	RB-04	Old Marina	6	6			0.46 @ 0-2'				1.4 @ 4-6'	
	RB-09	Old Marina	6	6			2.01 @ 0-2'					5.1
	SD-34	Old Marina	6	6			1.13 @ 0-2'		3.75 @ 2-4'		2.06 @ 4-6'	2.76
	SD-35	Old Marina	6	6			5.1 @ 0-2'		6.8 @ 2-4'		2.56 @ 4-6'	ND (0.31)
	SD-36	Old Marina	6	6			1.75 @ 0-2'		0.84 @ 2-4'		3.29 @ 4-6'	11.6
	SD-37	Old Marina	6	6			0.37 @ 0-2'		2.95 @ 2-4'		2.95 @ 4-6'	2.42
	SD-38	Old Marina	6	6			2.54 @ 0-2'		7.17 @ 2-4'		5.95 @ 4-6'	ND (0.3)
	SD-40	Old Marina	6	6			0.47 @ 0-2'		2.08 @ 2-4'		2.22 @ 4-6'	3
	VC-502	Old Marina	6	6		1.919	1.295	2.25	3.412	5.341	3.952	0.296
OM-6	VC-503	Old Marina	6	6	0.0911	1.604	2.43	3.74	4.619	5.109	5.772	4.547
	VC-504	Old Marina	6	6	1.067	1.683	1.661	2.45	3.705	5.03	4.6	2.9
	VC-505	Old Marina	6	6	0.414	1.59	1.69	4.117	5.663	6.05	4.57	1.651
	VC-506	Old Marina	6	6	0.131	0.213	0.777	2.396	3.295	4.754	5.35	7.82
	VC-507	Old Marina	6	6	0.3342	0.258	0.4554	1.028	3.89	6.31	3.221	ND (0.086)
	VC-508	Old Marina	6	6	0.186	0.274	1.402	0.786	1.635	7.76	5.19	0.825
	VC-509	Old Marina	6	6	0.767	1.6	2.594	3.373	5.451	6.797	7.019	8.34
	VC-510	Old Marina	6	6	0.457	0.208	0.32	0.726	1.587	3.006	4.9	5.187
	VC-511B	Old Marina	6	6							6.14	7.66 J
	VC-511C	Old Marina	6	6							4.9	4.6
	VC-512	Old Marina	6	6	0.272	0.302	0.3437	0.74	0.511	9.91	0.4935	4.34
	VC-513	Old Marina	6	6	0.309	0.65	3.215	4.11	5.11	2.58	5.45	ND (0.0856)
	VC-514	Old Marina	6	6	0.307	0.325	0.243	0.759	1.972	1.752	1.73	17
	VC-515	Old Marina	6	6	0.254	0.289	0.654	1.249	3.154	9.78	0.0924	ND (0.0869)
	VC-518	Old Marina	6	6	0.258	0.0951	0.457	0.127	0.0673	1.196		
	VC-518A	Old Marina	6	6						4.26		
	VC-518B	Old Marina	6	6						2.88		
	VC-518C	Old Marina	6	6						6.089 J		
OMCA-2	VC-516	Old Marina	6	4	0.389	0.243	0.818	2.221	3.15	13.66	ND (0.0852)	ND (0.0817)
OMCA-3	VC-511	Old Marina	6	5	0.239	0.347	0.748	0.522	0.553	0.8019	4.117	11.01
	VC-511A	Old Marina	6	5							12.76	6.67
OMCA-4	VC-501	Old Marina	6	5	4.483	2.56	1.513	2.097	2.82	3.98	165.3	30.6

TABLE 1. OU-2 SEDIMENTS PROPOSED FOR BENEFICIAL USE - PCB EVALUATION

FORMER ANACONDA WIRE AND CABLE COMPANY

1 RIVER STREET, HASTINGS-ON-HUDSON, NEW YORK

Beneficial Use Cell	Sample ID	Site Area	Dredge Depth (ft.)	Beneficial Use Depth (ft.)	Total PCB Results by Depth Intervals (feet below mudline)							
					0 - 0.5	0.5 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 8
KC-3	VC-532A	Kinnally Cove	3	3		0.209 J	5.8	1.72	0.097 J			
	VC-540A	Kinnally Cove	3	3			2.1	7.1				
	VC-540B	Kinnally Cove	3	3			5.9	6.5				
KC-4	VC-531	Kinnally Cove	4	4	0.222 J	0.484 J	4.18	8	2.6	ND (0.086)	0.034 J	
	VC-531A	Kinnally Cove	4	4			2.53	3.88	9.2			
	VC-531B	Kinnally Cove	4	4			5.13	4.92 J	2.33			
	VC-531C	Kinnally Cove	4	4			2.78	4.33	5.2			
	VC-532	Kinnally Cove	4	4	0.248 J	5.13	4.24	4.9	2.28	0.039 J	0.084 J	0.011 J
	VC-532C	Kinnally Cove	4	4		0.399 J	5.61	2.24	2.3			
KC-5	VC-522	Kinnally Cove	5	5	0.62	0.2602 J	1.767	2.034	1.932	3.231	ND (0.0843)	ND (0.0854)
	VC-522A	Kinnally Cove	5	5			5.89	4.51	5.2	5.1		
	VC-522B	Kinnally Cove	5	5			1.67	4.23	4.08	8.4		
	VC-522C	Kinnally Cove	5	5			1.23	4.4	5.22	5.63		
	VC-526	Kinnally Cove	5	5	0.101 J	0.068 J	0.142 J	0.94	0.84	1.3	0.037 J	
	VC-526A	Kinnally Cove	5	5						ND (0.087)		
	VC-526B	Kinnally Cove	5	5						9.9		
	VC-526C	Kinnally Cove	5	5						ND (0.089)		
	VC-545	Kinnally Cove	5	5			1.78	4.27	2.41	2.87	ND (0.091)	
	VC-546	Kinnally Cove	5	5			1.231 J	6.7	1.94 J	8	ND (0.091)	
	VC-551	Kinnally Cove	5	5				3.51	8.4	8.1	ND (0.088)	
	VC-556	Kinnally Cove	5	5				5.1	9.8	0.77		
	VC-557	Kinnally Cove	5	5			0.93	2.15	5.5	0.219		
	VC-558	Kinnally Cove	5	5			0.71	1.93	1.92	6.8	0.179	
KC-6	VC-524	Kinnally Cove	6	6	0.086 J	0.099 J	0.132 J	0.331 J	0.91	0.57	0.94	5.2
	VC-527	Kinnally Cove	6	6	0.506 J	0.487 J	0.47 J	2.31	3.621 J	3.68	8.381 J	8
	VC-528	Kinnally Cove	6	6	0.567 J	0.95	3.032 J	3.17	2.01	6.24	9.4	
	VC-535	Kinnally Cove	6	6	0.482 J	0.687 J	1.439 J	2.47	2.39	3.33	5.4	7.3
	VC-543	Kinnally Cove	6	6					6.8	9.7	3.24	9.4
	VC-547	Kinnally Cove	6	6				2.114 J	2.2	5.331 J	7.17	5.2
	VC-548	Kinnally Cove	6	6				2.784 J	4.492 J	6.788 J	4.13	11.32
	VC-549	Kinnally Cove	6	6			0.892 J	2.39	2.51	1.42	3	12.1
	VC-555	Kinnally Cove	6	6					0.88	1.93		33.5
	VC-559	Kinnally Cove	6	6				1.775 J	2.29	4.55	8	8.44
	VC-561	Kinnally Cove	6	6				5.15	3.1	4.3	4.2	9.5
KCCA-1	VC-536	Kinnally Cove	6	4	0.55 J	0.25 J	1.076 J	1.79	4.08	12.5	13	
	VC-552	Kinnally Cove	6	4			2.1	2.48	4.13	12.4	16.8	0.063 J

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TABLE 1. OU-2 SEDIMENTS PROPOSED FOR BENEFICIAL USE - PCB EVALUATION

FORMER ANACONDA WIRE AND CABLE COMPANY

1 RIVER STREET, HASTINGS-ON-HUDSON, NEW YORK

Beneficial Use Cell	Sample ID	Site Area	Dredge Depth (ft.)	Beneficial Use Depth (ft.)	Total PCB Results by Depth Intervals (feet below mudline)							
					0 - 0.5	0.5 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 8
KCCA-2	VC-534	Kinnally Cove	6	5	0.299 J	1.392 J	2.36	3.54	3.46	4.96	10.01	9.039 J
KCCA-4	VC-519	Kinnally Cove	6	4	0.37 J	0.121	0.26	0.907	1.971	10.12	5.88	ND (0.0864)
	VC-542	Kinnally Cove	6	4					1.38	1.48	6.5	16.2
KCCA-5	VC-564	Kinnally Cove	5	2			1.68	25.7	4.4	39.8	0.63	
KCCA-6	VC-525	Kinnally Cove	5	4	0.083 J	0.061 J	0.35	0.38	1.1	1.2	0.14	
	VC-525A	Kinnally Cove	5	4					3.68	35.5		
	VC-525C	Kinnally Cove	5	4					5	8.2		
	VC-529	Kinnally Cove	5	4	0.746 J	0.626 J	0.54 J	2.93	4.9	17.6	0.328 J	
	VC-550	Kinnally Cove	5	4				3.54	6.3	22.8	0.186 J	
	VC-562	Kinnally Cove	5	4				1.96	4.3	36.1	0.29	
	VC-520	Kinnally Cove	5	4	0.175 J	0.324	0.603 J	6.23 J	3.08	18.17 J	0.2333 J	0.106
KCCA-8	VC-544	Kinnally Cove	5	4				3.62	3.98	18	ND (0.088)	
	VC-554	Kinnally Cove	6	4					8.452	3.47	3.19	11.1
KCCA-9	VC-521	Kinnally Cove	5	4	0.48 J	0.431	1.431	4.16	3.71	11.25	0.469	0.07 J
KCCA-10	VC-537	Kinnally Cove	4	3	0.407 J	0.493 J	1.059 J	0.93	10.7	0.204 J	0.065 J	ND (0.087)
	VC-537A	Kinnally Cove	5	3			0.301		7.8			
	VC-537B	Kinnally Cove	4	3			3.92		7.7			
KCCA-11	VC-530	Kinnally Cove	4	3	0.429 J	0.54	1.263 J	1.22	3.88	0.077 J	ND (0.087)	0.016 J
	VC-530A	Kinnally Cove	4	3			1.341 J	2.88	9.3			
	VC-530B	Kinnally Cove	4	3			6.77	3.89	6			
	VC-530C	Kinnally Cove	4	3			0.613	4.76	28.9			
KCCA-12	VC-563	Kinnally Cove	4	3				4.19 J	21.4	1.09		
	VC-538	Kinnally Cove	4	2	0.27 J	0.742 J	2.14	3.43	0.76	0.083 J	0.017 J	
	VC-538A	Kinnally Cove	4	2			2.44	15.3				
	VC-538B	Kinnally Cove	4	2			1.97	4.01 J				
	VC-538C	Kinnally Cove	4	2			2.88	3.26				
KCCA-13	VC-539	Kinnally Cove	3	2	0.392 J	1.69	1.82		1.4	0.168 J	0.028 J	0.015 J
	VC-539A	Kinnally Cove	3	2		0.536 J	2.8 J	3	0.61			
	VC-539B	Kinnally Cove	3	2		0.48	3.99	4.14	0.027 J			
	VC-539C	Kinnally Cove	3	2		0.533 J	2.76 J	14.7	0.102 J			
KCCA-14	VC-540	Kinnally Cove	3	2	0.411 J	0.51	3.32	5.8	ND (0.087)	ND (0.085)	ND (0.088)	ND (0.075)
	VC-540C	Kinnally Cove	3	2			3.52	11.5				

Notes:

All concentrations are in milligrams per kilogram (mg/kg) Total PCBs.

J - Estimated value

ND - Not detected above laboratory detection limits

-Thick horizontal borders on this table enclose adjoining beneficial use cells.

-Gray shading indicates to be excavated.

-Green shading indicates to be excavated & proposed for Beneficial Use.

-Orange shading indicates Beneficial Use Depth adjusted based on COC Metals concentrations (See Table 2).

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TABLE 2. OU-2 SEDIMENTS PROPOSED FOR BENEFICIAL USE - METALS EVALUATION

FORMER ANACONDA WIRE AND CABLE COMPANY

1 RIVER STREET, HASTINGS-ON-HUDSON, NEW YORK

PCB Benef	Metals Beneficial Use Cell	Sample Locations Results	Dredge Depth (ft.)	Beneficial Use Depth for PCBs (ft.)	Beneficial Use Depth Adjusted for Metals (ft.)	Metal Results by Depth Intervals (feet below mudline)																							
						0 - 0.5			0.5 - 1			1 - 2			2 - 3			3 - 4			4 - 5			5 - 6			6 - 8		
						Copper	Lead	Zinc	Copper	Lead	Zinc	Copper	Lead	Zinc	Copper	Lead	Zinc	Copper	Lead	Zinc	Copper	Lead	Zinc	Copper	Lead	Zinc	Copper	Lead	Zinc
NS-2		VC-403	6	6	6	61	62	129	75	60	132	86	88	141	128	120	189	222	151	235	274	155	257	322	180	290	430	153	294
NS-2		VC-405	6	6	6	66	47	130	63	56	149	85	90	152	123	134	221	126	135	235	150	144	225	219	174	269	453	169	383
NS-3	NSCA-M1	VC-406	6	6	1	181	51	469	1,540	186	1,190	3,570	184	3,350	9,770	1,510	11,800	8,450	1,070	15,600	6,560	330	11,000	8,640	254	15,800	5,990	120	6,870
NS-3	NSCA-M2	VC-407	6	6	1	86	48	168	1,320	189	804	3,970	212	3,810	6,410	355	6,720	3,570	233	6,870	3,240	167	5,010	1,930	162	2,670	863	155	1,310
NS-3	NSCA-M3	VC-410	6	6	1	67	50	153	631	67	183	3,920	137	210	813	138	265	957	150	280	6,300	148	320	1,200	162	1,190	632	169	1,090
NS-5	NSCA-M4	CS-43	6	6	0	2,560	1,390	5,710	1,080	523	2,510	1,080	523	2,510	2,680	289	531	-	-	-	-	-	-	-	-	-	-	-	-
NSCA-9		VC-409	6	1	1	79	48	131	1,250	171	432	636	306	404	780	139	817	1,800	179	2,000	1,020	121	1,560	289	127	311	163	111	220
NSCA-10		VC-411	6	4	4	59	56	153	85	66	158	176	92	155	958	294	233	437	141	259	452	139	272	283	131	301	405	145	386
NSCA-11		VC-412	6	5	4	53	51	134	153	73	150	169	104	169	572	133	175	262	140	166	549	838	206	544	143	215	523	164	267
NSCA-14		VC-420	6	4	4	72	49	130	227	91	169	397	99	178	795	123	185	1,630	277	219	850	368	250	560	166	226	291	196	224
NSCA-15		VC-421	6	2	2	81	66	149	763	107	215	734	132	213	1,910	137	213	4,360	228	230	1,600	359	296	548	208	226	220	117	205

Notes:

All concentrations are in milligrams per kilogram (mg/kg).

Gray shading indicates to be excavated.

Green shading indicates to be excavated & proposed for Beneficial Use.

Concentrations compared to the following Protection of Groundwater Soil Cleanup Objectives:

(From 6 NYCRR Part 375-6.8: Table 375-6.8(b): Restricted Use Soil Cleanup Objectives, Protection of Groundwater)

Copper = 1,720 mg/kg

Lead = 450 mg/kg

Zinc = 2,480 mg.kg

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TABLE 3. SUMMARY OF DETECTIONS AND SAMPLE DENSITY FOR BENEFICIAL USE

FORMER ANACONDA WIRE AND CABLE COMPANY

1 RIVER STREET, HASTINGS-ON-HUDSON, NEW YORK

OU-2 (Sediment) Beneficial Use				
Area	Sample Count	Average (mg/kg)	Quantity (cu.yds.)	Cu.yds./ Sample
Kinnally Cove	219	2.84		
Old Marina	148	2.44		
Old Marina and Kinnally Cove	***367***	***2.68***	***27,970***	***76.2***
Nearshore	93	2.23		
Northern Boat Slip	44	1.78		
Nearshore Area/Boat Slip	***137***	***2.08***	***23,568***	***172.0***
Deepwater Northwest Area	94	1.27		
Deepwater Area	36	0.90		
Deepwater Areas	***130***	***1.17***	***2,139***	***16.5***
Total OU-2	**634**	**2.24**	**53,676**	**84.7**

OU-1 (Concrete) Beneficial Use				
Area	Sample Count	Average (mg/kg)	Quantity (cu.yds.)	Cu.yds./ Sample
Building 22 Concrete Floor	11	0.96	242	22.0
Building 22B Concrete Floor	6	0.08	23	3.9
Building 51A Concrete Floor	6	1.10	247	41.2
Building 52 Concrete Floor	73	3.60	2,465	33.8
Building 72 Concrete Floor	1	0.13	159	159.2
Building 72A Concrete Floor	7	2.38	283	40.5
Total Concrete	**104**	**2.89**	**3,421**	**32.9**

Notes:

All concentrations are in milligrams per kilogram (mg/kg) Total PCBs.

cu.yds. - cubic yards

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TABLE 4. OU-1 CONCRETE PROPOSED FOR BENEFICIAL USE

FORMER ANACONDA WIRE AND CABLE COMPANY

1 RIVER STREET, HASTINGS-ON-HUDSON, NEW YORK

Sample ID	Site Area	Estimated Concrete Thickness and Beneficial Use Depth (inches)	Average Total PCB Concentration (mg/kg)	Sample Depth Range (inches)																		
				-	0 - 0.5	0 - 1	0 - 3	0.5 - 1	1 - 2	1 - 2.5	2 - 3	2 - 3.5	2.5 - 3.5	2.5 - 4	3 - 4	3.5 - 4.5	3.5 - 5	4 - 5	4 - 5.5	5 - 6	8 - 8.8	8.8 - 9.3
22-FC-1-02	Building 22	6.0	1.25		7			0.25		0.18				0.017				0.013		0.012		
22-FC-1-03	Building 22	6.0	0.62		ND (0.067)			2.81		ND (0.067)			ND (0.067)			0.095						
22-FC-1-01	Building 22B	6.0	0.08		0.21			0.017	0.027			ND (0.067)					ND (0.067)			ND (0.067)		
51A-FC-1-01	Building 51A	6.0	0.78			2.2			ND (0.067)		ND (0.067)											
51A-FC-1-02	Building 51A	6.0	1.43			4.2			0.021		0.067											
52-FC-1-02	Building 52	8.8	4.75		27.2			0.98	0.06		0.032				0.036				0.19			
52-FC-1-03	Building 52	8.8	3.90		12			7.3	0.13		0.043				0.026							
52-FC-1-04	Building 52	8.8	8.47		11.6			25	5.6		0.077				0.052							
52-FC-1-05	Building 52	8.8	3.03		11			1	0.087		0.029											
52-FC-1-06	Building 52	8.8	1.94		8.3			1.2	0.087		ND (0.067)				ND (0.067)							
52-FC-1-08	Building 52	8.8	3.54		12			5.2	ND (0.067)		0.39				0.067							
52-FC-1-09	Building 52	8.8	7.37		12			25	14		0.47				0.026			0.049		0.019		
FLR-CON-003	Building 52	9.3	0.05				ND (0.05)															
FLR-CON-005	Building 52	9.3	2.62				2.62 J															
FLR-CON-006	Building 52	9.3	0.52				0.517															
FLR-CON-007	Building 52	9.3	0.03				0.0273 J															
FLR-CON-008	Building 52	9.3	0.25				0.249															
FLR-CON-010	Building 52	9.3	0.10				0.0965															
FLR-CON-011	Building 52	9.3	4.77				4.769 J															
FLR-CON-013	Building 52	9.3	0.05				0.0457 J															
FLR-CON-014	Building 52	9.3	0.05				0.0542															
FLR-CON-018	Building 52	9.3	0.73				0.7347															
FLR-CON-019	Building 52	9.3	0.05				ND (0.05)															
FLR-CON-020	Building 52	9.3	0.05				ND (0.05)															

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TABLE 4. OU-1 CONCRETE PROPOSED FOR BENEFICIAL USE

FORMER ANACONDA WIRE AND CABLE COMPANY

1 RIVER STREET, HASTINGS-ON-HUDSON, NEW YORK

Sample ID	Site Area	Estimated Concrete Thickness and Beneficial Use Depth (inches)	Average Total PCB Concentration (mg/kg)	Sample Depth Range (inches)																	
				-	0 - 0.5	0 - 1	0 - 3	0.5 - 1	1 - 2	1 - 2.5	2 - 3	2 - 3.5	2.5 - 3.5	2.5 - 4	3 - 4	3.5 - 4.5	3.5 - 5	4 - 5	4 - 5.5	5 - 6	8 - 8.8	8.8 - 9.3
ELR-CON-024	Building 52	9.3	0.16				0.1608 J															
ELR-CON-025	Building 52	9.3	2.52				2.52															
ELR-CON-034	Building 52	9.3	0.69				0.692															
ELR-CON-106	Building 52	9.3	0.03				0.0322 J															
ELR-CON-108	Building 52	9.3	5.29				5.29															
ELR-CON-117	Building 52	9.3	0.75				0.754															
ELR-CON-119	Building 52	9.3	10.0				10															
ELR-CON-241	Building 52	9.3	0.20				0.2															
ELR-CON-321	Building 52	9.3	2.41				2.413 J															
ELR-CON-323	Building 52	9.3	5.76				5.76															
ELR-CON-325	Building 52	9.3	3.79				3.79															
ELR-CON-420	Building 52	9.3	9.60				9.6															
ELR-CON-421	Building 52	9.3	0.18																		0.183	
ELR-CON-437	Building 52	9.3	8.69				8.69															
ELR-CON-522	Building 52	9.3	0.92				0.916															
ELR-CON-523	Building 52	9.3	3.95				3.95															
ELR-CON-604	Building 52	9.3	1.50			2.28			0.71													
ELR-CON-605	Building 52	9.3	1.53			3			ND (0.05)													
ELR-CON-701	Building 52	9.3	1.52			3			ND (0.049)													
ELR-CON-702	Building 52	9.3	4.13			8.2			0.05 J													
72-FC-1-01	Building 72	7.3	0.13	0.13																		
72A-FC-1-01	Building 72A	7.3	2.38		3.4			1.28	0.114		0.041				0.74			ND (0.067)		11		

Notes:

concentrations are in milligrams per kilogram (mg/kg).

Estimated value

- Not detected above laboratory detection limits shown.

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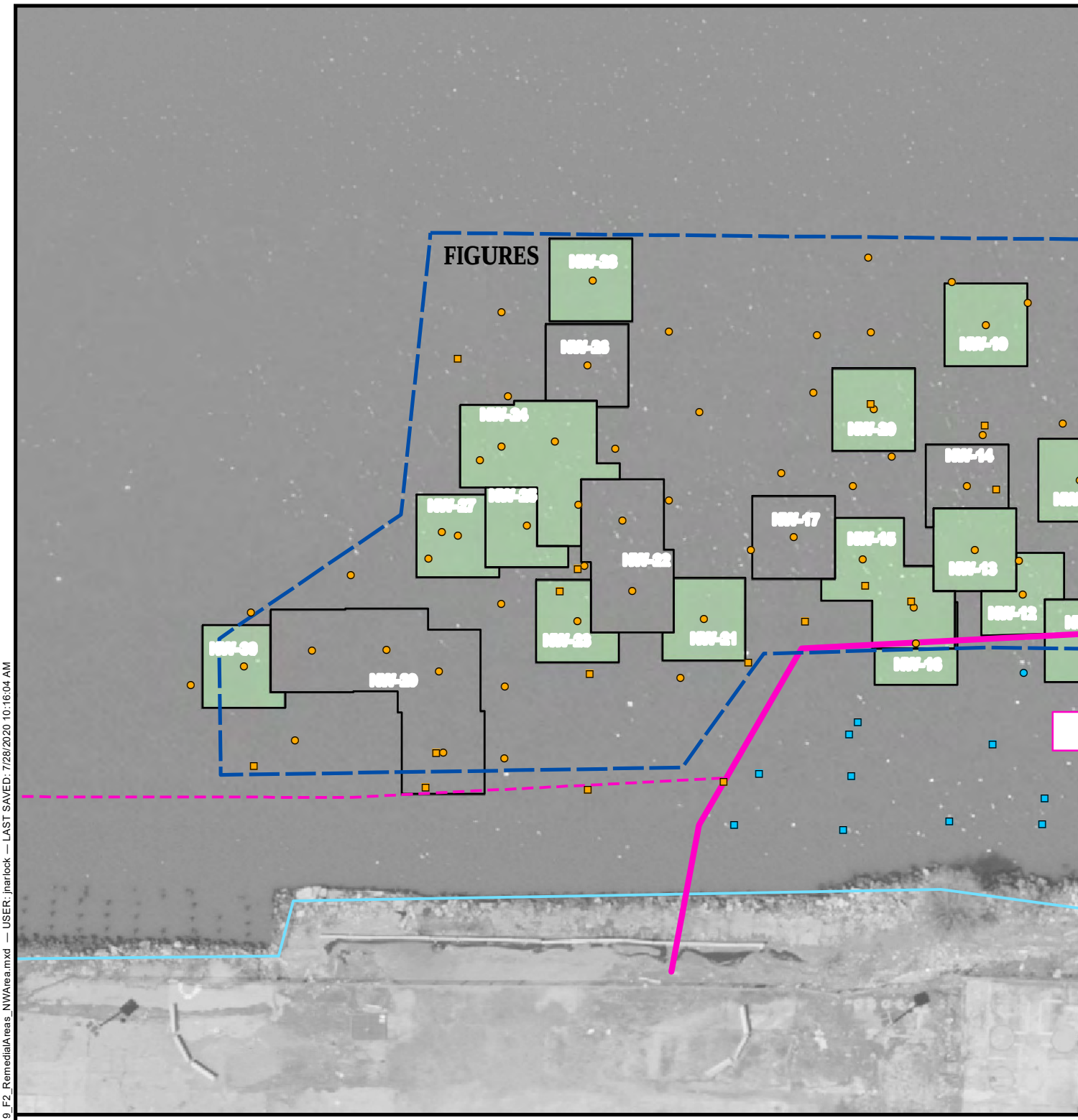
FIGURES



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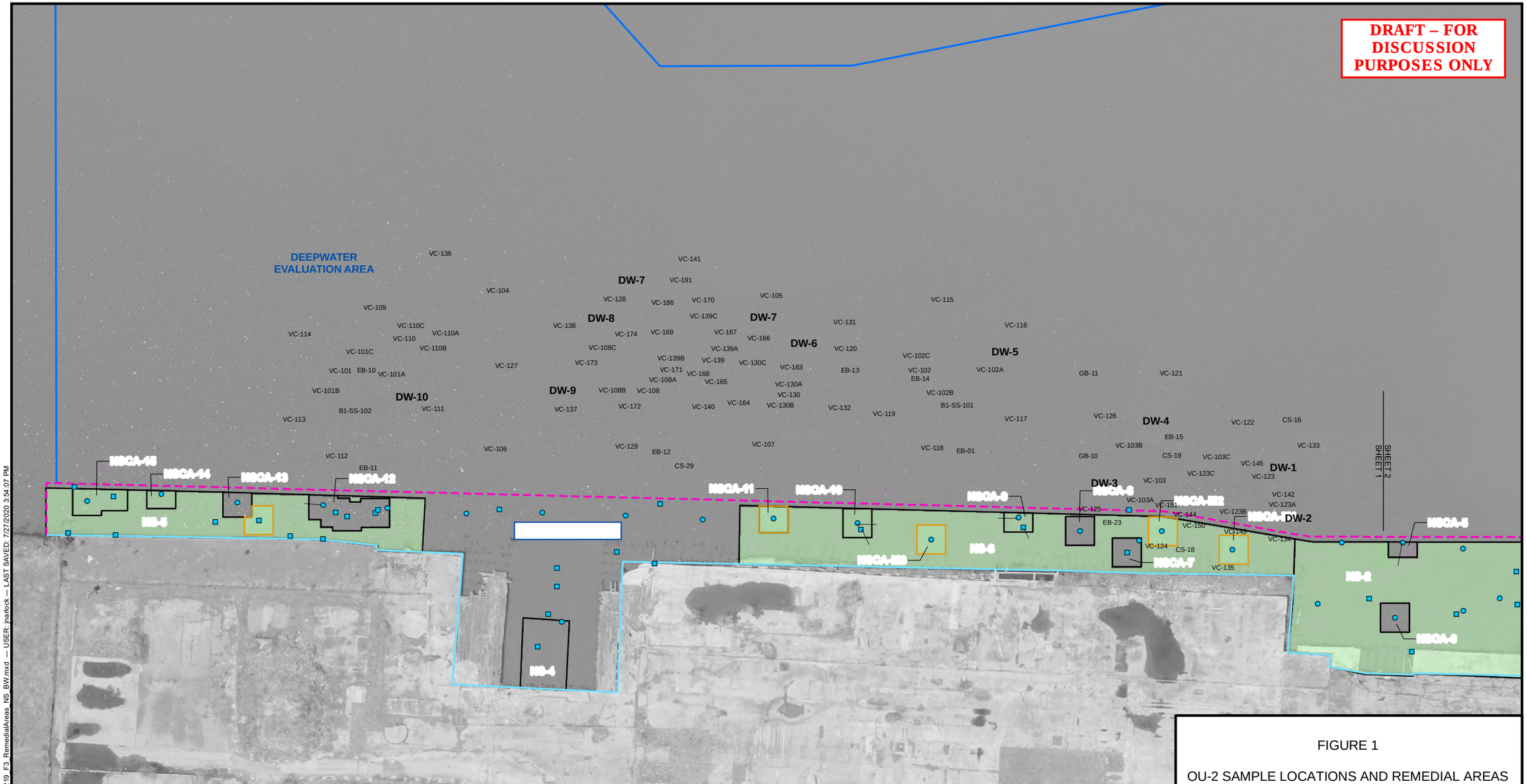

Legend

PDI	Historical Samples
A	C Deepwater

Remedial Area
CA Cell Area
Proposed for Beneficial Use
See Table 2 for depths of beneficial use sediments
Sheet Pile
Silt Curtain
OU-1/OU-2 Boundary/MHW
OU-2 ROD Boundary

Aerial: Westchester County NY, High Resolution Orthophotos, Spring 2018

0 50 100
SCALE IN FEET

FIGURE 1

OU-2 SAMPLE LOCATIONS AND REMEDIAL AREAS DEEPWATER

NYSDEC SITE #3-60-022
1 RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

SOVEREIGN CONSULTING INC.

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DEEPWATER NORTHWEST AREA

NORTHWEST EXTENSION AREA

NW-1 NW-2 NW-3 NW-4 NW-5 NW-6 NW-7 NW-8 NW-9 NW-10 NW-11 NW-12 NW-13 NW-14 NW-15 NW-16 NW-17 NW-18 NW-19 NW-20 NW-21 NW-22 NW-23 NW-24 NW-25 NW-26 NW-27 NW-28 NW-29 NW-30

HSCA-1 HSCA-2 HSCA-3 HSCA-4 HSCA-5 HSCA-6 HS-1 HS-2

SHEET 2
SHEET 1

GIS FILE PATH: X:\SOVEREGN\HastingsOnHudson\1219_F3_RemedialAreas_NS_BW.mxd — USER: jnarlock — LAST SAVED: 7/27/2020 3:57:20 PM

Legend

PDI **Historical Samples**

A C Deepwater Northwest Area

A C Northwest Extension Area

Remedial Area
CA = Cell Area

Proposed for Beneficial Use
See Table 2 for depths of beneficial use sediments

Sheet Pile

Silt Curtain

OU-1/OU-2 Boundary/MHW

OU-2 ROD Boundary

NOTES:
1. Westchester County NY, High Resolution Orthophotos, Spring 2018
2. Sediment Map from Hudson River Estuary Sediment Environment Map, NYS DEC. 2006.

0 25 50
SCALE IN FEET

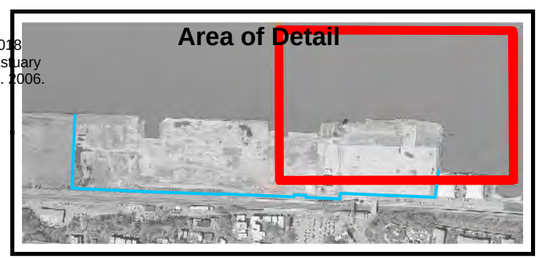

FIGURE 2

OU-2 SAMPLE LOCATIONS AND REMEDIAL AREAS
NORTHWEST DEEPWATER AND NEA

NYSDEC SITE #3-60-022
1 RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

SOVEREIGN CONSULTING INC.

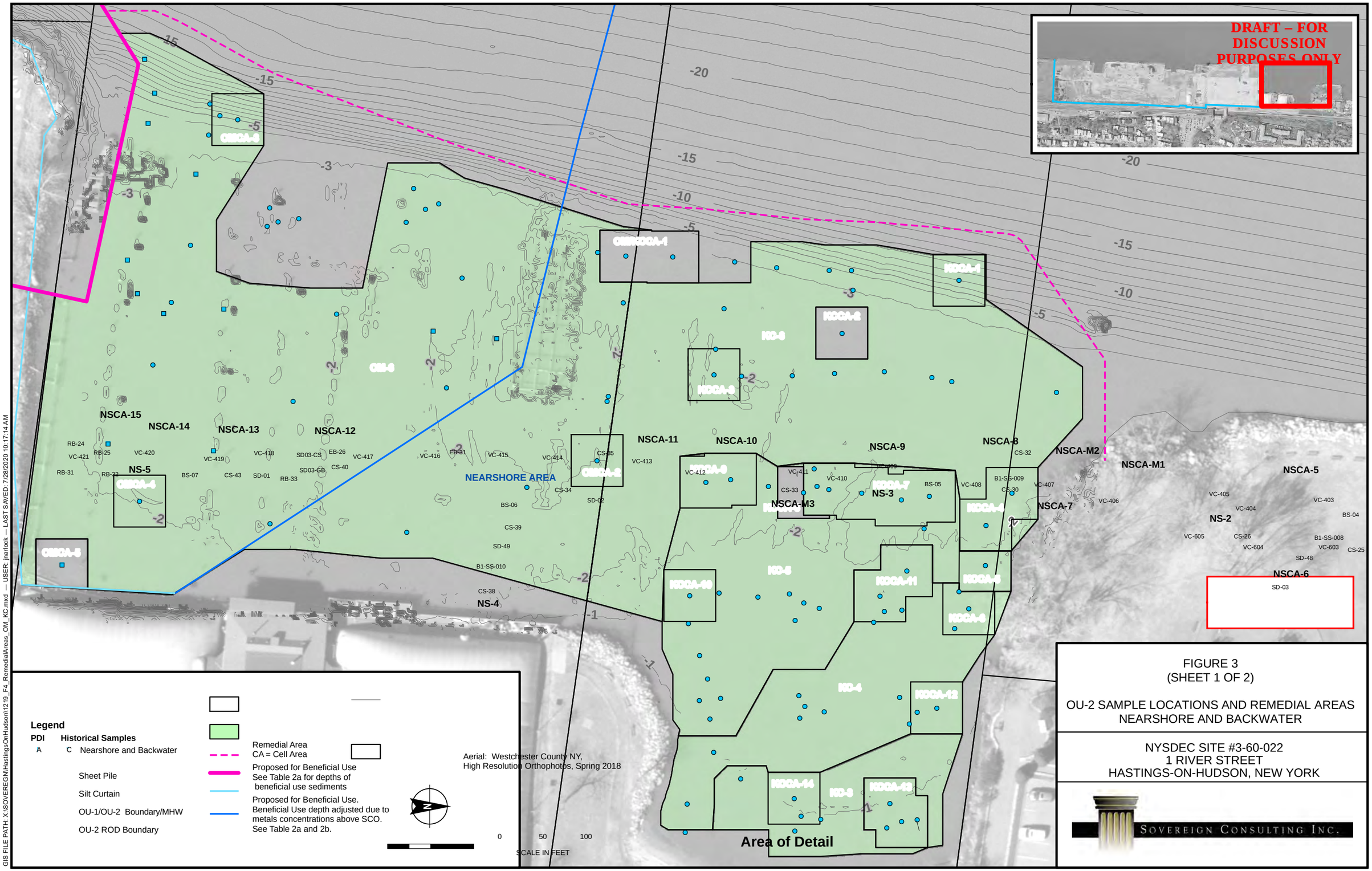

FIGURE 3
(SHEET 1 OF 2)

OU-2 SAMPLE LOCATIONS AND REMEDIAL AREAS
NEARSHORE AND BACKWATER

NYSDEC SITE #3-60-022
1 RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

SOVEREIGN CONSULTING INC.

FIGURE 3
(SHEET 2 OF 2)

OU-2 SAMPLE LOCATIONS AND REMEDIAL AREAS
NEARSHORE AND BACKWATER

NYSDEC SITE #3-60-022
1 RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

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Area of Detail

OMCA-3
OMCA-4
OMCA-5
Old Marina
OM-6
OM/KCCA-1
KCCA-1
KCCA-2
KC-6
KCCA-3
KCCA-9
OMCA-2
KCCA-7
KCCA-8
KCCA-4
Kinnally Cove
KC-5
KCCA-10
KCCA-11
KCCA-5
KCCA-6
KC-4
KCCA-12
KCCA-13
KCCA-14
KC-3

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FIGURE 4

OLD MARINA & KINNALLY COVE

NYSDEC SITE #3-60-022
1 RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

SOVEREIGN CONSULTING INC.

Legend

PDI	Historical Samples	
A	C	Old Marina and Kinnally Cove

Remedial Area
CA = Cell Area

Proposed for Beneficial Use
See Table 2 for depths of
beneficial use sediments

Silt Curtain

Sheet Pile

OU-1/OU-2
Boundary/MHW

OU-2 ROD Boundary

Bathymetric Contour
Ocean Surveys, Inc
in 10-16 December 2012)
NAVD 1988
(North American Vertical Datum)

Village of Hastings Tax Parcels

Aerial: Westchester County NY,
High Resolution Orthophotos, Spring 2018

0 25 50
SCALE IN FEET

GIS FILE PATH: X:\SOVEREGN\HastingsOnHudson\1219_F5_ConcreteBeneficialUse_rev2021.mxd — USER: jnarlock — LAST SAVED: 5/5/2021 11:28:11 AM

ARCADIS Design & Consultancy for natural and built assets

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S-3
6 FT

S-16
6 FT

S-17
8 FT

22-FC-1-01

22-FC-1-03

22-FC-1-02

S-19
12 FT

S-20
8 FT

S-13
12 FT

S-11
6 FT

S-6
4 FT

Legend

- PDI SAMPLES (Includes Concrete Waste Characterization Samples)
- HISTORIC SAMPLES
- No Result
- @ Drain
- MANHOLE
- Trench/Trench-like Feature
- Property Limits
- Concrete Beneficial Use Area
- Removal Area

Aerial: Westchester County NY, High Resolution Orthophotos, Spring 2018

0 50 100

SCALE IN FEET

Area of Detail

FIGURE 5
(SHEET 1 OF 2)

CONCRETE BENEFICIAL USE - REVISED MAY 2021

NYSDEC SITE #3-60-022
1 RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

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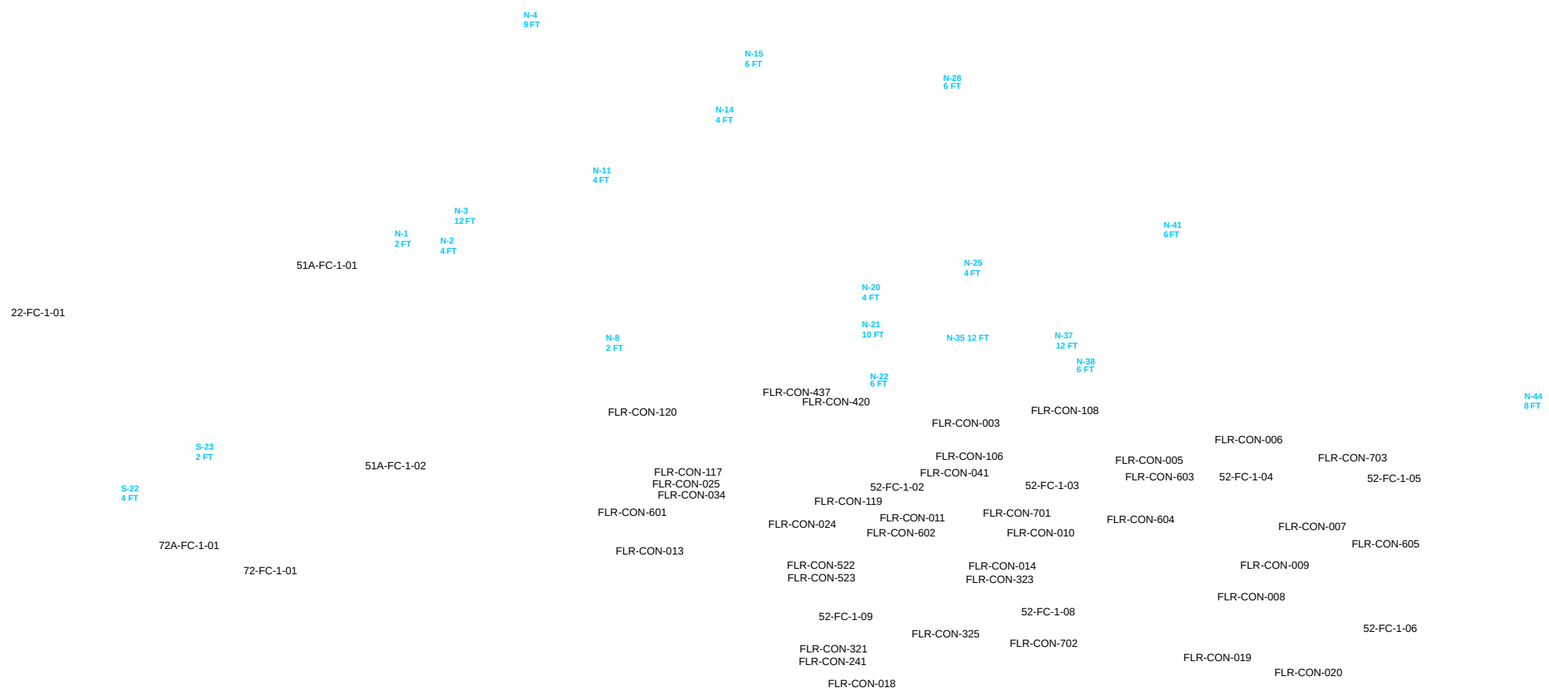

Legend

- PDI SAMPLES (Includes Concrete Waste Characterization Samples)
- HISTORIC SAMPLES
- No Result
- Drain
- MANHOLE
- Trench/Trench-like Feature
- Property Limits
- Concrete Beneficial Use Area
- Removal Area

Aerial: Westchester County NY,
High Resolution Orthophotos, Spring 2018

0 50 100

SCALE IN FEET

Area of Detail

FIGURE 5
(SHEET 2 OF 2)

CONCRETE BENEFICIAL USE -
REVISED MAY 2021

NYSDEC SITE #3-60-022
1 RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

Arcadis of New York, Inc.

One Lincoln Center

110 West Fayette Street

Suite 300

Syracuse

New York 13202

Tel 315 446 9120

Fax 315 449 0017

www.arcadis.com