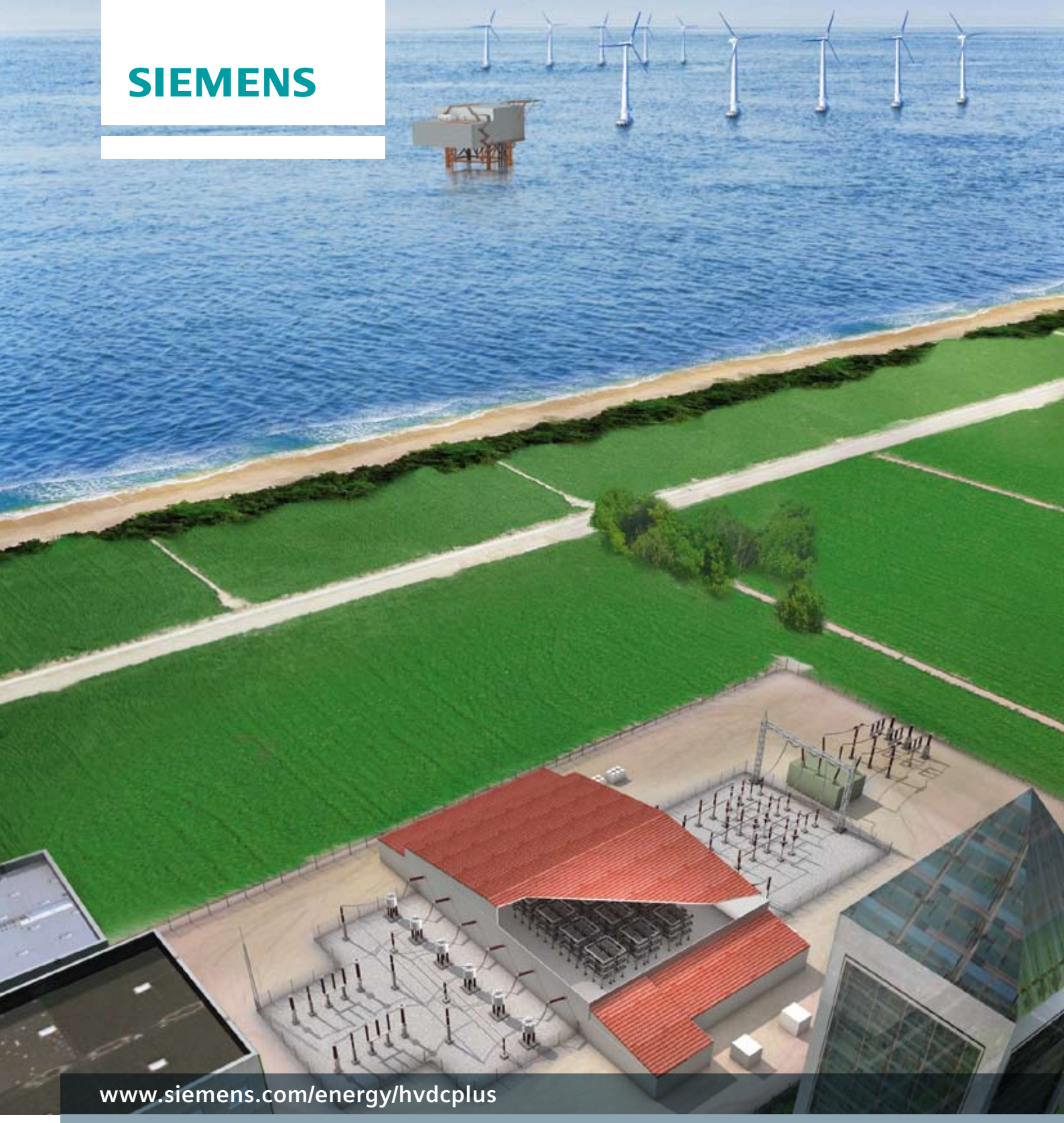
Appendix 1

The Smart Way – HVDC PLUS – One Step Ahead

SIEMENS



www.siemens.com/energy/hvdcplus

The Smart Way

HVDC PLUS – One Step Ahead

Answers for energy.

HVDC PLUS – Maximum power in the smallest space

The customized solution for evolving power markets

Keeping the power flowing is part of our life and essential for society, just like keeping the blood flowing in our veins. Lack of power brings devastating consequences to our daily life. Nowadays, fundamental changes are affecting the power industry: deregulation and privatization of the power markets, urbanization around the world, and a growing demand for energy. Renewable energy sources are gaining importance. For these reasons, innovative and highly efficient solutions for power transmission are needed.

The global climate change poses new challenges for power generation and transmission. Innovative solutions will contribute to the reduction in CO_2 emissions and to an optimized use of energy resources. The most crucial points in today's and tomorrow's power supply are sustainability, security and efficiency.

The Siemens answer is HVDC PLUS.

As an innovation leader, Siemens has developed an advanced and universally applicable solution for power transmission up to 1,000 MW and above with HVDC PLUS. Applying advanced technologies, the well-known benefits of HVDC are now available for new applications. Examples are interconnection of weak AC grids, grid access for islanded networks or renewable energy sources, such as wind farms, both offshore and onshore.

HVDC PLUS
The smart transmission technology of the future

- **HVDC technology in the smallest space**
  Even when space is limited, HVDC PLUS enables the use of highly efficient HVDC technology.
- **Optimal connection of distributed generation**
  The scalability of HVDC PLUS means that remote energy sources such as offshore wind farms can be connected to the power grid in the most suitable way.

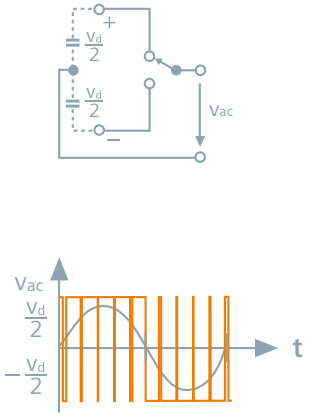
- **Operational benefits**
  Minimum time and costs for maintenance and high operational reliability make HVDC PLUS a particularly economical solution.
- **Potential environmental protection tool for CO_2 reduction**
  With HVDC PLUS, islanded networks such as oil and gas platforms as well as mines can be connected without need for local generation which is less efficient. This allows for CO_2 reduction.
- **Fast and cost-efficient project execution**
  Due to the standardized modular design of HVDC PLUS, time and resources are saved during both planning and implementation.
- **Support of AC system stability**
  HVDC PLUS offers fast stabilization of the AC voltage in weak grids. In addition, it is also possible to feed passive networks without generation, by means of black-start capability.

The next generation of HVDC

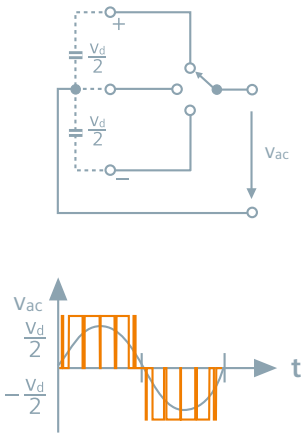
HVDC PLUS is the Voltage-Sourced Converter (VSC) technology which uses a Modular Multilevel Converter (MMC) design.

- The MMC provides a nearly ideal sinusoidal-shaped waveform on the AC side and a smooth DC voltage. Therefore, there are few if any requirements for high frequency and harmonic filters.
- The VSC offers an independent control of active and reactive power.
- MMC allows for low switching frequencies, resulting in lower system losses.
- The modular design of the MMC provides a high degree of flexibility in the converter station design.
- HVDC PLUS uses robust, proven standard components, such as typical AC power transformers and industrial class IGBTs (Insulated Gate Bipolar Transistors) used for traction and industrial drives.

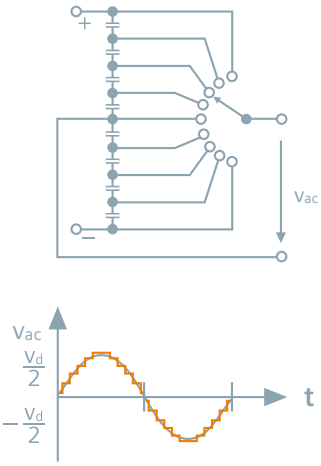
Two-level



Three-level



Multilevel



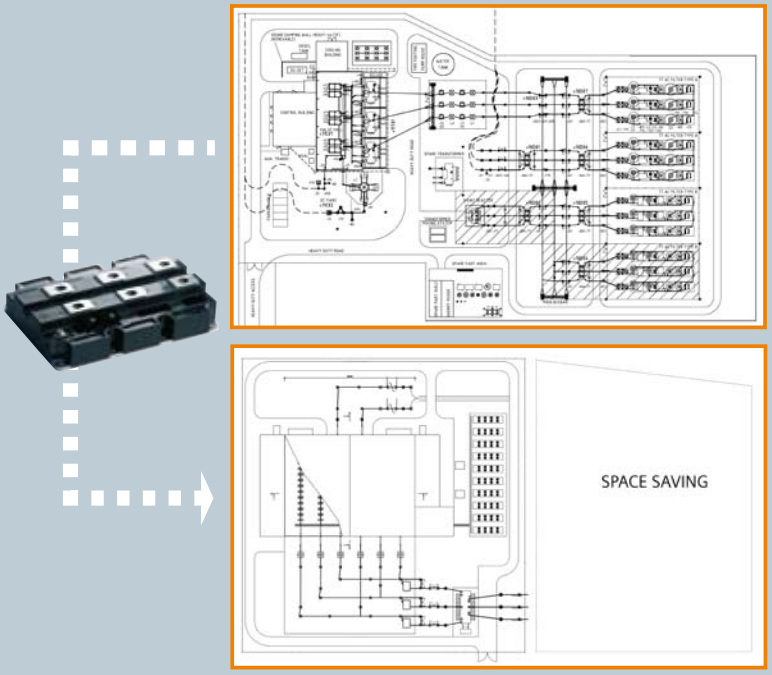
Grid access in minimum time

HVDC PLUS reduces the time and resources expended during the project development phase. The relatively low number of components simplifies design, planning, and engineering tasks. Thanks to the modular design with fewer elements than conventional HVDC systems, installation and commissioning also require considerably less time and less space than conventional systems.

Compact and adaptable station layout

The MMC technology makes HVDC PLUS converters compact and adaptable.

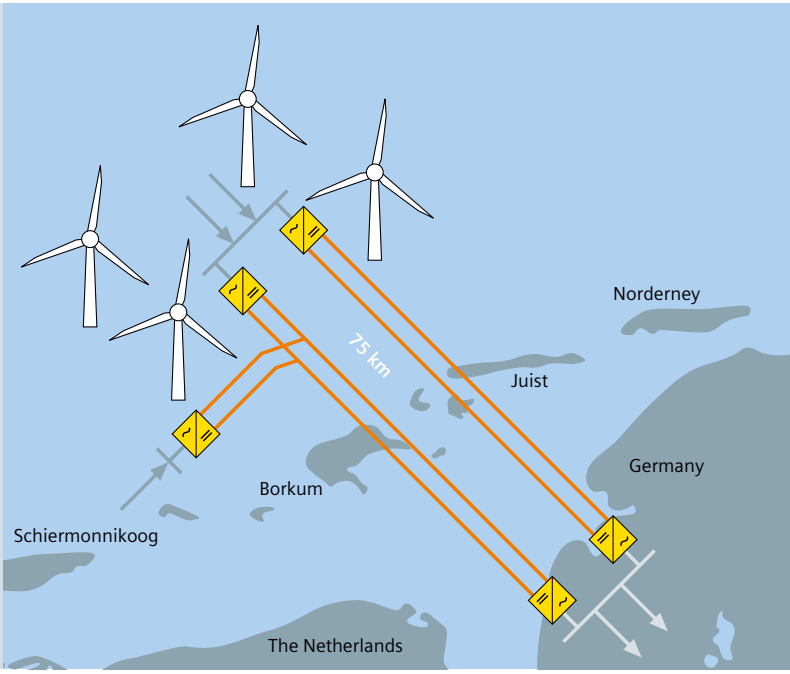
- A low profile converter building can be selected when visual resources are critical or alternatively the station footprint can be reduced by increasing the height of the building.
- A small site footprint reduces costs.
- Indoor installation of reactors and switchgear is possible, but not required.
- HVDC PLUS is an appropriate solution where space is limited or costly. Examples are offshore platforms or congested areas in large cities.



Scalable system design

The MMC technology offers a high degree of flexibility. This allows the most suitable solution to the given power transmission task.

- Efficient use of HVDC technology at any rating up to 1,000 MW.
- An HVDC PLUS point-to-point transmission system can easily be expanded into a multi-terminal system with three or more converter stations.



Grid access

In the emerging world of offshore connections Siemens has taken the early lead. Siemens offers comprehensive turnkey grid access solutions, ranging from first feasibility and power system studies to the engineering, procurement, construction, and commissioning of entire grid connections.

- Oil platforms can be supplied with power from efficient land-based generation sources.
- Large offshore wind farms can be connected to the grid with HVDC PLUS when an AC solution is not feasible.

Economical and Environmental benefits

Environmental constraints will play an important role in the power system developments.

- MMC with low switching frequencies – reduced losses.
- Less components – lower time and cost demands for planning, engineering, construction, and commissioning.
- Lower space requirements – reduced property costs.
- Power electronics with self-commutated converters, such as MMC offer benefits for power transmission.

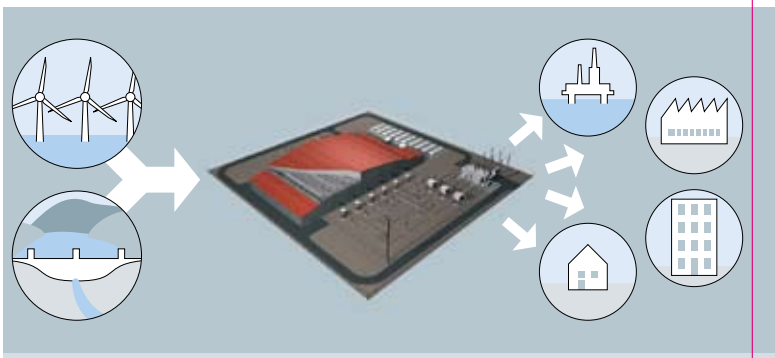
Operational advantages

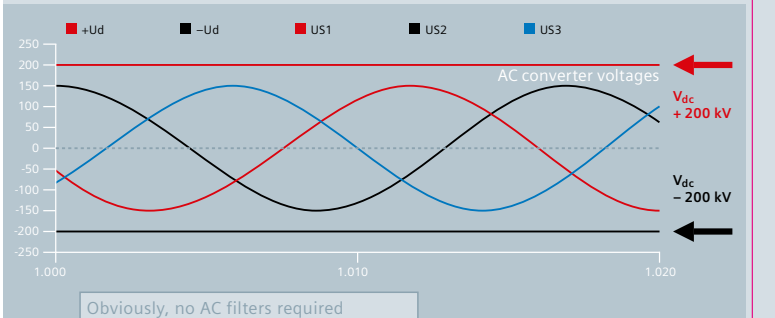
- A very high level of system availability, full redundancy for all key parts of the converter.
- Online real-time monitoring of all main components.
- Minimized maintenance and service requirements.
- Standard control and protection system, Win-TDC (SIMATIC) hardware and software, proven in practice in a wide range of applications worldwide.
- A minimum quantity of AC components due to reduced requirements to harmonic and high frequency filtering.

Stabilization of the AC network

The VSC technology features make HVDC PLUS fully suitable for AC voltage control. The advantages are especially apparent in connections with weak AC networks.

- Low dependency on short-circuit power, voltage, and frequency of the AC networks.
- Reactive power can be generated or consumed independently from active power transmission.
- Unbalance control for compensation of large single-phase loads.



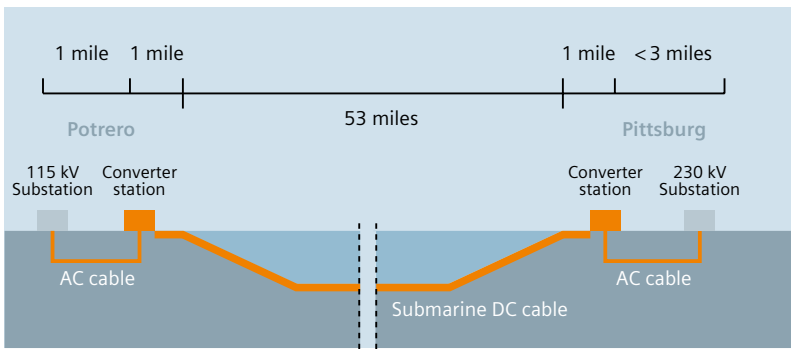


Proven performance – first installed HVDC PLUS project

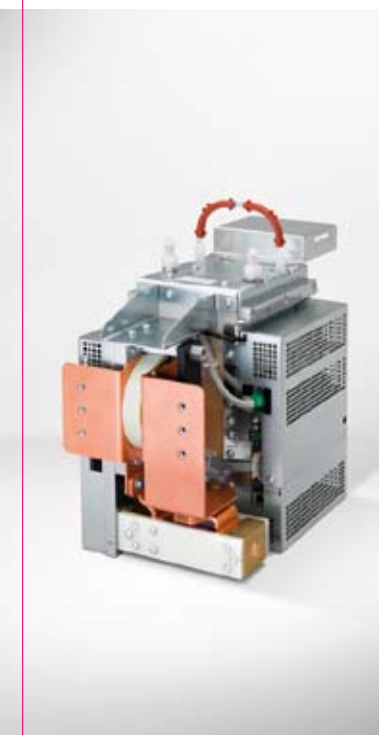
In very many cases, areas of high power demand are not close to areas of generation. Connecting offshore wind farms to the grid, increasing availability of electric power supply on oil platforms or transmitting power via submarine cables across the sea are perfect examples of where HVDC PLUS is the preferred solution for providing efficient and reliable power transmission over long distances. The Trans Bay Cable link, the first HVDC PLUS system in the world, is provided by Siemens and transmits up to 400 MW of power from Pittsburg in the East Bay to Potrero Hill in the center of San Francisco since 2010 – covering a distance of 85 km right across the bottom of the San Francisco Bay.

Example of application

First HVDC PLUS System in the World:
Trans Bay Cable Link, San Francisco, USA
The HVDC PLUS system for Trans Bay Cable LLC transmits up to 400 megawatts and +/- 170 MVAr Reactive Power Support at a DC voltage of +/- 200 kV. It is the first order for Siemens using its innovative HVDC PLUS technology. The main advantages of the new HVDC PLUS link are the increased network security and reliability due to network upgrade, reduced system losses and reliable provision of power from the East Bay generation site right to the center of the city. Since its commissioning in 2010, the HVDC transmission helps to meet the City of San Francisco's future electrical demand and it is a highly energy-efficient, cost-effective solution.



Power Module



Converter Arm Segment

Project references

World's first VSC HVDC with 2x 1,000 MW: INELFE, France–Spain

The INELFE/Siemens transmission links 1 and 2 between Baixas, west of Perpignan in France, and Santa Llogaia, south-west of Figueras in Spain, is an important component of the trans-European electricity network. The installation can transmit rated power of 1,000 MW per link with minimal transmission losses. The converter stations use HVDC PLUS voltage-sourced converters in a modular multilevel converter arrangement (VSC-MMC) with a transmission voltage of ±320 kV DC. The power will be transmitted over a distance of about 65 kilometers with underground cables in trenches and in a tunnel through the Pyrenees for about eight kilometers. The project illustrates the unique capability of VSC technology to meet special technical demands. The independent exchange of reactive power for each network, as well as the black-start capability, which enables the HVDC system to restart a collapsed network, are particularly worth mentioning. The converter stations are scheduled to be ready for tests by the end of 2013.

864 MW offshore HVDC PLUS link SylWin1, Germany

Siemens will supply the world's largest voltage-sourced converter (VSC) offshore system with a rating of 864 MW for the SylWin1 project. Siemens' HVDC PLUS link will connect the Dan Tysk wind farm to the German shore. The converter will be installed on an offshore platform, where the voltage level will be stepped up and converted to ±320 kV DC. The platform will accommodate all electrical equipment required for the HVDC converter station: two transformers, four AC cable compensation reactors, and high-voltage gas-insulated switchgear (GIS). Similar to the BorWin2 and HelWin1 projects, the Siemens wind power offshore substation (WIPOS®) will be designed as a floating, self-lifting platform. The energy will be transmitted via subsea and land cable to Büttel, where an onshore converter station will reconvert the DC to AC and feed it into the 380 kV AC grid. The transmission link is scheduled to start operation in 2014.

800 MW offshore HVDC PLUS link BorWin2, Germany

For the BorWin2 project, Siemens will supply the voltage-sourced converter (VSC) system – using Siemens HVDC PLUS technology – with a rating of 800 MW. The wind farms Veja Mate and Global Tech 1 are designed to generate 800 MW and will be connected through Siemens' HVDC PLUS link to shore. The converter will be installed on an offshore platform, where the voltage level will be stepped up and then converted to ±300 kV DC. The platform will accommodate all the requisite electrical equipment for the HVDC converter station, two transformers, four AC cable compensation reactors and high-voltage gas-insulated switchgear (GIS). The Siemens wind power offshore substation (WIPOS) will be designed as a floating, self-lifting platform. Power will be transmitted via subsea and land cable to Diele close to Papenburg, where an onshore converter station will reconvert the DC back to AC and feed it into the 380 kV AC network. The entire transmission link is expected to begin operation in 2013.

576 MW offshore HVDC PLUS link HelWin1, Germany

For the project HelWin1, Siemens will be supplying a voltage-sourced converter (VSC) system with a rating of 576 MW using Siemens HVDC PLUS technology. The wind farms Nordsee Ost and Meerwind are designed to generate 576 MW and will be connected through a Siemens' HVDC PLUS link to shore. The converter will be installed on an offshore platform, where the voltage level will be stepped up and then converted to ±250 kV DC. The platform will accommodate all the requisite electrical high-voltage AC and DC equipment for the converter station. Similar to the BorWin2 project, the Siemens wind power offshore substation (WIPOS) will also be designed as a floating, self-lifting platform. Energy will be transmitted via subsea and land cable to Büttel, northwest of Hamburg, Germany, where an onshore converter station will reconvert the DC back to AC and transmit it into the high-voltage grid. The entire transmission link and grid connection is expected to be in operation by 2013.

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Appendix 2

ConEd Letter 12-12-12

conEdison
a conEdison, Inc. company

Candida L. Canizio
Director
Real Estate

December 12, 2012

Mr. Edward M. Stern
PowerBridge LLC
501 Kings Highway East
Suite 300
Fairfield CT 06825

Dear Mr. Stern:

This correspondence is in response to your inquiry about the availability of a parcel of Con Edison property consisting of approximately 121 acres of mostly vacant land located in Verplanck within the Town of Cortlandt. Con Edison anticipates marketing the majority of this property in the near future but will retain certain portions of it for its public utility purposes. Such future marketing will be conducted through a competitive bidding process in accordance with New York State Public Service Commission requirements. Once a purchaser has been selected, the parties will file an application to the Public Service Commission requesting approval of the transfer pursuant to the Public Service Law.

We understand that you are interested in participating in the competitive bidding process to support your development efforts for the West Point Project. After touring the property several months ago, you expressed your interest in the Verplanck property. Thus, I will provide you with the marketing materials when they are prepared. If you have not already done so, please contact our transmission planning department, as it will be your point of contact for interconnecting your proposed project to the Con Edison electric transmission system. Should you have any other questions, please do not hesitate to contact me.

Very truly yours,

Candl S

Consolidated Edison Company of New York, Inc.
4 Irving Place New York NY 10003 212 460 3188 212 228 6720 fax canizioc@coned.com

Appendix 3

Agency Consultations

Payson Whitney

From: Betsy Hohenstein [brhohens@gw.dec.state.ny.us]
Sent: Thursday, August 16, 2012 1:41 PM
To: Payson Whitney; Chris Hocker
Cc: Andrew.Davis@dps.ny.gov; Jeremy.Flaum@dps.ny.gov; Betsy Blair; Diane English; Karen Woodfield; Larry Wilson
Subject: Re: West Point Project

Attachments: Comments on the West Point Project Geotechnical Sediment Sam_1.pdf

Comments on the West Point Pro...

Good afternoon, Payson:

Attached are DEC's comments from our Division of Water, in review of the West Point Project sediment sampling plan.

Please be advised that the review comments are submitted back to you at your request and apply to sampling to take place in the Hudson River.

This Article VII is in a pre-application phase, and at our pre-application meeting, we discussed the need for West point Partners to look at alternative routes, including several possible land-based routes. The developers should clearly understand that today's review and comments do not reflect any favor towards, nor approval of a River - based route. Land based route alternatives must be fully developed and exhausted to satisfy Part 608 claiming a water dependent use.

Contact me with questions. Thank you.

Betsy

Betsy Hohenstein
Environmental Analyst, Major Projects Bureau Division of Environmental Permits NYSDEC
625 Broadway
Albany, NY 12233
phone (518) 402-9174

>>> "Payson Whitney" <pwhitney@essgroup.com> 8/1/2012 2:53 PM >>>
Betsy, Karen, and Diane.

I am sending 2 copies of our sediment sampling plan to Betsy via FedEx today for your review and approval.

Please send along any comments/suggestions you may have when you review the plan.

We are starting the geophysical survey this Saturday and are working starts starting the vibracoring at the end of the month or in early September.

Thanks.

Payson

Payson R. Whitney, III, PE | Vice President, Land Development & Engineering

ESS Group, Inc.

100 Fifth Avenue, 5th Floor, Waltham, MA 02451

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<mailto:pwhitney@essgroup.com> | www.essgroup.com
<http://www.essgroup.com/>

Comments on the West Point Project Geotechnical Sediment Sampling and Analysis Plan
DEC's Division of Water
Sediment Assessment and Management Unit
August 9, 2012

1. Dredged material will not be used for backfill into the HDD pit. All HDD pits shall be filled with clean material. Please remove the statement from Section 1.0 first paragraph regarding storage of dredged material for use as backfill.

2. Please remove the sentence on page 1 stating that the number of core samples may decrease depending on the results of the Geophysical Field Program. An appropriate alternate sample location should be substituted for any proposed location with greater than 90% sand and gravel.

3. On page 2, in the discussion regarding cutting cores into more manageable sections, please add wording requiring examination of the core prior to cutting to ensure that no core is cut in a manner that precludes individual horizons from being sampled separately.

4. Samples will be analyzed for copper, volatile organic compounds and dioxins/furans. The plan should be updated to remove the sentence on page 6 indicating that these analyses will not be conducted. There can be provisions for a reduced number of dioxin/furan samples, but these analyses should not be completely eliminated.

5. Remove the requirement on page 6, Section 5.0 that individual horizons be two feet thick.

6. Please replace "qualified analytical laboratories" with "ELAP-certified laboratories" on page 10, Section 5.8.

7. In addition to the 50 samples initially proposed, please collect two additional samples in each HDD pit. Due to high concentrations of PCB's previously detected in the sediment, please collect additional core samples in the Red Hook, Kingston, Rhinebeck, Dutchess Junction, Constitution Island and Buchanan portions of the route.

8. Please send the amended plan in electronic format for our files.

Payson Whitney

From: Karen Woodfield [klwoodfi@gw.dec.state.ny.us]

Sent: Thursday, August 23, 2012 11:21 AM

To: Payson Whitney

Cc: Andrew.Davis@dps.ny.gov; Jeremy.Flaum@dps.ny.gov; Betsy Blair; Betsy Hohenstein; Diane English; Larry Wilson; Chris Hocker

Subject: RE: West Point Project

Please modify the plan to add core samples at locations along the proposed installation route that correspond with river miles 99, 89, 59.5, 53.8 and 42.5 and, in the vicinity of Kingston, VC17 should be moved to RM 93 and an additional sample should be collected at RM 92. Due to high PAH's and metals previously detected at some of these additional locations, all additional core samples should be analyzed for PCB, PAH and metals. Please call me if you have any questions. Thank you.

>>> "Payson Whitney" <pwhitney@essgroup.com> 8/21/2012 11:55 AM >>>
Betsy.

Thank you for sending along DEC's comments on the sampling plan for West Point.

In comment 7, DEC states, "Due to high concentrations of PCB's previously detected in the sediment, please collect additional core samples in the Red Hook, Kingston, Rhinebeck, Dutchess Junction, Constitution Island and Buchanan portions of the route." We would like additional guidance as to locations (water depth, distance from riverbank, etc.) for these samples so we can make sure our samples our in the correct location. If there specific locations where DEC would like us to sample near in these areas, please provide coordinates, as they would help us locate sampling points on our route that are near these areas.

Thanks.
Payson

Payson R. Whitney, III, PE
ESS Group, Inc.
pwhitney@essgroup.com

-----Original Message-----
From: Betsy Hohenstein [mailto:brhohens@gw.dec.state.ny.us]
Sent: Thursday, August 16, 2012 1:41 PM
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Cc: Andrew.Davis@dps.ny.gov; Jeremy.Flaum@dps.ny.gov; Betsy Blair; Diane English; Karen Woodfield; Larry Wilson
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Contact me with questions. Thank you.

Betsy

Betsy Hohenstein
Environmental Analyst, Major Projects Bureau
Division of Environmental Permits
NYSDEC
625 Broadway
Albany, NY 12233
phone (518) 402-9174

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

APR 15 2013

Susan Herz
ESS Group
101 Fifth Avenue, 5th Floor
Waltham, Massachusetts 02451

Re: West Point Transmission Project

Dear Ms. Herz,

Your letters dated April 2, 2013, and April 11, 2013, provided information on the West Point Transmission Project, which will involve the construction and operation of an electric transmission facility between Westchester and Greene Counties, New York. The construction of the electric transmission facility will require the installation of a cable route within the Hudson River, from RM 118 (RKM 190) to RM 42 (RKM 68). At the northern and southern terminus of the cable, the cable will be interconnected to an overland cable route that will be installed at the northern and southern landfall substations. Installation of the cable within the Hudson River will require jetting, via a hydroplow, as well as the use of a horizontal directional drill.

Your letters also requested information on the presence of species listed by NOAA's National Marine Fisheries Service (NMFS) in the vicinity of the West Point Transmission Project. The following Endangered Species Act (ESA) listed species occur in the Hudson River:

Shortnose Sturgeon (Acipenser brevirostrum)

A population of the federally endangered shortnose sturgeon occurs in the Hudson River. Shortnose sturgeon have been documented in the Hudson River from upper Staten Island (approximately rkm -4.8) to the Troy Dam (approximately rkm 245). From late fall to early spring, adult shortnose sturgeon concentrate in a few overwintering areas. The largest overwintering area is just south of Kingston, New York, near Esopus Meadows (rkm 139-152) (Dovel *et al.*, 1992). The fish overwintering at Esopus Meadows are mainly spawning adults. Captures of shortnose sturgeon during the fall and winter from Saugerties to Hyde Park (greater Kingston reach), indicate that additional smaller overwintering areas may be present (Geoghegan *et al.*, 1992). Both Geoghegan *et al.* (1992) and Dovel *et al.* (1992) also confirmed an overwintering site in the Croton-Haverstraw Bay area (rkm 54-61). Fish overwintering in areas below Esopus Meadows are mainly thought to be pre-spawning adults. Typically, movements during overwintering periods are localized and fairly sedentary.

When water temperatures reach 8-9°C, typically in late March through mid-April, reproductively active adults begin their migration upstream to the spawning grounds that extend from below the Federal Dam at Troy to about Coeymans, New York (rkm 245-212) (Dovel *et al.*, 1992). Spawning typically occurs at water temperatures between 10-18°C (generally from late April through May) after which adults disperse quickly down river into their summer range. In fact, Dovel *et al.* (1992) reported that spawning fish tagged at Troy were recaptured in Haverstraw Bay in early June. The broad summer range occupied by adult shortnose sturgeon extends from approximately rkm 38 to rkm 177. Similar to non-spawning adults, most juveniles occupy the broad region of Haverstraw Bay (rkm 54-61) by late fall and early winter (Geoghegan *et al.*, 1992; Dovel *et al.*, 1992). Juveniles are distributed throughout the mid-river region during the summer (rkm 38-152) and move back into the Haverstraw Bay region during the late fall (Bain *et al.*, 1998; Geoghegan *et al.*, 1992). Eggs and larvae are expected to be present within the vicinity of the spawning grounds for approximately four weeks post spawning (i.e., at the latest, through mid-June).

Atlantic Sturgeon (Acipenser oxyrinchus oxyrinchus)

Use of the river by Atlantic sturgeon has been described by several authors. The area around Hyde Park (approximately rkm134) has consistently been identified as a spawning area through scientific studies and historical records of the Hudson River sturgeon fishery (Dovel and Berggren, 1983; Van Eenennaam *et al.*, 1996; Kahnle *et al.*, 1998; Bain *et al.*, 2000). Habitat conditions at the Hyde Park site are described as freshwater year round with bedrock, silt and clay substrates and waters depths of 12-24 m (Bain *et al.*, 2000). Bain *et al.* (2000) also identified a spawning site at rkm 112 based on tracking data. The rkm 112 site, located to one side of the river, has clay, silt and sand substrates, and is approximately 21-27 m deep (Bain *et al.*, 2000).

Young-of-year (YOY) have been recorded in the Hudson River between rkm 60 and rkm 148, which includes some brackish waters; however, larvae must remain upstream of the salt wedge because of their low salinity tolerance (Dovel and Berggren, 1983; Kahnle *et al.*, 1998; Bain *et al.*, 2000). Catches of immature sturgeon (age 1 and older) suggest that juveniles utilize the estuary from the Tappan Zee Bridge through Kingston (rkm 43- rkm 148) (Dovel and Berggren, 1983; Bain *et al.*, 2000). Seasonal movements are apparent with juveniles occupying waters from rkm 60 to rkm 107 during summer months and then moving downstream as water temperatures decline in the fall, primarily occupying waters from rkm 19 to rkm 74 (Dovel and Berggren, 1983; Bain *et al.*, 2000). Based on river-bottom sediment maps (Coch and Bokuniewicz, 1986) most juvenile sturgeon habitats in the Hudson River have clay, sand, and silt substrates (Bain *et al.*, 2000). Newburgh and Haverstraw Bays in the Hudson River are areas of known juvenile sturgeon concentrations (Sweka *et al.*, 2007). Sampling in spring and fall revealed that highest catches of juvenile Atlantic sturgeon occurred during spring in soft-deep areas of Haverstraw Bay even though this habitat type comprised only 25% of the available habitat in the Bay (Sweka *et al.*, 2007). Overall, 90% of the total 562 individual juvenile Atlantic sturgeon captured during the course of this study (14 were captured more than once) came from Haverstraw Bay (Sweka *et al.*, 2007). At around 3 years of age, Hudson River juveniles exceeding 70 cm total length begin to migrate to marine waters (Bain *et al.*, 2000).

Atlantic sturgeon adults are likely to migrate through the action area in the spring as they move from oceanic overwintering sites to upstream spawning sites and then migrate back through the area as they move to lower reaches of the estuary or oceanic areas in the late spring and early summer. Atlantic sturgeon adults are most likely to occur in the action area from May – September. Tracking data from tagged juvenile Atlantic sturgeon indicates that during the spring and summer individuals are most likely to occur within rkm 60-170. During the winter months, juvenile Atlantic sturgeon are most likely to occur between rkm 19 and 74. This seasonal change in distribution may be associated with seasonal movements of the saltwedge and differential seasonal use of habitats.

Please note, as the New York Bight DPS of Atlantic sturgeon is the only DPS of Atlantic sturgeon that spawns in the Hudson River, the information provided above only applies to this DPS. However, other DPSs of Atlantic sturgeon (i.e., Gulf of Maine, Chesapeake Bay, Carolina, and South Atlantic) are known to be present within the Hudson River, approximately up to the 0.5 ppt salinity threshold in the River. As such, subadult and adult Atlantic sturgeon from any DPS may be present within the Hudson River.

Conclusions

Based on the information provided above, the cable route is proposed to be installed through areas of the Hudson River essential to shortnose and Atlantic sturgeon foraging, overwintering, and/or spawning. Of particular concern is the portion of the cable route proposed to be installed through reaches of the Hudson River identified as spawning grounds for Atlantic sturgeon (i.e., rkm 134 and rkm 112).[1] We strongly recommend that no in-water work be undertaken from May 1 through August 31 of any calendar year to protect spawning adults and early life stages of Atlantic sturgeon. Additionally, if possible, we would recommend that in-water work not be undertaken from late fall through the winter in those reaches of the Hudson River identified as overwintering grounds for Atlantic and shortnose sturgeon.

Based on the information presented above, ESA listed species of shortnose and Atlantic sturgeon will occur in the project area and thus, any proposed in-water work has the potential to impact these species. As project details become finalized, a consultation, pursuant to section 7 of the ESA of 1973, as amended, may be necessary as any discretionary federal action, such as the approval or funding of a project by a Federal agency, that may affect an ESA listed species must undergo consultation pursuant to section 7 of the ESA. If the proposed project has the potential to affect ESA listed species, and it is being approved, permitted or funded by a Federal agency, the lead Federal agency, or their designated non-Federal representative, is responsible for determining whether the proposed action is likely to affect the listed species. The Federal agency would submit their determination along with justification for their determination and a request for concurrence, to the attention of the ESA Section 7 Coordinator, NMFS Northeast Regional Office, Protected Resources Division, 55 Great Republic Drive, Gloucester, MA

[1] Spawning grounds of shortnose sturgeon will not be affected by this project as they are located well above the project area (i.e., rkms 245-212).

01930. After reviewing this information, NMFS would then be able to conduct a consultation under section 7 of the ESA.

Should you have any questions about these comments or about the section 7 consultation process in general, please contact Danielle Palmer at (978)282-8468 or by e-mail (Danielle.Palmer@noaa.gov).

Sincerely,

Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

References

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EC: Rusanowsky, NMFS/HCD
Palmer, NMFS/PRD
File Code: Sec 7 technical assistance 2013– West Point Transmission, Hudson River

United States Department of the Interior

FISH AND WILDLIFE SERVICE
NEW YORK ECOLOGICAL SERVICES FIELD OFFICE
3817 LUKER ROAD
CORTLAND, NY 13045
PHONE: (607)753-9334 FAX: (607)753-9699
URL: www.fws.gov/northeast/nyfo/es/section7.htm

Consultation Tracking Number: 05E1NY00-2013-SLI-0530 May 10, 2013
Project Name: West Point Transmission Project

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project.

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated critical habitat, and candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: http://www.fws.gov/northeast/nyfo/es/section7.htm

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects

should follow the Services wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: West Point Transmission Project

Official Species List

Provided by:

NEW YORK ECOLOGICAL SERVICES FIELD OFFICE
3817 LUKER ROAD
CORTLAND, NY 13045
(607) 753-9334
http://www.fws.gov/northeast/nyfo/es/section7.htm

Expect additional Species list documents from the following office(s):

LONG ISLAND ECOLOGICAL SERVICES FIELD OFFICE
340 SMITH ROAD
SHIRLEY, NY 11967
(631) 286-0485

Consultation Tracking Number: 05E1NY00-2013-SLI-0530
Project Type: Transmission Line
Project Description: The planned electric transmission facility extends between Westchester and Greene Counties, New York including an In-River Cable in the Hudson River and Northern and Southern Overland Cables. From the Northern Landfall the Overland Cable routes to a Converter Station then connects to the National Grid Leeds Substation. From the Southern Landfall the Overland Cable routes to a Converter Station then connects to the Con Edison Buchanan Substation. The In-River and Overland Cables will be buried.

Project Location Map:

Project Coordinates: MULTIPOLYGON (((-73.8430244 42.2700558, -73.8442129 42.2700626, -73.8442035 42.2709739, -73.8442598 42.2709742, -73.8443207 42.2656958, -73.84647 42.2657081, -73.8464697 42.2657424, -73.8464295 42.2657593, -73.8444064 42.2657478, -73.8443518 42.271009, -73.8443173 42.271042, -73.8442028 42.2710425, -73.8441945 42.2718366, -73.843006 42.2718298, -73.8430092 42.2715197, -73.8428519 42.271516, -73.8428184 42.2714871, -73.8428413 42.2703219, -73.8427695 42.2701713, -73.8426936 42.2700932, -73.8424808 42.2700237, -73.8395235 42.269648, -73.8396938 42.2693654, -73.8399385 42.2690639, -73.84013 42.2686096, -73.8402428 42.2680493, -73.8402498 42.2678486, -73.8401653 42.2671297, -73.8400667 42.2669025, -73.8395811 42.2662368, -73.8394176 42.2659075, -73.8391317 42.2648665, -73.8388861 42.2641543, -73.8387215 42.2634728, -73.838556 42.2632294, -73.8377426 42.2624196, -73.8376506 42.26236, -73.8375123 42.2623299, -73.8369636 42.262389, -73.8367344 42.262481, -73.8363928 42.2624925, -73.8353659 42.2627273, -73.8342998 42.2630006, -73.8332407 42.2633692, -73.8328823 42.2634058, -73.8318053 42.2636151, -73.8304479 42.2640048, -73.8300563 42.2640505, -73.8284528 42.2640963, -73.8277667 42.2640494, -73.8229438 42.2631636, -

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Project Counties: Columbia, NY | Dutchess, NY | Greene, NY | Orange, NY | Putnam, NY | Rockland, NY | Ulster, NY | Westchester, NY

Endangered Species Act Species List

Species lists are not entirely based upon the current range of a species but may also take into consideration actions that affect a species that exists in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Please contact the designated FWS office if you have questions.

Bog Turtle *(Clemmys muhlenbergii)*

Population: northern

Listing Status: Threatened

Dwarf wedgemussel *(Alasmidonta heterodon)*

Population: Entire

Listing Status: Endangered

Indiana bat *(Myotis sodalis)*

Population: Entire

Listing Status: Endangered

New England Cottontail rabbit *(Sylvilagus transitionalis)*

Listing Status: Candidate

Northern Wild monkshood *(Aconitum noveboracense)*

Listing Status: Threatened

Small Whorled pogonia *(Isotria medeoloides)*

Listing Status: Threatened

United States Department of the Interior

FISH AND WILDLIFE SERVICE
LONG ISLAND ECOLOGICAL SERVICES FIELD OFFICE
340 SMITH ROAD
SHIRLEY, NY 11967
PHONE: (631)286-0485 FAX: (631)286-4003

Consultation Tracking Number: 05E1LI00-2013-SLI-0114 May 10, 2013
Project Name: West Point Transmission Project

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project.

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, and proposed species, designated critical habitat, and candidate species that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the

human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: West Point Transmission Project

Official Species List

Provided by:

LONG ISLAND ECOLOGICAL SERVICES FIELD OFFICE
340 SMITH ROAD
SHIRLEY, NY 11967
(631) 286-0485

Expect additional Species list documents from the following office(s):

NEW YORK ECOLOGICAL SERVICES FIELD OFFICE
3817 LUKER ROAD
CORTLAND, NY 13045
(607) 753-9334
http://www.fws.gov/northeast/nyfo/es/section7.htm

Consultation Tracking Number: 05E1LI00-2013-SLI-0114
Project Type: Transmission Line
Project Description: The planned electric transmission facility extends between Westchester and Greene Counties, New York including an In-River Cable in the Hudson River and Northern and Southern Overland Cables. From the Northern Landfall the Overland Cable routes to a Converter Station then connects to the National Grid Leeds Substation. From the Southern Landfall the Overland Cable routes to a Converter Station then connects to the Con Edison Buchanan Substation. The In-River and Overland Cables will be buried.

Project Location Map:

Project Coordinates: MULTIPOLYGON (((-73.8430244 42.2700558, -73.8442129 42.2700626, -73.8442035 42.2709739, -73.8442598 42.2709742, -73.8443207 42.2656958, -73.84647 42.2657081, -73.8464697 42.2657424, -73.8464295 42.2657593, -73.8444064 42.2657478, -73.8443518 42.271009, -73.8443173 42.271042, -73.8442028 42.2710425, -73.8441945 42.2718366, -73.843006 42.2718298, -73.8430092 42.2715197, -73.8428519 42.271516, -73.8428184 42.2714871, -73.8428413 42.2703219, -73.8427695 42.2701713, -73.8426936 42.2700932, -73.8424808 42.2700237, -73.8395235 42.269648, -73.8396938 42.2693654, -73.8399385 42.2690639, -73.84013 42.2686096, -73.8402428 42.2680493, -73.8402498 42.2678486, -73.8401653 42.2671297, -73.8400667 42.2669025, -73.8395811 42.2662368, -73.8394176 42.2659075, -73.8391317 42.2648665, -73.8388861 42.2641543, -73.8387215 42.2634728, -73.838556 42.2632294, -73.8377426 42.2624196, -73.8376506 42.26236, -73.8375123 42.2623299, -73.8369636 42.262389, -73.8367344 42.262481, -73.8363928 42.2624925, -73.8353659 42.2627273, -73.8342998 42.2630006, -73.8332407 42.2633692, -73.8328823 42.2634058, -73.8318053 42.2636151, -73.8304479 42.2640048, -73.8300563 42.2640505, -73.8284528 42.2640963, -73.8277667 42.2640494, -73.8229438 42.2631636, -

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Project Counties: Columbia, NY | Dutchess, NY | Greene, NY | Orange, NY | Putnam, NY | Rockland, NY | Ulster, NY | Westchester, NY

Endangered Species Act Species List

Species lists are not entirely based upon the current range of a species but may also take into consideration actions that affect a species that exists in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Please contact the designated FWS office if you have questions.

There are no listed species identified for the vicinity of your project.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

Joe Martens
Commissioner

April 15, 2013

Susan Herz
ESS Group
100 5th Avenue
Waltham, MA 02451

Dear Ms. Herz:

In response to your recent request, we have reviewed the New York Natual Heritage Database with respect to an Environmental Assessment for the Proposed West Point Transmission Line, # W 296 001, area as indicated on the map you enclosed, - located in Counties and Towns along Hudson River From Athens to Buchanan.

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities, which our database indicates occur, or may occur, on your site or in the immediate vicinity of your site. For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental impact assessment.

The enclosed report may be included in documents that will be available to the public. However, any maps displaying locations of rare species are considered sensitive information, and should not be included in any document that will be made available to the public, without permission from the New York Natural Heritage Program.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, as listed at www.dec.ny.gov/about/39381.html.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Jean Pietrusiak, Information Services
NYS Department Environmental Conservation

Enc. # 306
cc: Reg. 3 and 4, Wildlife Mgr.

New York Natural Heritage Program

Report on Rare Animals, Rare Plants, and Significant Natural Communities

The following rare plants, rare animals, and significant natural communities have been documented along the proposed route of the West Point Transmission Project. They occur either in the Hudson River, in tidal wetlands along the Hudson River, or on the Hudson River shore.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS**
County: **_Hudson River**			
Hudson River			
Shortnose Sturgeon	*Acipenser brevirostrum*	Endangered *and Federally Listed*	S1
County: **_Lower Hudson River**			
Hudson River Mile 44-56			
Anadromous Fish Concentration Area			S3
Lower Hudson River			
Atlantic Sturgeon	*Acipenser oxyrinchus*	No Open Season *and Federally Listed*	S1
County: **Columbia**			
Greendale			
Long's Bittercress	*Cardamine longii*	Threatened	S2
Heartleaf Plantain	*Plantago cordata*	Rare	S3
North Germantown			
Russet-tipped Clubtail	*Stylurus plagiatus*	Unlisted	S1
Roeliff Jansen Kill			
Anadromous Fish Concentration Area			S3
Golden Club	*Orontium aquaticum*	Threatened	S2
Heartleaf Plantain	*Plantago cordata*	Rare	S3
Freshwater Tidal Marsh			S2
Rogers Island			
Delmarva Beggar-ticks	*Bidens bidentoides*	Rare	S3
Smooth Bur-marigold	*Bidens laevis*	Threatened	S2
Long's Bittercress	*Cardamine longii*	Threatened	S2
Golden Club	*Orontium aquaticum*	Threatened	S2

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	HERITAGE CONSERVATION STATUS*
Heartleaf Plantain	*Plantago cordata*	Rare	S3
Freshwater Intertidal Mudflats			S2
Freshwater Tidal Swamp			S1
Stockport Creek			
Anadromous Fish Concentration Area			S3
County: **Columbia, Greene**			
Rogers Island			
Anadromous Fish Concentration Area			S3
Freshwater Tidal Marsh			S2
Stewart Island			
Bald Eagle *Breeding*	*Haliaeetus leucocephalus*	Threatened	S2S3B,S2N
County: **Columbia, Greene, Ulster**			
Germantown Clermont Flats			
Anadromous Fish Concentration Area			S3
County: **Dutchess**			
Astor Point			
Narrow-leaved Sedge	*Carex amphibola*	Endangered	S1
Davis' Sedge	*Carex davisii*	Threatened	S2
Denning Point			
Davis' Sedge	*Carex davisii*	Threatened	S2
Denning Point Cove			
Pied-billed Grebe *Breeding*	*Podilymbus podiceps*	Threatened	S3B,S1N
Fishkill Creek Mouth			
Bald Eagle *Nonbreeding*	*Haliaeetus leucocephalus*	Threatened	S2S3B,S2N
Anadromous Fish Concentration Area			S3
Mid-Hudson Bridge			
Peregrine Falcon *Breeding*	*Falco peregrinus*	Endangered	S3B
Newburgh-Beacon Bridge			
Peregrine Falcon *Breeding*	*Falco peregrinus*	Endangered	S3B

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	HERITAGE CONSERVATION STATUS*
Tivoli Bays			
King Rail	*Rallus elegans*	Threatened	S1B
Breeding			
Anadromous Fish Concentration Area			S3
Tivoli Bays Cruger Island			
Bald Eagle	*Haliaeetus leucocephalus*	Threatened	S2S3B,S2N
Breeding			
Delmarva Beggar-ticks	*Bidens bidentoides*	Rare	S3
Delmarva Beggar-ticks	*Bidens bidentoides*	Rare	S3
Estuary Beggar-ticks	*Bidens hyperborea var. hyperborea*	Endangered	S1
Golden Club	*Orontium aquaticum*	Threatened	S2
Heartleaf Plantain	*Plantago cordata*	Rare	S3
Freshwater Intertidal Shore			S2S3
Freshwater Tidal Marsh			S2
Freshwater Tidal Swamp			S1
Tivoli Bays North Bay			
Golden Club	*Orontium aquaticum*	Threatened	S2
Freshwater Intertidal Mudflats			S2
Freshwater Tidal Marsh			S2
Tivoli Bays South Bay			
Freshwater Intertidal Mudflats			S2
Tivoli Landing			
Russet-tipped Clubtail	*Stylurus plagiatus*	Unlisted	S1
Vanderburgh Cove			
Anadromous Fish Concentration Area			S3
Freshwater Intertidal Mudflats			S2
Freshwater Tidal Marsh			S2
Wappingers Creek Mouth			
Anadromous Fish Concentration Area			S3

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS**
County: **Dutchess, Ulster**			
Esopus Estuary			
Anadromous Fish Concentration Area			S3
Esopus Meadows			
Shortnose Sturgeon	*Acipenser brevirostrum*	Endangered *and Federally Listed*	S1
The Flats			
Anadromous Fish Concentration Area			S3
County: **Greene**			
Brandow Point			
Least Bittern *Breeding*	*Ixobrychus exilis*	Threatened	S3B,S1N
Russet-tipped Clubtail	*Stylurus plagiatus*	Unlisted	S1
Delmarva Beggar-ticks	*Bidens bidentoides*	Rare	S3
Heartleaf Plantain	*Plantago cordata*	Rare	S3
Freshwater Tidal Marsh			S2
Catskill Marsh			
Delmarva Beggar-ticks	*Bidens bidentoides*	Rare	S3
Freshwater Intertidal Mudflats			S2
Freshwater Tidal Creek			S2
Freshwater Tidal Marsh			S2
Freshwater Tidal Swamp			S1
Greene Point			
Golden Club	*Orontium aquaticum*	Threatened	S2
Hudson River Athens			
Long's Bittercress	*Cardamine longii*	Threatened	S2
Inbocht Bay			
Least Bittern *Breeding*	*Ixobrychus exilis*	Threatened	S3B,S1N
Delmarva Beggar-ticks	*Bidens bidentoides*	Rare	S3
Long's Bittercress	*Cardamine longii*	Threatened	S2

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS**
Southern Dodder	*Cuscuta obtusiflora var. glandulosa*	Endangered	S1
Heartleaf Plantain	*Plantago cordata*	Rare	S3
Freshwater Intertidal Mudflats			S2
Freshwater Intertidal Shore			S2S3
Freshwater Tidal Marsh			S2
Middle Ground Flats			
Delmarva Beggar-ticks	*Bidens bidentoides*	Rare	S3
Smooth Bur-marigold	*Bidens laevis*	Threatened	S2
Heartleaf Plantain	*Plantago cordata*	Rare	S3
Murderers Creek Mouth			
Delmarva Beggar-ticks	*Bidens bidentoides*	Rare	S3
Heartleaf Plantain	*Plantago cordata*	Rare	S3
Rip Van Winkle Bridge			
Peregrine Falcon *Breeding*	*Falco peregrinus*	Endangered	S3B
Smiths Landing Cementon			
Heartleaf Plantain	*Plantago cordata*	Rare	S3
West Flats			
Freshwater Intertidal Shore			S2S3
County: **Greene, Ulster**			
Smiths Landing Cementon			
Freshwater Intertidal Mudflats			S2
County: **Orange**			
Con Hook			
Brackish Intertidal Mudflats			S1S2
Moodna Creek Mouth			
Bald Eagle *Nonbreeding*	*Haliaeetus leucocephalus*	Threatened	S2S3B,S2N
Anadromous Fish Concentration Area			S3

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	HERITAGE CONSERVATION STATUS*
County: **Orange, Ulster**			
Cedar Cliff			
Bald Eagle *Nonbreeding*	*Haliaeetus leucocephalus*	Threatened	S2S3B,S2N
County: **Putnam**			
Constitution Island			
Bald Eagle *Nonbreeding*	*Haliaeetus leucocephalus*	Threatened	S2S3B,S2N
Long's Bittercress	*Cardamine longii*	Threatened	S2
Water Pigmyweed	*Crassula aquatica*	Endangered	S1
Gypsy-wort	*Lycopus rubellus*	Endangered	S1
Cliff Community			S4
Constitution Marsh			
Anadromous Fish Concentration Area			S3
Atlantic Silverside	*Menidia menidia*	Unlisted	S2S3
County: **Rockland**			
Dunderberg Mountain Base			
Terrestrial Starwort	*Callitriche terrestris*	Threatened	S2S3
Iona Island			
Long's Bittercress	*Cardamine longii*	Threatened	S2
Spongy Arrowhead	*Sagittaria montevidensis var. spongiosa*	Threatened	S2
Saltmarsh Aster	*Symphyotrichum subulatum var. subulatum*	Threatened	S2
Brackish Intertidal Mudflats			S1S2
Brackish Tidal Marsh			S3S4
County: **Rockland, Westchester**			
Bear Mountain Bridge			
Peregrine Falcon *Breeding*	*Falco peregrinus*	Endangered	S3B
Iona Island			
Bald Eagle *Nonbreeding*	*Haliaeetus leucocephalus*	Threatened	S2S3B,S2N

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS**
County: **Ulster**			
Bristol Beach			
Alewife Floater	*Anodonta implicata*	Unlisted	S1S2
Tidewater Mucket	*Leptodea ochracea*	Unlisted	S1
Delmarva Beggar-ticks	*Bidens bidentoides*	Rare	S3
Freshwater Intertidal Mudflats			S2
Esopus Meadows			
Anadromous Fish Concentration Area			S3
Eves Point			
Russet-tipped Clubtail	*Stylurus plagiatus*	Unlisted	S1
Rondout Creek Mouth			
Anadromous Fish Concentration Area			S3
Delmarva Beggar-ticks	*Bidens bidentoides*	Rare	S3
Freshwater Intertidal Shore			S2S3
Freshwater Tidal Marsh			S2
Saugerties Marsh			
Heartleaf Plantain	*Plantago cordata*	Rare	S3
Freshwater Intertidal Mudflats			S2
Freshwater Tidal Marsh			S2
Freshwater Tidal Swamp			S1
Ulster Landing			
Heartleaf Plantain	*Plantago cordata*	Rare	S3

* Conservation status in NYS as ranked by NY Natural Heritage Program on a 1 to 5 scale:
S1 = Critically imperiled
S2 = Imperiled
S3 = Rare or uncommon
S4 = Abundant and apparently secure
S5 = Demonstrably abundant and secure

B after one of the above ranks indicates the status rank is for breeding populations only.

N after one of the above ranks indicates the status rank is for nonbreeding wintering populations only.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS**

For most sites, comprehensive field surveys have not been conducted; this report only includes records from our databases. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental impact assessment.

From: Sarah Faldetta
Sent: Friday, August 17, 2012 10:36 AM
To: Yates, Brian (PEB)
Cc: Payson Whitney; Terry Orr; Carl Nielsen
Subject: RE: West Point Transmission Project (ESS Project No. W296-000.06)

The contact person at USACE for the West Point Project is:

Stephen A. Ryba
Regulatory, Western Section
NY District US Army Corps of Engineers
26 Federal Plaza, Room 1937
NY NY 10278

917-790-8512

After we review your comment letter, we will be in touch about next steps.

Thanks, Sarah Faldetta

-----Original Message-----
From: Yates, Brian (PEB) [mailto:Brian.Yates@parks.ny.gov]
Sent: Thu 8/16/2012 1:38 PM
To: Sarah Faldetta
Subject: RE: West Point Transmission Project (ESS Project No. W296-000.06)

Sarah,

I have completed the letter to forward to the USACE, New York District, regarding your request for a modified APE for the West Point Transmission Project. Have you identified a contact person at USACE yet?

-Brian

_____
From: Sarah Faldetta [mailto:sfaldetta@essgroup.com]
Sent: Thursday, July 26, 2012 2:55 PM
To: Yates, Brian (PEB)
Cc: chocker@powerbridge.us; John Dax; Payson Whitney; Terry Orr
Subject: RE: West Point Transmission Project (ESS Project No. W296-000.06)

Thank you for your voice mail message and confirmation email below. We would welcome the opportunity to meet face-to-face with your office to introduce the West Point Project, and will give you a call to schedule after we review your comment letter. Please note that, in addition to requiring USACE permits, the Project will also require a Certificate under Article VII, to be issued by the New York State Public Siting Commission. This agency should also receive a copy of your comment letter.

Thank you and we look forward to working with you.

Sarah Faldetta, ESS

-----Original Message-----
From: Yates, Brian (PEB) [mailto:Brian.Yates@parks.ny.gov]
Sent: Thu 7/26/2012 2:06 PM
To: Sarah Faldetta

Subject: RE: West Point Transmission Project (ESS Project No. W296-000.06)

Sarah,

Thank you. I just want to let you know that we have no problem with reducing the study area/ APE as you requested for the project. However, as the SHPO, we make recommendations to the lead federal agency. Ultimately, they must approve it. I will issue to the USACE a review letter of your request, and copy you, indicating our approval of the request and our recommendations to the USACE.

Give me a call when you have some time to discuss. Considering how large this project is, I know that we would appreciate a face-to-face meeting wherein you can introduce us to the project in a bit more detail.

I look forward to assisting you with the Section 106 review.

Best Regards,

-Brian

_____
From: Sarah Faldetta [mailto:sfaldetta@essgroup.com]
Sent: Thursday, July 26, 2012 10:47 AM
To: Yates, Brian (PEB)
Cc: Payson Whitney; Terry Orr; chocker@powerbridge.us; John Dax
Subject: RE: West Point Transmission Project (ESS Project No. W296-000.06)

Brian: The USACE New York District will be the lead federal agency for the West Point Project. We do not have a contact person there as yet.

Thank you, Sarah Faldetta, ESS

-----Original Message-----
From: Yates, Brian (PEB) [mailto:Brian.Yates@parks.ny.gov]
Sent: Wed 7/25/2012 10:43 AM
To: Sarah Faldetta
Subject: West Point Transmission Project (ESS Project No. W296-000.06)

Sarah,

For purposes of compliance with Section 106, who is the identified lead agency for the West Point Transmission Project?

Thanks,

-Brian
Wm. Brian Yates, M.S., RPA
New York State Office of Parks, Recreation & Historic Preservation Historic Preservation Field Services Bureau PO Box 189 Waterford, New York 12188-0189

(518) 237-8643 Ext. 3288 (Telephone)
(518) 233-9049 (Fax)
Brian.Yates@parks.ny.gov
www.nysparks.com<http://www.nysparks.com/>

Andrew M. Cuomo
Governor

Rose Harvey
Commissioner

New York State Office of Parks, Recreation and Historic Preservation

Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189
518-237-8643
www.nysparks.com

August 18, 2012

Mr. Stephen A. Ryba
Regulatory, Western Section
NY District US Army Corps of Engineers
26 Federal Plaza, Room 1937
New York, NY 10278

Re: CORPS PERMITS, NYS PSC
West Point Transmission Project/Submerged Line: Athens to Hudson River to Cortlandt, New York (ESS Project No. W296-000.06)
Multiple Counties, New York
12PR03054

Dear Mr. Ryba:

On July 10, 2012 our office received a request from ESS Group, Inc. regarding the proposed West Point Transmission Project. The project consists of a proposed 1,000 MW 320 kV HVDC submarine cable to be installed beneath the Hudson River between Athens and Cortlandt, New York. Specifically, the request included concurrence from our office with the applicant's plan to 1) identify only those resources within and along the banks of the portion of the Hudson River that will contain the in-water cable (as potential Project effects would be limited to physical impacts to the river bed); and 2) identify known resources within 0.25 miles of upland components (the two proposed converter stations and the upland cable routes, once defined).

The request letter continued by providing basic proposed methods for conducting a remote sensing survey for the proposed area of potential effects (APE). It states:

> *"To gather field information about existing conditions along the Project route in the Hudson River, an in-river high resolution geophysical will commence this month within a 200- to 300-foot wide survey corridor, centered upon the proposed route. The survey will consist of tracklines spaced 50 feet apart, utilizing multi-beam echo sounder, side scan sonar (100 percent overlap coverage), shallow subbottom profiler (Chirp) and magnetometer equipment. The geophysical survey data will be reviewed by a qualified marine archaeologist to determine the presence or absence of potentially significant submerged cultural resources. If these are found, efforts will be made to revise the route to avoid these resources, or, if avoidance is found infeasible, to further assess the historic significance of the resources, in consultation with the OPRHP.*
>
> *Following review of the geophysical data, a geotechnical vibracore survey will commence this summer to field-confirm aspects of the geophysical survey and to collect sediment sampling for chemical and bulk physical testing. The marine archaeologist will examine logs and photographs of each vibracore for indications of potential submerged cultural resources."*

"The upland cable routes and the proposed converter station locations, once defined, will be assessed in accordance with OPRHP guidelines for the presence or absence of known and potential cultural resources by the selected CRM firm.

Efforts will be made to avoid, minimize or mitigate adverse impacts to significant historic properties. In addition, consultation with involved Native American tribes will be initiated, to achieve compliance with Section 106. All CRM reports will be prepared in accordance with OPRHP guidelines, and will be submitted to OPRHP for review and acceptance."

Based upon the provided information, our office has no objection to the proposed APE. Furthermore, we find the presented methods acceptable and in accordance with established survey methods and reporting standards.

Should you have any questions, please feel free to contact me directly at (518) 237-8643, Extension 3288 or via electronic mail at Brian.Yates@oprhp.state.ny.us. If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above.

Sincerely,

Wm. Brian Yates
Historic Preservation Specialist

cc: Mr. Andrew C. Davis, New York State Public Service Commission
Ms. Sarah K. Faldetta, ESS Group, Inc.

From: Yates, Brian (PEB) [Brian.Yates@parks.ny.gov]
Sent: Thursday, August 30, 2012 1:36 PM
To: stephen.ryba@usace.army.mil
Cc: andrew.davis@dps.state.ny.us; Sarah Faldetta; Bonafide, John (PEB); Herter, Nancy (PEB)
Subject: West Point Transmission Project/ Submerged Line: NYSHPO response letter

Attachments: 12PR03054 Stephen Ryba concur with request from ESS Group 08182012.pdf
Mr. Ryba,

Our office recently received a request from the applicant for our concurrence with a proposed area of potential effects (APE) for the proposed undertaking. Recognizing the CORPS lead agency status for Section 106 review, we respectfully submit the attached review letter for your consideration. Please feel free to contact me with any questions.

Best Regards,

-Brian

Wm. Brian Yates, M.S., RPA
New York State Office of Parks, Recreation & Historic Preservation
Historic Preservation Field Services Bureau
PO Box 189
Waterford, New York 12188-0189

(518) 237-8643 Ext. 3288 (Telephone)
(518) 233-9049 (Fax)
Brian.Yates@parks.ny.gov
www.nysparks.com

Appendix 4

In-River Cable Route Field Evaluations Report

In-River Cable Route Field Evaluations Report

West Point Transmission Project
Hudson River – New York

PREPARED FOR:
West Point Partners, LLC
c/o PowerBridge
501 Kings Highway East, Suite 300
Fairfield, Connecticut 06825

PREPARED BY:
ESS Group, Inc.
100 Fifth Avenue, 5th Floor
Waltham, Massachusetts 02451

ESS Project No. W296-001.04

December 18, 2012

www.essgroup.com

IN-RIVER CABLE ROUTE FIELD EVALUATIONS REPORT
West Point Transmission Project
Hudson River – New York

Prepared For:

West Point Partners, LLC
c/o PowerBridge
501 Kings Highway East, Suite 300
Fairfield, Connecticut 06825

Prepared By:

ESS Group, Inc.
100 Fifth Avenue, 5th Floor
Waltham, Massachusetts 02451

ESS Project No. W296-001.04

December 18, 2012

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1.0 INTRODUCTION

At the request of West Point Partners ("WPP"), ESS Group, Inc. ("ESS") and our subconsultant, Alpine Ocean Seismic Survey, Inc. ("Alpine"), of Norwood, New Jersey, completed a geotechnical field investigation (the "Study") for the West Point Transmission Project ("Project"). The Study included an estuarine sediment sampling program developed to assess sediment physical, chemical and geothermal properties as well as provide a benthic macroinvertebrate community assessment for seabed sediments along the proposed in-river cable route area. The investigation was completed to support associated geotechnical and environmental impact assessments for:

- Preliminary engineering design and installer constructability assessments;
- Environmental regulatory permitting; and
- Preparation of an ecological risk assessment to support environmental regulatory permitting.

The data and assessments contained in this report will be compared with the results of other published studies regarding sediment conditions in the area of the study corridor and will be used to evaluate the range of possible impacts to physical and biological resources and settings as part of preparation of environmental impact assessments to support the Project's regulatory permitting and licensing efforts.

ESS submitted an *In-River Geotechnical Sediment Sampling and Analysis Plan* ("SAP") for the Study to the New York State Department of Environmental Conservation ("NYS DEC") and the New York State Department of Public Service Office of Energy Efficiency and the Environment for review and approval in August 2012. Comments were received from both agencies in August 2012; the SAP was revised to respond to those comments and finalized on September 14, 2012. The September 14, 2012 SAP was followed during implementation of the Study and is included in Appendix A.

Alpine was responsible for field operations (i.e., advancement and collection of vibracores) and establishing horizontal control. ESS was responsible for directing and observing field activities; splitting, logging, and sampling sediment cores; and coordinating all activities with Alpine and the analytical laboratories. ESS and Alpine also conducted marine benthic macroinvertebrate sampling from the research vessel and ESS performed quantitative macroinvertebrate analysis on the benthic samples. The methods and findings of the benthic sampling and analysis are presented under separate cover.

The following sections summarize the methods and findings of the vibracore sampling and analysis portion of the Study.

2.0 STUDY AREA, CONTROL INFORMATION, AND EQUIPMENT

2.1 Study Area

The Study was conducted along the proposed in-river cable route alignment, which includes a 200-foot-wide study corridor approximately 75 miles long within the Hudson River between two landfall locations (Athens and Buchanan, New York).

2.2 Horizontal and Vertical Control

Positioning was accomplished by Alpine using a differential global positioning system (DGPS) installed on the vessel (R/V *Samantha Miller*). Prior to commencement of the field investigation, the DGPS's accuracy was verified by occupying a known horizontal control-point near the study area. Horizontal positions were referenced in feet to the New York State Plan East (3101) North American Datum 83. Vertical field measurements were not obtained because river currents prevented accurate measurements. Sampling elevations will be determined post-Study using geophysical survey data obtained for the Project.

2.3 Equipment

The following equipment was used and provided by Alpine:

Survey Vessel:

- R/V *Samantha Miller* (65-foot-long utility boat outfitted for sediment sampling operations).

Vibracore Equipment:

- Alpine Model P pneumatic vibracore equipped with a standard 20-foot-long, 4-inch nominal diameter steel core barrel; clean, clear 3 and 5/8-inch plastic liners; a sediment catcher; a cutting shoe; and a stabilization support assembly with four "legs" and "feet". A variety of ancillary support equipment and gear was also used, included an air compressor to drive the pneumatic corer and an on-board crane to deploy the corer.

Navigation Equipment:

- A Hemisphere V110 Vector GPS was utilized and received Coast Guard corrections.
- The DGPS signal was brought into Hypack navigation software, which was used to position the vessels at the proposed core/drill location.

3.0 GEOTECHNICAL INVESTIGATION

3.1 Vibracore Collection

From September 20 to September 28, 2012, the research vessel *Samantha Miller* was used to collect sediment cores from 56 locations along the proposed in-river cable route. Alpine typically utilized a two-point anchoring system along with the DGPS to locate the vessel at each location. At some locations a one-point anchoring technique was sufficient to obtain and hold position. After the vessel was positioned, the corer (assembled with clean plastic liner) was deployed off the stern of the vessel and lowered through the water column via hydraulic crane to the sediment-water interface. After contacting sediment, the corer was mechanically released from its support assembly and lowered into the sediment using the hydraulic crane/winch.

Vibracores were collected from a total of 56 locations. Fifty (50) cores were collected along the proposed jet-plow embedment area of the route. Three (3) cores (VC-L1, VC-L2, VC-L3) were collected from the proposed northern cofferdam/dredge landfall location and three (3) cores (VC-L4, VC-L5, VC-L6) were collected from the proposed southern cofferdam/dredge landfall location. For the proposed jet-plow embedment area of the route, this corresponds to an average sampling interval of approximately 1.5 miles between sample locations. The volume and location of cores was determined based on a review of existing information and sediment data specific to the proposed cable corridor. Refer to Figures 1 through 4 for vibracore sample locations.

At three (3) locations (VC-L2, VC-18, VC-50), an additional core was collected for *ex-situ* geothermal sampling. Half-foot geothermal samples were cut from the geothermal cores from three depth intervals (4.5 to 5.0 feet, 9.5 to 10 feet, and 14.5 to 15 feet) below the sediment-water interface. These samples were retained by Alpine and Alpine arranged for *ex-situ* thermal analysis by GeoTherm USA of Dublin, California.

Upon recovery, the cores were generally cut into 5-foot sections starting from the bottom of the core. All core sections were capped at both ends immediately after cutting and were sealed with waterproof tape to preserve moisture content. To the extent practicable, core sections were collected with no air headspace.

The core sections were carefully marked with identification information (i.e., date, core ID, top and bottom, and section orientation) to allow for reassembly at time of splitting, logging, and sampling. After labeling, the core sections were kept cool and in a vertical position on the vessel, during transfer to shore and

during transport to Alpine's Norwood, New Jersey facility, where the cores were split, photo-logged, field characterized, and sub-sampled.

The target penetration depth was approximately 10 feet below the sediment-water interface for each primary core and 15 feet for the geothermal cores. The target depth for primary cores took into account the potential for a cable burial depth of 15 feet below the authorized navigation channel depths when crossing a federally authorized navigation channel and to a target depth of cover of 8 feet below the present bottom in areas outside the federally authorized navigation channel. The deeper geothermal core target penetration depth allowed for sampling sediments below the anticipated cable burial depth. In the event that refusal was encountered at depths less than the target penetration, one retry was attempted near that location and the core with more penetration/recovery was maintained for sub-sampling. One retry was also attempted if sediment recovery from a core that achieved target penetration was less than 80% of the penetration. Penetration and recovery values are presented on the vibracore observation logs presented in Appendix B.

3.2 Vibracore Splitting, Photo Logging, and Field Characterization

Vibracores were placed on a table specifically designed for vibracore processing at Alpine's shore-based facility in Norwood, New Jersey. The cores were reassembled based on field labeling that identified the top, bottom, and order of the core sections. Two cuts (offset by 180 degrees) were made down the length of each core with swivel-head shears. Equipment was cleaned between cores to reduce the potential for cross-contamination between cores. A clean steel wire was then dragged through the length of the core (from bottom to top) to help separate the two core halves.

With the core halves positioned side-by-side and a tape measure in between, cores were photographed at 1-foot intervals. Core labels were used to document core identity in the photographs. Vibracore photographic logs containing images of all 56 primary cores are presented in Appendix C.

Following photo logging, the physical characteristics of the cores were documented using the USGS visual-manual methodology. Observations were documented in the field with particular attention to changes in stratigraphy (including color, predominant grain sizes, and evidence of contamination). Vibracore observation logs containing field observations and geotechnical laboratory testing results are presented in Appendix B.

To assist with field characterization of the recovered sediments, ESS used a hand-held Torvane Shear Device (DGSI, Model S-160) to estimate the shear strength of cohesive sediment. Torvane field screening was typically performed at multiple depths within an individual core in order to evaluate relative shear strength variability as a function of depth. Sediment consistency did not change significantly with depth. Table 1 presents a summary of Torvane field screening results. It is important to note that Torvane field screening does not replace laboratory testing analysis for determination of sediment shear strength. The Torvane data in Table 1 are provided as an initial characterization of the shear strength of the sediment only.

3.3 Vibracore Sampling

All 56 vibracore locations were sampled for bulk physical and chemical laboratory testing. Samples were collected based on field characterization of the sediment cores. If stratification was observed, one homogenized sample was collected from each distinct stratum. Distinct color changes and distinct changes in predominant grain size were the primary indicators of separate strata within a core. If no stratification was observed throughout the length of the core, one homogenized sample from the entire length of the core was collected. If the predominant grain size or color observed indicated that individual strata within the core may be significantly different in sediment quality, the entire core was not homogenized. Instead, one homogenized sample was collected from each distinct stratum. Care was

taken to proportionally represent the entire length of each sample interval. ESS also visually inspected individual cores for indicators or potential changes in total organic carbon (TOC) content and evidence of contamination (i.e., observable staining or odor). No distinct strata were identified solely based on TOC or evidence of contamination.

Homogenized core samples were collected by taking sediment from the entire length of each identified stratum using decontaminated stainless steel spoons. Sediment was placed in decontaminated stainless steel mixing bowls. Enough sediment was collected to fill the laboratory-supplied sample containers (physical and chemical). The sediment was mixed using the stainless steel spoon until the sediment was a uniform color and consistency. The stainless steel spoon was used to transfer homogenized sediment into laboratory-supplied sample containers for physical and chemical testing.

Volatile organic compound (VOC) grab samples were collected prior to sample homogenization. Sediment for VOC analysis was collected using laboratory-provided clean (disposable) sediment syringes. Sediment for VOC analysis was collected from three locations (near the top, mid-point, and bottom) within each stratum and placed in laboratory-provided volatile organic analysis (VOA) vials.

Sample Identification

Stratigraphy samples were identified by the vibracore location followed by "-S1", "-S2", etc. (e.g., "VC-01-S1"). The S1 sample represented sediment within the upper-most distinct stratum identified within the core, the S2 sample represented sediment within the next deepest distinct stratum, and so on.

Sample Handling

Sediment was placed in laboratory-supplied sample containers (glassware for chemical samples and plastic zipper-seal bags for physical samples). Laboratory-provided labels were used to identify chemical sediment samples. The labels were pre-printed with analytical parameter requests, job identification, and preservation information and were filled out by ESS staff just prior to sampling with sample identification, date, time, and sampler name(s). Indelible marker was used to label physical sample bags with similar information.

Immediately following sample collection, chemical sample containers (except VOA vials) were placed in a refrigerator maintained at 4 degrees Celsius. VOA vials were immediately placed in a freezer in order to suspend the 48-hour hold time associated with method 5035/8260 VOC analysis. Physical sample bags were placed directly into coolers awaiting shipment. Physical and chemical laboratory chain of custody forms were also filled out immediately after sample collection. Samples were transported to the laboratories via courier every one to three days depending on sampling accumulation/storage capacity. Chemical samples were transported to Alpha Analytical in Mansfield, Massachusetts and physical samples were transported to Geotesting Express, Inc. in Boxborough, Massachusetts.

3.4 Geothermal Testing

The 0.5-foot geothermal core samples (discussed in Section 3.1 above) were shipped to GeoTherm USA of Dublin, California for *ex-situ* thermal resistivity and thermal dry out characterization tests. The results of GeoTherm's analyses are presented in Appendix D.

4.0 SEDIMENT SAMPLE LABORATORY RESULTS

4.1 Physical Results

A total of 60 physical sediment samples were collected from the 56 vibracores. Samples were analyzed for the following parameters by Geotesting Express, Inc. of Acton, Massachusetts:

- ASTM Classification based on Particle Size Analysis (ASTM D422)
- Moisture, Ash, & Total Organic Matter Content (ASTM D2974)

- Specific Gravity (ASTM D854)
- Atterberg Limits (ASTM D4318)

On the basis of grain size analysis, the northern portion of the route (VC-L1 through VC-17) was ASTM classified by the laboratory predominately as sand, including SM (silty sand, 15 of 20 samples) and SP-SM (poorly graded sand with silt, 3 of 20 samples). The remainder of the route (VC-18 through VC-L6) was ASTM classified predominately as silt and clay, including CH (fat clay, 26 of 40 samples), ML (silt with sand, 6 of 40 samples), MH (elastic silt, 4 of 40 samples), and CL (sandy lean clay, 1 of 40 samples).

Ash Content is the nonvolatile inorganic matter in a soil. Ash Content values range from 92.5 milligrams per kilogram (mg/kg) (VC-16-S1) to 99.5 mg/kg (VC-02-S1). The majority of the samples had Ash Content above 95 mg/kg.

Organic matter is the carbon-based matter within a soil. Organic Matter values range from 0.5 mg/kg (VC-02-S1) to 7.5 mg/kg (VC-16-S1). All samples had organic matter values below 5 mg/kg except VC-26-S2 (5.4 mg/kg), VC-27-S1 (5.4 mg/kg), VC-28-S1 (5.5 mg/kg), VC-32-S1 (6.4 mg/kg), VC-42-S1 (5.1 mg/kg), VC-L4-S1 (5.3 mg/kg), VC-L5-S1 (6.1 mg/kg), and VC-L6-S1 (6.4 mg/kg).

Liquid Limit is a measure of the moisture content at which a soil passes from plastic to a liquid state. Liquid Limit values range from 30 (VC-20-S1) to 94 (VC-46-S1).

Plastic Limit is a measure of the moisture content at which a soil changes from a semi-solid to a plastic solid. Plastic Limit values range from 23 (VC-09-S1 and VC-20-S1) to 36 (VC-49-S1).

Moisture Content values range from 22% (VC-14-S1) to 120% (VC-46-S1). A sample with moisture content greater than the Liquid Limit will behave like a fluid, while samples with moisture content between the Liquid Limit and Plastic Limit will behave like a plastic. All samples (with the exception of VC-03-S1, VC-19-S1, VC-27-S1, VC-31-S1, VC-36-S1, VC-43-S1, and VC-47-S1) have moisture contents greater than their respective Liquid Limits. The moisture content of the exceptions listed above is greater than the Plastic Limit. Twenty of the 60 samples submitted for Atterberg Limits were found to be non-plastic, which is typical of sandy sediments.

Plasticity Index values range from 10 (VC-CB07-S2) to 97 (VC-CB50-S1). Plasticity index is the difference between Liquid Limit and Plastic Limit, which provides information about the range of water contents over which a soil exhibits plastic properties.

Physical laboratory analytical results are summarized in Table 1. Physical laboratory analytical reports are presented in Appendix E.

4.2 Chemical Results

A total of 60 sediment samples, not including quality assurance/quality control (QA/QC) samples, were collected at 56 different vibracore locations along the proposed in-river cable route and submitted to Alpha Analytical of Westborough, Massachusetts for chemical analysis.

Samples were analyzed for the following parameters:

- *Total Organic Carbon (TOC)* – Samples were analyzed using EPA Method 9060.
- *Metals* – Samples were analyzed for arsenic, cadmium, copper, lead, and mercury (As, Cd, Cu, Pb, and Hg) using U.S. Environmental Protection Agency (EPA) Method 6020A for all metals except mercury (Hg), which was analyzed using EPA Method 7474.
- *Polycyclic Aromatic Hydrocarbons (PAHs)* – Samples were analyzed using EPA Method 8270.

- *Volatile Organic Compounds (VOCs)* – Samples were analyzed for benzene, toluene, ethylbenzene, and xylenes using EPA Method 8260C.
- *Pesticides* – Samples were analyzed using EPA Method 8081B.
- *Polychlorinated Biphenyl (PCB) Aroclors* – Samples were analyzed using EPA Method 8082A.
- *PCB Congeners* – The six (6) samples with the greatest PCB aroclor concentrations were analyzed for PCB congeners using EPA Method 8270D-SIM/NOAA-M.
- *Dioxins/Furans* – The six (6) samples with the greatest PCB aroclor concentrations were analyzed for dioxins/furans using EPA Method 1613B.

Refer to Appendix F for chemical laboratory analytical reports containing sample results, laboratory case narratives, laboratory QA/QC information including surrogate recoveries, internal laboratory control samples, laboratory control spikes, and analytical results for QA/QC samples submitted by ESS (field duplicates, matrix spike and matrix spike duplicates). Chemical sample results are summarized in Table 2A (TOC, metals, PAH, VOC, pesticides, and PCB aroclors) and Table 2B (PCB congeners and dioxin/furans). These tables present the results in comparison to the NYS DEC Sediment Quality Threshold Values established in Table 2 of the NYS DEC Technical and Operational Guidance Series (TOGS) 5.1.9 (November 2004).

Based on the concentration of contaminants, sediment is classified as Class A, B, or C. The three classes of sediment quality were developed for dredged material proposed for in-water/riparian placement under the TOGS. The following are the definitions of the three Classes of sediment quality thresholds under the NYS DEC TOGS:

- Class A - No Appreciable Contamination (No Toxicity to aquatic life).
- Class B - Moderate Contamination (Chronic Toxicity to aquatic life).
- Class C - High Contamination (Acute Toxicity to aquatic life).

Referring to Table 2A and Table 2B, the following narrative presents a general summary of results for the above analyses.

- *TOC* – TOC was detected in all samples at concentrations ranging from 0.098 mg/kg to 3.89 mg/kg. There are no NYS DEC Sediment Quality Threshold Values established for TOC.
- *Metals* – Concentrations of all five metals analyzed were detected in all samples above the laboratory method reporting limits, with the following exceptions. Mercury was not detected above the method reporting limit in 13 samples and lead was not detected above the method reporting limit in two samples. Forty-two of 60 samples have metals concentrations within Class A Sediment Quality Threshold Values; 18 samples have metals concentrations within Class B range; and one sample (VC-48-S1) has metals concentrations (for lead) above the Class C threshold.
- *PAHs* – Concentrations of one or more polycyclic aromatic hydrocarbon were detected above laboratory reporting limits in 38 of 60 samples. Fifty-seven of 60 samples have total detected PAH concentrations within Class A Sediment Quality Threshold Values; two samples have total detected PAH concentrations within Class B range; and no samples contain total PAH concentrations above the Class C threshold.
- *VOCs* – VOCs were not detected above the method reporting limit in any samples. All 60 samples are within the Class A Sediment Quality Threshold Values for VOCs.

- *Pesticides* – Concentrations of one or more pesticide compounds (specifically 4,4-DDD, 4,4-DDE, 4,4-DDT, dieldrin, and mirex) were detected above laboratory method reporting limits in 29 of 60 samples. Thirteen samples have detected pesticide concentrations within Class B Sediment Quality Threshold Values. The remaining 47 samples did not have pesticides detected above Class A range and no samples were within Class C range for pesticides.
- *PCB Aroclors* – Concentrations of one or more PCB aroclors (specifically 1242, 1254, and/or 1260) were detected above laboratory method reporting limits in 23 samples. Forty-three of 60 samples have total detected PCB concentrations within Class A Sediment Quality Threshold Values; 10 samples have total detected PCB concentrations within Class B range; and seven samples contain total PCB concentrations above the Class C threshold.
- *PCB Congeners* – PCB congeners were detected above the laboratory method reporting limit in each of the six samples chosen for analysis. Three of the samples have total detected PCB congeners concentrations within Class B Sediment Quality Threshold Values and three have total PCB congeners concentrations above the Class C threshold.
- *Dioxins/Furans* – Dioxin and Furans were detected above the laboratory method reporting limit in each of the six samples chosen for analysis. All six samples have total detected dioxin/furans concentrations within Class B Sediment Quality Threshold Values.

Tables

TABLE 1
SUMMARY OF SEDIMENT PHYSICAL RESULTS
West Point Project

Core Location	Sample	Depth[1] (feet)	Field Visual Description	Laboratory Visual Description	ASTM Classification		Torvane Test Results Shear Strength[2]			Consistency of Cohesive Sediment based on Torvane Shear Strength	Moisture , Ash, Organic Matter ASTM D 2974			Specific Gravity ASTM D 854	Particle Size ASTM D 422				Atterburg Limits ASTM D 4318			
					Group Name	Group Symbol	kg/cm^2	k Pa	PSI		Moisture Content %	Ash Content %	Organic Matter %		% Gravel	% Sand	% Silt & Clay	%< 0.0016 mm	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index
VC-L1	S1	0 - 10.0	Moist, medium dense, light brown to olive gray FINE SAND, with occasional pockets/seams of organic material and occasional pockets/seams of olive gray silty sand	Moist, grayish brown silty sand	Silty sand	SM	Non-cohesive			Non-cohesive	23	99.2	0.8	2.7	0.7	87	12.3	2	Non-plastic			
VC-L2	S1	0 - 10.0	Moist, medium dense, olive grey FINE SAND, with occasional seams of olive gray clay	Moist, dark grayish brown sand with silt	Poorly graded sand with silt	SP-SM	Non-cohesive			Non-cohesive	24	99.2	0.8	2.71	0	90.1	9.9	1	Non-plastic			
VC-L3	S1	0 - 9.9	Moist, medium dense, olive grey FINE SAND, with occasional pocets of woody organic material (2.6' - 3.2') and occasional pockets of olive grey silty clay	Moist, grayish brown silty sand	Silty sand	SM	Non-cohesive			Non-cohesive	27	98.9	1.1	2.72	0	82.4	17.6	3	Non-plastic			
VC-01	S1	0 - 5.5	Moist, medium dense, light brown to olive grey COARSE TO FINE SAND (0-0.7' no sediment and at 1.9' pocket of light brown silty clay)	Moist, dark grayish brown silty sand	Silty sand	SM	Non-cohesive			Non-cohesive	23	98.8	1.2	2.7	1.2	81.9	16.9	2	Non-plastic			
VC-02	S1	0 - 4.0	Moist, medium dense, light brown, MEDIUM TO FINE SAND with a seam of shell fragments at 2.0'	Moist, dark grayish brown sand with silt	Poorly graded sand with silt	SP-SM	Non-cohesive			Non-cohesive	28	99.5	0.5	2.69	0	89.5	10.5	1	Non-plastic			
VC-02	S2	4.0 - 5.5	Moist, medium dense, well graded COBBLES/GRAVEL/COARSE SAND with trace light grey clay	Not analyzed	Not analyzed		Non-cohesive			Non-cohesive	Not analyzed			Not analyzed	Not analyzed				Not analyzed			
VC-03	S1	0 - 3.1	Moist, medium stiff, olive grey, SILTY CLAY, with occasional pockets/layers of organic material	Moist, dark grayish brown silt	Elastic silt	MH	0.3	24.5	3.6	Medium Stiff	54	95.6	4.4	2.55	0	7.1	92.9	15	58	32	26	1
VC-03	S2	3.1 - 8.7	Moist, medium dense, well-graded COBBLE/GRAVEL/COARSE SAND with light grey silty clay between 6.7 - 7.1	Not analyzed	Not analyzed		Non-cohesive			Non-cohesive	Not analyzed			Not analyzed	Not analyzed				Not analyzed			
VC-04	S1	0 - 9.8	Moist, medium dense, olive grey, MEDIUM TO FINE SAND, with frequent interbedded seams/layers of olive grey silty clay and with frequent interbedded layers/seams of woody organic material	Moist, dark grayish brown silty sand	Silty sand	SM	Non-cohesive			Non-cohesive	38	97.4	2.6	2.6	0	78.7	21.3	4	Non-plastic			
VC-05	S1	0 - 9.9	Moist, medium dense, olive grey, MEDIUM TO FINE SAND (small cobble sized rock at 8.2')	Moist, grayish brown silty sand	Silty sand	SM	Non-cohesive			Non-cohesive	24	99.2	0.8	2.72	0	83.2	16.8	2	Non-plastic			
VC-06	S1	0 - 8.7	Moist, medium dense, olive grey, FINE SAND with occasional interbedded seams of olive grey silty clay and with occasional pockets of organic material	Moist, grayish brown silty sand	Silty sand	SM	Non-cohesive			Non-cohesive	32	97.9	2.1	2.66	0.1	83.8	16.1	3	Non-plastic			
VC-07	S1	0 - 10.0	Moist, medium dense, olive grey, FINE SAND with occasional pockets of organic material (1.9' a seam of olive grey silty clay)	Moist, dark grayish brown silty sand	Silty sand	SM	Non-cohesive			Non-cohesive	29	99.1	0.9	2.62	0	79.8	20.2	3	Non-plastic			
VC-08	S1	0 - 10.0	Moist, medium dense, olive grey, FINE SAND with frequent pockets/seams of woody organic material and at 2.2' a seam of olive grey silty clay	Moist, grayish brown silty sand	Silty sand	SM	Non-cohesive			Non-cohesive	35	98.3	1.7	2.69	0	81.4	18.6	4	Non-plastic			
VC-09	S1	0 - 8.9	Moist, soft, olive grey SILTY CLAY, with pockets of shell fragments and seams of fine sand and organic deposits, 7.8 - 8.1 large rock	Moist, grayish brown clay with sand	Lean clay with sand	CL	0.2	22.1	3.2	Soft	43	97	3	2.68	1.1	23.5	75.4	14	42	23	19	1
VC-10	S1	0 - 10.0	Moist, soft, SILTY FINE SAND, with layers/seams of organics and silty clay, shell fragments between 0 - 1.5 and wood fragments at 1.9 and 3.7	Moist, grayish brown silty sand	Silty sand	SM	0.1	8.8	1.3	Soft	46	98	2	2.7	0	83.2	16.8	3	Non-plastic			
VC-11	S1	0 - 9.6	Moist, medium dense, olive grey FINE SAND with frequent interbedded seams of olive grey silty clay	Moist, dark grayish brown silty sand	Silty sand	SM	Non-cohesive			Non-cohesive	34	98.6	1.4	2.69	0	64.1	35.9	9	Non-plastic			
VC-12	S1	0 - 9.8	Moist, medium dense, olive grey, MEDIUM SAND with pockets of woody organic matter at 3.4, 3.8, 5.8, and 6.1 and dense black organic matter at 8.5 and 8.9	Moist, dark gray silty sand	Silty sand	SM	Non-cohesive			Non-cohesive	25	99.1	0.9	2.65	2.9	83.9	13.2	1	Non-plastic			

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West Point Project

Core Location	Sample	Depth[1] (feet)	Field Visual Description	Laboratory Visual Description	ASTM Classification		Torvane Test Results Shear Strength[2]			Consistency of Cohesive Sediment based on Torvane Shear Strength	Moisture , Ash, Organic Matter ASTM D 2974			Specific Gravity ASTM D 854	Particle Size ASTM D 422				Atterburg Limits ASTM D 4318			
					Group Name	Group Symbol	kg/cm^2	k Pa	PSI		Moisture Content %	Ash Content %	Organic Matter %		% Gravel	% Sand	% Silt & Clay	%< 0.0016 mm	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index
VC-13	S1	0 - 9.5	Moist, medium dense, olive grey, MEDIUM SAND with a pocket of olive grey clay at 2.2, a seam of black organic material at 4.1, a pocket of black organic material at 5.5, and a pocket of woody organic material at 9.2	Moist, dark gray silty sand	Silty sand	SM	Non-cohesive			Non-cohesive	26	99.2	0.8	2.68	0	87	13	2	Non-plastic			
VC-14	S1	0 - 9.9	Moist, medium dense, olive grey, MEDIUM SAND, with seams of dark gray organic material at 6.3, 6.3, 7.0, 7.3, and 7.9, and pockets of wood at 9.2 and 9.3	Moist, dark grayish brown silty sand	Silty sand	SM	Non-cohesive			Non-cohesive	22	99.2	0.8	2.68	0	87.7	12.3	2	Non-plastic			
VC-15	S1	0 - 9.9	Moist, medium dense, olive grey, MEDIUM SAND, with woody organic material between 0 - 2.1 and 7.5 - 7.7	Moist, grayish brown sand with silt	Poorly graded sand with silt	SP-SM	Non-cohesive			Non-cohesive	25	98.3	1.7	2.65	0	91.6	8.4	1	Non-plastic			
VC-16	S1	0 - 9.9	Moist, medium dense, olive grey, SILTY FINE SAND, with frequent interbedded seams/layers of woody organic material (5.3 - 6.7, 6.9 - 7.6, and 9.5) and olive grey clay (6.8 and 8.1 - 9.3)	Moist, very dark gray silty sand with organics	Silty sand	SM	Non-cohesive			Non-cohesive	85	92.5	7.5	2.57	0	73	27	3	Non-plastic			
VC-17	S1	0 - 9.8	Moist, medium dense, olive grey, FINE SAND, with frequent interbedded pockets and seams/layers of organic material also between 5.0 - 7.1 fine sand with little clay	Moist, grayish brown silty sand	Silty sand	SM	Non-cohesive			Non-cohesive	43	96.1	3.9	2.65	0.3	81.2	18.5	3	Non-plastic			
VC-18	S1	0 - 10.0	Moist, soft, olive grey, SILTY CLAY with frequent interbedded seams/layers of organic material and with frequent interbedded layers of dark grey fine sand	Wet, gray silt with sand	Silt with sand	ML	0.1	9.8	1.4	Soft	60	95.1	4.9	2.67	0	23.3	76.7	12	50	32	18	2
VC-19	S1	0 - 10.0	Moist, soft, olive grey, SILTY CLAY with frequent interbedded seams of dark grey fine sand and with occasional pockets of woody organic material	Moist, olive silt with sand	Silt with sand	ML	0.1	9.8	1.4	Soft	34	96.8	3.2	2.64	0	15	85	8	46	29	17	0
VC-20	S1	0 - 10.0	Moist, soft, olive grey, SILTY CLAY with frequent interbedded seams of dark gray fine sand, pocket of woody organic material at 8.2' and dark grey medium sand between 0 - 2.1	Wet, very dark grayish brown sandy clay	Sandy lean clay	CL	0.1	9.8	1.4	Soft	39	97.8	2.2	2.69	0	38	62	5	30	23	7	2
VC-21	S1	0 - 10.0	Moist, soft, olive grey, SILTY CLAY with frequent, interbedded seams of dark grey medium sand and with occasional pockets of woody organic material	Wet, olive gray sandy clay	Sandy fat clay	CH	0.1	9.8	1.4	Soft	63	97	3	2.61	0	43.9	56.1	11	54	26	28	1
VC-22	S1	0 - 10.1	Moist, soft, olive grey, SILTY CLAY with frequent interbedded seams of dark fine sand and frequent interbedded seams/layers of woody organic material	Wet, grayish brown sandy silt	Sandy silt	ML	0.1	7.8	1.1	Soft	57	95.4	4.6	2.57	0	41.3	58.7	6	44	30	14	2
VC-23	S1	0 - 9.9	Moist, soft, olive grey, SILTY CLAY, with seams and layers of woody organics and silty sandy clay	Wet, brownish gray silt with sand	Silt with sand	ML	0.1	7.8	1.1	Soft	57	96.6	3.4	2.62	0	20.7	79.3	16	50	31	19	1
VC-24	S1	0 - 10.0	Moist, soft, olive grey, SILTY CLAY, with frequent interbedded seams of dark grey fine sand and organic woody material between 0.5 - 1.2	Wet, dark grayish brown silt	Elastic silt	MH	0.2	19.6	2.8	Soft	63	95.6	4.4	2.59	0	12.3	87.7	13	59	31	28	1
VC-25	S1	0 - 6.6	Moist, soft, olive grey, SILTY CLAY, with lenses of silty sand and organics	Wet, gray sandy silt	Sandy silt	ML	0.1	7.4	1.1	Soft	55	97.6	2.4	2.68	0.2	33.3	66.5	9	37	26	11	3
VC-25	S2	6.6 - 11.0	Moist, dense, olive grey, SILTY SAND, with seams and layers of silty clay	Moist, gray silty sand	Silty sand	SM	Non-cohesive			Non-cohesive	34	98.8	1.2	2.7	2.4	66.5	31.1	5	Non-plastic			
VC-26	S1	0 - 6	Moist, soft, olive grey, SILTY CLAY with a seam of woody organic material at 4.0 and a gap in the core between 4.9 - 5.1	Moist, grayish brown silty sand	Silty sand	SM	0.1	7.8	1.1	Soft	38	98.1	1.9	2.67	0	69.8	30.2	0	Non-plastic			
VC-26	S2	6 - 9.9	Moist, medium dense, dark grey, FINE SAND with frequent interbedded seams/layers of olive grey silty clay and layers of woody organic material at 9.4 and 9.8	Wet, brownish gray silt with organics	Elastic silt	MH	Non-cohesive			Non-cohesive	72	94.6	5.4	2.61	0	6.9	93.1	22	63	32	31	1

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					Group Name	Group Symbol	kg/cm^2	k Pa	PSI		Moisture Content %	Ash Content %	Organic Matter %		% Gravel	% Sand	% Silt & Clay	%< 0.0016 mm	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index
VC-27	S1	0 - 9.9	Moist, soft, olive grey, SILTY CLAY with a pocket of shell hash at 9.1	Moist, dark grayish brown clay with organics	Fat clay	CH	0.1	9.8	1.4	Soft	76	94.6	5.4	2.65	0	1.2	98.8	31	76	32	44	1
VC-28	S1	0 - 10.0	Moist, soft, olive grey, SILTY CLAY with seams and layers of sandy silty clay	Wet, grayish brown clay with organics	Fat clay	CH	0.1	12.7	1.8	Soft	68	94.5	5.5	2.64	0	4.5	95.5	20	59	29	30	1
VC-29	S1	0 - 10.1	Moist, soft, olive grey, SILTY CLAY with trace fine sand and frequent interbedded seams of dark grey fine sand and a pocket of shell hash at 7.3	Wet, dark olive clay	Fat clay	CH	0.1	7.8	1.1	Soft	74	95.7	4.3	2.64	0	9.3	90.7	16	64	31	33	1
VC-30	S1	0 - 9.95	Moist, soft, olive grey, SILTY CLAY with interbedded with silty sand seams	Wet, grayish brown clay	Fat clay	CH	0.1	7.4	1.1	Soft	67	97.2	2.8	2.68	0	11	89	19	59	26	33	1
VC-31	S1	0 - 10.1	Moist, soft, olive grey, SILTY CLAY with seams/layers of sand, shell hash between 6.0 and 10.1, voids due to settling between 0 - 0.5 and 5 - 5.4	Moist, grayish brown clay	Fat clay	CH	0.1	8.8	1.3	Soft	62	95.5	4.5	2.65	1.8	11.6	86.6	20	63	28	35	1
VC-32	S1	0 - 9.5	Moist, soft, olive grey, SILTY CLAY, with a pocket of woody organic material at 5.5 and frequent interbedded seams of dark grey fine sand between 8.2 - 9.5	Wet, grayish brown clay with organics	Fat clay	CH	0.1	7.8	1.1	Soft	67	93.6	6.4	2.63	0	3.8	96.2	17	59	29	30	1
VC-33	S1	0 - 9.8	Moist, soft, olive grey, SILTY CLAY with lenses of organic material at 1.5 and 2.6 - 2.7	Wet, grayish brown clay	Fat clay	CH	0.1	7.4	1.1	Soft	68	96.3	3.7	2.66	0	5.9	94.1	19	59	30	29	1
VC-34	S1	0 - 11.0	Moist, soft, olive grey, SILTY CLAY with a gap in core between 4.5 - 5.0, pockets of shell fragments between 5.6 and 6.0, a seam of shell fragments at 7.9 and shell hash between 8.2 - 11.0	Wet, grayish brown clay	Fat clay	CH	0.1	9.0	1.3	Soft	64	97.2	2.8	2.71	0.7	7.6	91.7	25	57	26	31	1
VC-35	S1	0 - 10.0	Moist, soft, olive grey, SILTY CLAY, with dark and light grey seams/layers of silty sand	Wet, olive gray clay	Fat clay	CH	0.1	7.4	1.1	Soft	87	95.8	4.2	2.66	0	2	98	25	78	33	45	1
VC-36	S1	0 - 10.0	Moist, soft, olive grey, CLAY, with trace shell fragments at 4.1, 5 - 7 and 8 - 10, woody organic fragments 0 -0.6 and a pocket of organic material at 1.7	Moist, grayish brown clay	Fat clay	CH	0.2	21.6	3.1	Soft	59	97.2	2.8	2.67	0	1.7	98.3	20	61	27	34	1
VC-37	S1	0 - 10.0	Moist, soft, olive grey, SILTY CLAY with seams/layers of light brown/yellow orange clay and shell fragments scattered between 7 - 8.5	Wet, grayish brown clay	Fat clay	CH	0.1	7.8	1.1	Soft	75	97.5	2.5	2.63	0	7.1	92.9	20	62	28	34	1
VC-38	S1	0 - 10.0	Moist, soft, olive grey, CLAY, interbedded with layers/seams of silty, sandy clay with a lense of wood at 1.2', organic fragment at 9.8 and a void from setting between 5.0 - 5.4	Moist, dark gray clay with sand	Fat clay with sand	CH	0.1	7.8	1.1	Soft	63	96.8	3.2	2.63	0.4	15.6	84	14	62	27	35	1
VC-39	S1	0 - 9.9	Moist, soft, olive grey, SILTY CLAY, with a pocket of woody organic material at 1.6	Wet, dark grayish brown silt	Elastic silt	MH	0.2	14.7	2.1	Soft	68	96.1	3.9	2.65	0	6.6	93.4	19	62	33	29	1
VC-40	S1	0 - 10.0	Moist, soft, olive grey, SILTY CLAY with trace organic matter and frequent interbedded seams of organic matter	Wet, gray clay	Fat clay	CH	0.1	7.8	1.1	Soft	77	96.9	3.1	2.64	0	12.6	87.4	13	73	31	42	1
VC-41	S1	0 - 10.0	Moist, soft, olive grey, SILTY CLAY with frequent interbedded seams of dark grey silty sand and a large piece of gravel at 1.9	Wet, dark gray clay	Fat clay	CH	0.8	79.4	11.5	Stiff	72	97.7	2.3	2.68	0	6.2	93.8	20	67	28	39	1
VC-42	S1	0 - 10.0	Moist, soft, olive grey CLAY, interbedded with lenses of fine sand, dark grey organic material/glass 0 - 0.6, and a pocket of woody organic material between 1.0 - 1.2	Wet, dark grayish brown clay with organics	Fat clay	CH	0.1	7.4	1.1	Soft	80	94.9	5.1	2.65	0	8.1	91.9	19	71	31	40	1
VC-43	S1	0 - 10.0	Moist, soft, olive grey SILTY CLAY with frequent interbedded seams of dark grey silty clay, shell hash at 4.9, and a large gravel sizes piece of rock at 9.1 and 9.4	Moist, gray clay	Fat clay	CH	0.1	11.8	1.7	Soft	74	97.2	2.8	2.69	0	2.9	97.1	34	82	31	51	1

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Core Location	Sample	Depth[1] (feet)	Field Visual Description	Laboratory Visual Description	ASTM Classification		Torvane Test Results Shear Strength[2]			Consistency of Cohesive Sediment based on Torvane Shear Strength	Moisture , Ash, Organic Matter ASTM D 2974			Specific Gravity ASTM D 854	Particle Size ASTM D 422				Atterburg Limits ASTM D 4318			
					Group Name	Group Symbol	kg/cm^2	k Pa	PSI		Moisture Content %	Ash Content %	Organic Matter %		% Gravel	% Sand	% Silt & Clay	%< 0.0016 mm	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index
VC-44A	S1	0 - 10.1	Moist, soft, olive grey SILTY CLAY with frequent interbedded seams/layers of dark grey fine sand with a layer of organic material (leaf/roots) at 4.1 and a seam of organic material (leaf/roots) at 7.9	Wet, dark gray sandy silt	Sandy silt	ML	0.1	8.1	1.2	Soft	64	96.7	3.3	2.58	0.0	38	62	13	44	27	17	2
VC-45	S1	0 - 10.0	Moist, soft, olive grey, SILTY CLAY with interbedded seams/ layers of dark grey silty clay with a seam of dark grey silty fine sand and/or clay at 7.3 and a few shell fragments at 9.3	Wet, dark gray clay	Fat clay	CH	0.1	9.8	1.4	Soft	82	96.4	3.6	2.61	0.0	6.2	93.8	23	74	30	44	1
VC-46	S1	0 - 2.0	Moist, soft, dark grey SILTY CLAY with frequent shell pockets	Wet, grayish brown clay	Fat clay	CH	0.1	4.9	0.7	Soft	120	95.4	4.6	2.65	0	4.7	95.3	20	94	35	59	1
VC-46	S2	2.0 - 4.0	Moist, soft, olive grey, SILTY CLAY	Wet, grayish brown clay	Fat clay	CH	0.1	9.8	1.4	Soft	73	96.9	3.1	2.71	0	2.5	97.5	23	68	29	39	1
VC-46	S3	4.0 - 7.2	Moist, soft, olive grey, SILTY CLAY with shell hash/cobble	Wet, gray silty sand with gravel	Clayey sand with gravel	SC	0.1	4.9	0.7	Soft	68	97.2	2.8	2.67	23.7	36	40.3	13	49	26	23	2
VC-47	S1	0 - 9.5	Wet/moist, soft, olive grey, CLAY with trace silt, with dark grey seams interbedded between 2.5 and 3.5 with a void space at 4.6 and dense clay between 4.8 - 9.5	Moist, olive brown clay	Fat clay	CH	0.1	6.9	1.0	Soft	77	95.7	4.3	2.66	0	1.2	98.8	27	79	35	44	1
VC-48	S1	0 - 10.8	Moist, soft, olive grey, CLAY with dark grey mottled layers from 0.5 - 2.3, frequent shell fragments and whole shells from 3 - 9.3, wood (lumber) fragment at 1	Wet, gray clay	Fat clay	CH	0.1	6.9	1.0	Soft	93	96.8	3.2	2.67	1.9	3.4	94.7	27	73	30	43	1
VC-49	S1	0 - 10.0	Moist, soft, olive grey, SILTY CLAY with frequent interbedded seams/layers of dark grey silty clay and a pocket of shell hash at 4.8	Wet, dark olive brown silt	Elastic silt	MH	0.1	7.8	1.1	Soft	95	96.4	3.6	2.64	0	4.7	95.3	17	77	36	41	1
VC-50	S1	0 - 8.6	Moist, soft, olive grey, SILTY CLAY possible slag or other material at 2.5, seams of dark grey from 0.5 - 1.0	Wet, dark gray clay	Fat clay	CH	0.1	6.9	1.0	Soft	100	95.7	4.3	2.64	0.0	5	95	26	80	33	47	1
VC-L4	S1	0 - 10.0	Moist, soft, olive grey SILTY CLAY with dark grey seams/layers from 2 - 7, organic pockets at 1.2, 6.2 and 9.4 and sand pockets at 6.2 and 6.9	Wet, very dark gray silt with organics	Fat clay	CH	0.1	6.3	0.9	Soft	100	94.7	5.3	2.64	0.0	7.8	92.2	26	81	34	47	1
VC-L5	S1	0 - 6.2	Wet/moist, soft, olive grey, SILTY CLAY with dark grey seams/layers of fine sand	Wet, dark gray clay with organics	Fat clay	CH	0.1	4.9	0.7	Soft	113	93.9	6.1	2.65	0.0	5.6	94.4	23	91	33	58	1
VC-L6	S1	0 - 10.8	Moist, soft, olive grey, CLAY with silt, red brick fragment at 5.2	Wet, gray clay with organics	Fat clay	CH	0.1	7.4	1.1	Soft	105	94.6	5.4	2.64	0.0	3.3	96.7	27	89	33	56	1

Notes:

(1) Sample interval measured from sediment-water interface.

(2) Shear Strength measured in field with DGSI, hand-held Torvane, Model S-160. Result is average of readings obtained approximately every 2 feet within sample interval.
Torvane field screening does not replace field and laboratory testing analysis.

TABLE 2A
SUMMARY OF SEDIMENT CHEMICAL ANALYTICAL DATA - TOC, METALS, PAH, VOC, PESTICIDES, PCB AROCLORS
West Point Project

PARAMETER	Sample Location			VC-L1-S1	VC-L2-S1	VC-L3-S1	VC-01-S1	VC-02-S1	VC-03-S1	VC-04-S1	VC-05-S1	VC-105-S1	VC-06-S1	VC-07-S1	VC-08-S1	VC-108-S1	VC-09-S1	VC-10-S1	VC-11-S1	VC-12-S1	VC-112-S1	VC-13-S1	VC-14-S1	VC-15-S1	VC-16-S1
	Sample Interval (feet) [1]			0 - 10	0 - 10	0 - 9.9	0 - 5.5	0 - 4.0	0 - 3.1	0 - 9.8	0 - 9.9	0 - 9.9	0 - 8.7	0 - 10	0 - 10	0 - 10	0 - 8.9	0 - 10	0 - 9.6	0 - 9.8	0 - 9.8	0 - 9.5	0 - 9.9	0 - 9.9	0 - 9.9
	Sampling Date			10/3/2012	10/2/2012	10/3/2012	10/2/2012	10/2/2012	10/2/2012	10/2/2012	10/2/2012	10/2/2012	10/2/2012	10/2/2012	10/2/2012	10/2/2012	10/2/2012	10/2/2012	10/2/2012	9/28/2012	9/28/2012	9/28/2012	9/28/2012	9/28/2012	9/28/2012
	Laboratory Sample No.			L1218010-20	L1218010-16	L1218010-19	L1218010-18	L1218010-17	L1218010-13	L1218010-10	L1218010-05	L1218010-06	L1218010-09	L1218010-12	L1218010-15	L1218010-14	L1218010-07	L1218010-08	L1218010-11	L1217617-19	L1217617-20	L1217617-21	L1217617-22	L1217617-24	L1217617-25
	NYSDEC Sediment Quality Threshold Values [2]																								
	Class A	Class B	Class C																						
GENERAL CHEMISTRY (%)																									
Moisture				18.3	19.2	22.7	19.2	20.4	36.9	26.7	17.1	17.3	25.8	22.3	24.5	27.2	32.2	27.3	24	17.7	17.7	19	18.1	15.5	47.1
Total Solids				81.7	80.8	77.4	80.8	79.6	63.1	73.3	82.8	82.7	74.2	77.7	75.5	72.8	67.8	72.7	76	82.3	82.3	81	81.9	84.5	52.9
Total Organic Carbon (Rep1)				0.158	0.483	0.507	0.273	0.098	1.95	1.01	0.145	0.164	0.769	0.397	0.352	0.507	1.08	0.638	0.512	0.212	0.184	0.195	0.272	0.297	3.43
Total Organic Carbon (Rep2)				0.153	0.39	0.655	0.247	0.108	1.83	0.858	0.179	0.223	0.824	0.367	0.416	0.593	1.07	0.634	0.502	0.17	0.205	0.178	0.24	0.414	3.89
METALS (mg/kg)																									
Arsenic, Total	< 8.2	8.2 - 53	> 53	**1.24**	**1.6**	**1.88**	**5.62**	**2.77**	**3.09**	**2.57**	**1.32**	**1.36**	**3.53**	**1.53**	**3.12**	**2.53**	**4.28**	**2.06**	**3.16**	**1.03**	**0.947**	**1.16**	**3.09**	**2.64**	**21**
Cadmium, Total	< 1.2	1.2 -9.5	> 9.5	**0.061**	**0.072**	**0.097**	**0.067**	**0.155**	**0.216**	**0.093**	**0.083**	**0.078**	**0.224**	**0.096**	**0.16**	**0.134**	**0.146**	**0.11**	**0.765**	**0.047**	**0.039**	**0.045**	**0.041**	**0.052**	**0.635**
Copper, Total	< 33	33 - 270	> 270	**2.81**	**4.43**	**6.09**	**4.88**	**3.81**	**19.6**	**6.04**	**4.8**	**4.53**	**7.94**	**5.36**	**8.06**	**6.27**	**14.9**	**7.24**	**13.8**	**4.09**	**3.8**	**3.62**	**3.27**	**3.44**	**30.6**
Lead, Total	< 47	47 - 218	> 218	**3.49**	**4.16**	**5.64**	**5.22**	**8.4**	**10.1**	**5.36**	**5.49**	**5.36**	**12.2**	**4.86**	**8.09**	**8.15**	**8.86**	**5**	**20.7**	**5.2**	**4.63**	**3.76**	**5.7**	**4.74**	**45.6**
Mercury, Total	< 0.17	0.17 - 1.0	> 1.0	0.008 J	0.012 J	0.012 J	0.005 J	**0.042**	**0.024**	0.013 J	0.006 J	**0.011**	**0.042**	0.008 J	0.022 J	**0.029**	**0.021**	0.012 J	**0.141**	0.008 J	**0.011**	0.008 J	**0.011**	0.005 J	**0.269**
PAH (µg/kg)																									
2-Chloronaphthalene				4.52 U	4.68 U	4.87 U	4.59 U	4.77 U	5.9 U	5.06 U	4.68 U	4.66 U	5.05 U	4.79 U	5.09 U	5.13 U	5.57 U	5.09 U	5.13 U	4.67 U	4.76 U	4.77 U	4.62 U	4.7 U	7.25 U
2-Methylnaphthalene				4.52 U	4.68 U	4.87 U	4.59 U	**5**	5.9 U	5.06 U	4.68 U	4.66 U	3.23 J	4.79 U	1.47 J	2.24 J	5.57 U	5.09 U	**43.3**	4.67 U	4.76 U	4.77 U	4.62 U	4.7 U	**92.9**
Acenaphthene				4.52 U	4.68 U	4.87 U	4.59 U	**6.66**	5.9 U	1.16 J	4.68 U	4.66 U	1.88 J	4.79 U	1.36 J	0.707 J	5.57 U	5.09 U	**29**	0.61 J	4.76 U	4.77 U	4.62 U	4.7 U	**36.7**
Acenaphthylene				4.52 U	4.68 U	4.87 U	4.59 U	3.23 J	5.9 U	5.06 U	4.68 U	4.66 U	1.43 J	4.79 U	1.08 J	1.35 J	5.57 U	5.09 U	**95.6**	4.67 U	4.76 U	4.77 U	4.62 U	0.451 J	**38.6**
Anthracene				4.52 U	4.68 U	4.87 U	4.59 U	3.84 J	5.9 U	1.39 J	4.68 U	4.66 U	4.53 J	4.79 U	**5.44**	4.23 J	5.57 U	1.52 J	**198**	1.9 J	4.76 U	4.77 U	4.62 U	4.7 U	**82**
Benz(a)anthracene				4.52 U	4.68 U	4.87 U	0.784 J	**14.9**	5.9 U	1.34 J	0.946 J	4.66 U	**7.82**	4.79 U	**12.1**	**7.08**	5.57 U	2.19 J	**663**	**5.4**	4.76 U	4.77 U	4.62 U	4.7 U	**225**
Benzo(a)pyrene				0.908 J	1.49 J	1.22 J	4.59 U	**19**	5.9 U	2.11 J	1.94 J	4.66 U	**9.34**	1.36 J	**12**	4.68 J	5.57 U	2 J	**471**	**5.66**	4.76 U	4.77 U	4.62 U	4.7 U	**224**
Benzo(b)fluoranthene				4.52 U	4.68 U	4.87 U	0.598 J	**9.02**	1.14 J	1.08 J	1 J	4.66 U	**5.42**	4.79 U	**7.83**	3.9 J	1.03 J	2.05 J	**461**	2.88 J	4.76 U	4.77 U	4.62 U	4.7 U	**161**
Benzo(ghi)perylene				4.52 U	4.68 U	4.87 U	4.59 U	**8.7**	5.9 U	5.06 U	4.68 U	4.66 U	4.45 J	4.79 U	**5.39**	2.44 J	5.57 U	1 J	**252**	1.76 J	4.76 U	4.77 U	4.62 U	4.7 U	**110**
Benzo(k)fluoranthene				4.52 U	4.68 U	4.87 U	4.59 U	**10.2**	5.9 U	1.04 J	0.552 J	4.66 U	**5.73**	4.79 U	**8.23**	3.19 J	5.57 U	0.94 J	**369**	3.18 J	4.76 U	4.77 U	4.62 U	4.7 U	**144**
Chrysene				4.52 U	4.68 U	4.87 U	0.752 J	**14**	1.6 J	1.57 J	1.03 J	0.551 J	**8.01**	4.79 U	**10.7**	**6.43**	1.17 J	2.34 J	**500**	3.95 J	4.76 U	4.77 U	4.62 U	4.7 U	**226**
Dibenz(a,h)anthracene				4.52 U	4.68 U	4.87 U	4.59 U	1.83 J	5.9 U	5.06 U	4.68 U	4.66 U	1.03 J	4.79 U	1.32 J	5.13 U	5.57 U	5.09 U	**79.9**	4.67 U	4.76 U	4.77 U	4.62 U	4.7 U	**27**
Fluoranthene				4.52 U	0.765 J	0.926 J	1.49 J	**13**	1.24 J	3.42 J	2 J	1.19 J	**9.98**	4.79 U	**19.9**	**11.2**	1.19 J	4.89 J	**999**	8.08	0.839 J	4.77 U	4.62 U	4.7 U	**290**
Fluorene				4.52 U	4.68 U	0.793 J	4.59 U	3.91 J	1.32 J	1.73 J	0.708 J	0.764 J	3.54 J	4.79 U	2.73 J	2.48 J	1.13 J	1.64 J	**61.2**	0.907 J	0.822 J	4.77 U	4.62 U	4.7 U	**46.5**
Indeno(1,2,3-cd)Pyrene				4.52 U	4.68 U	4.87 U	4.59 U	**7.47**	5.9 U	5.06 U	4.68 U	4.66 U	4.06 J	4.79 U	**5.46**	2.37 J	5.57 U	5.09 U	**286**	1.95 J	4.76 U	4.77 U	4.62 U	4.7 U	**106**
Naphthalene				4.52 U	4.68 U	4.87 U	4.59 U	**11.1**	5.9 U	1.68 J	4.68 U	4.66 U	4.71 J	4.79 U	2.33 J	2.6 J	5.57 U	0.882 J	**72.2**	1.22 J	1.06 J	0.718 J	0.74 J	0.915 J	**164**
Phenanthrene				4.52 U	1.96 J	2.07 J	1.41 J	**10.9**	1.79 J	**5.06**	1.81 J	1.67 J	**10.3**	4.79 U	**12.1**	**9.09**	1.55 J	4.22 J	**559**	**4.74**	1.94 J	1.06 J	4.62 U	4.7 U	**223**
Pyrene				4.52 U	0.586 J	0.729 J	2.12 J	**24.8**	1.24 J	2.4 J	1.63 J	0.999 J	**14.9**	4.79 U	**19.6**	**13.8**	1.09 J	4.64 J	**820**	**6.93**	0.723 J	0.465 J	4.62 U	4.7 U	**316**
Sum PAH [3]	< 4,000	4,000 - 45,000	> 45,000	39.33	37.56	37.39	34.69	170	43.7	39.2	33	35.46	102.9	42.08	131.6	82.9	40.58	44	5962	58.5	36.32	38.02	40.01	39.0	2516
VOC (µg/kg)																									
Benzene	< 590	590-2,160	> 2,160	0.66 U	0.74 U	0.69 U	0.6 U	0.63 U	0.94 U	0.63 U	0.64 U	0.59 U	0.68 U	0.71 U	0.61 U	0.67 U	0.8 U	0.87 U	0.64 U	0.63 U	0.63 U	0.68 U	0.66 U	0.69 U	1 U
Ethylbenzene				0.66 U	0.74 U	0.69 U	0.6 U	0.63 U	0.94 U	0.63 U	0.64 U	0.59 U	0.68 U	0.71 U	0.61 U	0.67 U	0.8 U	0.87 U	0.64 U	0.63 U	0.63 U	0.68 U	0.66 U	0.69 U	1 U
o-Xylene				1.3 U	1.5 U	1.4 U	1.2 U	1.2 U	1.9 U	1.3 U	1.3 U	1.2 U	1.4 U	1.4 U	1.2 U	1.3 U	1.6 U	1.7 U	1.3 U	1.2 U	1.3 U	1.4 U	1.3 U	1.4 U	2.1 U
p/m-Xylene				1.3 U	1.5 U	1.4 U	1.2 U	1.2 U	1.9 U	1.3 U	1.3 U	1.2 U	1.4 U	1.4 U	1.2 U	1.3 U	1.6 U	1.7 U	1.3 U	1.2 U	1.3 U	1.4 U	1.3 U	1.4 U	2.1 U
Toluene				0.99 U	0.89 J	1 U	0.89 U	0.94 U	1.4 U	0.95 U	0.95 U	0.89 U	1 U	1.1 U	0.92 U	1 U	1.2 U	1.3 U	0.97 U	0.94 U	0.18 J	1 U	0.16 J	0.6 J	0.29 J
Sum BTEX [3]	< 960	960-5,900	> 5,900	2.5	3.1	2.6	2.2	2.3	3.5	2.4	2.4	2.2	2.6	2.7	2.3	2.5	3.0	3.2	2.4	2.3	2.1	2.6	2.1	2.7	3.4
PESTICIDES (µg/kg)																									
4,4'-DDD				0.114 U	0.117 U	0.122 U	0.116 U	0.118 U	0.15 U	0.126 U	0.114 U	0.115 U	0.127 U	0.121 U	0.124 U	0.129 U	0.14 U	0.131 U	**0.896**	0.112 U	0.111 U	0.117 U	0.119 U	0.112 U	**2.81**
4,4'-DDE				0.114 U	0.117 U	**0.203**	0.116 U	0.118 U	0.15 U	0.126 U	0.114 U	0.115 U	**0.26**	0.121 U	**0.227**	**0.244**	0.14 U	**0.195**	**1.26**	0.112 U	0.111 U	**0.158**	**0.246**	**0.244**	**1.19**
4,4'-DDT				0.114 U	0.117 U	0.122 U	0.116 U	0.118 U	0.15 U	0.126 U	0.114 U	0.115 U	0.127 U	0.121 U	0.124 U	0.129 U	0.14 U	0.131 U	**0.412**	0.112 U	0.111 U	0.117 U	0.119 U	0.112 U	**0.287**
Sum DDT,DDD,DDE [3]	< 3	3 - 30	> 30	0.171 U	0.176 U	0.325	0.174 U	0.177 U	0.23 U	0.189 U	0.171 U	0.173 U	0.39	0.182 U	0.351	0.373	0.21 U	0.326	2.57	0.168 U	0.1665 U	0.275	0.365	0.356	4.29
Chlordane	< 3	3 - 36	> 36	5.68 U	5.84 U	6.12 U	5.78 U	5.9 U	7.52 U	6.3 U	5.7 U	5.75 U	6.36 U	6.05 U	6.19 U	6.44 U	6.98 U	6.53 U	6.08 U	5.61 U	5.54 U	5.85 U	5.96 U	5.62 U	8.93 U
Dieldrin	< 110	110 - 480	> 480	0.114 U	0.117 U	0.122 U	0.116 U	0.118 U	0.15 U	0.126 U	0.114 U	0.115 U	0.127 U	0.121 U	0.124 U	0.129 U	0.14 U	0.131 U	**0.724**	0.112 U	0.111 U	0.117 U	0.119 U	0.112 U	**0.771**
Mirex	< 1.4	1.4 - 14	> 14	0.114 U	0.117 U	0.122 U	0.116 U	0.118 U	0.15 U	0.126 U	0.114 U	0.115 U	0.127 U	0.121 U	0.124 U	0.129 U	0.14 U	0.131 U	**0.23**	0.112 U	0.111 U	0.117 U	0.119 U	0.112 U	0.179 U
PCB Aroclors (µg/kg)																									
Aroclor 1016				4.54 U	4.67 U	4.89 U	4.62 U	4.72 U	6.01 U	5.04 U	4.56 U	4.6 U	5.09 U	4.84 U	4.95 U	5.15 U	5.59 U	5.22 U	24.3 U	4.49 U	4.43 U	4.68 U	4.77 U	4.5 U	7.15 U
Aroclor 1221				4.54 U	4.67 U	4.89 U	4.62 U	4.72 U	6.01 U	5.04 U	4.56 U	4.6 U	5.09 U	4.84 U	4.95 U	5.15 U	5.59 U	5.22 U	24.3 U	4.49 U	4.43 U	4.68 U	4.77 U	4.5 U	7.15 U
Aroclor 1232				4.54 U	4.67 U	4.89 U	4.62 U	4.72 U	6.01 U	5.04 U	4.56 U	4.6 U	5.09 U	4.84 U	4.95 U	5.15 U	5.59 U	5.22 U	24.3 U	4.49 U	4.43 U	4.68 U	4.77 U	4.5 U	7.15 U
Aroclor 1242				4.54 U	4.67 U	4.89 U	**6.48**	**78**	6.01 U	5.04 U	4.56 U	4.6 U	**50.9**	4.84 U	**27.9**	**25.8**	5.59 U	5.22 U	**880**	4.49 U	4.43 U	4.68 U	4.77 U	4.5 U	**298**
Aroclor 1248				4.54 U	4.67 U	4.89 U	4.62 U	4.72 U	6.01 U	5.04 U	4.56 U	4.6 U	5.09 U	4.84 U	4.95 U	5.15 U	5.59 U	5.22 U	24.3 U	4.49 U	4.43 U	4.68 U	4.77 U	4.5 U	7.15 U
Aroclor 1254				4.54 U	4.67 U	4.89 U	4.62 U	**8.2**	6.01 U	5.04 U	4.56 U	4.6 U	**8.29**	4.84 U	**9.6**	**9.15**	5.59 U	5.22 U	**154**	4.49 U	4.43 U	4.68 U	4.77 U	4.5 U	**61.4**
Aroclor 1260				4.54 U	4.67 U	4.89 U	4.62 U	4.72 U	6.01 U	5.04 U	4.56 U	4.6 U	5.09 U	4.84 U	4.95 U	5.15 U	5.59 U	5.22 U	**39**	4.49 U	4.43 U	4.68 U	4.77 U	4.5 U	**16.6**
Sum Aroclors [3]	< 100	100-1,000	> 1,000	15.89 U	16.35 U	17.12 U	20.34	98	21.04 U	17.64 U	15.96 U	16.1 U	71.9	16.94 U	49.9	47.8	19.57 U	18.27 U	1122	15.72 U	15.51 U	16.38 U	16.70 U	15.8 U	390

Legend:

"Bold" = Parameter was detected above quantitation limit

"U" = Parameter not detected at quantitation limit presented

"J" = Estimated value, below quantitation limit

Notes:

(1) Sample interval measured in feet from sediment-water interface.

(2) Sediment Quality Threshold Values (NYDEC TOGS 5.1.9, Table 2, November 2004).

(3) Non-detects assumed present at one-half the quantitation limit presented.

Field duplicates:

Sample VC-105-S1 is a field duplicate of VC-05-S1

Sample VC-112-S1 is a field duplicate of VC-12-S1

Sample VC-132-S1 is a field duplicate of VC-32-S1

Sample VC-145-S1 is a field duplicate of VC-45-S1

Sample VC-150-S1 is a field duplicate of VC-50-S1

TABLE 2A
SUMMARY OF SEDIMENT CHEMICAL ANALYTICAL DATA - TOC, METALS, PAH, VOC, PESTICIDES, PCB AROCLORS
West Point Project

PARAMETER	Class A	Class B	Class C	Sample Location	VC-17-S1	VC-18-S1	VC-19-S1	VC-20-S1	VC-21-S1	VC-22-S1	VC-23-S1	VC-24-S1	VC-25-S1	VC-25-S2	VC-26-S1	VC-26-S2	VC-27-S1	VC-28-S1	VC-29-S1	VC-30-S1	VC-31-S1	VC-32-S1	VC-132-S1	VC-33-S1	VC-34-S1	VC-35-S1
				Sample Interval (feet) [1]	0 - 9.8	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10.1	0 - 9.9	0 - 10	0 - 6.6	6.6 - 11	0 - 6	6 - 9.9	0 - 9.9	0 - 10	0 - 10.1	0 - 10	0 - 10.1	0 - 9.5	0 - 9.5	0 - 9.8	0 - 11	0 - 10
				Sampling Date	9/28/2012	10/1/2012	10/1/2012	10/1/2012	10/1/2012	9/27/2012	9/27/2012	9/27/2012	9/28/2012	9/28/2012	9/27/2012	9/27/2012	9/27/2012	9/27/2012	9/27/2012	9/27/2012	9/27/2012	9/27/2012	9/27/2012	9/26/2012	9/27/2012	9/27/2012
				Laboratory Sample No.	L1217617-23	L1218010-01	L1218010-04	L1218010-02	L1218010-03	L1217617-16	L1217617-12	L1217617-15	L1217617-17	L1217617-18	L1217617-10	L1217617-11	L1217617-14	L1217617-13	L1217617-09	L1217617-03	L1217617-05	L1217617-07	L1217617-08	L1217617-02	L1217617-06	L1217617-04
				NYSDEC Sediment Quality Threshold Values [2]																						
GENERAL CHEMISTRY (%)																										
Moisture					28.4	42.3	35.5	28.3	37	41.7	40.1	38.4	37.1	28.1	43.9	31.2	41.9	42.7	46.2	41.7	41.5	43.7	43.3	44.5	40.5	50.8
Total Solids					71.6	57.7	64.5	71.6	63	58.3	59.9	61.6	62.9	71.9	56.1	68.8	58.1	57.3	53.8	58.3	58.6	56.3	56.7	55.5	59.5	49.2
Total Organic Carbon (Rep1)					2.22	1.78	1.14	0.774	1.29	2.72	1.57	1.48	0.99	0.567	1.85	0.716	1.97	1.76	1.65	1.22	1.72	1.54	1.53	1.7	1.23	1.59
Total Organic Carbon (Rep2)					2.58	1.53	1.18	0.737	1.29	2.15	1.84	1.43	0.914	0.475	1.94	0.882	1.96	1.77	1.6	1.23	1.84	1.69	1.61	1.73	1.2	1.59
METALS (mg/kg)																										
Arsenic, Total	< 8.2	8.2 - 53	> 53		**5.49**	**6.42**	**6.34**	**2.7**	**5.76**	**8.32**	**7.9**	**4.19**	**2.4**	**5.19**	**15.1**	**2.73**	**18**	**11**	**4.47**	**5.65**	**11**	**7.14**	**6.98**	**6.67**	**7.02**	**7.33**
Cadmium, Total	< 1.2	1.2 -9.5	> 9.5		**0.747**	**0.916**	**0.441**	**0.839**	**0.187**	**1.25**	**1.5**	**0.2**	**0.149**	**0.091**	**0.485**	**0.13**	**0.543**	**2.51**	**0.19**	**0.136**	**1.28**	**0.277**	**0.276**	**1.89**	**0.114**	**0.17**
Copper, Total	< 33	33 - 270	> 270		**17.2**	**15.9**	**26.3**	**10.2**	**13.6**	**38.2**	**40.7**	**13.3**	**9.05**	**6.39**	**34.2**	**6.67**	**46.6**	**60**	**13.6**	**13.4**	**35.4**	**18.2**	**18.4**	**33.3**	**16**	**16.9**
Lead, Total	< 47	47 - 218	> 218		**28.6**	**11.2**	**27.4**	**6.19**	**10.8**	0.163 J	**50.3**	**16**	**7.88**	**7.42**	**48.7**	**5.96**	**61**	**89.8**	**9.71**	**12.3**	**57.7**	0.265 U	**23.1**	**50.2**	**13.2**	**15.7**
Mercury, Total	< 0.17	0.17 - 1.0	> 1.0		**0.18**	**0.037**	**0.196**	**0.055**	0.019 J	**0.512**	**0.474**	**0.04**	**0.045**	**0.011**	**0.486**	**0.042**	**0.79**	**0.641**	**0.048**	**0.047**	**0.742**	**0.281**	**0.317**	**0.444**	**0.042**	**0.064**
PAH (µg/kg)																										
2-Chloronaphthalene					5.37 U	6.44 U	5.97 U	5.16 U	5.93 U	6.41 U	6.58 U	6.05 U	6.33 U	5.54 U	6.88 U	5.39 U	6.59 U	6.84 U	7.01 U	6.83 U	6.7 U	6.65 U	6.6 U	3.13 J	6.52 U	7.52 U
2-Methylnaphthalene					**142**	1.58 J	**33.1**	2.68 J	5.93 U	**41.3**	**57.6**	1.81 J	6.33 U	5.54 U	**45.4**	5.39 U	**52.7**	**83.7**	7.01 U	6.83 U	**49.3**	**7.22**	**8.31**	**36.8**	6.52 U	7.52 U
Acenaphthene					**78**	1.92 J	**11.4**	1.25 J	5.93 U	**14.5**	**18.7**	1.12 J	0.934 J	5.54 U	**23.8**	5.39 U	**27.5**	**34.8**	7.01 U	6.83 U	**21**	5.85 J	5.66 J	**33.9**	6.52 U	7.52 U
Acenaphthylene					**116**	1.54 J	**21.1**	1.71 J	5.93 U	**26.9**	**35.6**	4.08 J	0.687 J	5.54 U	**34.2**	5.39 U	**34.8**	**48.5**	7.01 U	6.83 U	**48.5**	6.14 J	5.92 J	**15.4**	6.52 U	7.52 U
Anthracene					**182**	5.84 J	**53.1**	4.2 J	0.938 J	**52.8**	**57.4**	**9.7**	3.82 J	5.54 U	**91.2**	5.39 U	**115**	**89.6**	7.01 U	1.43 J	**94.4**	**22.5**	**23.6**	**65.6**	1.3 J	1.36 J
Benz(a)anthracene					**692**	**13.9**	**112**	**6.73**	5.93 U	**147**	**204**	**24.8**	**15.5**	5.54 U	**240**	5.39 U	**199**	**257**	7.01 U	1.26 J	**250**	**49.5**	**59.2**	**179**	6.52 U	7.52 U
Benzo(a)pyrene					**844**	**9.82**	**113**	**7.79**	1.57 J	**150**	**202**	**20.2**	**11.4**	5.54 U	**227**	5.39 U	**204**	**229**	7.01 U	6.83 U	**234**	**44.4**	**49.1**	**112**	6.52 U	7.52 U
Benzo(b)fluoranthene					**629**	**7.94**	**86.2**	**7.32**	1.52 J	**127**	**167**	**16.5**	**9.73**	1.05 J	**181**	0.83 J	**157**	**190**	1.32 J	3.07 J	**184**	**40.8**	**45.7**	**84.2**	1.72 J	2.05 J
Benzo(ghi)perylene					**492**	4.15 J	**61.6**	4.66 J	5.93 U	**82.7**	**96.9**	**8.27**	4.74 J	5.54 U	**112**	5.39 U	**105**	**114**	7.01 U	1.32 J	**118**	**23.2**	**24.5**	**61.6**	6.52 U	7.52 U
Benzo(k)fluoranthene					**510**	**8.15**	**72.1**	4.6 J	5.93 U	**103**	**118**	**14.2**	**9.96**	5.54 U	**130**	5.39 U	**128**	**146**	7.01 U	6.83 U	**152**	**34**	**37.6**	**56.7**	6.52 U	7.52 U
Chrysene					**620**	**12.6**	**117**	**8.02**	1.5 J	**142**	**189**	**24.8**	**13.8**	5.54 U	**218**	5.39 U	**203**	**236**	7.01 U	6.83 U	**242**	**48.8**	**57.2**	**192**	6.52 U	7.52 U
Dibenz(a,h)anthracene					**128**	1.49 J	**15.5**	1.08 J	5.93 U	**22.1**	**25.7**	2.48 J	1.6 J	5.54 U	**29.4**	5.39 U	**25.3**	**31**	7.01 U	6.83 U	**30.3**	6.57 J	**6.95**	**16.8**	6.52 U	7.52 U
Fluoranthene					**924**	**24.4**	**131**	**11.3**	1.58 J	**209**	**248**	**31.6**	**21.7**	1.3 J	**307**	1.06 J	**296**	**323**	1.93 J	3.71 J	**322**	**82.6**	**90.6**	**144**	2.78 J	3.73 J
Fluorene					**82.1**	5.65 J	**23.1**	3.53 J	2.65 J	**25.9**	**38**	4.58 J	2.77 J	1.6 J	**50.7**	0.885 J	**57**	**60.6**	2.19 J	6.16 J	**42.6**	**14.7**	**15.4**	**50**	5.42 J	5.41 J
Indeno(1,2,3-cd)Pyrene					**524**	4.44 J	**54.8**	3.98 J	5.93 U	**82.2**	**94.3**	**8.69**	5.38 J	5.54 U	**108**	5.39 U	**102**	**108**	7.01 U	6.83 U	**113**	**22.9**	**25.2**	**44.3**	6.52 U	7.52 U
Naphthalene					**226**	2.34 J	**39.5**	2.92 J	5.93 U	**60.7**	**54.2**	3.46 J	1.62 J	5.54 U	**63**	5.39 U	**64.7**	**90**	7.01 U	1.25 J	**62.7**	**11.6**	**12.7**	**21.5**	1.46 J	1.45 J
Phenanthrene					**528**	**17.3**	**123**	**10.2**	2.57 J	**141**	**171**	**15**	**9.09**	1.73 J	**235**	1.67 J	**242**	**264**	2.8 J	4.53 J	**224**	**61.2**	**62.1**	**350**	4.9 J	5.05 J
Pyrene					**892**	**21.2**	**154**	**11.2**	1.48 J	**225**	**292**	**32**	**18.7**	1.15 J	**341**	0.964 J	**335**	**407**	1.48 J	2.52 J	**373**	**76.7**	**83.8**	**312**	1.9 J	2.3 J
Sum PAH [3]	< 4,000	4,000 - 45,000	> 45,000		7612	147.5	1224	95.8	43.5	1656	2073	226	137.8	42.8	2440	40.44	2351	2716	55.29	55.27	2564	562	617	1779	55.3	62.71
VOC (µg/kg)																										
Benzene	< 590	590-2,160	> 2,160		0.67 U	0.98 U	0.92 U	0.71 U	1 U	0.93 U	1 U	0.99 U	0.84 U	0.75 U	1.1 U	0.82 U	1 U	1 U	1 U	0.93 U	1 U	1.2 U	1.1 U	1.1 U	0.88 U	1.2 U
Ethylbenzene					0.67 U	0.98 U	0.92 U	0.71 U	1 U	0.93 U	1 U	0.99 U	0.84 U	0.75 U	1.1 U	0.82 U	1 U	1 U	1 U	0.93 U	1 U	1.2 U	1.1 U	1.1 U	0.88 U	1.2 U
o-Xylene					1.3 U	2 U	1.8 U	1.4 U	2 U	1.9 U	2.1 U	2 U	1.7 U	1.5 U	2.2 U	1.6 U	2 U	2 U	2.1 U	1.9 U	2.1 U	2.3 U	2.1 U	2.2 U	1.8 U	2.4 U
p/m-Xylene					1.3 U	2 U	1.8 U	1.4 U	2 U	1.9 U	2.1 U	2 U	1.7 U	1.5 U	2.2 U	1.6 U	2 U	2 U	2.1 U	1.9 U	2.1 U	2.3 U	2.1 U	2.2 U	1.8 U	2.4 U
Toluene					1 U	1.5 U	0.28 J	0.27 J	0.32 J	1.4 U	0.29 J	1.5 U	1.3 U	1.1 U	1.7 U	1.2 U	1.5 U	1.5 U	1.6 U	1.4 U	0.31 J	1.7 U	1.6 U	1.7 U	1.3 U	1.8 U
Sum BTEX [3]	< 960	960-5,900	> 5,900		2.5	3.7	3.0	2.4	3.3	3.5	3.4	3.7	3.2	2.8	4.2	3.0	3.8	3.8	3.9	3.5	3.4	4.4	4.0	4.2	3.3	4.5
PESTICIDES (µg/kg)																										
4,4'-DDD					**9.94**	0.168 U	0.147 U	**0.564**	0.151 U	**4.29**	**3.35**	**0.473**	0.148 U	0.136 U	0.171 U	0.138 U	0.164 U	**6.62**	0.182 U	0.158 U	**2.34**	0.162 U	0.167 U	**2.06**	0.156 U	0.195 U
4,4'-DDE					**2.64**	0.168 U	0.147 U	**0.403**	0.151 U	**3.09**	**3.28**	**0.313**	0.148 U	0.136 U	**0.239**	0.138 U	0.164 U	**7.91**	0.182 U	0.158 U	**1.78**	0.162 U	0.167 U	**3.24**	0.156 U	0.195 U
4,4'-DDT					**2.47**	0.168 U	0.147 U	**0.152**	0.151 U	**0.942**	**1.06**	0.153 U	0.148 U	0.136 U	0.171 U	0.138 U	0.164 U	**3.02**	0.182 U	0.158 U	**0.656**	0.162 U	0.167 U	**0.872**	0.156 U	0.195 U
Sum DDT,DDD,DDE [3]	< 3	3 - 30	> 30		15.05	0.252 U	0.2205 U	1.119	0.2265 U	8.32	7.69	0.863	0.222 U	0.204 U	0.410	0.207 U	0.246 U	17.55	0.273 U	0.237 U	4.78	0.243 U	0.251 U	6.17	0.234 U	0.293 U
Chlordane	< 3	3 - 36	> 36		6.48 U	8.38 U	7.33 U	6.44 U	7.56 U	7.83 U	7.88 U	7.66 U	7.42 U	6.78 U	8.55 U	6.91 U	8.2 U	8.43 U	9.13 U	7.93 U	7.94 U	8.12 U	8.37 U	8.8 U	7.78 U	9.73 U
Dieldrin	< 110	110 - 480	> 480		**2.65**	0.168 U	0.147 U	**0.391**	0.151 U	**1.6**	**1.68**	0.153 U	0.148 U	0.136 U	0.171 U	0.138 U	0.164 U	**4.79**	0.182 U	0.158 U	**0.997**	0.162 U	0.167 U	**1.84**	0.156 U	0.195 U
Mirex	< 1.4	1.4 - 14	> 14		**1.64**	0.168 U	0.147 U	0.129 U	0.151 U	**1.53**	**0.42**	0.153 U	0.148 U	0.136 U	0.171 U	0.138 U	0.164 U	**1.07**	0.182 U	0.158 U	**1.03**	0.162 U	0.167 U	**0.211**	0.156 U	0.195 U
PCB Aroclors (µg/kg)																										
Aroclor 1016					25.9 U	6.7 U	5.87 U	5.15 U	6.05 U	12.5 U	31.5 U	6.13 U	5.93 U	5.43 U	6.84 U	5.53 U	6.56 U	67.4 U	7.3 U	6.34 U	6.35 U	6.49 U	6.69 U	35.2 U	6.22 U	7.79 U
Aroclor 1221					25.9 U	6.7 U	5.87 U	5.15 U	6.05 U	12.5 U	31.5 U	6.13 U	5.93 U	5.43 U	6.84 U	5.53 U	6.56 U	67.4 U	7.3 U	6.34 U	6.35 U	6.49 U	6.69 U	35.2 U	6.22 U	7.79 U
Aroclor 1232					25.9 U	6.7 U	5.87 U	5.15 U	6.05 U	12.5 U	31.5 U	6.13 U	5.93 U	5.43 U	6.84 U	5.53 U	6.56 U	67.4 U	7.3 U	6.34 U	6.35 U	6.49 U	6.69 U	35.2 U	6.22 U	7.79 U
Aroclor 1242					**1260**	6.7 U	5.87 U	**116**	6.05 U	**526**	**1100**	**27.6**	5.93 U	5.43 U	**103**	5.53 U	6.56 U	**2380**	7.3 U	6.34 U	**306**	6.49 U	6.69 U	**1910**	6.22 U	7.79 U
Aroclor 1248					25.9 U	6.7 U	5.87 U	5.15 U	6.05 U	12.5 U	31.5 U	6.13 U	5.93 U	5.43 U	6.84 U	5.53 U	6.56 U	67.4 U	7.3 U	6.34 U	6.35 U	6.49 U	6.69 U	35.2 U	6.22 U	7.79 U
Aroclor 1254					**205**	6.7 U	5.87 U	**42.7**	6.05 U	**179**	**230**	**13.2**	5.93 U	5.43 U	**8.64**	5.53 U	6.56 U	**333**	7.3 U	6.34 U	**99.6**	6.49 U	6.69 U	**205**	6.22 U	7.79 U
Aroclor 1260					**37.2**	6.7 U	5.87 U	**12.6**	6.05 U	**58.2**	**73.4**	6.13 U	5.93 U	5.43 U	6.84 U	5.53 U	6.56 U	**107**	7.3 U	6.34 U	**29.4**	6.49 U	6.69 U	**75**	6.22 U	7.79 U
Sum Aroclors [3]	< 100	100-1,000	> 1,000		1554	23.5 U	20.55 U	182	21.18 U	788	1466	56.1	20.76 U	19.01 U	129	19.36 U	22.96 U	2955	25.6 U	22.19 U	448	22.72 U	23.42 U	2260	21.77 U	27.27 U

Legend:

"Bold" = Parameter was detected above quantitation limit

"U" = Parameter not detected at quantitation limit presented

"J" = Estimated value, below quantitation limit

Notes:

(1) Sample interval measured in feet from sediment-water interface.

(2) Sediment Quality Threshold Values (NYDEC TOGS 5.1.9, Table 2, November 2004).

(3) Non-detects assumed present at one-half the quantitation limit presented.

Field duplicates:

Sample VC-105-S1 is a field duplicate of VC-05-S1

Sample VC-112-S1 is a field duplicate of VC-12-S1

Sample VC-132-S1 is a field duplicate of VC-32-S1

Sample VC-145-S1 is a field duplicate of VC-45-S1

Sample VC-150-S1 is a field duplicate of VC-50-S1

TABLE 2A
SUMMARY OF SEDIMENT CHEMICAL ANALYTICAL DATA - TOC, METALS, PAH, VOC, PESTICIDES, PCB AROCLORS
West Point Project

PARAMETER	Sample Location			VC-36-S1	VC-37-S1	VC-38-S1	VC-39-S1	VC-40-S1	VC-41-S1	VC-42-S1	VC-43-S1	VC-44A-S1	VC-45-S1	VC-145-S1	VC-46-S1	VC-46-S2	VC-46-S3	VC-47-S1	VC-48-S1	VC-49-S1	VC-50-S1	VC-150-S1	VC-L4-S1	VC-L5-S1	VC-L6-S1
	Sample Interval (feet) [1]			0 - 10	0 - 10	0 - 10	0 - 9.9	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10.1	0 - 10	0 - 10	0 - 2.0	2.0 - 4.0	4.0 - 7.2	0 - 9.5	0 - 10.8	0 - 10	0 - 8.6	0 - 8.6	0 - 10	0 - 6.2	0 - 10.8
	Sampling Date			9/26/2012	9/26/2012	9/26/2012	9/26/2012	9/26/2012	9/26/2012	9/26/2012	9/26/2012	9/25/2012	9/25/2012	9/25/2012	9/26/2012	9/26/2012	9/26/2012	9/26/2012	9/25/2012	9/26/2012	9/20/2012	9/20/2012	9/25/2012	9/25/2012	9/20/2012
	Laboratory Sample No.			L1217306-11	L1217617-01	L1217306-17	L1217306-18	L1217306-16	L1217306-10	L1217306-09	L1217306-12	L1217306-03	L1217306-04	L1217306-05	L1217306-13	L1217306-14	L1217306-15	L1217306-08	L1217306-06	L1217306-07	L1217124-01	L1217124-03	L1217306-01	L1217306-02	L1217124-02
	NYSDEC Sediment Quality Threshold Values [2]																								
	Class A	Class B	Class C																						
GENERAL CHEMISTRY (%)																									
Moisture				38	45.6	38.8	38.5	42.2	41.4	44.3	44.2	38.8	45.3	44.3	51.1	43.4	36	43.9	47.8	50.6	49.9	50.4	51.1	53.1	49.5
Total Solids				62	54.4	61.2	61.5	57.8	58.6	55.7	55.8	61.2	54.7	55.8	48.9	56.6	64	56.1	52.2	49.4	50.1	49.6	48.9	46.9	50.5
Total Organic Carbon (Rep1)				1.2	1.42	1.29	1.46	1.71	1.4	1.51	1.51	1.04	1.44	1.36	1.71	1.15	0.574	1.74	1.26	1.93	1.7	2.59	2.02	2.1	1.81
Total Organic Carbon (Rep2)				1.2	1.38	1.4	1.36	1.75	1.33	1.76	1.53	1.3	1.38	1.41	1.71	1.08	0.579	1.72	1.22	1.92	1.68	2.98	1.95	2.13	1.83
METALS (mg/kg)																									
Arsenic, Total	< 8.2	8.2 - 53	> 53	**7.7**	**7.82**	**6.08**	**6.54**	**6.41**	**7.22**	**7.29**	**7.93**	**7.79**	**6.17**	**7.47**	**13.3**	**9.11**	**12.8**	**20.5**	**8.94**	**3.17**	**8.39**	**7.34**	**9.86**	**1.63**	**7.79**
Cadmium, Total	< 1.2	1.2 -9.5	> 9.5	**0.161**	**0.467**	**0.2**	**0.188**	**0.498**	**0.173**	**0.204**	**0.196**	**0.165**	**0.195**	**0.319**	**0.334**	**0.138**	**0.25**	**0.332**	**1.13**	**0.862**	**2.21**	**1.31**	**1.37**	**0.303**	**0.854**
Copper, Total	< 33	33 - 270	> 270	**16.9**	**16.6**	**14.1**	**16.4**	**17**	**16.7**	**17.2**	**19.7**	**13.1**	**16.3**	**20.1**	**28.5**	**19.8**	**14.3**	**28.8**	**20**	**16.4**	**43.2**	**29.2**	**46.7**	**13.2**	**37.2**
Lead, Total	< 47	47 - 218	> 218	**12.7**	**15.4**	**9.96**	**11.3**	**11.4**	**11.7**	**13.3**	**14.4**	**9.21**	**15.3**	**17.8**	**35**	**13.8**	**10.3**	**39.8**	**235**	**19.9**	**53.5**	**0.312**	**41.2**	**12.6**	**35.9**
Mercury, Total	< 0.17	0.17 - 1.0	> 1.0	**0.035**	**0.106**	**0.032**	**0.033**	**0.044**	**0.033**	**0.037**	**0.04**	**0.02**	**0.05**	**0.062**	**0.562**	**0.024**	**0.022**	**0.553**	**0.328**	**0.161**	**0.297**	**0.203**	**0.278**	**0.094**	**0.276**
PAH (µg/kg)																									
2-Chloronaphthalene				6.12 U	7.2 U	6.11 U	6.26 U	6.45 U	6.46 U	6.63 U	6.65 U	6.2 U	7 U	6.91 U	7.86 U	6.7 U	5.76 U	6.88 U	7.37 U	7.51 U	7.49 U	7.49 U	7.92 U	8.16 U	7.48 U
2-Methylnaphthalene				6.12 U	7.2 U	6.11 U	6.26 U	6.45 U	6.46 U	6.63 U	6.65 U	6.2 U	7 U	6.91 U	6.19 J	6.7 U	5.76 U	**10.8**	**13.8**	**18.2**	6.92 J	**28**	**22.4**	**47.3**	**14.1**
Acenaphthene				6.12 U	7.2 U	6.11 U	6.26 U	6.45 U	6.46 U	1.87 J	6.65 U	6.2 U	7 U	1.14 J	**7.96**	6.7 U	5.76 U	**7.72**	**14.4**	**8.78**	4.51 J	**42**	**22.4**	**22.5**	**8.19**
Acenaphthylene				6.12 U	7.2 U	6.11 U	6.26 U	3.97 J	6.46 U	6.63 U	6.65 U	6.2 U	7 U	6.91 U	3.96 J	6.7 U	1.06 J	6.18 J	**11.6**	**18.4**	5.68 J	**14.1**	**27.6**	**40.2**	**18.9**
Anthracene				1.06 J	7.2 U	1.36 J	6.26 U	3.07 J	1.09 J	2.59 J	1.47 J	6.2 U	2.22 J	3.05 J	**13.6**	1.64 J	2.05 J	**23.6**	**32.9**	**24.6**	**12.3**	**142**	**131**	**61.5**	**25.8**
Benz(a)anthracene				6.12 U	7.2 U	1.51 J	1.36 J	**10.7**	6.46 U	5.21 J	1.34 J	6.2 U	1.97 J	3.8 J	**31.5**	6.7 U	2.92 J	**48.7**	**66**	**72.6**	**35.2**	**708**	**330**	**167**	**91.5**
Benzo(a)pyrene				6.12 U	7.2 U	6.11 U	6.26 U	**11.7**	6.46 U	2.53 J	6.65 U	6.2 U	7 U	1.77 J	**24.9**	6.7 U	2.1 J	**44.8**	**44.3**	**70.1**	**35**	**591**	**242**	**178**	**101**
Benzo(b)fluoranthene				1.16 J	1.88 J	1.66 J	1.9 J	**8.4**	0.862 J	3.07 J	1.95 J	1.19 J	1.65 J	3.21 J	**21.4**	1.18 J	2.44 J	**31.8**	**41.4**	**67.6**	**31.6**	**613**	**240**	**165**	**101**
Benzo(ghi)perylene				6.12 U	7.2 U	6.11 U	1.26 J	6.32 J	6.46 U	1.42 J	6.65 U	6.2 U	7 U	2.39 J	**15.3**	6.7 U	1.72 J	**23.4**	**23.3**	**45**	**19.1**	**329**	**127**	**116**	**64.3**
Benzo(k)fluoranthene				6.12 U	7.2 U	1.08 J	1.1 J	**9.64**	0.964 J	3.58 J	1.32 J	0.865 J	1.35 J	2.58 J	**23.4**	0.8 J	2.61 J	**36.4**	**42.2**	**70.5**	**34**	**555**	**221**	**159**	**78.2**
Chrysene				1.84 J	7.2 U	2.62 J	2.97 J	**13.9**	1.96 J	5.99 J	2.79 J	1.61 J	3.4 J	5.14 J	**33.1**	1.7 J	4.27 J	**49.2**	**79.7**	**88.3**	**42.5**	**698**	**344**	**198**	**102**
Dibenz(a,h)anthracene				6.12 U	7.2 U	6.11 U	6.26 U	2.16 J	6.46 U	6.63 U	6.65 U	6.2 U	7 U	1.32 J	4.99 J	6.7 U	5.76 U	5.62 J	6.94 J	**12.4**	7.04 J	**107**	**40**	**30.2**	**16**
Fluoranthene				2.44 J	2.84 J	3.4 J	3.28 J	**10.3**	2.24 J	**10**	4.65 J	1.95 J	6.5 J	**10.2**	**64.5**	2.63 J	**5.85**	**85.2**	**199**	**136**	**71.2**	**1380**	**704**	**321**	**171**
Fluorene				4.71 J	3.35 J	3.84 J	4.51 J	4.96 J	4.62 J	5.42 J	**6.99**	4.25 J	**7.39**	**9.54**	**12.5**	4.74 J	3.02 J	**18.1**	**24.6**	**19.6**	**11.8**	**61.5**	**36**	**38.6**	**21**
Indeno(1,2,3-cd)Pyrene				6.12 U	7.2 U	6.11 U	6.26 U	5.9 J	6.46 U	6.63 U	6.65 U	6.2 U	7 U	2.07 J	**11.1**	6.7 U	5.76 U	**20.3**	**21**	**37.7**	**17.9**	**396**	**128**	**116**	**63.5**
Naphthalene				1.1 J	1.01 J	1.04 J	0.9 J	1.65 J	0.95 J	2.13 J	1.41 J	6.2 U	1.75 J	2.26 J	**10.4**	1.47 J	1.78 J	**19.2**	**15**	**20.8**	**9.66**	**32.9**	**23**	**52.1**	**16.8**
Phenanthrene				3.34 J	2.73 J	2.91 J	3.73 J	6.28 J	2.79 J	6.5 J	6.54 J	2.35 J	**10.5**	**16.5**	**36.3**	3.14 J	3.7 J	**56**	**114**	**73.5**	**37.4**	**772**	**323**	**182**	**82.5**
Pyrene				2.05 J	3.14 J	3.41 J	3.18 J	**11**	2.27 J	**8.88**	4.01 J	2.01 J	5.62 J	**9.41**	**65.6**	2.81 J	**6.4**	**88.9**	**185**	**151**	**76.1**	**1110**	**636**	**347**	**179**
Sum PAH [3]	< 4,000	4,000 - 45,000	> 45,000	48.3	58.2	47.3	49.2	119.6	46.82	76	59.07	48.3	70	84.7	390.6	50.3	54.3	579	939	939	462	7583	3601	2245	1159
VOC (µg/kg)																									
Benzene	< 590	590-2,160	> 2,160	0.84 U	1 U	1 U	0.76 U	1.2 U	1.2 U	1.2 U	0.98 U	0.97 U	1.3 U	1 U	1.5 U	1.1 U	1 U	1.1 U	1.1 U	1.4 U	1.2 U	1.2 U	1.5 U	1.4 U	1.3 U
Ethylbenzene				0.84 U	1 U	1 U	0.76 U	1.2 U	1.2 U	1.2 U	0.98 U	0.97 U	1.3 U	1 U	1.5 U	1.1 U	1 U	1.1 U	1.1 U	1.4 U	1.2 U	1.2 U	1.5 U	1.4 U	1.3 U
o-Xylene				1.7 U	2 U	2.1 U	1.5 U	2.4 U	2.3 U	2.3 U	2 U	1.9 U	2.6 U	2.1 U	3.1 U	2.1 U	2.1 U	2.2 U	2.1 U	2.8 U	2.4 U	2.3 U	3 U	2.9 U	2.6 U
p/m-Xylene				1.7 U	2 U	2.1 U	1.5 U	2.4 U	2.3 U	2.3 U	2 U	1.9 U	2.6 U	2.1 U	3.1 U	2.1 U	2.1 U	2.2 U	2.1 U	2.8 U	2.4 U	2.3 U	3 U	2.9 U	2.6 U
Toluene				1.3 U	1.5 U	1.6 U	1.1 U	1.8 U	1.7 U	1.7 U	1.5 U	1.4 U	1.9 U	1.6 U	2.3 U	1.6 U	1.6 U	1.7 U	1.6 U	2.1 U	1.8 U	1.8 U	2.2 U	2.2 U	1.9 U
Sum BTEX [3]	< 960	960-5,900	> 5,900	3.2	3.8	3.9	2.8	4.5	4.4	4.4	3.7	3.6	4.9	3.9	5.8	4.0	3.9	4.2	4.0	5.3	4.5	4.4	5.6	5.4	4.9
PESTICIDES (µg/kg)																									
4,4'-DDD				0.305 U	0.169 U	0.306 U	0.312 U	0.332 U	0.33 U	0.334 U	0.338 U	**0.978**	0.35 U	**0.382**	0.382 U	0.343 U	0.303 U	**1.09**	**1.29**	**10.3**	**2.14**	**3.82**	**4.41**	**4.32**	**2.13**
4,4'-DDE				0.305 U	0.169 U	0.306 U	0.312 U	0.332 U	0.33 U	0.334 U	0.338 U	0.303 U	0.35 U	**0.379**	0.382 U	0.343 U	0.303 U	0.331 U	**0.98**	**5.14**	**1.55**	**2.87**	**4.38**	**5.46**	**2.14**
4,4'-DDT				0.305 U	0.169 U	0.306 U	0.312 U	0.332 U	0.33 U	0.334 U	0.338 U	0.303 U	0.35 U	0.348 U	0.382 U	0.343 U	0.303 U	0.331 U	0.363 U	**4.79**	**0.638**	**1.06**	**2.11**	**1.36**	**0.8**
Sum DDT,DDD,DDE [3]	< 3	3 - 30	> 30	0.458 U	0.254 U	0.459 U	0.468 U	0.498 U	0.495 U	0.501 U	0.507 U	1.281	0.525 U	0.935	0.573 U	0.515 U	0.455 U	1.42	2.45	20.2	4.33	7.75	10.90	11.14	5.1
Chlordane	< 3	3 - 36	> 36	15.2 U	8.46 U	15.3 U	15.6 U	16.6 U	16.5 U	16.7 U	16.9 U	15.2 U	17.5 U	17.4 U	19.1 U	17.2 U	15.2 U	16.6 U	18.2 U	19.2 U	18.6 U	19.5 U	19.3 U	20.5 U	19 U
Dieldrin	< 110	110 - 480	> 480	0.305 U	0.169 U	0.306 U	0.312 U	0.332 U	0.33 U	0.334 U	0.338 U	0.303 U	0.35 U	0.348 U	0.382 U	0.343 U	0.303 U	0.331 U	**0.49**	**1.48**	**0.897**	**1.34**	**2.16**	**1.61**	**0.52**
Mirex	< 1.4	1.4 - 14	> 14	0.305 U	0.169 U	0.306 U	0.312 U	0.332 U	0.33 U	0.334 U	0.338 U	0.303 U	0.35 U	**0.364**	0.382 U	0.343 U	0.303 U	0.331 U	**0.426**	**0.545**	0.372 U	0.39 U	**1.5**	**1.17**	**0.549**
PCB Aroclors (µg/kg)																									
Aroclor 1016				12.2 U	6.77 U	12.2 U	12.5 U	13.3 U	13.2 U	13.3 U	13.5 U	12.1 U	14 U	13.9 U	15.3 U	13.7 U	12.1 U	13.2 U	14.5 U	15.4 U	14.9 U	15.6 U	15.5 U	16.4 U	15.2 U
Aroclor 1221				12.2 U	6.77 U	12.2 U	12.5 U	13.3 U	13.2 U	13.3 U	13.5 U	12.1 U	14 U	13.9 U	15.3 U	13.7 U	12.1 U	13.2 U	14.5 U	15.4 U	14.9 U	15.6 U	15.5 U	16.4 U	15.2 U
Aroclor 1232				12.2 U	6.77 U	12.2 U	12.5 U	13.3 U	13.2 U	13.3 U	13.5 U	12.1 U	14 U	13.9 U	15.3 U	13.7 U	12.1 U	13.2 U	14.5 U	15.4 U	14.9 U	15.6 U	15.5 U	16.4 U	15.2 U
Aroclor 1242				12.2 U	6.77 U	12.2 U	12.5 U	13.3 U	13.2 U	13.3 U	13.5 U	12.1 U	14 U	13.9 U	15.3 U	13.7 U	12.1 U	13.2 U	**119**	**797**	**455**	**987**	**468**	**589**	**227**
Aroclor 1248				12.2 U	6.77 U	12.2 U	12.5 U	13.3 U	13.2 U	13.3 U	13.5 U	12.1 U	14 U	13.9 U	15.3 U	13.7 U	12.1 U	13.2 U	14.5 U	15.4 U	14.9 U	15.6 U	15.5 U	16.4 U	15.2 U
Aroclor 1254				12.2 U	6.77 U	12.2 U	12.5 U	13.3 U	13.2 U	13.3 U	13.5 U	12.1 U	14 U	13.9 U	15.3 U	13.7 U	12.1 U	13.2 U	**51.2**	**252**	**88**	**188**	**145**	**198**	**76.4**
Aroclor 1260				12.2 U	6.77 U	12.2 U	12.5 U	13.3 U	13.2 U	13.3 U	13.5 U	12.1 U	14 U	13.9 U	15.3 U	13.7 U	12.1 U	13.2 U	14.5 U	**167**	**33.9**	**70.5**	**70.3**	**100**	**40.4**
Sum Aroclors [3]	< 100	100-1,000	> 1,000	42.7 U	23.70 U	42.7 U	43.8 U	46.6 U	46.2 U	46.6 U	47.3 U	42.4 U	49 U	48.7 U	53.6 U	48.0 U	42.4 U	46.2 U	206	1247	607	1277	714	920	374

Legend:

"Bold" = Parameter was detected above quantitation limit

"U" = Parameter not detected at quantitation limit presented

"J" = Estimated value, below quantitation limit

Notes:

(1) Sample interval measured in feet from sediment-water interface.

(2) Sediment Quality Threshold Values (NYDEC TOGS 5.1.9, Table 2, November 2004).

(3) Non-detects assumed present at one-half the quantitation limit presented.

Field duplicates:

Sample VC-105-S1 is a field duplicate of VC-05-S1

Sample VC-112-S1 is a field duplicate of VC-12-S1

Sample VC-132-S1 is a field duplicate of VC-32-S1

Sample VC-145-S1 is a field duplicate of VC-45-S1

Sample VC-150-S1 is a field duplicate of VC-50-S1

TABLE 2B
SUMMARY OF SEDIMENT CHEMICAL ANALYTICAL DATA - PCB CONGENERS AND DIOXINS/FURANS
West Point Project

PARAMETER	Sample Location			VC-11-S1	VC-17-S1	VC-23-S1	VC-28-S1	VC-33-S1	VC-49-S1
	Sample Interval (feet) [1]			0 - 9.6	0 - 9.8	0 - 9.9	0 - 10	0 - 9.8	0 - 10
	Sampling Date			10/2/2012	9/28/2012	9/27/2012	9/27/2012	9/26/2012	9/26/2012
	Laboratory Sample No.			L1219937-01	L1219937-02	L1219937-03	L1219937-04	L1219937-05	L1219937-06
	Laboratory Sample No.			L1219944-01	L1219944-02	L1219944-03	L1219944-04	L1219944-05	L1219944-06
	NYSDEC Sediment Quality Threshold Values [2]								
	Class A	Class B	Class C						
PCB Congeners (µg/kg)									
Cl10-BZ#209				0.928 U	0.972 U	0.516 J	0.559 J	0.678 U	0.404 J
Cl2-BZ#8				**33**	**28.9**	**30.2**	**50.9**	**44.3**	**4.38**
Cl3-BZ#18				**99.1**	**103**	**125**	**192**	**183**	**32.4**
Cl3-BZ#28				**130**	**146**	**203**	**274**	**213**	**56.2**
Cl4-BZ#44				**24**	**29.8**	**33.5**	**45.4**	**29**	**23.5**
Cl4-BZ#49				**42.5**	**46.7**	**71.8**	**101**	**90.6**	**24.6**
Cl4-BZ#52				**56.2**	**59.6**	**89.6**	**127**	**110**	**38.4**
Cl4-BZ#66				**6.26**	**10.3**	**17.4**	**16.4**	**12.3**	**10.9**
Cl5-BZ#101				**10.9**	**15.1**	**27.5**	**26.7**	**19.1**	**13.4**
Cl5-BZ#105				**2.65**	**4.19**	**7.33**	**6.94**	**4.46**	**1.32**
Cl5-BZ#118				**6.9**	**9.62**	**18.4**	**16.3**	**11.8**	**7.04**
Cl5-BZ#87				**2.32**	**4.09**	**4.61**	**4.78**	**3.21**	**1.16**
Cl6-BZ#128				**0.986**	**2.29**	**4.69**	**3.14**	**1.83**	**1.03**
Cl6-BZ#138				**5.5**	**8.78**	**18.3**	**14.8**	**9.17**	**6.87**
Cl6-BZ#153				**2.84**	**4.55**	**10.4**	**7.62**	**4.34**	**5.3**
Cl7-BZ#170				**1.06**	**1.79**	**3.43**	**3.08**	**1.88**	**1.95**
Cl7-BZ#180				**1.22**	**1.77**	**4.34**	**3.92**	**2.43**	**2.57**
Cl7-BZ#183				0.928 U	0.972 U	0.89	0.784	0.514 J	0.652 J
Cl7-BZ#184				0.928 U	0.972 U	0.641 U	0.644 U	0.678 U	0.772 U
Cl7-BZ#187				**1.45**	**1.72**	**3.8**	**3.11**	**2.25**	**2.51**
Cl8-BZ#195				0.928 U	0.972 U	0.366 J	0.644 U	0.678 U	0.514 J
Cl9-BZ#206				0.62 J	0.8 J	**1.23**	**1.46**	**1.14**	**1.01**
Sum Congeners [3]	< 100	100-1,000	> 1,000	859	962	1353	1801	1491	473
DIOXIN/FURAN (pg/g)		TEF [4]							
2,3,7,8-TCDD		1		0.412 J	0.398 J	**0.933**	**1.37**	**1.14**	**2.3**
1,2,3,7,8-PeCDD		0.5		0.948 J	1.11 J	**2.86**	**3.93**	2.21 J	**3.13**
1,2,3,4,7,8-HxCDD		0.1		1.81 J	1.75 J	**6.18**	**9.46**	**5.25**	**5.85**
1,2,3,6,7,8-HxCDD		0.1		**12.9**	**11.7**	**35.7**	**49.6**	**26.9**	**35.9**
1,2,3,7,8,9-HxCDD		0.1		**6.49**	**6.46**	**20.7**	**26.5**	**15**	**21.5**
1,2,3,4,6,7,8-HpCDD		0.01		**223**	**166**	**700**	**951**	**581**	**558**
OCDD		0.001		**1420**	**990**	**4730** E	**7520** E	**4360** E	**4330** E
2,3,7,8-TCDF		0.1		**5.17**	**8.85**	**20.1**	**36.1**	**21.4**	**23.7**
1,2,3,7,8-PeCDF		0.05		0.706 J	1.08 J	**3.18**	**5.06**	**2.49**	**3.42**
2,3,4,7,8-PeCDF		0.5		2.28 J	**2.72**	**8.02**	**11.5**	**8.22**	**10.7**
1,2,3,4,7,8-HxCDF		0.1		**2.63**	2.02 J	**6.3**	**10.4**	**5.3**	**7.36**
1,2,3,6,7,8-HxCDF		0.1		2.12 J	1.66 J	**4.97**	**6.85**	**3.63**	**5.07**
2,3,4,6,7,8-HxCDF		0.1		1.87 J	1.68 J	**4.72**	**7.3**	**3.82**	**6.22**
1,2,3,7,8,9-HxCDF		0.1		0.149 U	0.09 U	0.119 U	0.521 U	0.155 U	0.142 U
1,2,3,4,6,7,8-HpCDF		0.01		**43.2**	**31.5**	**90.3**	**127**	**55.2**	**92.6**
1,2,3,4,7,8,9-HpCDF		0.01		1.55 J	1.19 J	**4.64**	**7.13**	**3.49**	**4.62**
OCDF		0.001		**60.1**	**41.2**	**159**	**243**	**102**	**139**
TEQ [5]	< 4.5	4.5 - 50	> 50	10	9	29	43	25	31

Legend:

"Bold" = Parameter was detected above quantitation limit

"U" = Parameter not detected at quantitation limit presented

"J" = Estimated value, below quantitation limit

"E" = Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

Notes:

(1) Sample interval measured in feet from sediment-water interface.

(2) Sediment Quality Threshold Values (NYDEC TOGS 5.1.9, Table 2, November 2004).

(3) Non-detects assumed present at one-half the quantitation limit presented. Sum of congeners multiplied by 2 to determine total PCB concentration.

(4) Toxicity Equivalency Factor (TEF) (NYSDEC TOGS 5.1.9, Appendix D, November 2004).

(5) The 2,3,78-TCDD Toxic Equivalency (TEQ) calculated by multiplying individual congener concentrations by its TEF and summing the products persuant to Appendix D of NYSDEC TOGS 5.1.9 (November 2004).
Non-detects assumed present at quantitation limit presented.

Figures

N

1

VC-L2 VC-L1 VC-L3

INSET

×RM 118

×RM 117

RM 116

VC-01

×RM 115

VC-03

RM 114

VC-02

×RM 113

RM 112

VC-04

×RM 111

2

VC-05

RM 110

×RM 109

RM 108

VC-06

RM 107

RM 106

VC-07

VC-08

RM 105

VC-09

RM 104

VC-10

SOURCES:

Bathymetric — NOAA Nautical Charts

LEGEND:

IN-WATER CABLE ROUTE CONCEPT (Subject to change)

×RM 103 — Hudson River Mile Marker

VC-01 — Sample Location

DATE: DECEMBER 2012

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WEST POINT TRANSMISSION

FIGURE 1

N

3

4

5

6

VC-11
VC-12
VC-13
VC-14
VC-15
VC-16
VC-17
VC-18
VC-19
VC-20
VC-21
VC-22
VC-23
VC-24
VC-25
VC-26
VC-27

RM 103
RM 102
RM 101
RM 100
RM 99
RM 98
RM 97
RM 96
RM 95
RM 94
RM 93
RM 92
RM 91
RM 90
RM 89
RM 88
RM 87
RM 86
RM 85
RM 84
RM 83
RM 82
RM 81
RM 80
RM 79

Uncharted Anchorage Ground

Anchorage 19-A

Malden-on-Hudson
Disposal Area Depths from survey of 1964
Green Flats
Barrytown
Ulster Landing
Tyler Pt
Goose I
Tivoli
Rhinecliff
Esopus Creek
Stony Creek
Saddle Bags
North Bay
South Bay
Magdalen Marsh
Sycamore Pt
Turkey Pt
Skillpot I
GLASCO
East Kingston
The Flat
Mills Pt
Clifton Pt
Astor Cove
Rutsen
Indian Kill
Norrie Yacht Basin
Indian Rock
Esopus
Sturgeon Pt
Ellerslie
Big Rock Pt
Jones I
Hemlock Pt
Prospect Hill
Esopus Meadows Pt
Cave Pt
Ulster Park
Dinsmore Pt
Staatsburg
Vanderburgh Cove
Landsman Kill
Black Creek
Bard Rock
HYDE PARK
East Par
Crum Elbow Creek
CRUM ELBOW
Rogers Pt
Rondout Creek

SAFETY AND SECURITY ZONE 165.169 (see note A)
NO-DISCHARGE ZONE (see note Z)
REGULATED NAVIGATION AREA 165.165 (see note)
KINGSTON RHINECLIFF FIXED BRIDGE TWO CHANNEL SPANS HOR CL 760 FT VERT CL 135 FT
ESOPUS MEADOWS Fl 2.5s 52ft 6M
R TOWERS (WGHQ) 920 kHz
TV TOWER
Cable Area

DATE: DECEMBER 2012

FIGURE 2

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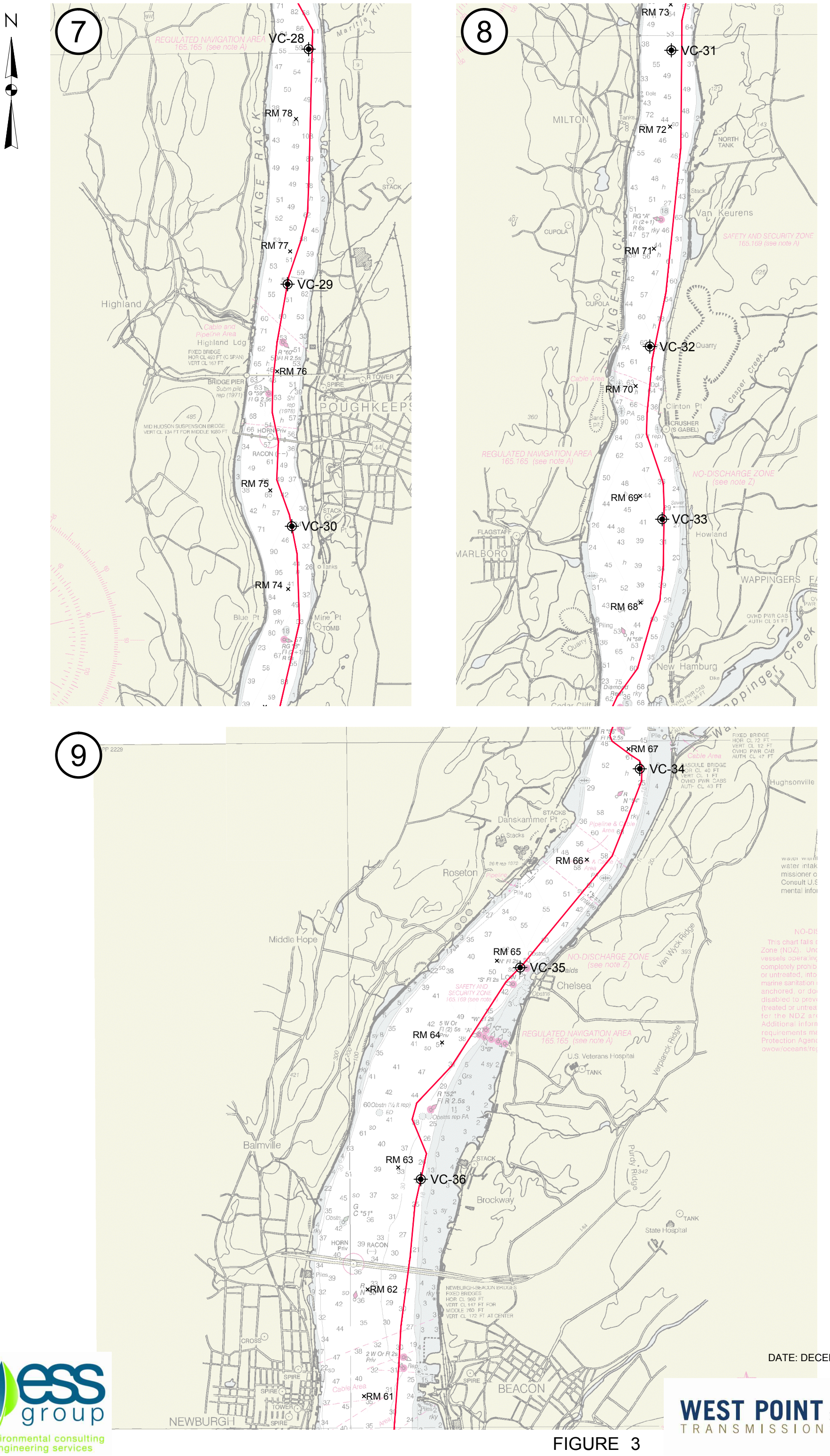
WEST POINT TRANSMISSION



DATE: DECEMBER 2012

FIGURE 3

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WEST POINT TRANSMISSION

N

10

VC-37
VC-38
VC-39
VC-40
VC-41
RM 60
RM 59
RM 58
RM 57
RM 56
RM 55
Dutchess Junction
Pollepel I
Storm King
Storm King Mt
Butter Hill
The Clove
Little Stony Pt
Target Pt
Plum Pt
Fishkill Cr
Denning Pt
Breakneck Ridge
Breakneck Pt

11

VC-42
VC-43
VC-44
VC-44a
VC-45
RM 54
RM 53
RM 52
RM 51
RM 50
RM 49
RM 48
WEST POINT
Garrison
Highland Falls
Sugarloaf Hill
Mystery Pt
Ft Montgomery
Manitou
Constitution I
Magazine Pt
Gees Pt
Duck I
Arden Brook
Storm King Hwy
Crows Nest Brook

12

VC-46
VC-47
VC-48
VC-49
VC-50
RM 47
RM 46
RM 45
RM 44
RM 43
RM 42
RM 41
Anthonys Nose
Bear Mountain
Iona I
Camp Smith
Jones Point
Dunderberg Mt
Peekskill Bay
PEEKSKILL
Tomkins Cove
Verplanck
Montrose
The Timp
Travis Pt
Charles Pt
Indian Point
Lake Meahagh
Popolopen Cr
Hessian Lake
Annsville Creek
Con Hook
Canada Hill
Mystery Pt

VC-L6
VC-L4
VC-L5
INSET

DATE: DECEMBER 2012

FIGURE 4

Appendix A

In-River Geotechnical Sediment Sampling and Analysis Plan (ESS, September 2012)

In-River Geotechnical Sediment Sampling and Analysis Plan

WEST POINT PROJECT

PREPARED FOR:

West Point Partners, LLC
c/o PowerBridge
501 Kings Highway East
Suite 300
Fairfield CT 06825

PREPARED BY:

ESS Group, Inc.
100 Fifth Avenue, 5th Floor
Waltham, Massachusetts 02451

Project No. W296-001.04

September 14, 2012

www.essgroup.com

IN-RIVER GEOTECHNICAL SEDIMENT SAMPLING AND ANALYSIS PLAN
West Point Project

Prepared For:

West Point Partners, LLC
c/o PowerBridge
501 Kings Highway East
Suite 300
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Prepared By:

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September 14, 2012

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FIGURES

1.0 PROJECT DESCRIPTION

In preparation for the New York State Article VII application and the USACE Individual Permit application for the West Point Project (the Project), this Sediment Sampling and Analysis Plan has been prepared to assess sediment conditions along the proposed submerged cable corridor within the Hudson River. The proposed cable route includes approximately 75 miles within the Hudson River between two landfall locations (Athens and Cortlandt, New York) (Figure 1). The anticipated cable installation method is jet-plow except for the areas adjacent to the landfalls, which will be dredged within temporary cofferdams to support horizontal directional drilling operations. It is anticipated that dredged material will be reused or disposed at an upland location. Any additional chemical characterization that may be necessary to support upland reuse/disposal will be completed at a later date.

This SAP is designed to outline the steps required to collect geotechnical information/data at various locations along the proposed cable route. Specifically, sediment samples will be obtained for bulk sediment physical and chemical analysis. This Geotechnical Field Program will be conducted in summer 2012 following the Project's Geophysical Field Program, to "ground-truth" geophysical data interpretations, and to gather physical and chemical data to be used in environmental assessments required for environmental regulatory permitting at the local, state, and federal levels. The findings of the geotechnical study will assist in evaluating the technical feasibility of the proposed cable route within the Hudson River. Benthic sampling will also occur concurrently with the geotechnical sampling; a Benthic Sampling Protocol has been prepared under separate cover.

2.0 PROJECT ORGANIZATION

ESS Group, Inc. (ESS), and the selected subcontractor will conduct this field investigation work. The subcontractor will be responsible for field operations (i.e., advancing vibracores) and establishing horizontal/vertical controls during the field program. ESS will be responsible for observing field activities; splitting, logging, and sampling cores; and coordinating all activities with the subcontractor and the selected analytical laboratory(ies).

Sediment samples for chemical and physical parameters will be analyzed by laboratories that are approved by the New York State Department of Health Environmental Laboratory Approval Program (NYSDOH ELAP).

3.0 GEOTECHNICAL FIELD INVESTIGATIONS

The geotechnical investigation will consist of collecting vibracores of shallow riverine sediment along the proposed cable route for field logging and laboratory analysis. The investigation will be conducted in accordance with the New York State Department of Environmental Conservation (NYSDEC) Division of Water's Technical & Operational Guidance Series (TOGS) 5.1.9 In-Water Riparian Management of Sediment and Dredge Material (TOGS 5.1.9, November 2004, revised 9/25/06).

Approximately 50 cores will be collected along the proposed jet-plow embedment area of the route. Three (3) cores will also be collected from each of the proposed cofferdam/dredge landfall locations, for a total of approximately 56 proposed cores. The volume and location of cores was determined based on a review of existing information and sediment data specific to the proposed cable corridor. Proposed core locations are shown on Figure 1.

The proposed cable installation depth is 15 feet below the authorized navigation channel depths when crossing or within a federally maintained navigation channel and to a target depth of cover of eight (8) feet below the present bottom outside the federally maintained navigation channel.

Target penetration depth for vibracores – The target core penetration depth will be approximately 15 feet below the authorized navigation channel depths inside the Federal Channel, and approximately ten (10) feet below the sediment-water interface outside the Federal Channel. The additional one foot of core

penetration, as specified in TOGS 5.1.9 to allow for characterization of material that would represent a new sediment surface, will not be performed because deeper sediments will not be exposed as a result of jet-plow installation or temporary dredging.

The sediment cores will be collected to the target penetration depth or until refusal is encountered. Refusal shall be defined as a penetration rate of less than one (1) foot in three (3) minutes. Should refusal occur prior to reaching the target depth, the coring device will be recovered, serviced, re-deployed at an offset station and a second attempt shall be made to reach the target depth. The core with greater penetration/recovery will be maintained for sub-sampling. One retry will also be attempted if sediment recovery from a core that achieves target depth is less than 80% of penetration. No more than three (3) cores will be collected at any location. Core locations will be named sequentially, as VC-01, VC-02, VC-03 or in some sensible modification thereof.

Upon recovery, each core will be capped at both ends by the subcontractor. When available, different color end caps will be used consistently on all vibracores to designate top from bottom. For example, top could be clear or blue and bottom could be red. Cores may be cut into smaller/manageable sections and capped accordingly at the discretion of ESS and the subcontractor. When sub-sampling the core later on, care will be taken not to include any sediment from this cut surface, or any plastic chips from the saw cut. Prior to cutting cores into more manageable sections, cores will be visually examined through the core liner to ensure that no core is cut in a manner that precludes individual horizons from being sampled separately.

The cores will be marked with identification information (i.e., core ID, date, top/bottom) using an indelible marker. The bottom section of a core will be designated as section #1 and section numbers will increase up the core. The markings will be located on both end caps (to denote top and bottom) and midway along the core barrel. If necessary, a piece of plastic sheeting or a plastic bag will be secured over the bottom cap of each section to protect the label. After labeling, the cores will be kept upright and cool until they are split, photo-logged, described, and sub-sampled at the core processing location.

Geotechnical borings may be advanced at a later date in the areas of the proposed landfalls, to provide samples for geotechnical physical analysis to be used by the Project engineers for cable system component and installation designs.

3.1 Vibracore System and Survey Control

Vibracores will be obtained from a vessel equipped with a vibracoring system capable of collecting standard 3.5-inch diameter cores up to 20 feet deep below the sediment-water interface. The subcontractor will be responsible for locating the vibracores to within three (3) meters of the target position, and will utilize the following survey and navigational controls:

- Horizontal survey control will be through Differential Global Positioning System DGPS, and will be referenced to New York East state plane coordinates (NAD83 datum) in feet. Vertical data will be referenced to NAVD88.
- Two independent DGPS systems will be applied, a primary and a secondary system. Independence between DGPS systems implies that both the base station segment and the survey platform segment are two independent systems. The secondary system will be available both as a backup for the primary system and for onboard quality assurance.
- Seabed elevation will be established at all sampling locations at the time of vibracore advancement.
- Survey data will be archived in digital format.

3.2 Vibracore Field Notes

Legible notes will be taken daily during vibracore operations by the ESS representative on the vessel in dedicated field notebooks, using an indelible writing instrument, and will include the following information:

- Date/time
- Author of field notes
- Vessel name, captain, and daily port
- Daily objective
- Names and roles of all other personnel on the vessel (including visitors)
- Descriptions of the wind and sea conditions, noting changes throughout the day and weather limitations
- Descriptions of the tide and current, noting changes throughout the day and limitations
- Arrival/departure times from port and at locations
- Core identification number
- Core location recorded electronically via DGPS
- Water depth at core locations
- Penetration length
- Recovery length
- Problems encountered during the coring, including results of additional coring attempts required due to poor penetration or recovery and which core attempt was retained for sub-sampling
- Visual description of the core material recovered (i.e., sand, silt, organics, etc.), including description of the material observed at the bottom of the core/core cutting shoe
- Summaries of communications with others
- Additional notes provided by the subcontractor, as applicable

Information in field books, logs and chains-of-custody should not be erased. Use single line cross-outs only and initial changes.

4.0 CORE PROCESSING AND LOGGING

Cores will be processed and logged either at a designated upland facility or on the coring vessel, depending on capacity. Details on core splitting, visual descriptions and logging methodologies are presented in the following sections. Any deviation from these methodologies should be discussed with the Project Manager and noted accordingly in field notes.

4.1 Core Processing Area

The core processing area will be under cover and protected from rain or water, be well-lit, have electric outlets and running water, and be of sufficient size to allow full lengths of at least one core to be laid out on the core processing surface. Sufficient storage must be available for unprocessed vibracores, coolers, boxes of sample jars, refrigerator(s), freezer, core processing tools, and other supplies. A broom, dust pan and trash container are also necessary.

If an upland area is used, the processing area should be on the first floor of a building proximal to a garage-type doorway where the core delivery vehicle can back up to the space, as cores are heavy. A cement floor is ideal. Unprocessed cores need to be stored vertically in refrigerators at temperatures of between 0 to 4 degrees C (32 to 39 degrees F). DOT-approved 55-gallon open-top drums should be available for disposal of excess sediments (see Section 5.10). A solid waste dumpster is also necessary on site for disposal of core liners (with sediment removed) and other solid waste generated during core processing.

4.2 Splitting of Cores

Each core will be split at the core processing facility and the previously labeled caps will be saved for photo logging purposes. Sediment within the cores will be assumed to be contaminated, and therefore dedicated disposable nitrile gloves will be worn at all times when handling samples. Gloves will be changed and properly disposed of as necessary to prevent cross contamination of separate laboratory samples. At a minimum, gloves shall be changed between each sampling location.

The lexan core liner will be cut lengthwise, on two opposing sides, with decontaminated power shears. Pre-cleaned flat, thin stainless steel blades of rectangular shape or stainless steel wire will be used to separate the core lengthwise into two half-cylinders, so that the center of the core is visible.

4.3 Photo Logging of Cores

The core will be photo logged. Photo logging will proceed as follows:

- A tape measure (divided into 0.10-foot units) will be placed next to the core for reference. The tape measure will be positioned so that the zero mark is located at the top of the core (i.e, the sediment-water interface) and oriented so it appears at the left side of the photographs.
- During photo logging, the core and the tape measure will not be moved. This will provide consistency in core measurements.
- The end caps from the core will be used as markers for the photo logging and will appear in each photograph of the core material.
- Each core photo will be taken in a uniform manner, with the two caps at the top of the photo and lined up with the upper and lower foot mark. The two halves of the core will be positioned at the bottom of the photo and the tape measure will be located between the two core halves. The photos will be taken for each foot of sediment as shown below:

4.4 Visual Examination of Cores and Core Logging

Each core will be visually examined and logged using a standard vibracore field logging sheet and a field book. The following information will be included on each core log:

1. Project number, site, and client/project name.
2. Core identification and collection date.
3. ESS field personnel on boat during coring.
4. Date/time of core logging/sub-sampling.
5. Core logging/sampling personnel (*ex situ*).
6. Depth of water during collection.
7. Core penetration length (to the nearest 0.1 foot).
8. Core recovery length (to the nearest 0.1 foot).
9. Unified Soils Classification System (USCS) classification.
10. Distinct changes in stratigraphy, including color, grain sizes, density, and organic material. Percent composition of materials within each core will be estimated, and noted as well.
11. The presence and size of larger gravels and clasts, and foreign man-made material such as metal, brick, etc. Photographs will be taken of any man-made materials.
12. Materials that may have been cut by the vibracore (i.e., cobbles, stones, etc.). Fresh fractured surfaces may be evidence of such vibracore cutting.
13. Any indications of contamination, including odors and visual staining.

4.5 Field Analysis of Cores

The shear strength of cohesive sediments will be measured in the field using a hand-held Torvane. The Torvane will be capable of measuring a stress range from zero to 2.5 kilograms per square centimeter (kg/cm^2). For each cohesive stratum measuring at least two (2) feet in thickness, Torvane readings will be taken every two (2) feet beginning near the top of the stratum, with a minimum of two (2) measurements per stratum.

5.0 SEDIMENT SAMPLING AND LABORATORY ANALYSIS

Sediment sampling, handling, storage/preservation, and analysis will be consistent with accepted industry standard field and laboratory procedures, and pursuant to the TOGS 5.1.9. Visual assessments of cores will be completed as detailed above in Section 4.4 of this plan. Following visual assessment and logging, each core will be sub-sampled for physical and chemical characteristics depending on sediment type and stratification observed in the cores.

If no stratification is observed throughout the length of a core, one (1) composite sample of the core will be selected for laboratory analysis. If the grain size, total organic carbon (TOC) or likelihood of contamination based on core lithology or known contamination history indicates that individual horizons within the core may be significantly different in sediment quality, each distinct stratum will be sampled separately.

If a core sample is observed to be comprised of greater than 90 percent sand and gravel, chemical laboratory analyses will not be performed, *provided the core was not collected from an area of known present or historical contamination*. Visual observations used to make the determination that a sample is greater than 90 percent sand and gravel will be documented by a laboratory grain size analysis. Samples from these locations will be collected and held at the laboratory for chemical analysis pending the results of the laboratory grain size analysis.

5.1 Physical Analysis

Each sample will be analyzed for the following physical parameters:

- Grain size and hydrometer (ASTM D 422)
- Moisture, Ash and Organic Matter (ASTM D 2974)
- Atterberg Limits (ASTM D 4318)
- Specific Gravity (ASTM D 854)

5.2 Chemical Analysis

Each sample will be analyzed for the parameters listed on the TOGS 5.1.9 Table 1 – revised 9/25/06 (presented on the next page), with the following exceptions:

- Samples will not be analyzed for mirex or chlordane.
- The six (6) samples with the greatest total PCB aroclor concentrations will also be analyzed for the NOAA list of PCB congeners and dioxins/furans.
- Grain size will be performed as indicated in Section 5.1, above.

Note: One additional sample container may be collected from each sample for archive purposes.

Table 1 - revised 9/25/06

Method Detection Limits and Suggested Analytical Methods

Parameter Sediment/Soil	EPA Method CLP\RCRA	Required Method Detection Limits (mg/kg, ppm)	No Appreciable Contamination (Threshold Values (mg/kg, ppm)
Metals			
Arsenic	Metals - EPA 6010B	3.0	<14
Cadmium	Metals - EPA 6010B	1.0	< 1.2
Copper+	Metals - EPA 6010B	5.0	< 33
Lead	Metals - EPA 6010B	2.0	< 33
Mercury *	Metals - EPA 6010B, 7470	0.2	< 0.17
PAH's and Petroleum-Related Compounds			
Benzene	EPA 8021, 8260B	0.0003	< 0.59
Total BTX+	EPA 8021, 8260B	0.0008	< 0.96
Total PAH	EPA 8270	0.33	< 4
Pesticides			
Sum of DDT+DDE+DDD *	EPA 8081A	0.0033	< 0.003
Mirex *+	EPA 8081A	0.189	< 0.0014
Chlordane +	EPA 8081A	0.0017	< 0.003
Dieldrin	EPA 8081A	0.0033	< 0.11
Chlorinated Hydrocarbons			
PCBs (sum of aroclors)	EPA 8082	0.033	< 0.1
Dioxin (Toxic Equivalency Total)+	EPA 1613B	0.000002	< 0.0000045
Physical Properties			
Grain Size	ASTM D41/D42		
Total Organic Carbon	EPA 9060A		

* Note: Threshold values lower than the Method Detection Limits are superseded by the Method Detection Limit.

+ Indicates case specific analytes.

5.3 Sample Containers

Appropriate pre-cleaned and unused sample containers will be provided by the laboratory(ies). Container quality will be visually checked prior to placing sediments into containers.

5.4 Sample Labeling

Laboratory-supplied pre-printed sample labels will be used to appropriately identify sample containers, and will be placed on the containers prior to filling with sediment. Samples collected during the geotechnical investigation will be labeled with a sample identification code. Sample labels will reference both the vibracore identification number (VC01, VC02, and so on) and sample number (i.e., VC01-S1, VC01-S2, VC01-S3, and so on). The following information will be recorded on each sample label, and sample labels will be checked twice to ensure accuracy and consistency with field records:

- Company name
- Project number
- Project/site name
- Sample identification code
- Sample description
- Analyses to be performed
- Preservation and storage method
- Date/time of sampling from the core
- Initials of person collecting the sample
- Pertinent comments, if applicable

5.5 Sample Collection and Handling

Any water which separates from the raw sediment sample during transport/storage (i.e., pore water) will be re-mixed with the solid components of the sediments prior to forming the composite samples. This pore water will not be decanted from the sediment sample.

Sediment adjacent to core cross-cuts or sediment adjacent to the liner walls that was disturbed by the lengthwise cutting process will not be sampled. Collection of plastic chips or shards that may be present as a result of the cutting process will be avoided. Sampling will be limited to the interior of the split core.

Samples will be homogenized prior to placement in sampling containers to ensure that representative samples are obtained. Homogenization will proceed by mixing the sample in a clean stainless steel bowl with a clean stainless steel spoon until the sample is visibly uniform in color and consistency. Only sampling equipment designed for environmental sampling will be used. Any water that has separated from the sediment will be mixed back into the sample. For chemical samples, material larger than one-quarter inch will be removed and noted, including twigs, leaves, shells, and gravel. For physical samples, all materials will be maintained in the sample unless it is too large for the sample container or misrepresents the sample (i.e., a composite would not statistically contain this piece of material). Materials that are too large or unrepresentative will be documented.

Homogenized sediment will be transferred into the appropriate clean containers using a stainless steel spoon and the containers closed securely. Care will be taken to prevent sediment from collecting on the exterior of sample containers. Sediment that accumulates on the container exterior and top, including jar threads, will be wiped off with a clean paper towel prior to securing the lid.

If chemical samples are to be frozen by the laboratory to suspend holding times, the jars will only be filled two-thirds to allow room for expansion of wet sediments and prevent container breakage.

Chemical sample containers will be placed in laboratory-supplied bubble-wrap bags and into an ice-packed cooler or refrigerator immediately after sampling. Large, heavy-duty zip-loc bags will be used to contain ice within coolers, which will prevent water from seeping into sample containers, damaging sample container labels and/or leaking from coolers during transport. Physical sample containers will be placed in coolers or other appropriate shipping containers, without ice.

5.6 Sample Tracking and Chain of Custody

The samples submitted for laboratory analysis will be preserved, stored, handled, and transmitted to the laboratory within allowable hold times. Laboratory-supplied chain-of-custody forms will be used to track sample custody for both physical and chemical samples. The chain-of-custody forms will be completed immediately after each sample is processed to minimize potential for errors. Chain-of–custody forms will be double-checked prior to releasing the samples, and laboratory personnel advised on the proper signature, date, and time of release information required. Chain of custody forms will include all information required by the laboratory including the following, at a minimum:

- Project name
- Project number
- Sample identification (e.g. Station location number)
- Company name
- Date (e.g. date = YYMMDD)
- Time (e.g. 4-digit, 24-hour)
- Sample matrix indicating type of sample (composite or grab)
- Initials of personnel performing the sampling
- Analyses to be performed and required method reporting limits
- Preservation technique
- Container type
- Number of containers for each sample
- Pertinent comments or special requests (e.g., archive, hold, freeze)
- Release signature with date and time

The samples will be delivered to the appropriate laboratories via overnight priority shipping or laboratory courier so that hold times will be met. If shipped overnight, the chains of custody will be placed in plastic bags and taped inside the cooler lid. Additionally, custody seals will be properly secured over the lid of each cooler (i.e. double-wrapped with filament tape). If transported via laboratory courier, chain of custody forms must be signed by the receiving laboratory staff with the date and time of release and do not need to be secured inside the coolers.

5.7 Sampling Equipment Decontamination Procedures

Every effort will be made to avoid cross-contamination of samples. Proper methods will be followed, including using dedicating sample equipment whenever possible. When equipment is to be reused, such as the re-use of plastic or stainless-steel spoons, trowels, or bowls, the following decontamination procedure will be followed before use with each new sample:

1. Distilled/deionized Water and Non-phosphate Detergent Rinse/Scrub – A non-phosphate laboratory-grade detergent will be added to distilled or deionized water and mixed in spray bottles per manufacturer's recommendations. The water/detergent solution will be sprayed onto equipment in quantities sufficient to promote formation of bubbles/foam when scrubbed with a scrub brush. Scrubbing shall continue until the absence of soil, sediment and foreign material on the equipment is confirmed visually.
2. Distilled/deionized Water Rinse – Distilled or deionized water will be either poured or sprayed over the equipment following the tap water/detergent rinse/scrub. The water rinse shall continue until the bubbles/foam generated from the water/detergent rinse/scrub has been purged from the equipment.
3. Isopropyl Alcohol Rinse – Following the water rinse, pesticide-grade isopropyl alcohol will be sprayed onto the equipment in sufficient quantities to coat the entire surface area of the equipment.
4. Distilled/deionized Water [Triple] Rinse – Following the isopropyl alcohol rinse, distilled or de-ionized water will be sprayed onto the equipment no fewer than three (3) times to coat the entire surface of the equipment.
5. Dry – Equipment shall be dried with clean paper towels or allowed to air dry (preferred, if time allows).
6. Storage – Once dry, to prevent contamination in between uses, items will be wrapped with dedicated sheets of tin foil and/or zip-lock plastic bags, or stored in an area not subject to cross-contamination from windblown sediment and/or water.

To keep transport to a minimum and prevent cross-contamination, the decontamination activities should occur in a designated area that is separate from, but in close proximity to, the sample handling location. Decontaminated sampling equipment will be stored in a location and manner that prevents cross-contamination. Storage and working areas, including the coolers, will be cleaned regularly.

5.8 Quality Assurance/Quality Control Program

The goal of the sampling strategies presented in this SSP is to provide sediment data which are accurate, representative and legally defensible. The Quality Assurance/Quality Control (QA/QC) measures in sampling sediments to be employed will include: use of proper containers and appropriate methods of sample collection and preservation; providing strict sample identification and chain-of-custody documentation; and decontamination and cross-contamination prevention procedures.

The NYSDEC Analytical Services Protocol (ASP), dated June 2000, provides the in-laboratory QA/QC requirements that will be utilized for this Project. Only ELAP-certified laboratories that will perform the appropriate laboratory QA/QC procedures will be used for this project. Additionally, if it is suspected that data may be subject to challenge, data will be reported via ASP Category B deliverables. Otherwise, at least 25 percent of samples will be reported as ASP Category B deliverables.

In addition to the QA/QC procedures described above, the following QA/QC sampling protocol, from Appendix C of the TOGS 5.1.9, will be followed for this geotechnical field program:

Table C-1 QC SAMPLES FOR SEDIMENTS			
Sample Type	**Purpose**	**Collection**	**Documentation**
Duplicate	Check laboratory and field procedures	1 sample per week or 10% of all field samples, whichever is greater	Assign two separate sample numbers, submit blind to the lab
Equipment (Rinseate) Blank	Check field decontamination procedures	Collect when sampling equipment is decontaminated and reused in the field.	Assign separate sample number
Matrix Spike and Matrix Spike Duplicate (MS/MSD)*	Required by laboratory protocols.	1 sample per twenty sediment samples	Assign both samples the same sample number. Indicate MS/MSD on chain-of-custody form.

*This is not necessary with PCB congener method or high resolution pesticide method or dioxin/furan analyses.

Table C-1 above, will be followed with the following conditions:

- Duplicate samples will not be counted as “field samples” or “sediment samples” for the purposes of calculating frequency of Duplicate and MS/MSD sample collection.
- Field duplicate and MS/MSD samples will be collected from cores/strata which are observed in the field to contain greater than 10% fines (silt/clay) (i.e., less than 90% sand).
- Field duplicate samples will be analyzed for the same chemical parameters as the primary sample.
- MS/MSD samples will be analyzed for the same chemical parameters as the primary sample except PCB congeners, pesticides and dioxin/furans are not required.
- Field duplicate and MS/MSD samples will not be analyzed for physical parameters.
- Equipment (Rinseate) Blank: analyte-free, laboratory-supplied deionized water will be used to rinse clean sampling equipment and will be collected into sample containers after sampling and completion of decontamination. One rinseate blank will be collected early in the sampling program and submitted to the laboratory on a separate chain-of-custody. The rinseate blank results will be evaluated by the Project Manager as soon as the results are available, and corrective action taken if warranted by the results.
- Rinseate Blank analysis will include all of the chemical parameters specified in this plan.

5.9 Archived Sediments

ESS will request that the chemical analytical laboratory freeze/archive, for one year, any additional sample aliquots collected for archive purposes and/ or any extra sediments remaining in sample containers following the requested analyses.

5.10 Excess Sediment Management

If an upland location is utilized for core processing/sampling, excess sediment remaining after sample collection will be transferred to DOT-approved 55-gallon open-top drums for temporary storage at the sample processing location. This sediment will be properly managed based on its chemical disposition.

6.0 NOTIFICATIONS

A "Coast Guard Sector New York Request for Marine Activity Approval" form shall be completed and filed with US Coast Guard Sector New York Waterways Management at least 10 business days prior to the start of field operations. This form is required to be submitted when sampling operations will occur:

1. Within any charted or Federal Channel;

2. Outside of the Pierhead Line on the East and Hudson Rivers, Upper New York Bay, and The Narrows; or

3. Within the waters of the western Long Island Sound approach to NY Harbor.

The completed form (version 14 May 2012) is filed with Mr. Jeff Yunker via email to Jeff.M.Yunker@uscg.mil or fax to (718) 354-4190 USCG notification, review and approval will generally take a minimum of 5 business days. Authorization to proceed will not be given until five (5) days after Coast Guard approval is granted. This timeline also applies to any revisions to an approved project.

Requests for Notice to Mariners for sampling operations outside of the areas listed above must be faxed to 617.223.8073 or emailed to LNM@uscg.mil by Tuesday for Thursday publication.

Appendix B

Vibracore Observation Logs

Project: West Point Project
Site: Hudson River, New York
Date: 9/28/12 (Cored), 10/3/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-L1**
Location: Northing: 1244673
Easting: 675909
Penetration/Recovery(ft.): 15.0 / 12.2
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-L1-S1	Non-Cohesive		Moist, medium dense, light brown to olive gray FINE SAND, with occasional pockets/seams of organic material and occasional pockets/seams of olive gray silty sand	SM	0.7	87.0	12.3	23	0.8
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/28/12 (Cored), 10/2/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-L2**
Location: Northing: 1244673
Easting: 675873
Penetration/Recovery(ft.): 16.2 / 13.8
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-L2-S1	Non-Cohesive		Moist, medium dense, olive grey FINE SAND, with occasional seams of olive gray clay	SP-SM	0	90.1	9.9	24	0.8
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/28/12 (Cored), 10/2/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-L3**
Location: Northing: 1244652
Easting: 675867
Penetration/Recovery(ft.): 15.2 / 12.1
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-L3-S1	Non-Cohesive		Moist, medium dense, olive grey FINE SAND, with occasional pockets of woody organic material (2.6' - 3.2') and occasional pockets of olive grey silty clay	SM	0	82.4	17.6	27	1.1
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/28/12 (Cored), 10/2/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 3.5" Plastic Liner
ESS Job No.: W296-001.04

Core : **VC-01**
Location: Northing: 1244197
Easting: 675760
Penetration/Recovery(ft.): 5.9 / 5.1
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-01-S1	Non-Cohesive		Moist, medium dense, light brown to olive grey COARSE TO FINE SAND (0-0.7' no sediment and at 1.9' pocket of light brown silty clay)	SM	1.2	81.9	16.9	23	1.2
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/28/12 (Cored), 10/2/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-02**
Location: Northing: 1237394
Easting: 668109
Penetration/Recovery(ft.): 9.6 / 5.4
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	**Geotechnical Laboratory Data**					
0	VC-02-S1	Non-Cohesive		Moist, medium dense, light brown, MEDIUM TO FINE SAND with a seam of shell fragments at 2.0'	SP-SM	0	89.5	10.5	28	0.5
4	VC-02-S2	Non-Cohesive		Moist, medium dense, well graded COBBLES/GRAVEL/COARSE SAND with trace light grey clay	GW*	NM	NM	NM	NM	NM

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:
*Based on field description

Project: West Point Project
Site: Hudson River, New York
Date: 9/27/12 (Cored), 10/2/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-03**
Location: Northing: 1237572
Easting: 667834
Penetration/Recovery(ft.): 12.1 / 8.9
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations / Geotechnical Laboratory Data						
0	VC-03-S1	3.6		Moist, medium stiff, olive grey, SILTY CLAY, with occasional pockets/layers of organic material	MH	0	7.1	92.9	54	4.4
1										
2										
3	VC-03-S2	Non-Cohesive		Moist, medium dense, well-graded COBBLE/GRAVEL/COARSE SAND with light grey SILTY CLAY between 6.7 - 7.1	GW*	NM	NM	NM	NM	NM
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:
*Based on field observation

Project: West Point Project
Site: Hudson River, New York
Date: 9/27/12 (Cored), 10/2/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-04**
Location: Northing: 1226841
Easting: 667395
Penetration/Recovery(ft.): 15.9 / 13.3
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-04-S1	Non-Cohesive		Moist, medium dense, olive grey, MEDIUM TO FINE SAND, with frequent interbedded seams/layers of olive grey SILTY CLAY and with frequent interbedded layers/seams of woody organic material	SM	0	78.7	21.3	38	2.6
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/27/12 (Cored), 10/2/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-05**
Location: Northing: 1219131
Easting: 662708
Penetration/Recovery(ft.): 15.6 / 14.8
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-05-S1	Non-Cohesive		Moist, medium dense, olive grey, MEDIUM TO FINE SAND (small cobble sized rock at 8.2')	SM	0	83.2	16.8	24	0.8
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/27/12 (Cored), 10/2/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-06**
Location: Northing: 1209935
Easting: 656481
Penetration/Recovery(ft.): 11.5 / 8.9
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-06-S1	Non-Cohesive		Moist, medium dense, olive grey, FINE SAND with occasional interbedded seams of olive grey silty clay and with occasional pockets of organic material	SM	0.1	83.8	16.1	32	2.1
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/27/12 (Cored), 10/2/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-07**
Location: Northing: 1201103
Easting: 650976
Penetration/Recovery(ft.): 15.7 / 12.5
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-07-S1	Non-Cohesive		Moist, medium dense, olive grey, FINE SAND with occasional pockets of organic material (1.9' a seam of olive grey silty clay)	SM	0	79.8	20.2	29	0.9
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/27/12 (Cored), 10/2/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-08**
Location: Northing: 1200314
Easting: 652378
Penetration/Recovery(ft.): 15.5 / 12.2
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-08-S1	Non-Cohesive		Moist, medium dense, olive grey, FINE SAND with frequent pockets/seams of woody organic material and at 2.2' a seam of olive grey silty clay	SM	0	81.4	18.6	35	1.7
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/27/12 (Cored), 10/2/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-09**
Location: Northing: 1192146
Easting: 647353
Penetration/Recovery(ft.): 11.7 / 8.8
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-09-S1	3.2		Moist, soft, olive grey SILTY CLAY, with pockets of shell fragments and seams of fine sand and organic deposits, 7.8 - 8.1 cobble	CL	1.1	23.5	75.4	43	3
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/27/12 (Cored), 10/2/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-10**
Location: Northing: 1190149
Easting: 649977
Penetration/Recovery(ft.): 16.0 / 13.8
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	**Geotechnical Laboratory Data**					
0	VC-10-S1	1.3		Moist, soft, SILTY FINE SAND, with layers/seams of organics and silty clay, shell fragments between 0 - 1.5 and wood fragments at 1.9 and 3.7	SM	0	83.2	16.8	46	2
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/27/12 (Cored), 10/2/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-11**
Location: Northing: 1181921
Easting: 647958
Penetration/Recovery(ft.): 13.2 / 9.6
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-11-S1	Non-Cohesive		Moist, medium dense, olive grey FINE SAND with frequent interbedded seams of olive grey silty clay	SM	0	64.1	35.9	34	1.4
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/26/12 (Cored), 9/28/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-12**
Location: Northing: 1178657
Easting: 647948
Penetration/Recovery(ft.): 14.5 / 9.6
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-12-S1	Non-Cohesive		Moist, medium dense, olive grey, MEDIUM SAND with pockets of woody organic matter at 3.4, 3.8, 5.8, and 6.1 and dense black organic matter at 8.5 and 8.9	SM	2.9	89.9	13.2	25	0.9
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/26/12 (Cored), 9/28/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-13**
Location: Northing: 1171702
Easting: 646879
Penetration/Recovery(ft.): 15.6 / 12.9
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-13-S1	Non-Cohesive		Moist, medium dense, olive grey, MEDIUM SAND with a pocket of olive grey clay at 2.2, a seam of black organic material at 4.1, a pocket of black organic material at 5.5, and a pocket of woody organic material at 9.2	SM	0	87	13	26	0.8
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/26/12 (Cored), 9/28/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-14**
Location: Northing: 1164961
Easting: 646165
Penetration/Recovery(ft.): 16.1 / 13.3
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
Field Observations					Geotechnical Laboratory Data					
0	VC-14-S1	Non-Cohesive		Moist, medium dense, olive grey, MEDIUM SAND, with seams of dark gray organic material at 6.3, 6.3, 7.0, 7.3, and 7.9, and pockets of wood at 9.2 and 9.3	SM	0	87.7	12.3	22	0.8
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/26/12 (Cored), 9/28/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-15**
Location: Northing: 1163651
Easting: 646362
Penetration/Recovery(ft.): 15.3 / 13.8
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Field Observations: Sample Number	Field Observations: Field Shear Strength (PSI)	Field Observations: Sediment Log	Field Observations: Materials Description	Geotechnical Laboratory Data: ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
0	VC-15-S1	Non-Cohesive		Moist, medium dense, olive grey, MEDIUM SAND, with woody organic material between 0 - 2.1 and 7.5 - 7.7	SP-SM	0	91.6	8.4	25	1.7
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/26/12 (Cored), 9/28/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-16**
Location: Northing: 1161381
Easting: 647035
Penetration/Recovery(ft.): 15.7 / 11.8
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-16-S1	Non-Cohesive		Moist, medium dense, olive grey, SILTY FINE SAND, with frequent interbedded seams/layers of woody organic material (5.3 - 6.7, 6.9 - 7.6, and 9.5) and olive grey clay (6.8 and 8.1 - 9.3)	SM	0	73	27	85	7.5
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/26/12 (Cored), 9/28/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-17**
Location: Northing: 1151213
Easting: 645061
Penetration/Recovery(ft.): 15.9 / 13.0
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-17-S1	Non-Cohesive		Moist, medium dense, olive grey, FINE SAND, with frequent interbedded pockets and seams/layers of organic material also between 5.0 - 7.1 fine sand with little clay	SM	0.3	81.2	18.5	43	3.9
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/26/12 (Cored), 10/1/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-18**
Location: Northing: 1140808
Easting: 643231
Penetration/Recovery(ft.): 16.1 / 13.8
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Field Observations: Sample Number	Field Observations: Field Shear Strength (PSI)	Field Observations: Sediment Log	Field Observations: Materials Description	Geotechnical Laboratory Data: ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
0	VC-18-S1	1.4		Moist, soft, olive grey, SILTY CLAY with frequent interbedded seams/layers of organic material and with frequent interbedded layers of dark grey fine sand	ML	0	23.3	76.7	60	4.9
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/26/12 (Cored), 10/1/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-19**
Location: Northing: 1133696
Easting: 642326
Penetration/Recovery(ft.): 15.9 / 13.5
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-19-S1	1.4		Moist, soft, olive grey, SILTY CLAY with frequent interbedded seams of dark grey fine sand and with occasional pockets of woody organic material	ML	0	15	85	34	3.2
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/26/12 (Cored), 10/1/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-20**
Location: Northing: 1125333
Easting: 640640
Penetration/Recovery(ft.): 16.9 / 15.0
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-20-S1	1.4		Moist, soft, olive grey, SILTY CLAY with frequent interbedded seams of dark gray fine sand, pocket of woody organic material at 8.2' and dark grey medium sand between 0 - 2.1	CL	0	38	62	39	2.2
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/26/12 (Cored), 10/1/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-21**
Location: Northing: 1120131
Easting: 639308
Penetration/Recovery(ft.): 16.7 / 13.3
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-21-S1	1.4		Moist, soft, olive grey, SILTY CLAY with frequent, interbedded seams of dark grey medium sand and with occasional pockets of woody organic material	CH	0	43.9	56.1	63	3
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/25/12 (Cored), 9/27/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-22**
Location: Northing: 1114899
Easting: 641217
Penetration/Recovery(ft.): 14.9 / 12.0
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
		Field Observations			Geotechnical Laboratory Data					
0	VC-22-S1	1.1		Moist, soft, olive grey, SILTY CLAY with frequent interbedded seams of dark fine sand and frequent interbedded seams/layers of woody organic material	ML	0	41.3	58.7	57	4.6
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/25/12 (Cored), 9/27/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-23**
Location: Northing: 1110874
Easting: 644089
Penetration/Recovery(ft.): 15.4 / 13.2
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-23-S1	1.1		Moist, soft, olive grey, SILTY CLAY, with seams and layers of woody organics and silty sandy clay	ML	0	20.7	79.3	57	3.4
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/25/12 (Cored), 9/27/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-24**
Location: Northing: 1102695
Easting: 643267
Penetration/Recovery(ft.): 16.0 / 13.9
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-24-S1	2.8		Moist, soft, olive grey, SILTY CLAY with frequent interbedded seams of dark gray fine sand, pocket of woody organic material at 8.2' and dark grey medium sand between 0 - 2.1	MH	0	12.3	87.7	63	4.4
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/25/12 (Cored), 9/28/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-25**
Location: Northing: 1092977
Easting: 642225
Penetration/Recovery(ft.): 13.3 / 16.4
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	**Geotechnical Laboratory Data**					
0	VC-25-S1	1.1		Moist, soft, olive grey, SILTY CLAY, with lenses of silty sand and organics	ML	0.2	33.3	66.5	55	2.4
7	VC-25-S2	Non-Cohesive		Moist, dense, olive grey, SILTY SAND, with seams and layers of silty clay	SM	2.4	66.5	31.1	34	1.2
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/25/12 (Cored), 9/27/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-26**
Location: Northing: 1082360
Easting: 643173
Penetration/Recovery(ft.): 15.3 / 13.8
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-26-S1	1.1		Moist, soft, olive grey, SILTY CLAY with a seam of woody organic material at 4.0 and a gap in the core between 4.9 - 5.1	SM	0	69.8	30.2	38	1.9
6	VC-26-S2	Non-Cohesive		Moist, medium dense, dark grey, FINE SAND with frequent interbedded seams/layers of olive grey silty clay and layers of woody organic material at 9.4 and 9.8	MH	0	6.9	93.1	72	5.4
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/25/12 (Cored), 9/27/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-27**
Location: Northing: 1071984
Easting: 641063
Penetration/Recovery(ft.): 15.4 / 13.8
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Field Observations: Sample Number	Field Observations: Field Shear Strength (PSI)	Field Observations: Sediment Log	Field Observations: Materials Description	Geotechnical Laboratory Data: ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
0	VC-27-S1	1.4		Moist, soft, olive grey, SILTY CLAY with a pocket of shell hash at 9.1	CH	0	1.2	98.8	76	5.4
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/25/12 (Cored), 9/27/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-28**
Location: Northing: 1063149
Easting: 645203
Penetration/Recovery(ft.): 15.2 / 13.8
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-28-S1	1.8		Moist, soft, olive grey, SILTY CLAY with seams and layers of sandy silty clay	CH	0	4.5	95.5	68	5.5
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/24/12 (Cored), 9/27/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-29**
Location: Northing: 1052720
Easting: 644270
Penetration/Recovery(ft.): 16.0 / 13.0
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-29-S1	1.1		Moist, soft, olive grey, SILTY CLAY with trace fine sand and frequent interbedded seams of dark grey fine sand and a pocket of shell hash at 7.3	CH	0	9.3	90.7	74	4.3
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/24/12 (Cored), 9/27/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-30**
Location: Northing: 1041980
Easting: 644458
Penetration/Recovery(ft.): 16.6 / 14.5
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-30-S1	1.1		Moist, soft, olive grey, SILTY CLAY with interbedded silty sand seams	CH	0	11	89	67	2.8
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/24/12 (Cored), 9/27/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-31**
Location: Northing: 1031931
Easting: 643291
Penetration/Recovery(ft.): 15.5 / 14.5
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-31-S1	1.3		Moist, soft, olive grey, SILTY CLAY with seams/layers of sand, shell hash between 6.0 and 10.1, voids due to settling between 0 - 0.5 and 5 - 5.4	CH	1.8	11.6	86.6	62	4.5
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/24/12 (Cored), 9/27/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-32**
Location: Northing: 1018788
Easting: 642336
Penetration/Recovery(ft.): 16.1 / 15.0
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-32-S1	1.1		Moist, soft, olive grey, SILTY CLAY, with a pocket of woody organic material at 5.5 and frequent interbedded seams of dark grey fine sand between 8.2 - 9.5	CH	0	3.8	96.2	67	6.4
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/24/12 (Cored), 9/26/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-33**
Location: Northing: 1011125
Easting: 642885
Penetration/Recovery(ft.): 16.0 / 13.8
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-33-S1	1.1		Moist, soft, olive grey, SILTY CLAY with lenses of organic material at 1.5 and 2.6 - 2.7	CH	0	5.9	94.1	68	3.7
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/24/12 (Cored), 9/27/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-34**
Location: Northing: 1000994
Easting: 641889
Penetration/Recovery(ft.): 15.5 / 15.8
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-34-S1	1.3		Moist, soft, olive grey, SILTY CLAY with a gap in core between 4.5 - 5.0, pockets of shell fragments between 5.6 and 6.0, a seam of shell fragments at 7.9 and shell hash between 8.2 - 11.0	CH	0.7	7.6	91.7	64	2.8
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/24/12 (Cored), 9/27/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-35**
Location: Northing: 992175
Easting: 636584
Penetration/Recovery(ft.): 14.50 / 13.4
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-35-S1	1.1		Moist, soft, olive grey, SILTY CLAY, with dark and light grey seams/layers of silty sand	CH	0	2	98	87	4.2
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/23/12 (Cored), 9/26/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-36**
Location: Northing: 982783
Easting: 632176
Penetration/Recovery(ft.): 13.7 / 12.4
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-36-S1	3.1		Moist, soft, olive grey, CLAY, with trace shell fragments at 4.1, 5 - 7 and 8 - 10, woody organic fragments 0 -0.6 and a pocket of organic material at 1.7	CH	0	1.7	98.3	59	2.8
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/23/12 (Cored), 9/26/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-37**
Location: Northing: 971060
Easting: 630949
Penetration/Recovery(ft.): 15.2 / 12.9
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-37-S1	1.1		Moist, soft, olive grey, SILTY CLAY with seams/layers of light brown/yellow orange clay and shell fragments scattered between 7 - 8.5	CH	0	7.1	92.9	75	2.5
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/23/12 (Cored), 9/26/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-38**
Location: Northing: 965892
Easting: 630564
Penetration/Recovery(ft.): 16.7 / 12.8
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-38-S1	1.1		Moist, soft, olive grey, CLAY, interbedded with layers/seams of silty, sandy clay with a lense of wood at 1.2', organic fragment at 9.8 and a void from setting between 5.0 - 5.4	CH	0.4	15.6	84	63	3.2
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/23/12 (Cored), 9/26/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-39**
Location: Northing: 961752
Easting: 630552
Penetration/Recovery(ft.): 12.7 / 11.0
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-39-S1	2.1		Moist, soft, olive grey, SILTY CLAY, with a pocket of woody organic material at 1.6	MH	0	6.6	93.4	68	3.9
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/23/12 (Cored), 9/26/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-40**
Location: Northing: 952216
Easting: 632547
Penetration/Recovery(ft.): 13.1 / 11.0
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-40-S1	1.1		Moist, soft, olive grey, SILTY CLAY with trace organic matter and frequent interbedded seams of organic matter	CH	0	12.6	87.4	77	3.1
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/23/12 (Cored), 9/26/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-41**
Location: Northing: 943340
Easting: 636447
Penetration/Recovery(ft.): 15.0 / 13.9
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-41-S1	11.5		Moist, soft, olive grey, SILTY CLAY with frequent interbedded seams of dark grey silty sand and a large piece of gravel at 1.9	CH	0	6.2	93.8	72	2.3
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/23/12 (Cored), 9/26/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-42**
Location: Northing: 938445
Easting: 639187
Penetration/Recovery(ft.): 16.9 / 16.7
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-42-S1	1.1		Moist, soft, olive grey CLAY, interbedded with lenses of fine sand, dark grey organic material/glass 0 - 0.6, and a pocket of woody organic material between 1.0 - 1.2	CH	0	8.1	91.9	80	5.1
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/23/12 (Cored), 9/26/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-43**
Location: Northing: 935098
Easting: 642549
Penetration/Recovery(ft.): 15.6 / 17.2
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-43-S1	1.7		Moist, soft, olive grey SILTY CLAY with frequent interbedded seams of dark grey silty clay, shell hash at 4.9, and a large gravel sizes piece of rock at 9.1 and 9.4	CH	0	2.9	97.1	74	2.8
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/22/12 (Cored), 9/25/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-44a**
Location: Northing: 924108
Easting: 641595
Penetration/Recovery(ft.): 20* / 19.9
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	**Geotechnical Laboratory Data**					
0	VC-44a-S1	1.2		Moist, soft, olive grey SILTY CLAY with frequent interbedded seams/layers of dark grey fine sand with a layer of organic material (leaf/roots) at 4.1 and a seam of organic material (leaf/roots) at 7.9	ML	0	38	62	64	3.3
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:
*Penetrometer malfunction, penetration estimated at 20 feet

Project: West Point Project
Site: Hudson River, New York
Date: 9/22/12 (Cored), 9/25/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-45**
Location: Northing: 915286
Easting: 640319
Penetration/Recovery(ft.): 15.9 / 14.0
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	**Geotechnical Laboratory Data**					
0	VC-45-S1	1.4		Moist, soft, olive grey, SILTY CLAY with interbedded seams/layers of dark grey silty clay with a seam of dark grey silty fine sand and/or clay at 7.3 and a few shell fragments at 9.3	CH	0	6.2	93.8	82	3.6
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/22/12 (Cored), 9/26/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-46**
Location: Northing: 907825
Easting: 634108
Penetration/Recovery(ft.): 13.4 / 7.5
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	**Geotechnical Laboratory Data**					
0	VC-46-S1	0.7		Moist, soft, dark grey SILTY CLAY with frequent shell pockets	CH	0	4.7	95.3	120	4.6
1										
2	VC-46-S2	1.4		Moist, soft, olive grey, SILTY CLAY	CH	0	2.5	97.5	73	3.1
3										
4	VC-46-S3	0.7		Moist, soft, olive grey, SILTY CLAY with shell hash/cobble	SC	23.7	36	40.3	68	2.8
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/22/12 (Cored), 9/26/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-47**
Location: Northing: 902600
Easting: 636138
Penetration/Recovery(ft.): 16.0 / 9.5
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-47-S1	1.0		Wet/moist, soft, olive grey, CLAY with trace silt, with dark grey seams interbedded between 2.5 and 3.5 with a void space at 4.6 and dense clay between 4.8 - 9.5	CH	0	1.2	98.8	77	4.3
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/22/12 (Cored), 9/25/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-48**
Location: Northing: 891015
Easting: 640267
Penetration/Recovery(ft.): 15.8 / 11.0
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-48-S1	1.0		Moist, soft, olive grey, CLAY with dark grey mottled layers from 0.5 - 2.3, frequent shell fragments and whole shells from 3 - 9.3, wood (lumber) fragment at 1	CH	1.9	3.4	94.7	93	3.2
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/21/12 (Cored), 9/26/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-49**
Location: Northing: 888841
Easting: 639194
Penetration/Recovery(ft.): 17.0 / 14.8
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	**Geotechnical Laboratory Data**					
0	VC-49-S1	1.1		Moist, soft, olive grey, SILTY CLAY with frequent interbedded seams/layers of dark grey silty clay and a pocket of shell hash at 4.8	MH	0	4.7	95.3	95	3.6
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/20/12 (Cored), 9/20/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-50**
Location: Northing: 887704
Easting: 639176
Penetration/Recovery(ft.): 11.0 / 8.6
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: J. Wiggin

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-50-S1	1.0		Moist, soft, olive grey, SILTY CLAY possible slag or other material at 2.5, seams of dark grey from 0.5 - 1.0	CH	0	5	95	100	4.3
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/21/12 (Cored), 9/25/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-L4**
Location: Northing: 884768
Easting: 639115
Penetration/Recovery(ft.): 12.5 / 11.5
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-L4-S1	0.9		Moist, soft, olive grey SILTY CLAY with dark grey seams/layers from 2 - 7, organic pockets at 1.2, 6.2 and 9.4 and sand pockets at 6.2 and 6.9	CH	0	7.8	92.2	100	5.3
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/21/12 (Cored), 9/25/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-L5**
Location: Northing: 884737
Easting: 639104
Penetration/Recovery(ft.): 12.1 / 6.6
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: M. Hoskins

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-L5-S1	0.7		Wet/moist, soft, olive grey, SILTY CLAY with dark grey seams/layers of fine sand	CH	0	5.6	94.4	113	6.1
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES:

Project: West Point Project
Site: Hudson River, New York
Date: 9/20/12 (Cored), 9/20/12 (Sampled)
Coring Company: Alpine Ocean Seismic Survey
Coring Method: Vibracore
Sampling Method: 4" Plastic Sleeve
ESS Job No.: W296-001.04

Core : **VC-L6**
Location: Northing: 884772
Easting: 639067
Penetration/Recovery(ft.): 13.0 / 10.5
Seas: NM
Depth to Sediment (ft.): NM
ESS Logger: J. Wiggin

Depth Below SWI (feet)	Sample Number	Field Shear Strength (PSI)	Sediment Log	Materials Description	ASTM Group Symbol (ASTM D 422)	Gravel Content (%) (ASTM D 422)	Sand Content (%) (ASTM D 422)	Silt/Clay Content (%) (ASTM D 422)	Moisture Content (%) (ASTM D 2974)	Organic Matter (%) (ASTM D 2974)
				Field Observations	Geotechnical Laboratory Data					
0	VC-L6-S1	1.1		Moist, soft, olive grey, CLAY with silt, red brick fragment at 5.2	CH	0.0	3.3	96.7	105	5.4
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

LEGEND:
ND: not detected
N/A: not applicable
SWI: sediment water interface
NM: not measured
NP: non-plastic

PROPORTIONS USED:
Trace: <10%
Little: 10-20%
Some: 20-35%
And: 35-50%

NOTES: