Appendix F
Hazardous Materials

Appendix F.4b
NYSDEC Approval of
Sediment Sampling and Analysis Plan
(April 2024)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Dredge Team, Region 2
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April 2, 2024

Richard Gilmour
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17-17 Route 208 North. Suite 200E
Fair Lawn, NJ 07410

RE: Sediment Sampling & Analysis Plan - North/West Battery Park City Resilience Project

Dear Mr. Richard Gilmour,

This letter has been prepared in response to your request for a Sediment Sampling and Analysis Plan (SSAP) on November 10, 2023, and subsequent revisions on February 24, 2024, and March 29, 2024. This SSAP is associated with the North/West Battery Park City Resiliency Project and coincides with dredging at two areas where proposed bridging structures are planned in Reach 5 of the Flood Barrier System. The dredge area encompasses two areas approximately 1,844 and 1,429 square yards inclusive of side slopes. Each dredge area will require dredging to the target dredge elevation of -17 NAVD88. Exiting sediment surface within the dredge footprints are variable (between -6.672 to -9.224 NAVD88). The dredge material will likely be placed at upland facility to be determined. This approval letter supersedes the previous approval letter from NYSDEC dated December 19, 2023

NYSDEC has determined that 14 sediment core sampling locations are sufficient to cover the scope of the project and approves the proposed sediment sampling plan entitled “Sediment Sampling and Analysis Plan North/West Battery Park Resiliency Project”, dated March 29, 2024.

Physical Sampling and Analysis
Cores shall be driven from the exiting sediment surface to the one foot below target project depth and separated into two segments, a segment homogenized over the project depth, and a segment representing the next six inches to be exposed after dredging. The remainder of the core can be excluded from the analysis. Please note that cores located within the footprint of the concrete slab do not require a segment representing the next six inches to be exposed. Do not homogenize individual cores if color, odor, grain size, total organic carbon (TOC), or likelihood of contamination based on core lithology or known contamination history differs among horizons. If homogenization is not appropriate, sample and analyze horizons separately. Analyze each core for grain size, TOC, and percent moisture. Field logs, including photographs, should be kept of each core, along with additional information on the physical characteristics observed in the field. If grain size analysis indicates that any individual core sample is greater than 90% sand (i.e., less than 10% of particles pass through a number 200 sieve) and contains less than 0.5% TOC, then no further testing is required on that core sample; however, NYSDEC should be notified before proceeding with the compositing scheme described below. If cores are not greater than 90% sand and/or less than 0.5% TOC, follow the chemical sampling procedures and compositing scheme outlined below.

Chemical Sampling and Analysis
Core samples with less than 90% sand and/or more than 0.5% TOC require additional chemical analyses. Core segments may be composited for chemical analyses according to the table below without further guidance if they have similar characteristics (e.g., grain size, TOC, color, etc.) and a similar likelihood of contamination based on core lithology or known contamination history. If core segments do not share similar characteristics as described above, analyze individual cores separately. Composites should consist of equal amounts of each individual homogenized core.

Dredge Sediment Composite	**Station Identification Number (core segment homogenized across the project depth)**
Composite 1	SPN-1, SPN-2
Composite 2	SPS-1, SPS-2
Composite 3	R5N-1, R5N-5
Composite 4	R5N-2, R5N-3, R5N-4
Composite 5	R5S-2, R5S-4
Composite 6	R5S-1, R5S-3, R5S-5
Exposed Sediment Composite	**Station Identification Number (core segment homogenized across the next 6 inches to be exposed)**
Composite 1-ex	SPN-1, SPN-2
Composite 4-ex	R5N-3
Composite 6-ex	R5S-1, R5S-3, R5S-5

This SSAP is designed to provide NYSDEC with the information needed to determine potential environmental impacts on natural resources and allow the project sponsor to identify potential upland placement locations if needed. Each raw sediment sample must be tested for the analytes listed in Table 2 of the NYSDEC Technical & Operational Guidance Series (TOGS) 5.1.9. In addition, if the disposal methods for this material include upland placement of amended dredge material product in New York or New Jersey, then measurements must also be made on raw sediment and amended dredge material product that includes all the analytes listed in Table 6.8 of 6 NYCRR Part 375 and in the New Jersey Department of Environmental Protection (NJDEP) Soil Remediation Standards and Screening Levels (revised 09-18-2017) (See Attachment 2 for protocols for testing processed dredged materials). The three referenced tables of required analytes are available at:

https://www.dec.ny.gov/docs/water_pdf/togs519.pdf
https://www.dec.ny.gov/docs/remediation_hudson_pdf/part375.pdf
https://www.nj.gov/dep/rules/rules/njac7_26d.pdf

Note that analyses of dredge material for upland placement should also include hexavalent and trivalent chromium, dioxins, and furans.

Please ensure the contract laboratory is aware of changes to the list of target analytes and analytical requirements. Laboratories used to perform the testing required herein must be certified by the State of New Jersey and the State of New York for the particular analytical method. Both states recommend verifying the volumes required for the tests with the laboratories prior to sampling. Any data package submitted to either NJDEP or NYSDEC shall comply with the QA/QC requirements outlined in Appendix B of the NJDEP technical manual entitled “The Management and Regulation of Dredging Activities and Dredged Material in New Jersey’s Tidal Waters” (October 1997).

If the material will be placed upland, the analytical package submitted must include a description of the recipe (i.e., types of additives and proportion) used to prepare the amended dredge material product. The amended dredge material product must also be pulverized and subjected to a Synthetic Precipitation Leaching Procedure (SPLP) using the USEPA Method 1312.

All sediment analyses should be provided to the NYSDEC/NJDEP in the form of a technical report that includes an excel spreadsheet summarizing the results and highlighting threshold exceedances of TOGS 5.1.9 Table 2, 6 NYCRR Part 375-6.8(b) Restricted Use Soil Cleanup Objectives, and NJDEP's Soil Remediation Standards and Screening Levels.

The technical report should include the results of physical and chemical analyses of the raw sediment. If upland placement is required, the report should also include the results of chemical analyses on the amended dredge material product. These results should be submitted in three summary data tables:

1. Raw sediment, bulk sediment chemistry
2. Amended dredge material product, bulk sediment chemistry
3. Dredged material product, SPLP results

Each placement location has its unique sampling requirements. The project sponsor is encouraged to contact potential placement locations to learn whether additional testing beyond those outlined here will be required.

If you have any questions regarding the SSAP, please feel free to contact Meaghan McCormack at meaghan.mccormack@dec.ny.gov.

Sincerely,

Meaghan McCormack

Meaghan McCormack, Ph.D.
Division of Marine Resources
NYSDEC

ATTACHMENT 1: Table 2 of the NYSDEC Technical & Operational Guidance Series (TOGS) 5.1.9

Threshold values are based on known and presumed impacts on aquatic organisms/ecosystem. Where fresh water and marine threshold values differ sufficiently, the marine value is presented in parentheses. All concentrations are in mg/kg dry weight.

Compound	Class A	Class B	Class C	Derivation Code
Metals (mg/kg)				
Arsenic	< 14 (8.2)	(8.2) 14 - 53	> 53	1
Cadmium	< 1.2	1.2 - 9.5	> 9.5	1
Copper*	< 33	33 - 207 (270)	> 207 (270)	1
Lead	< 33 (47)	33 (47) - 166 (218)	> 166 (218)	1
Mercury+	< 0.17	0.17 - 1.6 (1.0)	> 1.6 (1.0)	1
PAHs and Petroleum-Related Compounds (mg/kg)				
Benzene	< 0.59	0.59 - 2.16	> 2.16	2
Total BTEX*	< 0.96	0.96 - 5.9	> 5.9	2
Total PAH[1]	< 4	4 - 35 (45)	> 35 (45)	1
Pesticides (mg/kg)				
Sum of DDT+DDD+DDE+	< 0.003	0.003 - 0.03	> 0.03	2
Mirex*+	< 0.0014	0.0014 - 0.014	> 0.014	2
Chlordane*+	< 0.003	0.003 - 0.036	> 0.036	1
Dieldrin	< 0.11	0.11 -0. 48	> 0.48	2
Chlorinated Hydrocarbons (mg/kg)				
PCBs (sum of aroclors)[2]	< 0.1	0.1 - 1	> 1	3
2,3,7,8-TCDD*[3] (sum of toxic equivalency)	< 0.0000045	0.0000045 - 0.00005	> 0.00005	4

+ Threshold values lower than the Method Detection Limit are superseded by the Method Detection Limit. (See Table 1)
* Indicates case-specific parameter (see Chapter II, Section A).
[1]For Sum of PAH, see Appendix E
[2]For the sum of the 22 PCB congeners required by the USACE NYD or EPA Region 2, the sum must be multiplied by two to determine the total PCB concentration.
[3]TEQ calculation as per the NATO - 1988 method (see Appendix D)

Note: The proposed list of analytes can be augmented with additional site specific parameters of concern. Any additional analytes suggested will require Division approved sediment quality threshold values for the A, B and C classifications.

ATTACHMENT 2: PROTOCOL FOR THE TESTING OF PROCESSED DREDGED MATERIAL FOR USE AS STRUCTURAL FILL

Revision (10/08)

The analytes which must be tested for are listed in the tables found at:

- https://www.nj.gov/dep/rules/rules/njac7_26d.pdf
  (For reuse of processed dredged material in the State of New Jersey)
- Hexavalent and Trivalent Chromium- recent literature
  http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf (Table 11-2, Restricted Use Soil Cleanup Objectives for reuse of processed dredged material in the State of New York, page 349).

The specific sampling plan will identify the pollutants that are to be analyzed for the dredging project.

Since the dredged material will be treated with other materials that will alter its physical and chemical composition, additional tests must be performed on the end product. The required tests are as follows:

- Bulk sediment chemistry, grain size, total organic carbon, and percent moisture analyses must be performed on each raw sediment composite/core sample or vertically stratified sample. Any water which separates from the raw sediment sample during transport/storage (i.e., porewater) must be re-mixed with the solid components of the sediments prior to forming the core or composite samples; this porewater must not be decanted from the sediment sample.

- For each core/composite sample/vertically stratified sample, a sample of the processed dredged material product will be created by combining measured amounts of proposed additive with a pre-weighed sample of the sediments to be dredged. The mixing time will, to the greatest extent possible, replicate the residence time in the blending facility/operation to be used in the actual full-scale project. The ratio of proposed additive to composite sediment sample, by weight, will be recorded. The dredged material product to be tested will be formed using the "recipe" (proportions of dredged material and proposed additive) which replicates the actual dredged material product to be used as structural fill on the site. The dredged material product will be pulverized, and each composite sample will be subjected to bulk sediment analyses.

- The dredged material product samples will be pulverized, and each sample subjected to a Synthetic Precipitation Leaching Procedure (SPLP) using the USEPA Method 1312.

A final report, including the results of the raw sediment and dredged material product testing, will be submitted to the Department in a series of three (3) summary data tables:

- Raw sediment bulk sediment chemistry
- Dredged material product bulk sediment chemistry
- Dredged material product SPLP results

ATTACHMENT 3: TABLE 375-6.8(B): RESTRICTED USE SOIL CLEAN UP OBJECTIVES

Table 375-6.8(b): Restricted Use Soil Cleanup Objectives

		Protection of Public Health					
Contaminant	**CAS Number**	**Residential**	**Restricted-Residential**	**Commercial**	**Industrial**	**Protection of Ecological Resources**	**Protection of Groundwater**
Metals							
Arsenic	7440-38-2	16 [f]	16 [f]	16 [f]	16 [f]	13 [f]	16 [f]
Barium	7440-39-3	350 [f]	400	400	10,000 [d]	433	820
Beryllium	7440-41-7	14	72	590	2,700	10	47
Cadmium	7440-43-9	2.5 [f]	4.3	9.3	60	4	7.5
Chromium, hexavalent [h]	18540-29-9	22	110	400	800	1 [e]	19
Chromium, trivalent [h]	16065-83-1	36	180	1,500	6,800	41	NS
Copper	7440-50-8	270	270	270	10,000 [d]	50	1,720
Total Cyanide [h]		27	27	27	10,000 [d]	NS	40
Lead	7439-92-1	400	400	1,000	3,900	63 [f]	450
Manganes [e]	7439-96-5	2,000 [f]	2,000 [f]	10,000 [d]	10,000 [d]	1600 [f]	2,000 [f]
Total Mercury		0.81 [j]	0.81 [j]	2.8 [j]	5.7 [j]	0.18 [f]	0.73
Nickel	7440-02-0	140	310	310	10,000 [d]	30	130
Selenium	7782-49-2	36	180	1,500	6,800	3.9 [f]	4 [f]
Silver	7440-22-4	36	180	1,500	6,800	2	8.3
Zinc	7440-66-6	2200	10,000 [d]	10,000 [d]	10,000 [d]	109 [f]	2,480
PCBs/Pesticides							
2,4,5-TP Acid (Silvex)	93-72-1	58	100 [a]	500 [b]	1,000 [c]	NS	3.8
4,4'-DDE	72-55-9	1.8	8.9	62	120	0.0033 [e]	17
4,4'-DDT	50-29-3	1.7	7.9	47	94	0.0033 [e]	136
4,4'-DDD	72-54-8	2.6	13	92	180	0.0033 [e]	14
Aldrin	309-00-2	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8	0.04 [g]	0.02
beta-BHC	319-85-7	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	5103-71-9	0.91	4.2	24	47	1.3	2.9
delta-BHC	319-86-8	100 [a]	100 [a]	500 [b]	1,000 [c]	0.04 [g]	0.25
Dibenzofuran	132-64-9	14	59	350	1,000 [c]	NS	210
Dieldrin	60-57-1	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	959-98-8	4.8 [i]	24 [i]	200 [i]	920 [i]	NS	102
Endosulfan II	33213-65-9	4.8 [i]	24 [i]	200 [i]	920 [i]	NS	102
Endosulfan sulfate	1031-07-8	4.8 [i]	24 [i]	200 [i]	920 [i]	NS	1,000 [c]
Endrin	72-20-8	2.2	11	89	410	0.014	0.06
Heptachlor	76-44-8	0.42	2.1	15	29	0.14	0.38
Lindane	58-89-9	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	1336-36-3	1	1	1	25	1	3.2
Semivolatiles							
Acenaphthene	83-32-9	100 [a]	100 [a]	500 [b]	1,000 [c]	20	98
Acenapthylene	208-96-8	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	107
Anthracene	120-12-7	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	1,000 [c]
Benz(a)anthracene	56-55-3	1 [f]	1 [f]	5.6	11	NS	1 [f]
Benzo(a)pyrene	50-32-8	1 [f]	1 [f]	1 [f]	1.1	2.6	22
Benzo(b)fluoranthene	205-99-2	1 [f]	1 [f]	5.6	11	NS	1.7
Benzo(g,h,i)perylene	191-24-2	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	1,000 [c]
Benzo(k)fluoranthene	207-08-9	1	3.9	56	110	NS	1.7
Chrysene	218-01-9	1 [f]	3.9	56	110	NS	1f
Dibenz(a,h)anthracene	53-70-3	0.33 [e]	0.33 [e]	0.56	1.1	NS	1,000 [c]
Fluoranthene	206-44-0	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	1,000 [c]
Fluorene	86-73-7	100 [a]	100 [a]	500 [b]	1,000 [c]	30	386
Indeno(1,2,3-cd)pyrene	193-39-5	0.5 [f]	0.5 [f]	5.6	11	NS	8.2
m-Cresol	108-39-4	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	0.33 [e]
Naphthalene	91-20-3	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	12
o-Cresol	95-48-7	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	0.33 [e]
p-Cresol	106-44-5	34	100 [a]	500 [b]	1,000 [c]	NS	0.33 [e]
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55	0.8 [e]	0.8 [e]
Phenanthrene	85-01-8	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	1,000 [c]
Phenol	108-95-2	100 [a]	100 [a]	500 [b]	1,000 [c]	30	0.33 [e]
Pyrene	129-00-0	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	1,000 [c]

NYCRR Part 375-6.8(b): Restricted Use Soil Cleanup Objectives

Volatiles							
1,1,1-Trichloroethane	71-55-6	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	0.68
1,1-Dichloroethane	75-34-3	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	0.33
1,2-Dichlorobenzene	95-50-1	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	1.1
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60	10	0.02 [f]
cis-1,2-Dichloroethene	156-59-2	59	100 [a]	500 [b]	1,000 [c]	NS	0.25
trans-1,2-Dichloroethene	156-60-5	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	0.19
1,3-Dichlorobenzene	541-73-1	17	49	280	560	NS	2.4
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250	20	1.8
1,4-Dioxane	123-91-1	9.8	13	130	250	0.1 [e]	0.1 [e]
Acetone	67-64-1	100 [a]	100 [b]	500 [b]	1,000 [c]	2.2	0.05
Benzene	71-43-2	2.9	4.8	44	89	70	0.06
Butylbenzene	104-51-8	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	12
Carbon tetrachloride	56-23-5	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	100 [a]	100 [a]	500 [b]	1,000 [c]	40	1.1
Chloroform	67-66-3	10	49	350	700	12	0.37
Ethylbenzene	100-41-4	30	41	390	780	NS	1
Hexachlorobenzene	118-74-1	0.33 [e]	1.2	6	12	NS	3.2
Methyl ethyl ketone	78-93-3	100 [a]	100 [a]	500 [b]	1,000 [c]	100 [a]	0.12
Methyl tert-butyl ether	1634-04-4	62	100 [a]	500 [b]	1,000 [c]	NS	0.93
Methylene chloride	75-09-2	51	100 [a]	500 [b]	1,000 [c]	12	0.05
n-Propylbenzene	103-65-1	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	3.9
sec-Butylbenzene	135-98-8	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	11
tert-Butylbenzene	98-06-6	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	5.9
Tetrachloroethene	127-18-4	5.5	19	150	300	2	1.3
Toluene	108-88-3	100 [a]	100 [a]	500 [b]	1,000 [c]	36	0.7
Trichloroethene	79-01-6	10	21	200	400	2	0.47
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380	NS	3.6
1,3,5- Trimethylbenzene	108-67-8	47	52	190	380	NS	8.4
Vinyl chloride	75-01-4	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	1330-20-7	100 [a]	100 [a]	500 [b]	1,000 [c]	0.26	1.6

All soil cleanup objectives (SCOs) are in parts per million (ppm).

NS = Not specified. See Technical Support Document (TSD).

[a]The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm. See TSD section 9.3.

[b]The SCOs for commercial use were capped at a maximum value of 500 ppm. See TSD section 9.3.

[c]The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm. See TSD section 9.3.

[d]The SCOs for metals were capped at a maximum value of 10,000 ppm. See TSD section 9.3.

[e]For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value.

[f]For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

[g]This SCO is derived from data on mixed isomers of BHC.

[h]The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

[i]This SCO is for the sum of endosulfan I, endosulfan II, and endosulfan sulfate.

[j]This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts). See TSD Table 5.6-1.