



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NEW YORK DISTRICT
JACOB K. JAVITS FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK NEW YORK 10278-0090

FEB 15 2018

Regulatory Branch

SUBJECT: Permit Modification Request 1 for NAN-2013-00259 for New York City Department of Small Business Services for Saw Mill Creek Mitigation Bank

Andrew Schwartz
Deputy Commissioner, Legal and Regulatory Affairs
New York City Department of Small Business Services
110 William Street
New York, New York 10037

Dear Mr. Schwartz:

In accordance with the provisions of Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) and Section 404 of the Clean Water Act (33 U.S.C. 1344), New York City Department of Small Business Services (NYCSBS) was issued Department of the Army Permit Number NAN-2013-00259 by the District Engineer on April 25, 2017. This permit authorized construction of a wetland mitigation bank at an approximately 69 acre site within the Sandy Hook-Staten Island watershed, in the Borough of Staten Island, Richmond County, New York and included the following requirements:

Special Condition B Paragraph 1 states: Analyte-specific detection limits shall be below Class A sediment classification concentrations as set forth in NYSDEC 2014, with the exception that detection limits for individual PCBs and dioxin and furan congeners shall be below 1 parts per trillion (ppt).

Special Condition B Paragraph 3 states: Sediment exceeding Class B sediment classification concentrations shall be removed to a depth such that the Class B concentrations are achieved in each of the top 0-15 cm and 15-30 cm horizons of sediment at the final project grade. Alternatively, areas with exceedances at project depth can be capped (or excavated and capped, depending on desired final elevation) with two feet of clean material, in which case post-excavation sampling to document clean conditions is not required.

Appendix C: Sediment Sampling Recommendations for the Saw Mill Creek Mitigation Bank dated November 30, 2016 and last modified February 7, 2017(see attached).

Appendix D: Characterization and Monitoring Requirements for the Saw Mill Creek Mitigation Bank dated January 3, 2017(see attached).

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SUBJECT: Permit Modification Request 1 for NAN-2013-00259 for New York City Department of Small Business Services for Saw Mill Creek Mitigation Bank

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In an email dated November 13, 2017, New York City Economic Development Corporation (NYCEDC) acting as agent for NYCSBS, requested modifications to Special Condition B, Paragraphs 1 and 3, and Appendices C and D of the existing permit as follows:

- (A) Modification to Special Condition B, Paragraph 1: Add the following sentence to the end of the paragraph: "For EPA Methods 1668 and 1613 performed per permit conditions, Method Detection Limits (MDL) shall be 2 pg/g."
- (B) Modification to Special Condition B, Paragraph 3: Remove the "15-30 cm horizon".
- (C) Modifications to Appendix C: Sediment Sampling Recommendations for the Saw Mill Creek Mitigation Bank.
- (D) Modifications to Appendix D: Characterization and Monitoring Requirements for the Saw Mill Creek Mitigation Bank.

The New York District has reviewed your November 13, 2017, request for a modification of the original permit and agrees that such modification would not be contrary to the general public interest. Accordingly, the subject permit is hereby specifically modified as follows:

1. Special Condition B Paragraph 1: Analyte-specific detection limits shall be below Class A sediment classification concentrations as set forth in NYSDEC 2014, with the exception that detection limits for individual PCBs and dioxin and furan congeners shall be below 1 parts per trillion (ppt). For EPA Methods 1668 and 1613 performed per permit conditions, Method Detection Limits (MDL) shall be 2 pg/g.
2. Special Condition B Paragraph 3: Sediment exceeding Class B sediment classification concentrations shall be removed to a depth such that the Class B concentrations are achieved in the top 0-15 cm horizon of sediment at the final project grade. Alternatively, areas with exceedances at project depth can be capped (or excavated and capped, depending on desired final elevation) with two feet of clean material, in which case post-excavation sampling to document clean conditions is not required.
3. Appendix C: Sediment Sampling Recommendations for the Saw Mill Creek Mitigation Bank dated November 30, 2016 and last modified February 12, 2018 (see attached).
4. Appendix D: Characterization and Monitoring Requirements for the Saw Mill Creek Mitigation Bank dated January 3, 2017 and last modified February 12, 2018 (see attached).

The modification of this permit shall be known as Department of the Army Permit Number NAN-2013-00259-M1. All other permit conditions to which the authorized work was made subject shall remain in effect including the expiration date of April 25, 2022. This letter shall be added to all copies of the permit, including those at the work site.

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SUBJECT: Permit Modification Request 1 for NAN-2013-00259 for New York City
Department of Small Business Services for Saw Mill Creek Mitigation Bank

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If any questions should arise concerning this matter, please contact Naomi Handell, of my staff, at (917) 790-8523.

Sincerely,



For and in behalf of

Thomas D. Asbery
Colonel, U.S. Army
District Engineer

Attachments

Appendix C: Sediment Sampling Recommendations for the Saw Mill Creek Mitigation Bank

Prepared by U.S. Fish and Wildlife Service November 30, 2016

Modified by the New York District Corps of Engineers February 7, 2017

NAN-2013-00259-EHA

Site Characterization and Excavation

Either ISM or discrete sampling should be used to sample the top 0-1 cm for the post-construction baseline and post-construction monitoring.

The formula in Appendix F of the NYDEC Screening and Assessment of Contaminated Sediment Guidance (NYSDEC 2014) was used in conjunction with the habitat area sizes for the wetland restoration (rehabilitation) and wetland restoration (re-establishment) categories within the Western and Eastern Sections of the proposed bank, as provided in Sheet 3 of 22 (Key Plan) of plans dated 14 December, 2015, prepared by Louis Berber and Associates, PC (stamped by Bethany M. Bearmore). A dredging factor (Df) of 3 was applied to the calculation, in accordance with the following criteria, listed in NYDEC (2014).

“Df equals 3 for sites:

- with documented contamination from past sediment data; or
- in areas of established fish consumption advisories or spills or site-specific contamination of concern (e.g., copper, mirex, dioxin, PCB's) in the drainage basin; or
- where there is a likelihood of contamination and dredging has not occurred in the last five years.”

This calculation provides a recommended sample sizes of $N = 27$ and $N=37$ for the Western and Eastern Sections, respectively.

Eastern Section

The Eastern Section encompasses three different proposed habitats (waterway, side-slopes [IM], and marsh plain [HM]) within four separate Wetland Disturbance Areas (WDAs). Given the complexity of the Eastern Section, we recommend that Incremental Sampling Methodology (ISM), instead of discrete sampling, be used to characterize this area. The ISM is “...a structured composite sampling and processing protocol that reduces data variability and provides a reasonably unbiased estimate of mean contaminant concentrations in a volume of soil targeted for sampling” (ITRC 2012). By using a recommended number of sampling increments and combining and subsampling them in a prescribed manner, more consistent and reproducible results can be obtained, yielding more defensible decisions with a smaller analytical investment. Using the ISM approach will allow the Eastern Section to be adequately characterized while keeping the number of samples to be analyzed within the recommendations of NYDEC (2014).

In accordance with the ISM, we recommend that each habitat type within each WDA of the Eastern Section be considered a Decision Unit (DU). This yields 11 decision units across the following identified DUs.

Appendix C: Sediment Sampling Recommendations for the Saw Mill Creek Mitigation Bank
 Prepared by U.S. Fish and Wildlife Service November 30, 2016
 Modified by the New York District Corps of Engineers February 7, 2017
 NAN-2013-00259

- WDA1: Northern part - waterway, side-slopes, marsh plain (3 DUs);
- WDA2: Southern part - waterway, side-slopes, marsh plain (3 DUs);
- WDA3: Western part- waterway, side-slopes, marsh plain (3 DUs);
- WDA4: Eastern part - marsh plain (1 DU);

Based on the relative size of each DU, the minimum recommended number of increments to be collected using the ISM (generally 20), and the total number of samples recommended by NYSDEC (2014), we recommend the following numbers of increments be collected and replicates analyzed for each.

Table 1. Number of increments and replicates (samples) to be analyzed within each WDA of the Eastern Section of the proposed Sawmill Mitigation Bank.

WDA	Habitat type	# Increments	# Replicates (samples) (per sampling horizon)
1	Waterway (proposed)	30	4
1	Side-slopes (IM) (proposed)	30	4
1	Marsh plain (HM)	30	4
2	Waterway (proposed)	20	3
2	Side-slopes (IM) (proposed)	20	3
2	Marsh plain (HM)	20	3
3	Waterway (proposed)	20	3
3	Side-slopes (IM) (proposed)	20	3
3	Marsh plain (HM)	20	3
4	Marsh plain (HM)	30	3

Western Section

As with the Eastern section, we recommend that samples to be collected in the Western Section be separated into four DUs, to separately characterize proposed waterway, side-slope (IM), and marsh plain (HM) habitats. In this case, we believe the recommended number of discrete samples to be analyzed is adequate to characterize all four DUs. However, ISM offers the advantage of resulting in fewer samples to analyze. Therefore, we offer two alternatives for sampling and analysis in the Western Section for consideration by the Applicant. As with the Eastern Section, sampling of proposed waterways, side-slopes, and marsh plain habitats in the Western Section should be conducted.

Alternative 1: discrete sampling

- 4 samples in proposed waterway
- 4 samples along proposed side slopes (IM)
- 12 samples in marsh plain (HM)
- Total = 20 (per sampling depth)**

Appendix C: Sediment Sampling Recommendations for the Saw Mill Creek Mitigation Bank
Prepared by U.S. Fish and Wildlife Service November 30, 2016
Modified by the New York District Corps of Engineers February 7, 2017
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Alternative 2: ISM

- 20 incremental samples in proposed waterway, combined to make 4 replicates
 - 20 incremental samples along proposed side slopes (IM), combined to make 4 replicates
 - 30 incremental samples in marsh plain (HM), combined to make 4 replicates
- Total = 12 (per sampling depth)**

Post-Construction Baseline and Post-Construction Monitoring

Once the site has excavated and graded, further sediment evaluations should proceed using the same sampling regime (*i.e.*, ISM or discrete sampling) as was used to characterize the site pre-construction. However, only the top 0-1 cm would be sampled for these evaluations.

Literature Cited

ITRC (Interstate Technology & Regulatory Council). 2012. Incremental Sampling Methodology. ISM-1. Washington, D.C.: Interstate Technology & Regulatory Council, Incremental Sampling Methodology Team. www.itrcweb.org.

NYSDEC. 2014. Screening and Assessment of Contaminated Sediments. Division of Fish, Wildlife and Marine Resources, June 24, 2014. Available at: http://www.dec.ny.gov/docs/fish_marine_pdf/screenassessedfin.pdf. Accessed November 25, 2016.

ORIGINAL

**Appendix D-Characterization and Monitoring Requirements for the
Saw Mill Creek Mitigation Bank
NAN-2013-00259-EHA**

January 3, 2017

Sediment Post-Grading Baseline-Prior to Planting

Sediment

- The permittee shall collect sediment samples from the top 0-1 centimeter (cm) below the final project surface in waterways, side-slopes, and the marsh surface within each previously-characterized WDA where grading is required. This sampling will be used to establish baseline conditions for evaluating re-contamination post-construction. The sampling regime and laboratory methods used to collect and characterize these samples shall follow those described below.

Sampling Regime and Laboratory Methods:

- Within each WDA where grading is required, the number and location of samples to be collected and analyzed shall be in accordance with a final sampling plan submitted to and approved by the Interagency Review Team (IRT). Samples shall be analyzed for the following compounds using the methods indicated below.
 - Target Analyte List (TAL) Metals: EPA Method 6010/6020
 - Mercury: EPA Method 7471A
 - Target Compound List (TCL) semi volatile organics: EPA Method 8270
 - Organochlorine pesticides: EPA Method 8081
 - Polychlorinated biphenyls (PCBs), as congeners: EPA Method 1668
 - 2,3,7,8-chloro substituted dioxins and furans (17 congeners): EPA Method 1613
 - Grain Size Distribution
 - Percent Moisture
 - Total organic carbon
 - pH
- Analyte-specific detection limits shall be below Class A sediment classification concentrations as set forth in NYSDEC (2014), with the exception that detection limits for individual PCBs and dioxin and furan congeners shall be below 1 picogram/gram (pg/g; part per trillion). No construction can proceed until these data are obtained and reviewed by the IRT for their adequacy in assessing existing environmental conditions.
- Contaminant concentrations shall be demonstrated to be within or below the Class B sediment classification concentrations as set forth in NYSDEC (2014), with the exception of total PCBs (sum of congeners), for which a threshold value of 20 ng/g (ppb) should be used.
- Sediment exceeding Class B sediment classification concentrations shall be removed to a depth such that the Class B concentrations are achieved in each of the top 0-15 cm and 15-30 cm horizons of sediment at the final project grade. Additional sediment sampling shall be performed as necessary to delineate potential sediment to be removed (up to two feet below

Appendix D-Characterization and Monitoring Requirements for the Saw Mill Creek Mitigation Bank NAN-2013-00259

project depth). Following removal, the Permittee shall document clean conditions in the top 0-15 cm and 15-30 cm of the final project grade, prior to planting. Alternatively, areas with exceedances at project depth can be excavated and capped with two feet of clean material, in which case post-excavation sampling is not required.

Biota Post-Construction Baseline

Biota

- Within each previously-characterized WDA and the 7-acre reference site (bordered by a Transco pipeline, railroad tracks, and River Road), the permittee shall collect fifteen mummichog, fifteen fiddler crabs, and sufficient lycosid and tetragnathid spiders and amphipods to form five composite samples of each taxon. These samples shall be chemically characterized using the analytical methodologies and detection limits listed below.
- Because of the demonstrated usefulness of mussels as sentinel organisms both to evaluate the rate of biological uptake and to establish biota-sediment accumulation factors (BSAFs) generally (see, for example, Kimbrough *et al.* 2008; Burkhard 2009; ASTM 2013), the IRT requests that caged mussel bioaccumulation studies be used instead of amphipods to evaluate recontamination and bioaccumulation at the bank. The protocols for mussel monitoring shall be consistent with those presented in ASTM method E2122 (ASTM 2013). The permittee shall place sufficient caged mussels within each previously-characterized WDA and the reference location to provide a minimum of fifteen individual mussels for tissue analysis three months after placement. The permittee shall also place sufficient caged mussels within each previously-characterized WDA and the reference location to provide a minimum of fifteen living individual mussels for tissue analysis at the end of the life of the monitoring period.
- Three months after placement of mussel cages, fifteen mussels shall be collected and composited to form five samples to be chemically characterized using the analytical methodologies listed below. The remaining caged mussels shall be left in place for the life of the monitoring period.
- Tissue samples shall be analyzed for the following compounds using the methods indicated below.
 - TAL metals: EPA Method 6010
 - Mercury: EPA Method 7471A
 - Organochlorine pesticides: EPA Method 8081
 - PCBs, as congeners: EPA Method 1668
 - 2,3,7,8-chloro substituted dioxins and furans (17 congeners): EPA Method 1613
 - Total Lipid Content (%)
 - Percent Moisture
- Analyte-specific detection limits shall be the same as those identified for sediment, above, unless otherwise indicated by the IRT.

Post-construction monitoring

Sediment

Appendix D-Characterization and Monitoring Requirements for the Saw Mill Creek Mitigation Bank NAN-2013-00259

- On an annual basis for the life of the monitoring period, the permittee shall collect sediment samples from the top 0-1cm below the final project surface in waterways, side-slopes, and the marsh surface within each previously-characterized WDA. The sampling regime and laboratory methods used to collect and characterize these samples shall follow those described above.
- Sediment samples collected for post-construction monitoring shall be analyzed and evaluated using the same methods, detection limits, and threshold concentrations used for the pre-construction site characterization and post-grading baseline assessment. Sediment samples should be co-located with all biota sampling, when possible.

Biota

- On an annual basis for the life of the monitoring period, the permittee shall collect biological samples (mummichog, fiddler crab, amphipods, and lycosid and tetragnathid spiders) within each previously-characterized WDA using the same sampling procedures and analytical methods identified for the post-grading baseline assessment. A time-of-year restriction will apply from May thru August for all biota sampling.
- On an annual basis over the life of the monitoring period, the permittee shall place sufficient caged mussels within each previously-characterized WDA and the reference location to provide a minimum of fifteen individual mussels for analysis of five composited tissue samples three months after placement. Protocols shall be consistent with those described previously and presented in ASTM method E2122 (ASTM 2013).
- Biological samples collected for post-construction monitoring shall be analyzed and evaluated using the same methods, detection limits, and threshold concentrations provided for the post-grading baseline assessment.

The permittee shall submit a post construction monitoring report to USACE and all members of the IRT by November of each year the mitigation bank is in operation. The monitoring report shall incorporate the results of testing for contaminants in tissue and sediment per the recommendations above. This monitoring shall be conducted in conjunction with any other performance criteria required by this permit for vegetative or hydrologic success. Failure to collect any of the sediment or biota samples during any one year of the monitoring period could result in an extension of the period required for monitoring.

Appendix D-Characterization and Monitoring Requirements for the Saw Mill Creek Mitigation Bank NAN-2013-00259

Literature Cited

ASTM. 2013. Standard Guide for Conducting In-situ Field Bioassays With Caged Bivalves. E2122-02. ASTM International, West Conshohocken, PA, 2013. www.astm.org.

Burkhard, L. 2009. Estimation of Biota Sediment Accumulation Factor (BSAF) from Paired Observations of Chemical Concentrations in Biota and Sediment. U.S. Environmental Protection Agency, Ecological Risk Assessment Support Center, Cincinnati, OH. EPA/600/R-06/047.

Kimbrough, K. L., W. E. Johnson, G. G. Lauenstein, J. D. Christensen and D. A. Apeti. 2008. An Assessment of Two Decades of Contaminant Monitoring in the Nation's Coastal Zone. Silver Spring, MD. NOAA Technical Memorandum NOS NCCOS 74. 105 pp.

NYSDEC. 2014. Screening and Assessment of Contaminated Sediments. Division of Fish, Wildlife and Marine Resources, June 24, 2014. Available at: http://www.dec.ny.gov/docs/fish_marine_pdf/screenassedfin.pdf. Accessed November 25, 2016.

Appendix C: Sediment Sampling Recommendations for the Saw Mill Creek Mitigation Bank

Prepared by U.S. Fish and Wildlife Service November 30, 2016

Modified by the New York District Corps of Engineers February 7, 2017 and February 12, 2018

NAN-2013-00259-M1

Site Characterization and Excavation

Either ISM or discrete sampling should be used to sample the top 0-1 cm for the post-construction baseline and post-construction monitoring.

The formula in Appendix F of the NYDEC Screening and Assessment of Contaminated Sediment Guidance (NYSDEC 2014) was used in conjunction with the habitat area sizes for the wetland restoration (rehabilitation) and wetland restoration (re-establishment) categories within the Western and Eastern Sections of the proposed bank, as provided in Sheet 3 of 22 (Key Plan) of plans dated 14 December, 2015, prepared by Louis Berber and Associates, PC (stamped by Bethany M. Bearmore). A dredging factor (Df) of 3 was applied to the calculation, in accordance with the following criteria, listed in NYSDEC (2014).

“Df equals 3 for sites:

- with documented contamination from past sediment data; or
- in areas of established fish consumption advisories or spills or site-specific contamination of concern (e.g., copper, mirex, dioxin, PCB's) in the drainage basin; or
- where there is a likelihood of contamination and dredging has not occurred in the last five years.”

This calculation provides a recommended sample sizes of $N = 27$ and $N=37$ for the Western and Eastern Sections, respectively.

Eastern Section

The Eastern Section encompasses three different proposed habitats (waterway, side-slopes [IM], and marsh plain [HM]) within three separate Wetland Disturbance Areas (WDAs). Given the complexity of the Eastern Section, we recommend that Incremental Sampling Methodology (ISM), instead of discrete sampling, be used to characterize this area. The ISM is “...a structured composite sampling and processing protocol that reduces data variability and provides a reasonably unbiased estimate of mean contaminant concentrations in a volume of soil targeted for sampling” (ITRC 2012). By using a recommended number of sampling increments and combining and subsampling them in a prescribed manner, more consistent and reproducible results can be obtained, yielding more defensible decisions with a smaller analytical investment. Using the ISM approach will allow the Eastern Section to be adequately characterized while keeping the number of samples to be analyzed within the recommendations of NYSDEC (2014).

In accordance with the ISM, we recommend that each habitat type within each WDA of the Eastern Section be considered a Decision Unit (DU). This yields 9 decision units across the following identified DUs.

Appendix C: Sediment Sampling Recommendations for the Saw Mill Creek Mitigation Bank
 Prepared by U.S. Fish and Wildlife Service November 30, 2016
 Modified by the New York District Corps of Engineers February 7, 2017
 NAN-2013-00259

WDA-A: Northern part - waterway, side-slopes, marsh plain (3 DUs);
 WDA-B: Southern part - waterway, side-slopes, marsh plain (3 DUs);
 WDA-C: Western part- waterway, side-slopes, marsh plain (3 DUs);
 *see attached map for location of each WDA

Based on the relative size of each DU, the minimum recommended number of increments to be collected using the ISM (generally 20), and the total number of samples recommended by NYSDEC (2014), we recommend the following numbers of increments be collected and replicates analyzed for each.

Table 1. Number of increments and replicates (samples) to be analyzed within each WDA of the Eastern Section of the proposed Sawmill Mitigation Bank.

WDA	Habitat type	# Increments	# Replicates (samples) (per sampling horizon)
A	Waterway (proposed)	20	3
A	Side-slopes (IM) (proposed)	20	3
A	Marsh plain (HM)	20	3
B	Waterway (proposed)	20	3
B	Side-slopes (IM) (proposed)	20	3
B	Marsh plain (HM)	20	3
C	Waterway (proposed)	20	**
C	Side-slopes (IM) (proposed)	20	**
C	Marsh plain (HM)	20	**

**Three replicates will be taken in WDA-A and the variance method will be applied to WDA-C

Western Section

As with the Eastern section, we recommend that samples to be collected in the Western Section be separated into four DUs, to separately characterize proposed waterway, side-slope (IM), and marsh plain (HM) habitats. In this case, we believe the recommended number of discrete samples to be analyzed is adequate to characterize all four DUs. However, ISM offers the advantage of resulting in fewer samples to analyze. Therefore, we offer two alternatives for sampling and analysis in the Western Section for consideration by the Applicant. As with the Eastern Section, sampling of proposed waterways, side-slopes, and marsh plain habitats in the Western Section should be conducted.

Alternative 1: discrete sampling

- 4 samples in proposed waterway
- 4 samples along proposed side slopes (IM)
- 12 samples in marsh plain (HM)
- Total = 20**

Appendix C: Sediment Sampling Recommendations for the Saw Mill Creek Mitigation Bank
Prepared by U.S. Fish and Wildlife Service November 30, 2016
Modified by the New York District Corps of Engineers February 7, 2017
NAN-2013-00259

Alternative 2: ISM

20 incremental samples in proposed waterway, combined to make 4 replicates

20 incremental samples along proposed side slopes (IM), combined to make 4 replicates

30 incremental samples in marsh plain (HM), combined to make 4 replicates

Total = 12

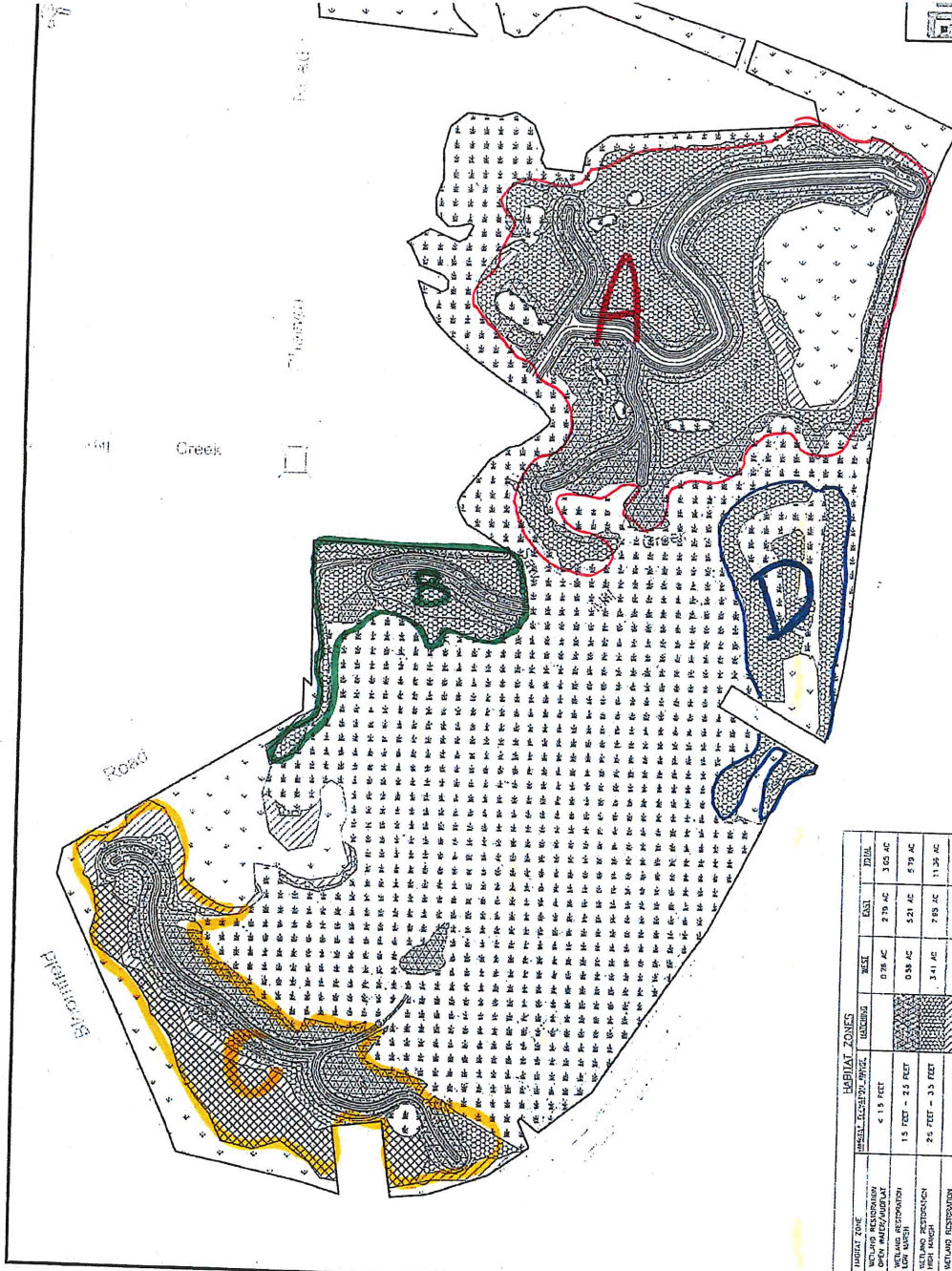
Post-Construction Baseline and Post-Construction Monitoring

Once the site has excavated and graded, further sediment evaluations should proceed using the same sampling regime (*i.e.*, ISM or discrete sampling) as was used to characterize the site post-grading. However, only the top 0-1 cm would be sampled for these evaluations.

Literature Cited

ITRC (Interstate Technology & Regulatory Council). 2012. Incremental Sampling Methodology. ISM-1. Washington, D.C.: Interstate Technology & Regulatory Council, Incremental Sampling Methodology Team. www.itrcweb.org.

NYSDEC. 2014. Screening and Assessment of Contaminated Sediments. Division of Fish, Wildlife and Marine Resources, June 24, 2014. Available at: http://www.dec.ny.gov/docs/fish_marine_pdf/screenasssedfin.pdf. Accessed November 25, 2016.



NOTES
 1. VERTICAL DATA IN NAVSSS
 2. HORIZONTAL DATA IN NAVSSS

HABITAT ZONE	HABITAT ZONES		WEEK	DAYS	TOTAL
	VERTICAL DATA	HORIZONTAL DATA			
WETLAND RESTORATION	< 15 FEET	WETLAND	0.78 AC	2.79 AC	3.57 AC
WETLAND RESTORATION	15 FEET - 25 FEET	WETLAND	0.58 AC	5.81 AC	6.39 AC
WETLAND RESTORATION	25 FEET - 35 FEET	WETLAND	3.41 AC	7.83 AC	11.24 AC
WETLAND RESTORATION	35 FEET - 50 FEET	WETLAND	1.81 AC	1.82 AC	3.63 AC
WETLAND RESTORATION	> 50 FEET	WETLAND	1.12 AC	0.33 AC	1.45 AC
BUFFER RESTORATION	NO SPECIFIC ELEVATION	WETLAND	0.00 AC	8.49 AC	8.49 AC
NON WETLAND RESTORATION	NO SPECIFIC ELEVATION	WETLAND	7.83 AC	26.03 AC	33.86 AC
WETLAND RESTORATION	NO SPECIFIC ELEVATION	WETLAND	0.00 AC	1.82 AC	1.82 AC
TOTAL			15.60 AC	53.94 AC	69.54 AC

DATE: 3/20/15
 PREPARED BY: [Name]
 CHECKED BY: [Name]
 SCALE: 1" = 400'
 DRAWN BY: [Name]

NO.	DATE	REVISION
1	3/20/15	PREPARATION FOR CONSTRUCTION BID

PROJECT NAME: VCP/...
 DRAWING NUMBER: ...
 DATE: 3/20/15

**Appendix D-Characterization and Monitoring Requirements for the
Saw Mill Creek Mitigation Bank
NAN-2013-00259-M1**

**January 3, 2017
Modified February 12, 2018**

Sediment Post-Grading Baseline-Prior to Planting

Sediment

- The permittee shall collect sediment samples from the top 0-1 centimeter (cm) below the final project surface in waterways, side-slopes, and the marsh surface within each previously-characterized WDA where grading is required. This sampling will be used to establish baseline conditions for evaluating re-contamination post-construction. The sampling regime and laboratory methods used to collect and characterize these samples shall follow those described below.

Sampling Regime and Laboratory Methods:

- Within each WDA where grading is required, the number and location of samples to be collected and analyzed shall be in accordance with a final sampling plan submitted to and approved by the Interagency Review Team (IRT). Samples shall be analyzed for the following compounds using the methods indicated below.
 - Target Analyte List (TAL) Metals: EPA Method 6010/6020
 - Mercury: EPA Method 7471A
 - Target Compound List (TCL) semi volatile organics: EPA Method 8270
 - Organochlorine pesticides: EPA Method 8081
 - Polychlorinated biphenyls (PCBs), as congeners: EPA Method 1668
 - 2,3,7,8-chloro substituted dioxins and furans (17 congeners): EPA Method 1613
 - Grain Size Distribution
 - Percent Moisture
 - Total organic carbon
 - pH
- Analyte-specific detection limits shall be below Class A sediment classification concentrations as set forth in NYSDEC (2014), with the exception that detection limits for individual PCBs and dioxin and furan congeners shall be below 1 picogram/gram (pg/g; part per trillion). No construction can proceed until these data are obtained and reviewed by the IRT for their adequacy in assessing existing environmental conditions.
- Contaminant concentrations shall be demonstrated to be within or below the Class B sediment classification concentrations as set forth in NYSDEC (2014), with the exception of total PCBs (sum of congeners), for which a threshold value of 20 ng/g (ppb) should be used.
- Sediment exceeding Class B sediment classification concentrations shall be removed to a depth such that the Class B concentrations are achieved the top 0-15 cm horizon of sediment at the final project grade. Additional sediment sampling shall be performed as necessary to

Appendix D-Characterization and Monitoring Requirements for the Saw Mill Creek Mitigation Bank NAN-2013-00259

delineate potential sediment to be removed (up to two feet below project depth). Following removal, the Permittee shall document clean conditions in the top 0-15 cm of the final project grade, prior to planting. Alternatively, areas with exceedances at project depth can be excavated and capped with two feet of clean material, in which case post-excavation sampling is not required.

Biota Post-Construction Baseline

Biota

- Within each previously-characterized WDA and the 7-acre reference site (bordered by a Transco pipeline, railroad tracks, and River Road), the permittee shall collect fifteen mummichog, fifteen fiddler crabs, and sufficient lycosid and tetragnathid spiders and amphipods to form five composite samples of each taxon. These samples shall be chemically characterized using the analytical methodologies and detection limits listed below.
- Because of the demonstrated usefulness of mussels as sentinel organisms both to evaluate the rate of biological uptake and to establish biota-sediment accumulation factors (BSAFs) generally (see, for example, Kimbrough *et al.* 2008; Burkhard 2009; ASTM 2013), the IRT requests that caged mussel bioaccumulation studies be used instead of amphipods to evaluate recontamination and bioaccumulation at the bank. The protocols for mussel monitoring shall be consistent with those presented in ASTM method E2122 (ASTM 2013). The permittee shall place sufficient caged mussels within each previously-characterized WDA and the reference location to provide a minimum of fifteen individual mussels for tissue analysis three months after placement. The permittee shall also place sufficient caged mussels within each previously-characterized WDA and the reference location to provide a minimum of fifteen living individual mussels for tissue analysis at the end of the life of the monitoring period.
- Three months after placement of mussel cages, fifteen mussels shall be collected and composited to form five samples to be chemically characterized using the analytical methodologies listed below. The remaining caged mussels shall be left in place for the life of the monitoring period.
- Tissue samples shall be analyzed for the following compounds using the methods indicated below.
 - TAL metals: EPA Method 6010
 - Mercury: EPA Method 7471A
 - Organochlorine pesticides: EPA Method 8081
 - PCBs, as congeners: EPA Method 1668
 - 2,3,7,8-chloro substituted dioxins and furans (17 congeners): EPA Method 1613
 - Total Lipid Content (%)
 - Percent Moisture
- Analyte-specific detection limits shall be the same as those identified for sediment, above, unless otherwise indicated by the IRT.

Appendix D-Characterization and Monitoring Requirements for the Saw Mill Creek Mitigation Bank NAN-2013-00259

Post-construction monitoring

Sediment

- On an annual basis for the life of the monitoring period, except monitoring year 1, the permittee shall collect sediment samples from the top 0-1cm below the final project surface in waterways, side-slopes, and the marsh surface within each previously-characterized WDA. The sampling regime and laboratory methods used to collect and characterize these samples shall follow those described above.
- Sediment samples collected for post-construction monitoring shall be analyzed and evaluated using the same methods, detection limits, and threshold concentrations used for the pre-construction site characterization and post-grading baseline assessment. Sediment samples should be co-located with all biota sampling, when possible.

Biota

- On an annual basis for the life of the monitoring period, the permittee shall collect biological samples (mummichog, fiddler crab, amphipods, and lycosid and tetragnathid spiders) within each previously-characterized WDA using the same sampling procedures and analytical methods identified for the post-grading baseline assessment. A time-of-year restriction will apply from May thru August for all biota sampling.
- On an annual basis over the life of the monitoring period, the permittee shall place sufficient caged mussels within each previously-characterized WDA and the reference location to provide a minimum of fifteen individual mussels for analysis of five composited tissue samples three months after placement. Protocols shall be consistent with those described previously and presented in ASTM method E2122 (ASTM 2013).
- Biological samples collected for post-construction monitoring shall be analyzed and evaluated using the same methods, detection limits, and threshold concentrations provided for the post-grading baseline assessment.

The permittee shall submit a post construction monitoring report to USACE and all members of the IRT by November of each year the mitigation bank is in operation. The monitoring report shall incorporate the results of testing for contaminants in tissue and sediment per the recommendations above. This monitoring shall be conducted in conjunction with any other performance criteria required by this permit for vegetative or hydrologic success. Failure to collect any of the sediment or biota samples during any one year of the monitoring period could result in an extension of the period required for monitoring.

Appendix D-Characterization and Monitoring Requirements for the Saw Mill Creek Mitigation Bank NAN-2013-00259

Literature Cited

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