SITE MANAGEMENT PLAN

ROBERT MOSES PARKWAY – SOUTH
NIAGARA COUNTY
NIAGARA FALLS, NEW YORK

NYSDEC Site Number: 932166

Prepared for:
New York State Office of Parks, Recreation and Historic Preservation
625 Broadway
Albany, New York 12238

Prepared by:
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Buffalo, New York 14203

SEPTEMBER 2019

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Revisions to Final Approved Site Management Plan:

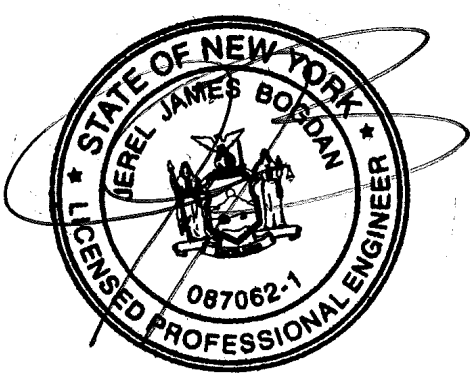
Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date
1	9/20/2019	Original submission	
2	1/29/2020	Revised submission; NYSDEC comments integrated	

CERTIFICATION STATEMENT

I, Jerel J. Bogdan, PE, certify that I am currently a NYS registered professional engineer as in defined in 6 NYCRR Part 375 and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

NAME: Jerel J. Bogdan, PE

DATE: 1/29/2020



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List of Acronyms

AS	Air Sparging
ASP	Analytical Services Protocol
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CAMP	Community Air Monitoring Plan
C/D	Construction and Demolition
CFR	Code of Federal Regulation
CLP	Contract Laboratory Program
COC	Certificate of Completion
CO2	Carbon Dioxide
CP	Commissioner Policy
DER	Division of Environmental Remediation
EC	Engineering Control
ECL	Environmental Conservation Law
ELAP	Environmental Laboratory Approval Program
ERP	Environmental Restoration Program
EWP	Excavation Work Plan
GHG	Green House Gas
GWE&T	Groundwater Extraction and Treatment
HASP	Health and Safety Plan
IC	Institutional Control
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYCRR	New York Codes, Rules and Regulations
O&M	Operation and Maintenance
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PID	Photoionization Detector
PRP	Potentially Responsible Party
PRR	Periodic Review Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RP	Remedial Party
RSO	Remedial System Optimization
SAC	State Assistance Contract
SCG	Standards, Criteria and Guidelines

SCO	Soil Cleanup Objective
SMP	Site Management Plan
SOP	Standard Operating Procedures
SOW	Statement of Work
SPDES	State Pollutant Discharge Elimination System
SSD	Sub-slab Depressurization
SVE	Soil Vapor Extraction
SVI	Soil Vapor Intrusion
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program

ES EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan:

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Site Identification:	Site 932166, Robert Moses Parkway – South Site Southwest of the intersection of John Daly Blvd and Buffalo Avenue (SBL: 158.16-1-1)

Institutional Controls:	1. The property may be used for commercial use; also allows for passive recreational use.
	Imposition of an institutional control in the form of a declaration of covenants and restrictions for the controlled property which will: • require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8(h)(3); • allow the use and development of the controlled property for commercial use, which would also allow for passive recreational use, as defined by Part 375-1.8(g), although land use is subject to local zoning laws; • restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and • require compliance with the Department approved Site Management Plan.
	3. All ECs must be inspected at a frequency and in a manner defined in the SMP.
Engineering Controls:	1. Cover systems placed over specific areas on the Site, including Hot Spots 1/3, 2, a portion of 4 south of the AT&T fiber optic line, and the asphalt pavement cover at the northwest corner of the Site.

Site Identification:	Site 932166, Robert Moses Parkway – South Site Southwest of the intersection of John Daly Blvd and Buffalo Avenue (SBL: 158.16-1-1)

Inspections:	Frequency
1. Cover inspection	Annually
Monitoring:	
1. Groundwater Monitoring Wells MW-1 through MW-7, WT-MW-1 and WT-MW-2	Annually
2. Periodic Review Report	Annually

Further descriptions of the above requirements are provided in detail in the latter sections of this Site Management Plan.

1.0 INTRODUCTION

1.1 General

This Site Management Plan (SMP) is a required element of the remedial program for the Robert Moses Parkway – South Site located in the City of Niagara Falls, Niagara County, New York; hereinafter referred to as the "Site" (See Figure 1 – Site Location Map). The Site is currently in the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program Site No. 932166 which is administered by New York State Department of Environmental Conservation (NYSDEC).

New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) entered into an Order on Consent on December 15, 2015 with the NYSDEC to remediate the site. A figure showing the site location and boundaries of this site is provided in Figure 2. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Declaration of Covenants provided in Appendix C.

After completion of the remedial work, some contamination was left at this site, which is hereafter referred to as "remaining contamination". Institutional and Engineering Controls (ICs and ECs) have been incorporated into the site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. A deed restriction granted to the NYSDEC, and recorded with the Niagara County Clerk, requires compliance with this SMP and all ECs and ICs placed on the site.

This SMP was prepared to manage remaining contamination at the site until the deed restriction is extinguished in accordance with ECL Article 71, Title 36. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the deed restriction and the grantor's successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the deed restriction. Failure to properly implement the SMP is a violation of the deed restriction, which is grounds for revocation of the Certificate of Completion (COC);

- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the Order on Consent (Index #R9-20151026-114; Site #932166) for the site, and thereby subject to applicable penalties.

All reports associated with the site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the site is provided in Appendix A of this SMP.

This SMP was prepared by C&S Engineers, Inc., on behalf of New York State Office of Parks, Recreation and Historic Preservation, in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 2010 and effective June 2010, and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs and/or ECs that are required by the Declaration of Covenants for the site.

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shut-down of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the site conditions. In accordance with the Declaration of Covenants for the site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.3 Notifications

Notifications will be submitted by the property owner to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the Order on Consent, 6NYCRR Part 375 and/or Environmental Conservation Law.
- 7-day advance notice of any field activity associated with the remedial program.
- 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the Order on Consent and all approved work plans and reports, including this SMP.
- Within 15 days after the transfer of all or part of the site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

Table 1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix A.

Table 1: Notifications*

Name	**Contact Information**
Benjamin McPherson, P.E., *NYSDEC Project Manager, Region 9*	716-851-7220 Benjamin.mcpherson@dec.ny.gov
Chad Staniszewski, P.E. *NYSDEC Region 9 HW Engineer*	716-851-7220 Chad.staniszewski@dec.ny.gov
Christine Vooris *NYSDOH*	518-402-7860 Christine.Vooris@health.ny.gov
Kelly Lewandowski *NYSDEC Site Control*	716-851-7220, Kelly.lewandowski@dec.ny.gov

** Note: Notifications are subject to change and will be updated as necessary.*

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The site is located in Niagara Falls, Niagara County, New York and is identified as a portion of Section 158 Block 16 and Lot 1-1 on the Niagara County Tax Map (see Figure 1 – Site Location Map). The site is an approximately 16.09-acre area and is bounded by Buffalo Avenue and Riverside Drive to the north, the Niagara River to the south, Robert Moses Parkway to the east and 4th Street to the west (see Figure 2 – Site Boundary Map). The boundaries of the site are more fully described in Appendix C – Declaration of Covenants.

The Site is located in the eastern portion of NYS OPRHP's larger Niagara Falls State Park. Prior to the creation of the Niagara Falls State Park, various industrial facilities were historically in operation in the area along Niagara River adjacent to the Site. However, no industrial facilities were confirmed to have existed within the boundaries of the Site itself. Since the Niagara Reservation was created in 1885, this area has been park land, but neither mills nor factories were historically shown to exist on the Site.

The owner of the site parcel at the time of issuance of this SMP is New York State Office of Parks, Recreation and Historic Preservation.

2.2 Physical Setting

2.2.1 Land Use

The Site consists of the following: a public park that includes pedestrian/bike paths, a pond, a small parking lot for approximately 13 vehicles, and a portion of the Riverway, a Niagara Falls State Park entrance road. The Site is zoned OS – Open Space and is currently utilized as a public park. Site occupants include the Niagara Falls State Park. The Site is relatively flat with some minor topographic relief toward the Niagara

River. The Site is bisected by the Riverway which runs east to west. A bike path is located on the southern portion of the Site along the Niagara River. The Site is covered with a few trees, with surface soils that have either been paved into pathways, vegetated, or stabilized for vegetation as part of Riverway road reconstruction/park redevelopment project. The Site contains a man-made pond in the southeast, with various pathways, light poles, and benches across the park area.

The properties adjoining the Site and in the neighborhood surrounding the Site primarily include commercial and residential properties. There are no properties immediately south of the Site because the Site adjoins the Niagara River; the properties immediately north of the Site include residential properties along Riverside Drive and commercial properties closer to 4th Street; the properties immediately east of the Site include vacant and open space properties; and the properties to the west of the Site include open space properties, including the remainder of the Niagara Falls State Park.

2.2.2 Geology

The Site is located in Niagara County within the Erie-Ontario Lake Plain physiographic province of New York. This physiographic region has little relief and is characteristic of an abandoned lakebed. The region includes three plains (Ontario, Huron, and Erie) which are separated by the east-west trending Niagara, Portage, and Onondaga escarpments. The City of Niagara Falls is located in the Ontario lowland of the Ontario plain. No unique landforms or geological formations exist on or in the vicinity of the Site.

Topography on the Site averages approximately 575 feet above mean sea level. In general, the topography gradually drops approximately five to ten feet in elevation from the north to south across the Site. Overall, the topography of the Site is relatively level. According to the Soil Survey of Niagara County (U.S. Department of Agriculture, Soil Conservation Service, the identified soils on Site are unsurveyed area (Ua).

Observations made during the advancement of the soil borings and excavation of the test pits during the remedial investigation indicated the presence of surface topsoil and fill, disturbed indigenous soils above the native soils, and shot rock from power tunnel construction conducted in the area historically.

Bedrock in the vicinity of the Site consists generally of gray, hard, very thin to thinly bedded, dolostone. The depth to bedrock on the Site ranges from approximately 10 to 15 feet below ground surface as evidenced by refusal in soil borings conducted during the geotechnical analysis of the Site.

2.2.3 Hydrogeology

Based on a review of NYSDEC data, the Site is not underlain by any mapped principal or primary aquifers. Groundwater at and in the vicinity of the Site is not used as a public drinking water supply.

The principal groundwater bearing zone beneath the Site is located between 10 and 14 feet below grade. Groundwater beneath the Site is mounded near the center. **Figures 3A, 3B, and 3C** show groundwater contours at the Site, as developed from the water level measurements collected during three groundwater sampling events in August 2016, April 2017, and December 2017.

Previous studies have shown that water levels have the potential to fluctuate by 1.5 feet or more in the upper Niagara River in response to the twice-daily changes in flow diversion from the River to the NYPA hydroelectric tunnels. In addition, water level and flow fluctuations are thought to be caused by other natural and anthropogenic factors, such as flow surges from Lake Erie, wind and ice conditions, precipitation patterns, and operation of the Ontario Power Generation hydroelectric system. . Daily cycles in River height combined with the permissive soil types (heterogeneous soils of sands and shotrock) may result in groundwater level fluctuations on the Site.

The results from the three groundwater sampling events, and groundwater level data thereof, indicate that the hydrogeologic conditions on the Site are variable. Detailed investigation of the variability in the hydraulic gradient on-site, integrating all natural and anthropogenic variables, was not included in the scope of the RI or IRM programs.

2.3 Investigation and Remedial History

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site. Full titles for each of the reports referenced below are provided in Section 8.0 - References.

May 2010, Preliminary Screening Investigation Report for the Hazardous Waste/Contaminated Materials Assessment of Reconstruction of Robert Moses Parkway from John Daly Boulevard to parking Lot #1, prepared by Watts Architecture and Engineering, P.C.

The Preliminary Supporting Document (PSI) documented the potential of contaminated fill and focused on the risk through the Riverway Project area. Assessment activities included a review of government and historical records, a Site inspection, and interviews with government agencies and persons with knowledge of the Site. This report associated known backfilling operations of the adjacent Hydraulic Canal with similar activities for the Port Day Pond and Niagara River shoreline due west and south of the canal. Various wastes, including municipal waste, building debris, and industrial wastes, were used as backfill throughout the area. The report concluded that further investigation is recommended if excavation would be required for future development.

March 2014, Detailed Site Investigation (DSI) Report for the Robert Moses Parkway (RMP)-South Segment/Riverway Project in Niagara Falls State Park, City of Niagara Falls, Niagara County, New York, Watts Project No. Y8195, prepared by Watts Architecture and Engineering, P.C.

A Detailed Site Investigation (DSI) subsequently followed the PSI. Limited site characterization efforts were conducted in November 2013 and January 2014 to preliminarily assess contaminant concentrations at the Site. The DSI included 37 borings and four test pits throughout the Riverway Project area. Samples were collected from 13 of the testing locations and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), pesticides, metals, cyanide, and hexavalent chromium.

On the Site, the DSI encountered brown-colored fill material and dark grey fill material. The brown fill generally contained no concentrations over the NYSDEC's Restricted Residential SCOs. However, the dark grey material contained high concentrations of VOCs, SVOCs, pesticides, and metals. Elevated concentrations of pesticides and metals were also present in the groundwater. No characteristic hazardous wastes were detected and no elevated levels of radiation were measured.

Of the 13 collected samples, eight were located within the RMP – South Site area of concern under headings of "Old Pond" Area and "New Pond" Area. Seven of these samples were from soil borings, while one was from a test pit. The following contaminant categories were observed as exceeding one or more NYSDEC criteria within the Site:

- Pesticides and metals were detected in soil within the area of concern
- SVOCs in soil at sample location B-8
- VOCs in soil at TP-4
- Pesticides and metals in groundwater at MW-8

A detailed Phase II subsurface investigation in areas of proposed excavation was recommended to document existing conditions, due to the finding of several sites in the project vicinity that were considered potential environmental risks to the project.

August 2014, Final Design Report/Environmental Assessment for the Robert Moses Parkway – South Segment – "Riverway," prepared by Hatch Mott MacDonald

A Design Report/Environmental Assessment (DR/EA) was prepared for the reconstruction of the Robert Moses Parkway. However, significant portions of the DR/EA are not related to the Site, but are instead centered on development design for the entire Riverway Project. However, a small section of the report summarized contaminated and hazardous materials associated with an area in close proximity to John B. Daly Boulevard and the Buffalo Avenue intersection (Site). In general, the report described past uses, including recreational use of the former Port Day Pond and filling operations prior to the creation of environmental laws. As a result, contaminated fill from unknown sources was determined to be likely considering the industrial area surrounding the Site.

March 2018, Remedial Investigation/Feasibility Study Report for Robert Moses Parkway-South Site, prepared by C&S Engineers

In response to the discovery of buried metal drums, chemical product/residue, and significantly stained soils during Park reconstruction activities on the Site, a Remedial Investigation (RI) was planned and implemented to characterize site conditions. Simultaneously, Interim Remedial Measures (IRMs) were implemented in hot spot areas to remove drums, chemical solids/residue, and the most significantly contaminated fill material. The RI for the Site consisted of test pits and the advancement of soil borings to characterize fill material soils, the collection and analysis of surface and subsurface soil

samples, and the installation and sampling of groundwater wells to characterize groundwater conditions at the Site. In accordance with New York State Department of Environmental Conservation (NYSDEC) guidance, the analytical results were compared to the Commercial Use Soil Cleanup Objectives (SCOs), which are applicable to the intended use of the Site as a passive park following completion of the Riverway road reconstruction/park redevelopment project.

The surface soil sampling identified six areas with arsenic concentrations above the Commercial Use SCOs. Additional surface soil samples were collected to characterize the extent of the impacts. Subsurface samples were collected throughout the Site. The most significant contaminants detected were pesticides, primarily alpha-hexachlorocyclohexane (alpha-BHC) and beta-BHC, at concentrations exceeding Industrial Use SCOs. SVOCs and metals were also detected at elevated concentrations. SVOCs detected at concentrations exceeding the Commercial Use SCO were hexachlorobenzene and benzo(a)pyrene (above the Industrial Use SCO). Metals detected at concentrations exceeding the Commercial Use SCO were mercury, arsenic, and lead. The IRMs were implemented to address the presence of these contaminants in subsurface soils, as well as drums and associated product/residue, encountered during construction activities associated with the Riverway road reconstruction/park redevelopment project.

The most significantly contaminated areas with alpha-BHC and beta-BHC impacts were addressed. Groundwater impacts at the Site are largely absent, although pesticides were detected in two monitoring well samples during the first groundwater sampling event at concentrations that exceeded pertinent water quality standards and guidance values. Similar results were observed during the second groundwater sampling event, with pesticides detected at one monitoring well. Elevated concentrations of SVOCs were detected during the third sampling event, though a fourth event was needed due to sampling errors. During the fourth groundwater sampling event conducted at the Site due to elevated levels of pesticides in previous groundwater sampling events, pesticides were detected in three samples at concentrations above the TOGS standards.

The report also included a Feasibility Study to identify and evaluate remedial alternatives to address the contamination observed in the RI and to select remedial actions to be implemented. Four alternatives were discussed in the report: No Action Alternative, the Commercial Use Alternative A (Site Management and Long-Term Monitoring), the Commercial Use Alternative B (Removal of All Soil Materials Exceeding Commercial Use SCOs at Pertinent Hot Spots, with Site Management and Long-Term Monitoring), and the Unrestricted Use-Complete Fill Removal Alternative.

Commercial Use Alternative A was determined to be a long-term remedy and anticipated to be acceptable to the community. This alternative would establish management practices and procedures to guide future invasive construction activities, including activities such as removal and off-site disposal of the most significantly contaminated material and/or placement of clean fill material over soil materials exceeding Commercial Use SCOs to eliminate potential exposure from the underlying material. These elements would minimize potential exposure to contaminated materials by users of the Site, surrounding residential

areas, and by workers engaged in invasive construction activities.

The recommended remedial action for the Site in Commercial Use Alternative A included:

- Placement of soil cover material (backfill that meets Commercial Use SCOs) over soil materials exceeding Commercial Use SCOs.
- A Site Management Plan and Soil/Fill Handling Plan.
- A Declaration of Covenants, Conditions, and Restrictions applied to the entire Site, with specific requirements for those areas where covers are necessary.
- Annual certification that all institutional and engineering controls remain in place and are effective, particularly for the soil covers.

June 2016 – November 2017 – Interim Remedial Measures, managed by C&S Engineers

The following IRM(s) has/have been completed at this site based on conditions observed during the RI.

Construction Zone IRM

Excavation and off-site disposal of waste and contaminated soil from areas in the Riverway Construction Zone. The contamination was addressed as an IRM to allow for continued construction of park and road improvements. The IRM was expanded to include a portion of the former Port Day Pond. The major components of the IRM included:

• Excavation and off-site disposal of approximately 236 tons of surface soil contaminated by arsenic which exceeded commercial soil cleanup objectives (CSCOs) from the northern border of the site;

• Excavation and off-site disposal of approximately 2,800 tons of soil containing pesticide/organochlorine wastes, which exceeded CSCOs, or exhibited nuisance conditions from the former Port Day Pond and Hot Spots 1/3, 2, 4, 4a, and 6. The excavated material was disposed off-site as hazardous waste. CSCOs for pesticides and/or semi-volatile organic compounds (SVOCs) were not achieved in Hot Spots 1/3, 2, and a portion of 4. These remaining areas were covered as part of the IRM activities and will be monitored as required by the final remedy;

• Excavation and off-site disposal of 1.38 tons of solid or semi-solid hazardous substances (pesticide wastes and chlorinated organics), including remnants of drums, from utility trenches and paving areas in Hot Spots 1/3 and 2. CSCOs for pesticides and SVOCs were not achieved in these areas;

• Excavation and off-site disposal of approximately 29,300 tons of residually impacted soil as solid waste. This soil was generated from Hot Spot 5, segregation of material from other hot spots, and general site grading activities; and

• Backfill of excavation areas to meet design grades with approved soil/fill that allows for commercial use; and

• Construction of covers in Hot Spots 1/3, Hot Spot 2, and a portion of Hot Spot 4 south of the AT&T fiber optic line where residual contamination remains exceeding the CSCOs. The cover in these areas consist of either asphalt, concrete, or soil cover. Where a soil cover is used it is a minimum of one foot of soil placed over a demarcation layer.

The IRM excavations were completed in several stages between June 2016 and November 2017. These IRM activities are documented in the IRM Construction Completion Report dated January 2019.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site, as listed in the Record of Decision dated March 2019, are as follows:

Groundwater

- ***RAOs for Public Health Protection***
  - Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- ***RAOs for Environmental Protection***
  - Remove the source of ground or surface water contamination.

Soil

- ***RAOs for Public Health Protection***
  - Prevent ingestion/direct contact with contaminated soil.
- ***RAOs for Environmental Protection***
  - Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

- ***RAOs for Public Health Protection***
  - Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at the site (if built in the future).

2.5 Remaining Contamination

The remedy for the Site consisted of IRM excavations and off-site disposal of waste and contaminated soil from various areas in the Riverway Construction Zone, conducted in several stages between June 2016 and November 2017, as summarized in Section 2.3. After completion of the remedial work, some contamination was left at this site, which is hereafter referred to as "remaining contamination". Remaining contamination will be limited to contaminated soil in the following areas on the Site:

- Surface soils in the southwest portion of the Site near Hot Spot 2; singular detections of benzo(a)pyrene and copper exceeding restricted use SCGs.

- Subsurface soils and solid/semi-solid hazardous substances near Hot Spots 1/3, 2, and a portion of Hot Spot 4; Commercial SCOs for pesticides and SVOCs were not achieved in these areas.

Institutional and Engineering Controls (ICs and ECs) have been incorporated into the site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. A deed restriction granted to the NYSDEC, and recorded with the Niagara County Clerk, requires compliance with this SMP and all ECs and ICs placed on the site. Areas with remaining contamination will be monitored and maintained with clean cover materials (material meeting Commercial SCOs) as described in Section 3.3.1.

2.5.1 Soil (Surface and Sub-Surface)

Post-IRM results indicate that two singular samples of on-site surface soil in the southwest portion of the Site near Hot Spot 2 exceed the unrestricted and restricted use SCGs for copper and benzo(a)pyrene. Surface soil sample locations are shown on Figure 4, including the location of surface soil samples exceeding SCGs (shown symbolically with red circles). The post-IRM surface soil sampling results are summarized in Table 2, including the concentration values of SCG exceedance (highlighted in yellow). The singular detections of benzo(a)pyrene and copper exceeding restricted use SCG are not

considered contaminants of concern as they are not related to hazardous waste disposal at the site. However, it should be noted that the area of these exceedances has been covered with clean cover materials (material meeting Commercial SCOs) due to the presence of contaminants of concern exceeding SCGs in the soil.

Subsurface soil contamination identified during the RI was partially addressed during the IRM. After the IRM, subsurface soil contamination exceeding the unrestricted and restricted use SCGs remains in Hot Spots 1/3, Hot Spot 2, a small portion of Hot Spot 4, and in four RI sample locations. Specifically, post-IRM results indicate that on-site subsurface soil exceeds the unrestricted and restricted use SCGs for certain VOCs, SVOCs, pesticides, and metals. Subsurface soil sample locations are shown on Figure 5, including the location of subsurface soil samples exceeding SCGs (shown symbolically with red circles). The post-IRM subsurface soil sampling results are summarized in Table 3, including the concentration values of exceedance (highlighted in yellow). CSCOs for certain VOCs, SVOCs, pesticides, and metals were not achieved in Hot Spots 1/3 (due to presence of fiber optic cable), 2 (due to concentrations not being significantly higher than CSCOs), and a portion of 4 (due to presence of fiber optic cable). The areas of these exceedances have been covered with clean cover materials (material meeting Commercial SCOs) due to the presence of contaminants of concern exceeding restricted use SCGs in subsurface soil.

2.5.2 Groundwater

Two groundwater sampling events have been conducted across nine overburden monitoring wells since IRM completion, with samples being analyzed VOCs, SVOCs, pesticides, PCBs, and metals to assess on-site groundwater conditions. Slow recovery and highly turbid samples typified these monitoring wells, suggesting that the overburden is not a significant source of groundwater. The location of monitoring wells and the most recent sampling results are summarized on Figure 6, including summary of the location and levels of remaining groundwater contamination (defined as those parameters observed in concentrations exceeding NYSDEC Division of Water Technical and Operational

Guidance Series (TOGS) standards). A tabular summary of results for these events, also highlighting the location and levels of remaining groundwater contamination, is provided in Table 4.

The primary remaining contaminants of concern in groundwater are alpha-BHC and beta-BHC. Monitoring wells where these contaminants exceed their respective SCGs are generally located in the vicinity of waste areas that were addressed during the IRM, as shown on Figure 6 and noted in Table 4. It is anticipated that groundwater quality will improve over time due to the removal of contaminated material. The metals and SVOCs detected in unfiltered groundwater samples are not considered site specific contaminants of concern.

2.5.3 Soil Vapor

Soil vapor sampling and analysis was not conducted on the Site as part of previous RI or remedial activities. Provisions for evaluation for soil vapor and radon intrusion for any occupied buildings that may be built on the Site in the future are included in Section 3.0.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 General

Since remaining contamination exists at the site, Institutional Controls (ICs) and Engineering Controls (ECs) are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs at the site. The IC/EC Plan is one component of the SMP and is subject to revision by the NYSDEC.

This plan provides:

- A description of all IC/ECs on the site;
- The basic implementation and intended role of each IC/EC;
- A description of the key components of the ICs set forth in the Environmental Easement;
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of IC/ECs, such as the implementation of the Excavation Work Plan (EWP) (as provided in Appendix B) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and
- Any other provisions necessary to identify or establish methods for implementing the IC/ECs required by the site remedy, as determined by the NYSDEC.

3.2 Institutional Controls

A series of ICs is required by the ROD to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination; and, (3) limit the use and development of the site to Commercial uses only (which would also allow for passive recreational use). Adherence to these ICs on the site is required by the

Declaration of Covenants and Restrictions and will be implemented under this SMP. ICs identified in the Declaration of Covenants and Restrictions may not be discontinued without an amendment to or extinguishment of the Declaration of Covenants and Restrictions. The IC boundaries are shown on Figure 2. These ICs are:

- Imposition of an institutional control in the form of a declaration of covenants and restrictions for the controlled property which will:
    - Require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8(h)(3);
    - Allow the use and development of the controlled property for commercial use, which would also allow for passive recreational use, as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP.
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Niagara County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP;
- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;
- Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Declaration of Covenants and Restrictions.

- The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries noted on Figure 2, and any potential impacts that are identified must be monitored or mitigated; and

- Vegetable gardens and farming on the site are prohibited;

3.3 Engineering Controls

3.3.1 Covers

Exposure to remaining contamination at the site is prevented by cover systems placed over specific areas on the Site, including Hot Spots 1/3, 2, a portion of 4 south of the AT&T fiber optic line, and the asphalt pavement cover at the northwest corner of the Site. These cover systems are comprised of a minimum of 12 inches of clean soil, asphalt pavement, concrete-covered sidewalks and other components of Site development as appropriate. Figure 5 presents the location of the cover systems and applicable demarcation layers. The Excavation Work Plan (EWP) provided in Appendix B outlines the procedures required to be implemented in the event the cover system is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection of the covers are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan (HASP) and associated Community Air Monitoring Plan (CAMP) prepared for the site and provided in Appendix L.

3.3.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10.

3.3.2.1 - Covers

The cover systems are permanent controls, and the quality and integrity of these systems will be inspected at defined, regular intervals in accordance with this SMP in perpetuity (annually). Cover systems may be inspected more frequently than once per year in response to significant environmental conditions/events occurring onsite to assess integrity of the covers.

3.3.2.2 - Monitoring Wells associated with Monitored Natural Attenuation

Groundwater monitoring activities at nine groundwater monitoring wells onsite (MW-1 through MW-7, WT-MW-1 and WT-MW-2) to assess natural attenuation will continue, as determined by the NYSDEC with consultation with NYSDOH, until residual groundwater concentrations are found to be consistently below ambient water quality standards, the site SCGs, or have become asymptotic at an acceptable level over an extended period. In the event that monitoring data indicates that monitoring for natural attenuation may no longer be required, a proposal to discontinue the system will be submitted by the remedial party. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

4.0 MONITORING AND SAMPLING PLAN

4.1 General

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring and Sampling Plan may only be revised with the approval of the NYSDEC. Details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of site management for the site are included in the Quality Assurance Project Plan provided in Appendix F.

This Monitoring and Sampling Plan describes the methods to be used for:

- Sampling and analysis of all appropriate media (e.g., groundwater, indoor air, soil vapor, soils);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance (SCGs), particularly groundwater standards and Part 375 SCOs for soil; and
- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment;

To adequately address these issues, this Monitoring and Sampling Plan provides information on:

- Sampling locations, protocol and frequency;
- Information on all designed monitoring systems;
- Analytical sampling program requirements;
- Inspection and maintenance requirements for monitoring wells;
- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 Site–Wide Inspection

Site-wide inspections will be performed annually or at a minimum of once per year. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed as provided in Appendix H - Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirm that site records are up to date.

Inspections of all remedial components installed at the site will be conducted. A comprehensive site-wide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report. Reporting requirements are outlined in Section 7.0 of this plan. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Declaration of Covenants and Restrictions;
- Achievement of remedial performance criteria; and

- If site records are complete and up to date;

Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the site, verbal notice to the NYSDEC must be given by noon of the following day. In addition, an inspection of the site will be conducted within 5 days of the event to verify the effectiveness of the IC/ECs implemented at the site by a qualified environmental professional, as determined by the NYSDEC. Written confirmation must be provided to the NYSDEC within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

4.3 Post-Remediation Media Monitoring and Sampling

Samples shall be collected from the all nine groundwater monitoring wells on a routine basis (annually). Sampling locations, required analytical parameters, and schedule are provided in Table 5 – Remedial System Sampling Requirements and Schedule below. Modification to the frequency or sampling requirements will require approval from the NYSDEC.

Table 5 – Post Remediation Sampling Requirements and Schedule

Sampling Location	Analytical Parameters			Schedule
	TCL VOCs	TCL SVOCs	TCL Pesticides	
MW-1	X	X	X	Annually
MW-2	X	X	X	Annually
MW-3	X	X	X	Annually
MW-4	X	X	X	Annually
MW-5	X	X	X	Annually
MW-6	X	X	X	Annually
MW-7	X	X	X	Annually
WT-MW-1	X	X	X	Annually
WT-MW-2	X	X	X	Annually

Detailed sample collection and analytical procedures and protocols are provided in Appendix E – Field Activities Plan and Appendix F – Quality Assurance Project Plan.

4.3.1 Groundwater Sampling

Groundwater monitoring will be performed annually to assess the performance of the remedy. Modification to the frequency or sampling requirements will require approval from the NYSDEC. Monitoring well construction logs are included in Appendix D of this document.

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced, if an event renders the wells unusable. Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of any monitoring well for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent Periodic Review Report. Well decommissioning without replacement will be done only with the prior approval of the NYSDEC. Well abandonment will be performed in accordance with NYSDEC's guidance entitled "*CP-43: Groundwater Monitoring Well Decommissioning Procedures.*" Monitoring wells that are decommissioned because they have been rendered unusable will be replaced in kind in the nearest available location, unless otherwise approved by the NYSDEC.

The sampling frequency may only be modified with the approval of the NYSDEC. This SMP will be modified to reflect changes in sampling plans approved by the NYSDEC.

Deliverables for the groundwater monitoring program are specified in Section 7.0 – Reporting Requirements.

4.3.2 Soil Vapor Intrusion Sampling

Soil vapor sampling and analysis was not conducted on the Site as part of previous RI or remedial activities. It is a requirement of the ROD that the SMP contain provisions for SVI sampling in the event that occupied buildings are constructed at the Site in the future. Prior to the construction of occupied buildings in the future, work plans for SVI assessment must be submitted to the NYSDEC and NYSDOH for approval, and attached to this SMP, once approved. The work plans may only be modified with the approval of the NYSDEC and NYSDOH.

4.3.3 Monitoring and Sampling Protocol

All sampling activities will be recorded in a field book and associated sampling log as provided in Appendix H - Site Management Forms. Other observations (e.g., groundwater monitoring well integrity, etc.) will be noted on the sampling log. The sampling log will serve as the inspection form for the monitoring network. Additional detail regarding monitoring and sampling protocols are provided in the site-specific Field Sampling Plan provided as Appendix E of this document.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

The site remedy does not currently rely on any mechanical systems, such as groundwater treatment systems, sub-slab depressurization systems or air sparge/soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of such components is not included in this SMP.

If such mechanical systems are added in the future, this SMP will be modified to reflect the associated operation and maintenance requirements.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

Increases in both the severity and frequency of storms/weather events, an increase in water level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that the site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding. Vulnerability assessments of the Site have not been performed historically.

This section provides a summary of vulnerability assessments that will be conducted for the site during periodic assessments, and briefly summarizes the vulnerability of the site and/or engineering controls to severe storms/weather events and associated flooding.

A discussion of potential vulnerabilities to be assessed during periodic reviews will include the following:

- Flood Plain: Identify whether the site is located in a flood plain, low-lying or low-groundwater recharge area.
- Site Drainage and Storm Water Management: Identify areas of the site which may flood during severe rain events due to insufficient groundwater recharge capabilities or inadequate storm water management systems.
- Erosion: Identify any evidence of erosion at the site or areas of the site which may be susceptible to erosion during periods of severe rain events.
- High Wind: Identify areas of the site and/or remedial system which may be susceptible to damage from the wind itself or falling objects, such as trees or utility structures during periods of high wind.

Vulnerability assessments will include collection and archiving of Photographs of any vulnerable areas identified at the Site.

6.2 Green Remediation Evaluation

NYSDEC's DER-31 Green Remediation requires that green remediation concepts and techniques be considered during all stages of the remedial program including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This section of the SMP provides a summary of any green remediation evaluations to be completed for the site during site management, and as reported in the Periodic Review Report (PRR). Green remediation principals and techniques will be implemented to the extent feasible in the site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gas and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste.

6.2.1 Timing of Green Remediation Evaluations

For major remedial system components, green remediation evaluations and corresponding modifications will be undertaken as part of a formal Remedial System Optimization (RSO), or at any time that the Project Manager feels appropriate, e.g. during significant maintenance events or in conjunction with storm recovery activities.

Modifications resulting from green remediation evaluations will be routinely implemented and scheduled to occur during planned/routine operation and maintenance activities. Reporting of these modifications will be presented in the PRR.

6.2.2 Frequency of System Checks, Sampling and Other Periodic Activities

Transportation to and from the Site and use of consumables in relation to visiting the Site in order to conduct system checks and or collect samples and shipping samples to a laboratory for analyses have direct and/or inherent energy costs. The schedule and/or means of these periodic activities have been prepared so that these tasks can be accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy or resources.

Consideration shall be given to:

- Reduced sampling frequencies;
- Reduced site visits and system checks;
- Coordination/consolidation of activities to maximize foreman/labor time; e.g., coordinating site visits for groundwater sampling cover inspections.

6.2.3 Metrics and Reporting

As discussed in Section 7.0 and as shown in Appendix H – Site Management Forms, information will be recorded to facilitate and document consistent implementation of green remediation during site management and to identify corresponding benefits; a set of metrics has been developed.

6.3 Remedial System Optimization

A Remedial Site Optimization (RSO) study will be conducted any time that the NYSDEC or the remedial party requests in writing that an in-depth evaluation of the remedy is needed. An RSO may be appropriate if any of the following occur:

- The remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the Decision Document;

- The management and operation of the remedial system is exceeding the estimated costs;
- The remedial system is not performing as expected or as designed;
- Previously unidentified source material may be suspected;
- Plume shift has potentially occurred;
- Site conditions change due to development, change of use, change in groundwater use, etc.;
- There is an anticipated transfer of the site management to another remedial party or agency; and
- A new and applicable remedial technology becomes available.

An RSO will provide a critique of a site's conceptual model, give a summary of past performance, document current cleanup practices, summarize progress made toward the site's cleanup goals, gather additional performance or media specific data and information and provide recommendations for improvements to enhance the ability of the present system to reach RAOs or to provide a basis for changing the remedial strategy.

7.0. REPORTING REQUIREMENTS

7.1 Site Management Reports

All site management inspection, maintenance and monitoring events will be recorded on the appropriate site management forms provided in Appendix H. These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of Table 6 and summarized in the Periodic Review Report.

Table 6: Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Inspection Report	Annually
Periodic Review Report	Annually, or as otherwise determined by the Department

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

All interim monitoring/inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc);

- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether contaminant conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting maintenance activities;
- Description of maintenance activities performed;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and,
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

Non-routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Description of non-routine activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and

- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

Data will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS^{TM} database in accordance with the requirements found at this link: *http://www.dec.ny.gov/chemical/62440.html.*

7.2 Periodic Review Report

A Periodic Review Report (PRR) will be submitted to the Department beginning sixteen (16) months after the Certificate of Completion or equivalent document is issued. After submittal of the initial Periodic Review Report, the next PRR shall be submitted annually to the Department or at another frequency as may be required by the Department. In the event that the site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the site described in Appendix C - Declaration of Covenants. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the site.
- Results of the required annual site inspections and severe condition inspections, if applicable.
- All applicable site management forms and other records generated for the site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.
- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances

highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends.

- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.

- A site evaluation, which includes the following:

  - The compliance of the remedy with the requirements of the site-specific ROD;

  - The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;

  - Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring and Sampling Plan for the media being monitored;

  - Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan; and

  - Trends in contaminant levels in the affected media will be evaluated to determine if the remedy continues to be effective in achieving remedial goals as specified by the ROD.

  - The overall performance and effectiveness of the remedy.

7.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, a qualified environmental professional or Professional Engineer licensed to practice in New York State will prepare, and include in the Periodic Review Report, the following certification as per the requirements of NYSDEC DER-10:

"*For each institutional or engineering control identified for the site, I certify that all of the following statements are true:*

- *The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*

- *The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*

- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*

- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*

- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*

- *If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;*

- *Use of the site is compliant with the environmental easement;*

- *The engineering control systems are performing as designed and are effective;*

- *No new information has come to my attention, including groundwater monitoring data from wells located at the site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid;*

- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program and generally accepted engineering practices; and*

- *The information presented in this report is accurate and complete. The assumptions made in the qualitative exposure assessment remain valid.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner/Remedial Party or Owner's/Remedial Party's Designated Site Representative] [I have been authorized and designated by all site owners/remedial parties to sign this certification] for the site."

The Periodic Review Report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located and the NYSDOH Bureau of Environmental Exposure Investigation. The Periodic Review Report may need to be submitted in hard-copy format, as requested by the NYSDEC project manager.

7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a Corrective Measures Work Plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by the NYSDEC.

7.4 Remedial Site Optimization Report

In the event that an RSO is to be performed (see Section 6.3), upon completion of an RSO, an RSO report must be submitted to the Department for approval. A general outline for the RSO report is provided in Appendix J. The RSO report will document the research/ investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual site model and present recommendations. RSO recommendations are to be implemented upon approval from the NYSDEC. Additional work plans, design documents, HASPs etc., may still be required to implement the recommendations, based upon the actions that need to be taken. A final engineering report and update to the SMP may also be required.

The RSO report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the site is located, Site Control, and the NYSDOH Bureau of Environmental Exposure Investigation.

8.0 REFERENCES

6NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.

NYSDEC DER-10 – "Technical Guidance for Site Investigation and Remediation".

NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

Remedial Investigation/Feasibility Study (RI/FS) Report for the Robert Moses Parkway-South Site Southwest of the Intersection of John Daly Blvd and Buffalo Avenue (SBL #158.16-1-1) Niagara Falls, Niagara County, New York, Site No. 932166, Prepared by C&S Engineers, March 2018.

Interim Remedial Measures Construction Completion Report (IRM CCR) for the Robert Moses Parkway-South Site Southwest of the Intersection of John Daly Blvd and Buffalo Avenue (SBL #158.16-1-1) Niagara Falls, Niagara County, New York, Site No. 932166, Prepared by C&S Engineers, January 2019.

Record of Decision (ROD) for the Robert Moses Parkway-South Site State Superfund Project Niagara Falls, Niagara County Site No. 932166, Prepared by Division of Environmental Remediation, New York State Department of Environmental Conservation, March 2019.

APPENDIX A – LIST OF SITE CONTACTS

Site Owner
New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP)
Contact: Andrew C. Giarrizzo, GLA
716.299.0806
Andrew.Giarrizzo@parks.ny.gov

Qualified Environmental Professional
C&S Engineers
Contact: Daniel Riker, PG
716.847.1630
driker@cscos.com

NYSDEC DER Project Manager
Benjamin Mcpherson, P.E.
716.851.7220
benjamin.mcpherson@dec.ny.gov

NYSDEC Regional HW Engineer
Chad Staniszewski, P.E.
716.851.7220
chad.staniszewski@dec.ny.gov

NYSDEC Site Control
Kelly Lewandowski
716.851.7220
Kelly.lewandowski@dec.ny.gov

APPENDIX B – EXCAVATION WORK PLAN (EWP)

B-1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the NYSDEC. Table [B-1] includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in Appendix A.

Table B-1: Notifications*

Name	Contact Information
Benjamin McPherson, P.E., *NYSDEC Project Manager, Region 9*	716-851-7220 Benjamin.mcpherson@dec.ny.gov
Chad Staniszewski, P.E. *NYSDEC Region 9 HW Engineer*	716-851-7220 Chad.staniszewski@dec.ny.gov
Christine Vooris *NYSDOH*	518-402-7860 Christine.Vooris@health.ny.gov
Kelly Lewandowski *NYSDEC Site Control*	716-851-7220, Kelly.lewandowski@dec.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control;
- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;

- A schedule for the work, detailing the start and completion of all intrusive work;
- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix G of this SMP;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

B-2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based (e.g. photoionization detector) soil screening will be performed by a qualified environmental professional during all excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed when invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil.

B-3 SOIL STAGING METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC.

B-4 MATERIALS EXCAVATION AND LOAD-OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and remedial party (if applicable) and its contractors are responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

A truck wash will be operated on-site, as appropriate. The qualified environmental professional will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the site until the activities performed under this section are complete Truck wash waters will be collected and disposed of off-site in an appropriate manner.

Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

B-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks loaded with site materials will exit the vicinity of the site using 4th Street . This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport;

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site. Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development. Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

B-6 MATERIALS DISPOSAL OFF-SITE

All material excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of material from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360.2. Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 361-5 Registration Facility).

B-7 MATERIALS REUSE ON-SITE

The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Evaluation of materials will be conducted in accordance with the IRM Work Plan developed by Watts Architecture & Engineering for the Site in March 2016 (Appendix K). Only material meeting commercial use SCOs and not presenting nuisance characteristics

may be reused onsite.

Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

B-8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, and will be managed off-site, unless prior approval is obtained from NYSDEC.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

B-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the Record of Decision. The existing cover system is comprised of a minimum of 12 inches of clean soil (approved soil/fill that allows for commercial use; required to meet Commercial Use SCOs before placement onsite), asphalt pavement, and concrete covered sidewalks. The demarcation layer,

consisting of orange snow fencing material, white geotextile or equivalent material, etc. will be replaced to provide a visual reference to the top of the remaining contamination zone, the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this SMP. If the type of cover system changes from that which exists prior to the excavation (i.e., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in an updated SMP.

B-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Trucks entering the site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

B-11 STORMWATER POLLUTION PREVENTION

Before commencing construction activity, the owner or operator of a construction project that will involve soil disturbance of one or more acres must obtain coverage under the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity. In order to gain coverage under the SPDES General Permit for Stormwater Discharges from Construction Activity, an owner or operator must:

- Develop a Stormwater Pollution Prevention Plan (SWPPP) in accordance with the requirements in the General Permit for Stormwater Discharges from Construction Activity.
- Submit a completed Notice of Intent (NOI) to the Department.
- Projects subject to MS4 regulation must submit a signed MS4 SWPPP Acceptance Form along with their NOI. With some exceptions, an owner or operator of a construction project within the boundaries of an MS4 is required to have their SWPPP reviewed and accepted by the MS4 prior to submitting their NOI to the Department.

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by the NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering. Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing

significant impacts to receiving waters. Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

B-12 EXCAVATION CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the Periodic Review Report.

B-13 COMMUNITY AIR MONITORING PLAN (CAMP)

CAMP procedures will be conducted consistent with the CAMP developed by Watts Architecture & Engineering for the Site in February 2016 (Appendix L). The location of air sampling stations will be set and adjusted on a daily or more frequent basis based on actual wind directions to provide an upwind and at least two downwind monitoring stations.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

B-14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site. If nuisance odors are identified at the site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the remedial party's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

B-15 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, un-vegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

APPENDIX C – DECLARATION OF COVENANTS

NIAGARA COUNTY – STATE OF NEW YORK
JOSEPH A. JASTRZEMSKI – NIAGARA COUNTY CLERK
P.O. BOX 461, LOCKPORT, NEW YORK 14095-0461

COUNTY CLERK'S RECORDING PAGE
THIS PAGE IS PART OF THE DOCUMENT – DO NOT DETACH

INSTRUMENT #: 2019-15009

Receipt#: 2019432599
Clerk: TH
Rec Date: 09/12/2019 02:21:57 PM
Doc Grp: DEED
Descrip: RESTRICTED COVENANTS
Num Pgs: 8

Party1: OFFICE OF PARKS AND RECREATOIN AND HISTORIC PRESERVATION
Party2: NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION
Town: NIAGARA FALLS

Recording:

Cover Page	0.00
Recording Fee	0.00
Cultural Ed	0.00
Records Management - Coun	0.00
Records Management - Stat	0.00
Total:	0.00

**** NOTICE: THIS IS NOT A BILL ****

Record and Return To:

NYSOPHP
31960 DEVEAUX WOODS DRIVE
NIAGARA FALLS NY 14305

WARNING***
** Information may change during the verification process and may not be reflected on this page.

Joseph A. Jastrzemski
Niagara County Clerk

NIAGARA COUNTY CLERK

JOSEPH A. JASTRZEMSKI

Receipt

Receipt Date: 09/12/2019 02:21:57 PM
RECEIPT # 2019432599

Recording Clerk: TH
Cash Drawer: CASH2
Rec'd Frm: NYSOPRHP
Rec'd In Person

Instr#: 2019-15009
DOC: RESTRICTED COVENANTS
OR Party: OFFICE OF PARKS AND RECREATOIN
AND HISTORIC PRESERVATION
EE Party: NEW YORK STATE DEPT OF
ENVIRONMENTAL CONSERVATION

Recording Fees	
Cover Page	$0.00
Recording Fee	$0.00
Cultural Ed	$0.00
Records Management - County	$0.00
Records Management - State	$0.00
DOCUMENT TOTAL: ---->	$0.00

Receipt Summary	
Document Count: 1	
TOTAL RECEIPT: ---->	$0.00
TOTAL RECEIVED: ---->	$0.00
CASH BACK: ---->	$0.00

P.O. Box 461, Lockport, NY 14095-0461 Phone (716) 439-7022 Fax (716) 439-7035

158.16-1-1 SBL.
SITE #932166 DEC.

#Record + Return:
Andrew Giarrizzo (NYSOPRHP)
3160 Devereux Woods Dr.
Niagara Falls, NY 14305

DECLARATION of COVENANTS and RESTRICTIONS

THIS COVENANT is made the 8th day of May 2019, by the State of New York, acting by and through the Office of Parks, Recreation and Historic Preservation ("Parks") with office headquarters at 625 Broadway, Albany, New York 12207.

WHEREAS, the Robert Moses Parkway-South Site is the subject of the Order on Consent and Administrative Settlement Index Number: R9-20151026-114 ("Order on Consent") executed by Parks as part of the New York State Department of Environmental Conservation's (the "Department's") Superfund Program, namely that parcel of real property located at the intersection of John B. Daly Boulevard and Buffalo Avenue in the City of Niagara Falls, County of Niagara, State of New York, which is part of lands taken by eminent domain in 1885, and being more particularly described in Appendix "A," attached to this Declaration and made a part hereof, and hereinafter referred to as "the Property"; and

WHEREAS, the Department approved a remedy to eliminate or mitigate all significant threats to the environment presented by the contamination disposed at the Property and such remedy requires that the Property be subject to restrictive covenants.

NOW, THEREFORE, Parks, for itself and its successors and/or assigns, covenants that:

First, the Property subject to this Declaration of Covenants and Restrictions is as shown on a map attached to this declaration as Appendix "B" and made a part hereof.

Second, unless prior written approval by the Department or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," is first obtained, where contamination remains at the Property subject to the provisions of the Site Management Plan ("SMP"), there shall be no construction, use or occupancy of the Property that results in the disturbance or excavation of the Property which threatens the integrity of the engineering controls or which results in unacceptable human exposure to contaminated soils.

Third, the owner of the Property shall not disturb, remove, or otherwise interfere with the installation, use, operation, and maintenance of engineering controls required for the Remedy, which are described in the SMP, unless in each instance the owner first obtains a written waiver of such prohibition from the Department or Relevant Agency.

Fourth, the owner of the Property shall prohibit the Property from ever being used for purposes other than for commercial use, which allows passive recreational use, without the express written waiver of such prohibition by the Department or Relevant Agency.

Fifth, the owner of the Property shall prohibit the use of the groundwater underlying the Property without treatment to render it safe for drinking water or for industrial purposes, as appropriate, and the user must first notify and obtain written approval to do so from the Department or Relevant Agency.

2019432599

2019-15009
09/12/2019 02:21:57 PM
8 Pages
RESTRICTED COVENANT

Joseph A. Jastrzemski, Niagara County Clerk Clerk: TH

Sixth, the owner of the Property shall provide a periodic certification, prepared and submitted by a professional engineer or environmental professional acceptable to the Department or Relevant Agency, which will certify that the institutional and engineering controls put in place are unchanged from the previous certification, comply with the SMP, and have not been impaired.

Seventh, the owner of the Property shall continue in full force and effect any institutional and engineering controls required for the Remedy and maintain such controls, unless the owner first obtains permission to discontinue such controls from the Department or Relevant Agency, in compliance with the approved SMP, which is incorporated and made enforceable hereto, subject to modifications as approved by the Department or Relevant Agency.

Eighth, this Declaration is and shall be deemed a covenant that shall run with the land and shall be binding upon all future owners of the Property, and shall provide that the owner and its successors and assigns consent to enforcement by the Department or Relevant Agency of the prohibitions and restrictions that the Order on Consent requires to be recorded, and hereby covenant not to contest the authority of the Department or Relevant Agency to seek enforcement.

Ninth, any deed of conveyance of the Property, or any portion thereof, shall recite, unless the Department or Relevant Agency has consented to the termination of such covenants and restrictions, that said conveyance is subject to this Declaration of Covenants and Restrictions.

IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

By: _____

Print Name: Thomas J. Ahlworth

Title: executive Deputy Comm. Date: May 8, 2019

STATE OF NEW YORK)

) s.s.:

COUNTY OF Albany)

On the 8th day of May, in the year 2019, before me, the undersigned, personally appeared Tom Aldworth, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Notary Public State of New York

VIRGINIA L DAVIS
NOTARY PUBLIC, STATE OF NEW YORK
NO. 01DA6101202
QUALIFIED IN ALBANY COUNTY
COMMISSION EXPIRES NOV. 10, 2019

Appendix "A"

ALL THAT TRACT OR PARCEL OF LAND, situate in the City of Niagara Falls, County of Niagara and State of New York, being part of Lot No. 43 and Lot No. 44 of the Mile Reserve and also being part of subdivision lots 48, 50, 52, 54, 56, 58, 60 and 62 as shown on a map as filed in the Niagara County Clerk's Office under Map Cover No. 463 and found in Book 5 of microfilmed maps bounded and described as follows:

Beginning at a set rebar in the east line of Fourth Avenue, said rebar being a distance of 334.04 feet south of the south line of Buffalo Avenue being 66 foot wide;

Thence S 88° 49' 05" E and thru sub lot 48 a distance of 64.19 feet to a set rebar;

Thence N 89° 49' 55" E and continuing thru sub lot 48 and 50 a distance of 66.00 feet to a set rebar;

Thence N 86° 37' 10" E and continuing thru sub lot 50 and 52 a distance of 66.00 feet to a set rebar;

Thence N81° 58' 40" E and continuing thru sub lot 52 and 54 a distance of 66.66 feet to a set rebar;

Thence along a curve to the left continuing thru sub lots 54, 56, 58, 60 and part of 62, with a 200 foot radius and a chord bearing of N 78° 25' 50" E , a chord distance of 247.48 feet with an arc distance of 247.64 to a set rebar;

Thence S 05° 41' 13" E a distance of 66.23 feet to a set rebar in the south line of said map cover;

Thence S 37° 31' 39" E a distance of 27.97 feet to a set rebar;

Thence N 72° 38' 41" E and over a distance of 34.99 feet to a set rebar;

Thence N 65° 42' 40" E and a distance of 192.30 feet to a set rebar;

Thence N 64° 29' 52" E a distance of 174.91 feet to a set rebar;

Thence on a curve to the left with a radius of 167.38 feet, a chord bearing of N 34° 17' 58" E, a chord distance of 180.67 and an arc length of 190.83 feet to a set rebar;

Thence N 02° 22' 06" W a distance of 94.74 feet to a set rebar in the south line of Buffalo Avenue;

Thence N 87° 14' 06 "E and along the south line of Buffalo Avenue a distance of 338.81 feet to the westerly line of the New York State Power Authority;

Thence S 20° 36' 02" E and along the said west line of the New York State Power Authority a distance of 124.67 feet to an existing rebar and cap;

Thence S 00° 42' 31" W and along the said west line of the New York State Power Authority a distance of 12.13 feet to an existing rebar;

Thence S 30° 57' 26" E and along the said west line of the New York State Power Authority a distance of 283.99 feet to an set rebar;

Thence S 02° 45' 40" E and along the said west line of the New York State Power Authority a distance of 115.00 feet to a set rebar;

Thence S 77° 42' 17" W and along the said west line of the New York State Power Authority a distance of 15.17 feet to a set rebar;

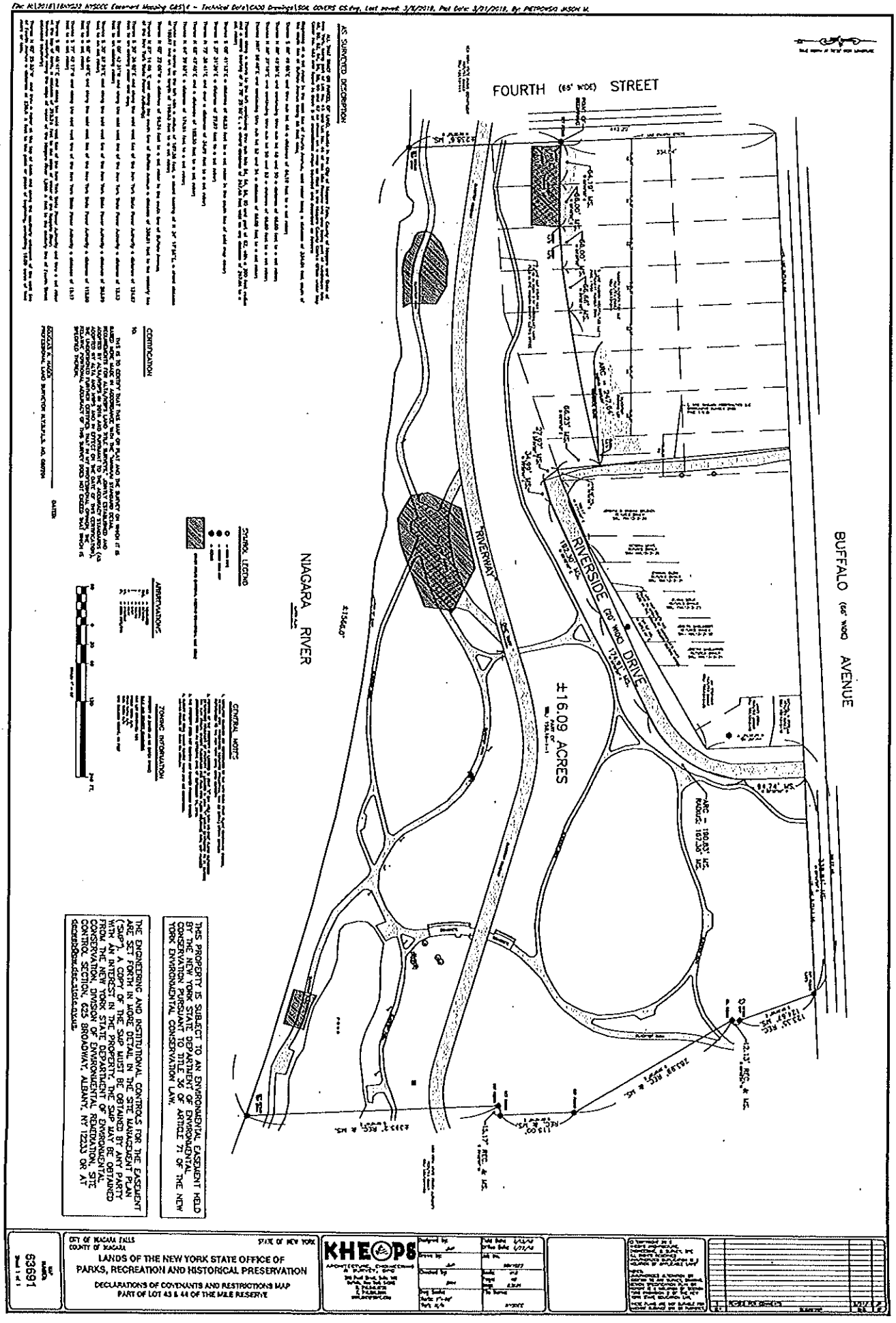
Thence S 02° 45' 41" E and along the said west line of the New York State Power Authority and thru a set rebar at the top of bank, a distance of 395.2± feet to the edge of water of the Niagara River;

Thence westerly along the edge of water of the Niagara River 1,566 ± feet to the easterly line of Fourth Street extended southerly;

Thence N 02° 25' 53" W and thru a rebar at the top of bank and along the southerly extension of the east line of Fourth Avenue a distance of 238.6 ± feet to the point or place of beginning, containing 16.09 acres of land more or less.

Appendix "B"

Appendix "B"



CITY OF NIAGARA FALLS
COUNTY OF NIAGARA
STATE OF NEW YORK

LANDS OF THE NEW YORK STATE OFFICE OF PARKS, RECREATION AND HISTORICAL PRESERVATION

DECLARATIONS OF COVENANTS AND RESTRICTIONS MAP
PART OF LOT 43 & 44 OF THE MILE RESERVE

KHEOPS

MAP NO. 53691

CHAPTER 191

AN ACT to amend chapter five hundred thirty-five of the laws of nineteen hundred eighty-seven relating to certain city income tax surcharge, in relation to making technical amendments to the effective date thereof

Became a law June 30, 1988, with the approval of the Governor. Passed on message of necessity pursuant to Article III, section 14 of the Constitution by a majority vote, three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Section six of chapter five hundred thirty-five of the laws of nineteen hundred eighty-seven relating to certain city income tax surcharge, as amended by chapter five hundred fifty-two of the laws of nineteen hundred eighty-seven, is amended to read as follows:

§ 6. This act shall take effect immediately and shall apply to taxable years beginning [in nineteen hundred eighty-seven] *after nineteen hundred eighty-six* provided, however, that section five of this act shall expire on September thirtieth, nineteen hundred ninety-one.

§ 2. This act shall take effect immediately.

CHAPTER 192

AN ACT to amend the civil practice law and rules, in relation to fees and to repeal subdivision (e) of section eight thousand eighteen of such law and rules relating thereto

Became a law July 1, 1988, with the approval of the Governor. Passed by a majority vote, three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Subdivision (a) of section eight thousand seventeen of the civil practice law and rules, as amended by chapter eight hundred fifty-eight of the laws of nineteen hundred eighty-four, is amended to read as follows:

[(a)] Exemption of the state and counties, and agencies and officers thereof, from fees of clerks. *(a)* Notwithstanding any other provision of this article or any other general, special or local law relating to fees of clerks, no clerk shall charge or collect a fee from the state, or an agency or officer thereof, for any service rendered in an action in which any of them is involved, nor shall any clerk charge or collect a fee for filing, recording or indexing any paper, document, map or proceeding filed, recorded or indexed for the county, or an agency or officer thereof acting in an official capacity, nor for furnishing a transcript, certification or copy of any paper, document, map or proceeding to be used for official purposes.

§ 2. Subdivision (e) of section eight thousand eighteen of such law and rules is repealed and subdivision (d) of such section, as amended by chapter five hundred thirty-two of the laws of nineteen hundred sixty-three, is amended to read as follows:

(d) Additional services without fee where index number assigned. A county clerk who has assigned an index number shall charge no further fee in the action to which the index number is assigned:

1. for the filing, entering, indexing, or docketing, and in the counties within the city of New York, for recording, as required by statute, of any and all papers in the action, or preliminary thereto or supplementary to judgment;

2. for furnishing an extract of minutes for filing with the clerk of the court, for affixing a certificate to a filed paper, for taxing

EXPLANATION–Matter in *italics* is new; matter in brackets [ ] is old law to be omitted.

APPENDIX D

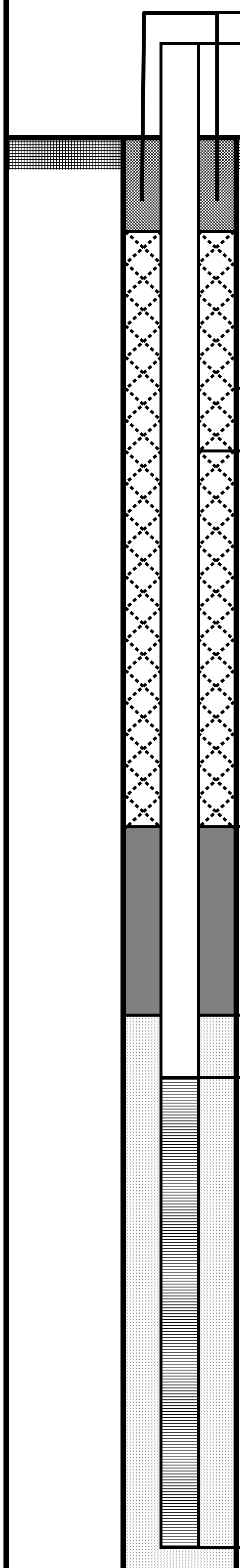
MONITORING WELL BORING AND CONSTRUCTION LOGS

C&S Engineers, Inc.
[illegible]

GROUNDWATER OBSERVATION WELL CONSTRUCTION LOG

		Well No.	**MW-1**
		Project No.:	[illegible]
		Surface Elev.:	
Project Name:	[illegible]	***Datum:***	[illegible]
Location:	[illegible]	***Start Date:***	[illegible]
Client:	NYSOPRHP	***Finish Date:***	[illegible]
Drilling Firm:	[illegible] ***Driller:*** [illegible]	***Inspector:***	AD
Drill Rig:	[illegible]	***Casing:***	[illegible]
Notes:	[illegible]		

The observation well was constructed south of HotSpot #4, approximately 15 feet south of AT&T Fiber Optic line, to a depth of 13.5 feet (refusal). Hollow Stem Augers (HSA) were used as the casing and the well was constructed inside the augers. Filter pack material and seal material were poured separately down the inside of the augers while the augers were retracted. Measurements were taken to asure that neither the filter pack or seal materials were bridging between the well and HSA. The well was developed by pump to remove fine materials.



Top Protective Casing

Top of Riser

0'-0" **Ground Surface**

[illegible]
- [ ] [illegible]
- [ ] [illegible]
- [x] [illegible]
- [ ] [illegible]

4.25" **Bore Hole Diameter**

2" **Well Diameter**

[illegible]
- [x] [illegible]
- [ ] [illegible]

[illegible]
- [ ] [illegible]
- [ ] [illegible]
- [ ] [illegible]
- [ ] [illegible]

Depth To:

1'-0" **Top of Seal**

[illegible]
- [x] [illegible]
- [ ] [illegible]
- [ ] [illegible]

3'-0" **Top of Filter Pack**

3'-6" **Top of Screen**

[illegible]
- [x] [illegible]
- [ ] [illegible]
- [ ] [illegible]
- [ ] [illegible]

[illegible]
- [ ] [illegible]
- [x] [illegible]
- [ ] [illegible]
- [ ] [illegible]
- [ ] [illegible]
- [ ] [illegible]

13'-6" **Bottom of Screen**

13'-6" **Bottom of Bore Hole**

Groundwater Measurement Data

Date	Time	Depth to Water	Water Elevation	Tide Status
[illegible]	[illegible]	[illegible]		

C&S COMPANIES

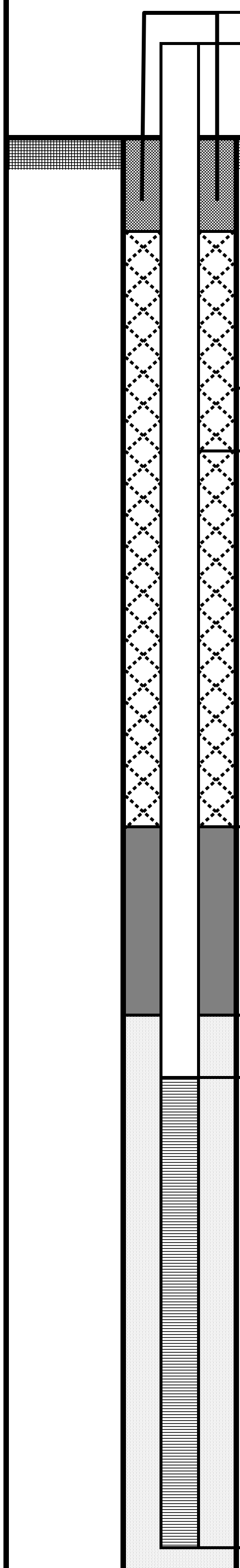
C&S Engineers, Inc.
[illegible]

GROUNDWATER OBSERVATION WELL CONSTRUCTION LOG

		Well No.	**MW-2**
		Project No.:	[illegible]
		Surface Elev.:	
Project Name:	R[illegible]	***Datum:***	[illegible]RO[illegible]ND S[illegible]R[illegible]A[illegible]E
Location:	R[illegible]	***Start Date:***	[illegible]
Client:	NYSOPRHP	***Finish Date:***	[illegible]
Drilling Firm:	N[illegible] ***Driller:*** [illegible]	***Inspector:***	AD
Drill Rig:	M[illegible]	***Casing:***	[illegible] H[illegible]S[illegible]A

Notes: [illegible]

The observation well was constructed south of HotSpot #1&3, south of AT&T Fiber Optic line, to a depth of 12.3 feet (refusal). Hollow Stem Augers (HSA) were used as the casing and the well was constructed inside the augers. Filter pack material and seal material were poured separately down the inside of the augers while the augers were retracted. Measurements were taken to asure that neither the filter pack or seal materials were bridging between the well and HSA. The well was developed by pump to remove fine materials.



Top Protective Casing

Top of Riser

0'-0" **Ground Surface**

S[illegible] B[illegible] M[illegible]
- [ ] S[illegible]
- [ ] B[illegible] S[illegible]rr[illegible]
- [x] [illegible]/B[illegible] [illegible]r[illegible]
- [ ] [illegible]r[illegible]

4.25" **Bore Hole Diameter**

2" **Well Diameter**

W[illegible]M[illegible]r[illegible]
- [x] P[illegible]
- [ ] S[illegible] S[illegible]

B[illegible]M[illegible]r[illegible]
- [ ] S[illegible]
- [ ] B[illegible] S[illegible]rr[illegible]
- [ ] [illegible]/B[illegible] [illegible]r[illegible]
- [ ] [illegible]r[illegible]

Depth To:

1'-0" **Top of Seal**

S[illegible]M[illegible]r[illegible]
- [x] B[illegible]/P[illegible]
- [ ] B[illegible] S[illegible]rr[illegible]
- [ ] [illegible]/B[illegible] [illegible]r[illegible]

4'-0" **Top of Filter Pack**

4'-4" **Top of Screen**

S[illegible]r[illegible] S[illegible]S[illegible]
- [x] [illegible]
- [ ] [illegible]
- [ ] [illegible]2[illegible]
- [ ] [illegible]2[illegible]

[illegible]r M[illegible]r[illegible]
- [ ] [illegible] S[illegible]d P[illegible]
- [x] [illegible] S[illegible]d P[illegible]
- [ ] [illegible] S[illegible]d P[illegible]
- [ ] 2 S[illegible]d P[illegible]
- [ ] 3 S[illegible]d P[illegible]
- [ ] [illegible] S[illegible]d P[illegible]

12'-4" **Bottom of Screen**

12'-4" **Bottom of Bore Hole**

Groundwater Measurement Data

Date	Time	Depth to Water	Water Elevation	Tide Status
[illegible]	[illegible]	[illegible]		

C&S Engineers, Inc.
[illegible]

GROUNDWATER OBSERVATION WELL CONSTRUCTION LOG

Well No.	MW-3
Project No.:	[illegible]
Surface Elev.:	
Datum:	[illegible]
Start Date:	[illegible]
Finish Date:	[illegible]
Inspector:	AD
Casing:	[illegible] HSA

Project Name: [illegible]

Location: [illegible]

Client: NYSOPRHP

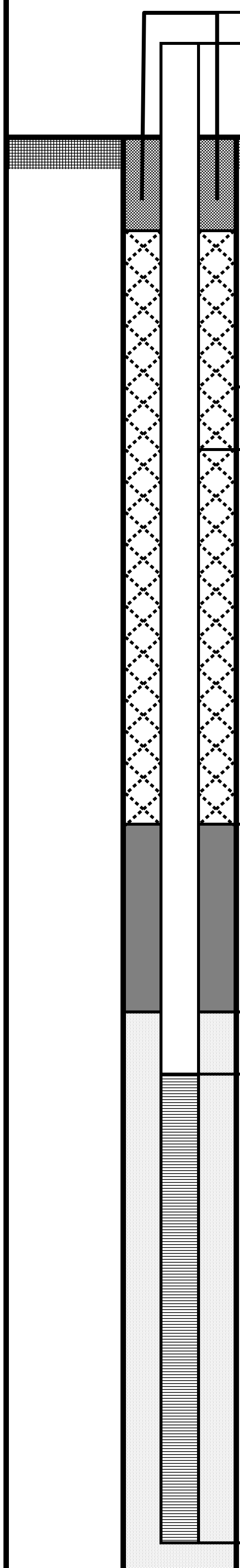
Drilling Firm: [illegible]

Driller: [illegible]

Drill Rig: [illegible]

Notes: [illegible]

The observation well was constructed south of AT&T Fiber Optic line, to a depth of 16 feet (refusal). Hollow Stem Augers (HSA) were used as the casing and the well was constructed inside the augers. Filter pack material and seal material were poured separately down the inside of the augers while the augers were retracted. Measurements were taken to asure that neither the filter pack or seal materials were bridging between the well and HSA. The well was developed by pump to remove fine materials.



Top Protective Casing

+3'-9" Top of Riser

0'-0" Ground Surface

[illegible] Material
- [ ] [illegible]
- [ ] [illegible]
- [x] [illegible]
- [ ] [illegible]

4.25" Bore Hole Diameter

2" Well Diameter

Well Material
- [x] PVC
- [ ] [illegible]

Backfill Material
- [ ] [illegible]
- [ ] [illegible]
- [x] [illegible]
- [ ] [illegible]

Depth To:

4'-0" Top of Seal

Seal Material
- [x] [illegible]
- [ ] [illegible]
- [ ] [illegible]

5'-0" Top of Filter Pack

6'-0" Top of Screen

Screen Slot Size
- [x] [illegible]
- [ ] [illegible]
- [ ] [illegible]
- [ ] [illegible]

Filter Material
- [ ] [illegible] Sand Pack
- [x] [illegible] Sand Pack
- [ ] [illegible] Sand Pack
- [ ] 2 Sand Pack
- [ ] 3 Sand Pack
- [ ] [illegible] Sand Pack

16'-0" Bottom of Screen

16'-0" Bottom of Bore Hole

Groundwater Measurement Data

Date	Time	Depth to Water	Water Elevation	Tide Status
[illegible]	[illegible]	[illegible]		

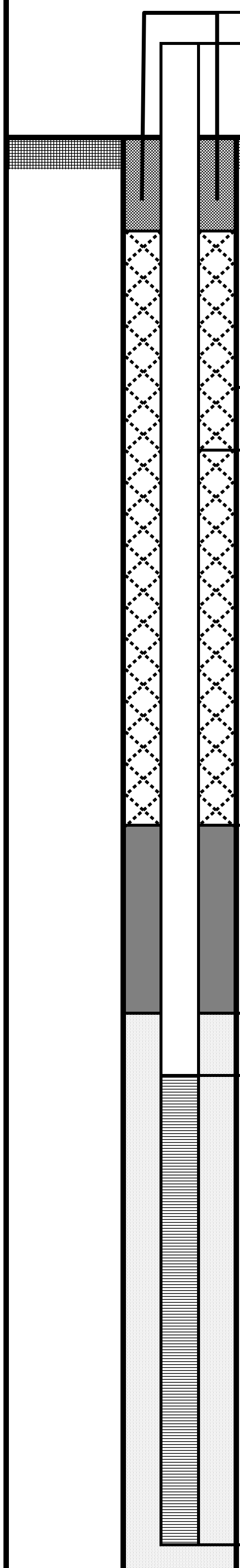
C&S Engineers, Inc.
[illegible]

GROUNDWATER OBSERVATION WELL CONSTRUCTION LOG

Well No.	**MW-4**
Project No.:	[illegible]
Surface Elev.:	
Datum:	[illegible]
Start Date:	[illegible]
Finish Date:	[illegible]
Inspector:	[illegible]M
Casing:	[illegible] HSA

Project Name:	[illegible]
Location:	[illegible]
Client:	NYSOPRHP
Drilling Firm:	[illegible]
Driller:	[illegible]
Drill Rig:	[illegible]
Notes:	[illegible]

The observation well was constructed to a depth of 11.3 feet (refusal). Hollow Stem Augers (HSA) were used as the casing and the well was constructed inside the augers. Filter pack material and seal material were poured separately down the inside of the augers while the augers were retracted. Measurements were taken to asure that neither the filter pack or seal materials were bridging between the well and HSA. The well was developed by pump to remove fine materials.



Top Protective Casing

+2'-4" **Top of Riser**

0'-0" **Ground Surface**

S[illegible] B[illegible] M[illegible] (Surface Backfill Material)
- [ ] [illegible]
- [ ] B[illegible] S[illegible]
- [x] [illegible]/B[illegible]
- [ ] [illegible]

10" **Bore Hole Diameter**

2" **Well Diameter**

W[illegible] M[illegible] (Well Material)
- [x] P[illegible]
- [ ] S[illegible] S[illegible]

B[illegible] M[illegible] (Backfill Material)
- [ ] [illegible]
- [ ] B[illegible] S[illegible]
- [x] [illegible]/B[illegible]
- [ ] [illegible]

Depth To:

1'-0" **Top of Seal**

S[illegible] M[illegible] (Seal Material)
- [x] B[illegible]/P[illegible]
- [ ] B[illegible] S[illegible]
- [ ] [illegible]/B[illegible]

4'-0" **Top of Filter Pack**

4'-6" **Top of Screen**

S[illegible] S[illegible] S[illegible] (Screen Slot Size)
- [x] [illegible]
- [ ] [illegible]
- [ ] [illegible]2[illegible]
- [ ] [illegible]2[illegible]

[illegible] M[illegible] (Filter Material)
- [ ] [illegible] S[illegible]d P[illegible]
- [x] [illegible] S[illegible]d P[illegible]
- [ ] [illegible] S[illegible]d P[illegible]
- [ ] 2 S[illegible]d P[illegible]
- [ ] 3 S[illegible]d P[illegible]
- [ ] [illegible] S[illegible]d P[illegible]

11'-3" **Bottom of Screen**

11'-3" **Bottom of Bore Hole**

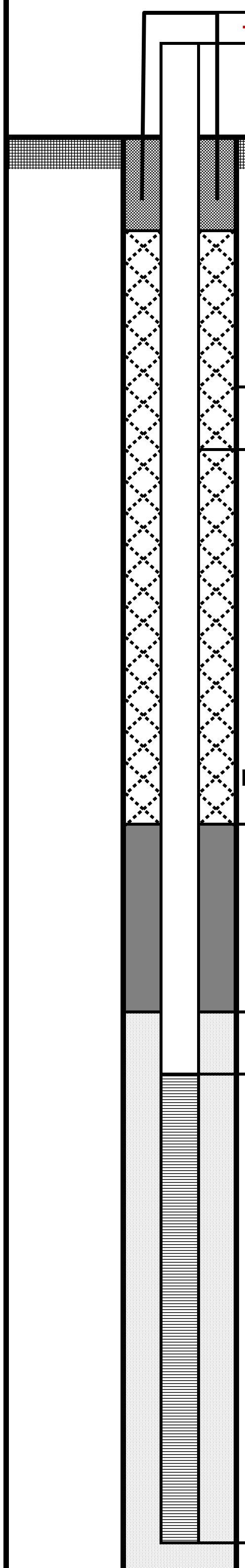
Groundwater Measurement Data

Date	Time	Depth to Water	Water Elevation	Tide Status
2[illegible]	3[illegible]3[illegible]	[illegible]		

C&S Engineers, Inc. [illegible]	GROUNDWATER OBSERVATION WELL CONSTRUCTION LOG	*Well No.*	MW-5
		Project No.:	[illegible]
		Surface Elev.:	

Project Name:	[illegible]	*Datum:*	[illegible]
Location:	[illegible]	*Start Date:*	[illegible]
Client:	NYSOPRHP	*Finish Date:*	[illegible]
Drilling Firm:	[illegible]	*Driller:* [illegible]	*Inspector:* AD
		Drill Rig: [illegible]	*Casing:* [illegible]
		Notes:	[illegible]

The observation well was constructed to a depth of 11.0 feet (refusal). Hollow Stem Augers (HSA) were used as the casing and the well was constructed inside the augers. Filter pack material and seal material were poured separately down the inside of the augers while the augers were retracted. Measurements were taken to asure that neither the filter pack or seal materials were bridging between the well and HSA. The well was developed by pump to remove fine materials.



Top Protective Casing

+2.38' **Top of Riser**

0.0 **Ground Surface**

[illegible] (Surface Backfill Material)
- [ ] [illegible]
- [ ] [illegible]
- [x] [illegible]
- [ ] [illegible]

10" **Bore Hole Diameter**

2" **Well Diameter**

[illegible] (Well Material)
- [x] [illegible]
- [ ] [illegible]

[illegible] (Backfill Material)
- [ ] [illegible]
- [ ] [illegible]
- [x] [illegible]
- [ ] [illegible]

Depth To:

4.0' **Top of Seal**

[illegible] (Seal Material)
- [x] [illegible]
- [ ] [illegible]
- [ ] [illegible]

5.0' **Top of Filter Pack**

6.0' **Top of Screen**

[illegible] (Screen Slot Size)
- [x] [illegible]
- [ ] [illegible]
- [ ] [illegible]
- [ ] [illegible]

[illegible] (Filter Material)
- [ ] [illegible]
- [x] [illegible]
- [ ] [illegible]
- [ ] [illegible]
- [ ] [illegible]
- [ ] [illegible]

11.0' **Bottom of Screen**

11.0' **Bottom of Bore Hole**

Groundwater Measurement Data

Date	Time	Depth to Water	Water Elevation	Tide Status
[illegible]	[illegible]	[illegible]		

C&S Engineers, Inc.

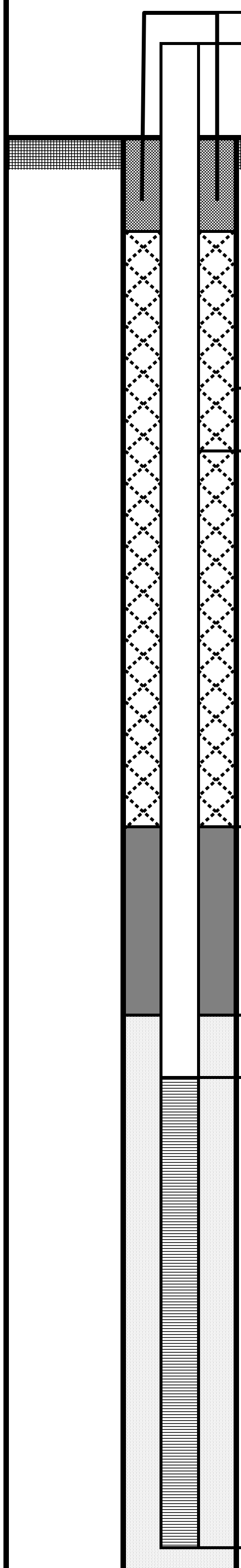
[illegible]

GROUNDWATER OBSERVATION WELL CONSTRUCTION LOG

Well No.	MW-6
Project No.:	[illegible]
Surface Elev.:	
Datum:	[illegible]
Start Date:	[illegible]
Finish Date:	[illegible]
Inspector:	AD

Project Name:	[illegible]
Location:	[illegible]
Client:	NYSOPRHP
Drilling Firm:	[illegible]
Driller:	[illegible]
Drill Rig:	[illegible]
Casing:	[illegible]
Notes:	[illegible]

The observation well was constructed to a depth of 12.0 feet (refusal). Hollow Stem Augers (HSA) were used as the casing and the well was constructed inside the augers. Filter pack material and seal material were poured separately down the inside of the augers while the augers were retracted. Measurements were taken to asure that neither the filter pack or seal materials were bridging between the well and HSA. The well was developed by pump to remove fine materials.



Top Protective Casing

+2.46' **Top of Riser**

0.0" **Ground Surface**

[illegible]
- [ ] [illegible]
- [ ] [illegible]
- [x] [illegible]
- [ ] [illegible]

10" **Bore Hole Diameter**

2" **Well Diameter**

[illegible]
- [x] [illegible]
- [ ] [illegible]

[illegible]
- [ ] [illegible]
- [x] [illegible]
- [ ] [illegible]
- [ ] [illegible]

Depth To:

5.0' **Top of Seal**

[illegible]
- [x] [illegible]
- [ ] [illegible]
- [ ] [illegible]

6.0' **Top of Filter Pack**

7.0' **Top of Screen**

[illegible]
- [x] [illegible]
- [ ] [illegible]
- [ ] [illegible]
- [ ] [illegible]

[illegible]
- [ ] [illegible]
- [x] [illegible]
- [ ] [illegible]
- [ ] [illegible]
- [ ] [illegible]
- [ ] [illegible]

12.0' **Bottom of Screen**

12.0' **Bottom of Bore Hole**

Groundwater Measurement Data

Date	Time	Depth to Water	Water Elevation	Tide Status
[illegible]	[illegible]	[illegible]		

C&S COMPANIES

C&S Engineers, Inc.
□□□ □ □□E□□□□ □ □□□□ B□d□
S□r□□□□□ N□ Y□r □32□2
P□□□□3□□□□□2□□□
□□□3□□□□□□□□□
□□□□□□□□□□

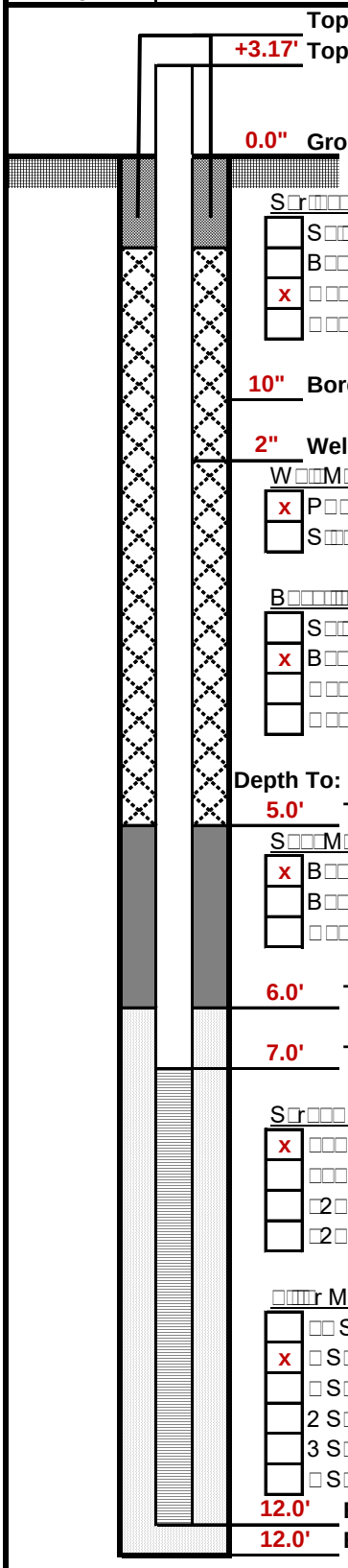
GROUNDWATER OBSERVATION WELL CONSTRUCTION LOG

Well No.	MW-7
Project No.:	□□□2□□□
Surface Elev.:	
Datum:	□RO□ND S□R□A□E
Start Date:	□/2□/□□
Finish Date:	□/2□/□□
Inspector:	AD

Project Name:	R□□□r□M□□□□ P□r□□ □□□ □S□□□ R□□ □d□□		
Location:	R□□□r□M□□□□ P□r□□ □□ □□□□□□ D□□ B□□□□□rd		
Client:	NYSOPRHP		
Drilling Firm:	N□□r□□□ W□□	**Driller:** □□	
		Drill Rig: M□□□□ □□□	**Casing:** □2□ H□S□A

Notes: □r□□d□ d□□r□□□□ □□□□□r□□□□ □ □□□□□□□□□□ □□□d □□□□□□r□□□□□ d□□□□□ □□□□ □□□d □□d □□□ □□□r □□□r□ □□□□□

The observation well was constructed to a depth of 12.0 feet (refusal). Hollow Stem Augers (HSA) were used as the casing and the well was constructed inside the augers. Filter pack material and seal material were poured separately down the inside of the augers while the augers were retracted. Measurements were taken to asure that neither the filter pack or seal materials were bridging between the well and HSA. The well was developed by pump to remove fine materials.



Top Protective Casing

+3.17' Top of Riser

0.0" Ground Surface

S□r□□□ B□□□□M□□r□□□
- [ ] S□□□ □□□□□
- [ ] B□□□□□□ S□rr□
- [x] □□□ □□/B□□□□□□ □r□□□
- [ ] □□□r□□□

10" Bore Hole Diameter

2" Well Diameter

W□□M□□r□□□
- [x] P□□
- [ ] S□□□□□□ S□□□

B□□□□M□□r□□□
- [ ] S□□□ □□□□□
- [x] B□□□□□□ S□rr□
- [ ] □□□ □□/B□□□□□□ □r□□□
- [ ] □□□r□□□

Depth To:

5.0' Top of Seal

S□□M□□r□□□
- [x] B□□□□□□ □ □□/P□□□□
- [ ] B□□□□□□ S□rr□
- [ ] □□□ □□/B□□□□□□ □r□□□

6.0' Top of Filter Pack

7.0' Top of Screen

S□r□□□ S□□S□□
- [x] □□□ □
- [ ] □□□ □
- [ ] □2□ □
- [ ] □2□ □

□□r M□□r□□□
- [ ] □□ S□d P□□
- [x] □ S□d P□□
- [ ] □ S□d P□□
- [ ] 2 S□d P□□
- [ ] 3 S□d P□□
- [ ] □ S□d P□□

12.0' Bottom of Screen

12.0' Bottom of Bore Hole

Groundwater Measurement Data

Date	Time	Depth to Water	Water Elevation	Tide Status
2□□□□□	□2□3□	□□□		
2□□□□□	3□□□	□□□□		

C&S Engineers, Inc. [illegible] E[illegible] S[illegible]r[illegible] B[illegible] N[illegible] Y[illegible]r[illegible] [illegible]2[illegible]3 P[illegible]3[illegible] [illegible]: [illegible]16 [illegible]4 [illegible]	# BORING LOG	**Boring No.**	**MW-1**
		Sheet 1 of:	
		Project No.:	1[illegible]2[illegible]9
Project Name:	R[illegible]r [illegible]M[illegible] P[illegible]r[illegible] S[illegible] R[illegible]d[illegible]I[illegible]	**Surface Elev.:**	
Location:	R[illegible]r [illegible]M[illegible] P[illegible]r[illegible] D[illegible] B[illegible]rd	**Datum:**	[illegible]RO[illegible]ND S[illegible]R[illegible]A[illegible]E
Client:	NYSOPRHP	**Start Date:**	[illegible]/20[illegible]
Drilling Firm:	N[illegible]r[illegible] W[illegible]	**Finish Date:**	[illegible]/20[illegible]

Groundwater	**Depth**	**Date & Time**	**Drill Rig:**	M[illegible]			**Inspector:**	AD
While Drilling:	[illegible]. [illegible]	[illegible]/2[illegible] 10:33	**Casing:**	[illegible]25 H[illegible]S[illegible]A	**Rock Core:**		**Undist:**	
Before Casing Removal:			**Sampler:**		**Other:**			
After Casing Removal:			**Hammer:**					

[illegible]N [illegible]N[illegible] to dr[illegible]r [illegible]2" w/[illegible]0 [illegible]r f[illegible]llin[illegible] 30" ASTM D[illegible]5[illegible] S[illegible]d[illegible]rd P[illegible]r[illegible] T[illegible]

Depth (ft)	**Sample No.**	**Symbol**	**Blows on Sampler per 6"**	**MATERIAL DESCRIPTION** S[illegible]S[illegible]d[illegible]S[illegible] - [illegible]r[illegible]	[illegible]d [illegible]3[illegible] [illegible]2[illegible]3[illegible] [illegible]2[illegible] [illegible]r[illegible]	**COMMENTS** [illegible], N[illegible], r[illegible]r[illegible], r[illegible] m[illegible]ist[illegible]re[illegible]r[illegible]r[illegible], R[illegible]D, [illegible] r[illegible]r[illegible]d)
1				***Brown, dry, sandy cuttings***	pp[illegible]:	T[illegible]9: [illegible]
2						
3						
4						
5						
6						
7						
8	▽			***Groundwater at 8.1 feet***		
9						
10						
11						
12						
13						
14						
15				***REFUSAL AT 13.5 FEET***		
16						
17						
18						
19						
20						
21						
22						
23						

C&S COMPANIES	**C&S Engineers, Inc.** □□□ E□ S□□□□ B□□□□□□ N□□ Y□□ □□2□3 P□□□□□□□□□□□□□□3□ □□□□□□□□□□□□□	**BORING LOG**	***Boring No.*** **MW-2** ***Sheet 1 of:*** ***Project No.:*** □□□□2□□□□

Project Name:	R□□□r□M□□□□P□r□□ □□□ □S□□□ R□□ □d□□l□□□□□□□□□	***Surface Elev.:***	
Location:	R□□□r□M□□□□P□r□□ □□ □□□□□□ D□□B□□□□□rd	***Datum:***	□RO□ND S□R□A□E
Client:	NYSOPRHP	***Start Date:***	□/2□/□□
Drilling Firm:	N□□r□□W□□	***Finish Date:***	□/2□/□□

Groundwater	Depth	Date & Time					
While Drilling:	□□□ □□	□/2□ □ □2□3□	***Drill Rig:***	M□□□□ □□□		***Inspector:***	AD
Before Casing Removal:			***Casing:***	□2□ H□S□A	***Rock Core:***	***Undist:***	
After Casing Removal:			***Sampler:***		***Other:***		
			Hammer:				

□N □□N□□□□□□□□□ □ □□ dr□□□ □□□ □□□r □2" □/□□□ □□□□□□□ □ □r □□□□□□ 3□" ASTM D□□□□□□S□□□d□rd P□□□□r□□□□ T□□□□

Depth (ft)	Sample No.	Symbol	Blows on Sampler per 6"	□ □□□□r□□ □ □□ □d□□□ □□□□□	**MATERIAL DESCRIPTION** S □S□□d□ □ □S□□□ □ □□r□□□□ □ □□□□□ □□□ □□□□□□	□ □□□d □3□□□□ □ □□□□ □ □2□3□□ □□□□□□ □□□2□□ □□r□□□ □□□□□	**COMMENTS** □□□□□N□□□□□□r□□□□□r□□r□□□□□□ □ □□□□r□□□□r□r□□R□D□□ r□□□□r□d□
□			□	□"□□"	***Topsoil, brown***	□ □□□	T□□ □□□2□□□
□			22	□"□□2"	***Rock chunks***	□ □□□	□2" R□□□□□r□d
			□□				
2			2□				
			□□	□"□□□"	***Sandy brown clay with rock, dry***	□ □□□	
3			□□				□□" R□□□□□r□d
			□□				D□r□ □r□□ □□□□□d□ □□□□□□□
□			□2				
			□	□"□□□"	***Brown, moist, sandy clay with brick and coal pieces***	□ □□□	
□			□				□□□□" R□□□□□r□d
			□				
□			□□				
			□□	□"□□"	***Brown, wet, silty rocks***	□ □□□	
□			2□				□" R□□□□□r□d
			□□				□ □□□□□ □□□□□□□□□□□
□			□2				□r□□□d□ □□□r □□□□□ □□□□
			□□	□"□2"	***Brown, saturated, silty rocks***	□ □□□	
□			□□				2" R□□□□□r□d
			□				W□□□□□□□ □□□□□□□□□□□
□□			□				
			3	□"□□"	***Brown, saturated, silty rocks***	□ □□□	
□□			□□				□" R□□□□□r□d
			□				
□2			□□				
			□□ / 2	□"□□"	***Brown, saturated, silty rocks***	□ □□□	□" R□□□□□r□d
□3							
					REFUSAL AT 12.4 FEET		
□□							
□□							
□□							
□□							
□□							
□□							
2□							
2□							
22							
23							

C&S Engineers, Inc.
□□□ E□□ S□r□□□
B□□□□□ N□□ Y□r□ □□2□3
P□□□□□□□□□□□□□□□□3□
□□□: □16 □□□□□□□□4
□□□□□□□□□□□□□

BORING LOG

				Boring No.	**MW-3**
				Sheet 1 of:	
				Project No.:	1□□□2□□□9
Project Name:	R□□□r□M□□□□P□r□□ □□□ □S□□□□ R□□ □d□□□I□□□□□□□□□□□			**Surface Elev.:**	
Location:	R□□□r□M□□□□P□r□□ □□ □□□□□□□ D□□□B□□□□□rd			**Datum:**	□RO□ND S□R□A□E
Client:	NYSOPRHP			**Start Date:**	□/28/□□
Drilling Firm:	N□□□r□□□W□□			**Finish Date:**	□/28/□□

Groundwater	**Depth**	**Date & Time**	**Drill Rig:**	M□□□□□ □□□		**Inspector:**	AD/□M
While Drilling:			**Casing:**	□25 H□S□A	**Rock Core:**	**Undist:**	
Before Casing Removal:			**Sampler:**		**Other:**		
After Casing Removal:			**Hammer:**				

□N □□N□□□□□□□□□ □ to dr□□□ □□□ □□□r □2" w/□□0 □□□□□□ □ □r f□llin□ 30" ASTM D□□5□□□S□□□d□rd P□□□□r□□□□ T□□□□

Depth (ft)	Sample No.	Symbol	Blows on Sampler per 6"	□ □□□□r□□ □ □□ □d□□□ □□□□□ **MATERIAL DESCRIPTION** S □S□□d□ □ □S□□□ □ - □r□□□□ □ □□ □□□□ □□□ □□□□□□□	□ □□□d □3□□□□□ □ □□□□ □ □2□3□□ □□□□□□ □□□□2□□ □□□r□□□ □□□□□□	**COMMENTS** □□□□, N□□□□□, r□□□□□□r□, r□□□□□□ m□ist□re □□□r□ r□□, R□D, □ r□□□□□r□d)
1				***Fill, dry, gravel, rock***	pp□:	T□□ □□
2						
3						
4						
5						
6						
7						
8						
9						
1□				***Wet to saturated, clayey silt, little clay, trace fine sand***		
1□						
12						
13						
1□						
1□						
1□				***END OF BORING AT 15 FEET***		
1□						
1□						
1□						
2□						
2□						
22						
23						

C&S Engineers, Inc.	BORING LOG	Boring No.	MW-4
		Sheet 1 of:	
		Project No.:	

Project Name:						**Surface Elev.:**	
Location:						**Datum:**	
Client:	NYSOPRHP					**Start Date:**	/2 /
Drilling Firm:						**Finish Date:**	/2 /
Groundwater	**Depth**	**Date & Time**	**Drill Rig:**			**Inspector:**	M
While Drilling:			**Casing:**	2 H S A	**Rock Core:**	**Undist:**	
Before Casing Removal:			**Sampler:**		**Other:**		
After Casing Removal:			**Hammer:**				

N N dr r 2" / r 3" ASTM D S d rd P r T

Depth (ft)	Sample No.	Symbol	Blows on Sampler per 6"		MATERIAL DESCRIPTION		COMMENTS
					S S d S r		N r r d
				"	***Topsoil, brown, moist to dry silty clay, trace clay***		T
				" 2 "	***Brown clay, sand, gravel - grey, subangular, 1" and***		2 " R r d
2			3		***smaller, dry***		
			3				
				"	***Brown, silty clay to dark grey trace fine sand***		
3							" R r d
			2				
				"	***Dark brown/grey, silty clay FILL, trace construction and***		
			22		***demolition fine crush, moist, imbedded gravel***		" R r d
			2				
			2				
	▽			"	***Brown, sandy clay, moist - wet imbedded gravel,***		
					subangular, 0.5" and smaller		" R r d
				"	***Rock pieces - water saturated, some silt***		
			/		***dark grey rock - brown silt***		
			2	"	***Dark grey, sandy clay - imbedded rock pieces***	3	
			/		***Saturated loose silt***		" R r d
			/		***No recovery***		
							W r dd d
2							
					END OF BORING AT 11.3 FEET		R
3							
2							
2							
22							
23							

C&S COMPANIES	C&S Engineers, Inc. □□□ E□ S□□□□ B□□□□□□ N□□ Y□r□ □□2□3 P□□□□□□□□□□□□□□3□ □□□□□□□□□□□□□□	**BORING LOG**	*Boring No.*	**MW-5**
			Sheet 1 of:	
			Project No.:	□□□□2□□□□

Project Name:	R□□□r□M□□□□P□r□□ □□□ □S□□□ R□□ □d□□l □□□□□□□□□□						*Surface Elev.:*	
Location:	R□□□r□M□□□□P□r□□ □□ □□□□□□ D□□B□□□□□rd						*Datum:*	□RO□ND S□R□A□E
Client:	NYSOPRHP						*Start Date:*	□/2□/□□
Drilling Firm:	N□□r□□W□□						*Finish Date:*	□/2□/□□
Groundwater	*Depth*	*Date & Time*	*Drill Rig:*	M□□□ □□			*Inspector:*	□M
While Drilling:			*Casing:*	□2□ H□S□A	*Rock Core:*		*Undist:*	
Before Casing Removal:			*Sampler:*		*Other:*			
After Casing Removal:			*Hammer:*					

□N □□N□□□□□□□□ □ □□ dr□□ □□□ □□□r □2" □/□□□ □□□□□□ □ □r □□□□□ 3□" ASTM D□□□□□□S□□□d□rd P□□□r□□□□ T□□□□

Depth (ft)	Sample No.	Symbol	Blows on Sampler per 6"	□ □□□□r□□ □ □□ □d□□ □□□□	**MATERIAL DESCRIPTION** S □S□□d□ □ □S□□□ □ □□r□□□□ □ □□□□□ □□ □□□□□	□ □□d □3□□□□ □ □□□□ □ □2□3□ □□□□□ □□□2□ □□r□□□ □□□□□	**COMMENTS** □□□□□N□□□□□r□□□□r□□r□□□□ □ □□□r□□□r□r□□R□D□ r□□□□r□d□
□			3	□"□□□"	***Topsoil, brown silt and clay, dry, some rock pieces***	□3 □□□	T□ □□□2□3□
			□□				□□" R□□□□r□d
			22				
2			3□				
			2□	□"□3"	***FILL - dry, rock pieces, silt trace, fine sand, rock***	□ □□□	
3			□□		***angular, dark grey, 1" and smaller sized***		3" R□□□□r□d
			□				
□			□				
			□□	□"□□"	***Brown, sandy clay, imbedded gravel, subangular,***	□ □□□	
□			□□		***1" and smaller sized***		□" R□□□□r□d
			□□				
□			□□				
			□3	□"□□□"	***Brown, moist, sandy clay, imbedded gravel, subangular,***	□□□ □□□	
□			□2		***1" and smaller sized***		□□" R□□□□r□d
			□□				
□			□□				
			□□	□"□□□"	***Brown, moist to wet, sandy clay, imbedded gravel,***	□□□ □□□	
□			22		***subangular, 1" and smaller sized***		□□" R□□□□r□d
□□	▽		□□ / 3				W□□r □□□□ □□□□
□□							
					REFUSAL AT 10.5 FEET, dry		M□□□d □□ □□□□□r□□ □□□□□□
□2							TP□2□□W□□□□□□r □□r□□□□□
□3							R□dr□□d □□□□□ □□□□□ r□□□□□
□□							
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□□							
□□							
□□							
2□							
2□							
22							
23							

C&S COMPANIES	C&S Engineers, Inc. □□□ E□□ S□r□□□ B□□□□□□ N□□ Y□r□ □□2□3 P□□□□□□□□□□□□□□□3□ □□□□□□□□□□□□□□□□□ □□□□□□□□□□□□	**BORING LOG**	

Boring No.	**MW-6**	***Sheet 1 of:***	
Project No.:	□□□□2□□□□	***Surface Elev.:***	
Datum:	□RO□ND S□R□A□E	***Start Date:***	□/2□/□□
Finish Date:	□/2□/□□	***Inspector:***	□M

Project Name: R□□□r□M□□□□P□r□□□□□ □S□□□□ R□□ □d□□I□□□□□□□□□□

Location: R□□□r□M□□□□P□r□□□□ □□□□□□ D□□□B□□□□□rd

Client: NYSOPRHP

Drilling Firm: N□□□r□□□W□□

Groundwater	Depth	Date & Time		
While Drilling:			***Drill Rig:***	M□□□□□ □□□
Before Casing Removal:			***Casing:***	□2□ H□S□A
After Casing Removal:			***Sampler:***	
			Hammer:	

Rock Core: ***Undist:***   ***Other:***

□N □□N□□□□□□□□ □ □□dr□□□ □□□ □□□r □2" □/□□□ □□□□□□ □ □r □□□□□3□" ASTM D□□□□□□S□□□d□rd P□□□□r□□□□ T□□□

Depth (ft)	Sample No.	Symbol	Blows on Sampler per 6"	□□□□□r□□ □ □□□d□□□ □□□□□	MATERIAL DESCRIPTION S □S□□d□ □ □S□□□ □ □□r□□□□□ □ □□□□□□ □□□ □□□□□□□	□ □□□d □3□□□□□ □ □□□□□ □ □2□3□□ □□□□□□ □□□□2□□ □□r□□□ □□□□□□	**COMMENTS** □□□□□N□□□□□□□r□□□□□r□□r□□□□□□ □ □□□□r□□□□r□ r□□□R□D□□ r□□□□□r□d□
			3	□"□□□"	***Topsoil, brown, silty, some clay, dry, trace imbedded***	□ □□□	T□□ □□□□□□
□			□□		***gravel, 1" and smaller, subangular***		□□" R□□□□□r□d
			□	□□"□□□"	***FILL - grey, fine crushed construction and***		
2			□□		***demolition, dry, medium, some silt trace clay***		
			□□	□"□□"	***FILL - dark grey, dry, fine crushed construction and***	□ □□□	
3			33		***demolition, medium, some silt trace clay***		□" R□□□□□r□d
			□□				
□			3□				
			□3	□"□3"	***FILL - dark grey, some silt trace clay, dry to moist,***	□ □□□	
□			□		***rock pieces, dark grey, coal, fine crushed***		3" R□□□□□r□d
			□		***construction and demolition debris***		
□			□3				
			2	□"□3"	***FILL - dark grey, some silt trace clay, dry to moist,***	□ □□□	
□			3		***rock pieces, dark grey, coal, fine crushed***		3" R□□□□□r□d
			2		***construction and demolition debris***		
□			□□				
			□□	□"□□"	***Brown, silty clay, with imbedded gravel, dark grey,***	□ □□□	
□			□□		***subround, 1" and smaller, moist to wet***		□" R□□□□□r□d
			2□				
□□	▽		2□				
			□□/□	□"□□"	***Water saturated silt/clay, loose with rock pieces,***	□ □□□	
□□					***dark grey angular, 1" and smaller***		□" R□□□□□r□d
							W□□□r □dd□d
□2							
					REFUSAL AT 11.6 FEET		
□3							
□□							
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2□							
2□							
22							
23							

C&S Engineers, Inc.
[illegible] E[illegible] S[illegible]r[illegible]
B[illegible] N[illegible] Y[illegible]r[illegible] [illegible]2[illegible]3
P[illegible]3[illegible]
[illegible]: [illegible]16 [illegible]4
[illegible]

BORING LOG

Boring No.	MW-7
Sheet 1 of:	
Project No.:	1[illegible]2[illegible]9
Project Name:	R[illegible]r[illegible]M[illegible] P[illegible]r[illegible] [illegible]S[illegible] R[illegible] [illegible]d[illegible]I[illegible]
Surface Elev.:	
Location:	R[illegible]r[illegible]M[illegible] P[illegible]r[illegible] D[illegible]B[illegible]rd
Datum:	[illegible]RO[illegible]ND S[illegible]R[illegible]A[illegible]E
Client:	NYSOPRHP
Start Date:	[illegible]/28/[illegible]
Drilling Firm:	N[illegible]r[illegible]W[illegible]
Finish Date:	[illegible]/28/[illegible]
Inspector:	[illegible]M

Groundwater	**Depth**	**Date & Time**	**Drill Rig:**	M[illegible]		
While Drilling:			**Casing:**	[illegible]25 H[illegible]S[illegible]A	**Rock Core:**	
Before Casing Removal:			**Sampler:**		**Other:**	
After Casing Removal:			**Hammer:**			

Undist:

[illegible]N [illegible]N[illegible] to dr[illegible] [illegible]r [illegible]2" w/[illegible]0 [illegible] [illegible]r f[illegible]llin[illegible] 30" ASTM D[illegible]5[illegible]S[illegible]d[illegible]rd P[illegible]r[illegible] T[illegible]

Depth (ft)	Sample No.	Symbol	Blows on Sampler per 6"	[illegible]	MATERIAL DESCRIPTION S [illegible]S[illegible]d[illegible] [illegible]S[illegible] - [illegible]r[illegible]	[illegible]d [illegible]3[illegible] [illegible]2[illegible]3[illegible] [illegible]2[illegible] [illegible]r[illegible]	COMMENTS [illegible], N[illegible], r[illegible]r[illegible], r[illegible] m[illegible]ist [illegible]re[illegible]r[illegible]r[illegible], R[illegible]D, [illegible] r[illegible]r[illegible]d)
			17	[illegible]"[illegible]3"	***Brown, gravel, silt trace sand, dry***	0 [illegible]	T[illegible]
1			35				3" R[illegible]r[illegible]d
			18				
2			18				
			15		***Rock pieces***		
3			24				
			17				
4			12				
			11	[illegible]"[illegible]2"	***Dark grey, rock pieces,angular, 1" and smaller with***	0 [illegible]	
5			22		***brown, silt, trace fine sand, dry***		2" R[illegible]r[illegible]d
			13				
6			18				
			17	[illegible]"[illegible]3"	***REFUSAL AT 5.5 feet, Moved 3 feet east***	0 [illegible]	
7			5		***Brown, silty clay, moist to wet, rock pieces***		3" R[illegible]r[illegible]d
			8				
8	▽		13				
			6	[illegible]"[illegible]"	***Rock pieces with water saturated, loose silt, trace, fine***		
9			7		***to medium sand***		[illegible]" R[illegible]r[illegible]d
			11				
1[illegible]			16				
			21	[illegible]"[illegible]"	***Water saturated, loose, silt trace clay, trace fine sand***	0 [illegible]	
1[illegible]			14		***with imbedded gravel***		[illegible]1" R[illegible]r[illegible]d
			7	[illegible]"[illegible]"	***Black, silt trace, fine sand, loose, water saturated***	0 [illegible]	
12			[illegible]/ [illegible]				
13					***REFUSAL AT 12.1 FEET***		
1[illegible]							
1[illegible]							
1[illegible]							
1[illegible]							
1[illegible]							
1[illegible]							
2[illegible]							
2[illegible]							
22							
23							

NATURE'S WAY
ENVIRONMENTAL CONSULTANTS & CONTRACTORS, INC

3553 Crittenden Road
Alden, NY 14004
(716) 937- 6527
www.natureswayenvironmental.com

WT-MW1

HOLE NUMBER: B 30

DATE: 01/13/14 ELEVATION: 565.47

PROJECT: Subsurface Investigation at Robert Moses Parkway
South Segment, Phase V & VI, Niagara Falls, NY

PREPARED FOR: Fisher Associates

BORING LOCATION: Northing: 1123194.04; Easting: 1022623.91

SN	0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	REC	MONITORING WELL	REMARKS	COMMENTS
1	3				15		Topsoil/fill (0.7)	1.5'		Soil Backfill (0.5)	Topsoil/fill to 0.7 foot over loamy soil fill with trace gravel to 4.0 feet over sandy fill with cinders and ash to 6.0 feet over silty glacial till to refusal
		5					Moist, brown (SAND-SILT-CLAY) fill with 5 to 15% gravel, little clay and very fine size sand, trace coal fragments, compact, contains roots and brick			Bentonite Seal (1.5)	
			10								
				17							
2	4				12			1.0'		2" PVC Riser Pipe (2.5)	
		6									
			6								
				9			(4.0)			2" 10 Slot PVC Screen	
3	6						Extremely moist to wet, mixed brown and gray (SILTY-SAND) fill with cinders, ash and wood, very fine size sand, compact (6.0)	1.0'			
		9			12					#2 Size Sand	Water initially encountered at 5.0' BGS
			3								
				6							
4	20				>50		Moist, brownish gray, gravelly (SANDY-SILT) with 15 to 25% gravel, little very fine size sand, very dense, massive soil structure (7.5)	0.9'			No Water at Completion
		50					Auger Refusal at 7.5' BGS		(7.5)		

LOGGED BY: Dale M. Gramza / Senior Geologist PAGE 1 of 1

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WT-MW2

HOLE NUMBER: B 9 (well)

DATE: 11/4/2013 ELEVATION: 565.54

PROJECT: Subsurface Investigation for
Robert Moses Parkway South Segment, Phase V-VI, Niagara Falls, NY

PREPARED FOR: Fisher Associates

BORING LOCATION: Northing: 1123121.608 ; Easting: 1022736.188

SN	0/6	6/12	12/18	18/24	N	LITH	DESCRIPTION AND CLASSIFICATION	REC	MONITORING WELL	REMARKS	COMMENTS
1	2						Topsoil 0.3	1.3'		2" PVC Riser	Topsoil to 0.3 foot over silty tending toward clayey glacial till to 2.9 feet over fractured dolostone rock to refusal
		6			18		Moist, grayish brown, gravelly (CLAYEY SILT) with 15 to 25% gravel, little to some clay, compact, massive soil structure				
			12								
				12							
2	4							1.3'		Bentonite	
		5					2.9		3.0		
			20		25		Dolostone rock, gray, hard, fractured, wet		3.5		
				23							
3	6							0.7'		#2 Size Sand	▼ Water Level at 4.0' BGS at Completion
		16									
			20		36						
				4							
4	7							0.4'		2" 10 Slot PVC Screen	
		10									
			5		15						
				3							
5	50/6"						8.5	0.3'	8.5		
							Auger Refusal at 8.5' BGS				

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APPENDIX E – FIELD SAMPLING PLAN

General

This Field Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the remedy as it pertains the groundwater quality. Details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of site management for the site are included in the Quality Assurance Project Plan provided in Appendix F of the SMP. Monitoring of other Engineering Controls is described in Section 4 of the SMP.

If sampling/monitoring of additional environmental media other than groundwater is deemed necessary in the future, pertinent revisions will be made to this Plan. This Plan may only be revised with the approval of the NYSDEC.

Purpose and Schedule

This Plan describes the methods to be used for:

1. Sampling and analysis of all appropriate media (groundwater);
2. Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards;
3. Assessing achievement of the remedial performance criteria;
4. Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
5. Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);
- Analytical sampling program requirements;
- Reporting requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and maintenance requirements for monitoring wells;

- Monitoring well decommissioning procedures; and
- Annual inspection and periodic certification.

Samples shall be collected from the all nine existing groundwater monitoring wells installed onsite on a routine basis (annually). Modification to the frequency or sampling requirements will require approval from the NYSDEC. A summary of sampling locations, required analytical parameters, and schedule are provided in Table A.

Table A – Post Remediation Sampling Requirements and Schedule

Sampling Location	Analytical Parameters			Schedule
	TCL VOCs	TCL SVOCs	TCL Pesticides	
MW-1	X	X	X	Annually
MW-2	X	X	X	Annually
MW-3	X	X	X	Annually
MW-4	X	X	X	Annually
MW-5	X	X	X	Annually
MW-6	X	X	X	Annually
MW-7	X	X	X	Annually
WT-MW-1	X	X	X	Annually
WT-MW-2	X	X	X	Annually

The same nine groundwater wells were used during the RI and IRM phases of the project to characterize groundwater conditions, and are shown on Figure 6 of the SMP. The overburden wells were constructed to straddle the water table at approximately six to 13 feet below grade. Each well was completed with five to 10 feet of 2-inch Schedule 40 0.010-slot well screen connected to an appropriate length of Schedule 40 PVC well riser to complete the well. The annulus was sand packed with quartz sand to approximately one to two feet above the screened section, and one to two feet of bentonite chips or pellets above the sand. The remaining annulus was grouted to ground surface. A simple PVC riser, with no protective casing, was initially left in place for each well. Flush-mount well covers have subsequently been installed on all wells to allow for long-term monitoring functionality. Monitoring well construction logs are included in Appendix D of the SMP. Deliverables for the groundwater monitoring program are specified below.

Site Hydrogeology

Based on a review of NYSDEC data, the Site is not underlain by any mapped principal or primary aquifers. Groundwater at, and in the vicinity of, the Site is not used as a public drinking water supply. The principal groundwater bearing zone beneath the Site is located between 10 and 14 feet below grade.

The results from the review of historical data and from data gathered from various groundwater sampling events conducted during the course of RI and IRM phases of this project the hydrogeologic conditions on the Site are variable, including a fluctuation between a positive and negative hydraulic gradient between the Site and the River. Potential factors associated with the variability may include:

- The influence of the NYPA hydroelectric tunnels, which are upstream of the Site, diverting varying amounts of River water during different times of the day and of the year.
- Two regulatory constraints on flow and water level fluctuations - the Niagara River Water Diversion Treaty of 1950 and the 1993 Directive of the International Niagara Board of Control (INBC). For purposes of generating electricity from the Niagara River, two seasons are recognized: tourist season and non-tourist season. The tourist season (April – October) coincides with the months in which tourist hours are in effect. By international treaty, at least 100,000 cubic feet per second (cfs) must be allowed to flow over Niagara Falls during tourist hours (April 1 - September 15, 8:00 a.m. – 10:00 p.m. and September 16 – October 31, 8:00 a.m. – 8:00 p.m.), and at least 50,000 cfs at all other times. Canada and the United States are entitled by treaty to produce hydroelectric power with the remainder. Previous studies have shown that water levels have the potential to fluctuate by 1.5 feet or more in the upper Niagara River in response to the twice-daily changes in flow diversion from the River.
- Other natural and anthropogenic factors. Previous studies have shown that groundwater elevations affected by water level fluctuations in the upper Niagara River were determined to be within the zero-to-two-foot zone and a small component (the first 0.5 feet) of the two-to-six-foot depth zone. These daily cycles in River height combined with the permissive soil types (heterogeneous soils of sands and shotrock) may result in groundwater level fluctuations on the Site.

Sampling Protocol

All monitoring well sampling activities will be recorded in a field book and a groundwater-sampling log included in **Appendix H** of the SMP. Other observations (e.g., well integrity, etc.) will be noted on the well sampling log. The well sampling log will

serve as the inspection form for the groundwater monitoring well network. Groundwater samples will be collected using low stress (low-flow) purging/sampling equipment and techniques as outlined in USEPA Standard Operating Procedure titled "*Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells".*

The following activities will be completed before going into the field each day before the start of sampling:

1. Fill out appropriate section on Well Sampling Logs for the wells to be sampled;
2. Obtain the sampling schedule for each well to be sampled;
3. Calibrate the Photoionization Detector (PID) with the calibration gas;
4. Determine the amount of sampling to be done for the day and prepare the necessary number of coolers;
5. Each well to be sampled will have designated coolers containing the pre-labeled, certified clean, sample bottles. The groundwater samples will be placed in the cooler labeled for the well from which they were taken. The bottle shall be labeled with large distinguishable letters, so that the groundwater samples will be placed in the proper cooler; and
6. Select the appropriate sample bottles for the day's sampling. The bottles shall be pre-marked with a sample parameter and preservatives. Reusable glass bottles will have been cleaned and prepared at the laboratory. The bottles for the various parameters to be analyzed from each well location will then be placed in a cooler.

The following steps describe the sample collection of groundwater.

1. Unlock and remove the well cap.
2. Test the air at the wellhead with the calibrated PID. If the gases from the well have caused the air in the breathing zone to read greater than 5 ppm, stop work and refer to the Health and Safety Plan. Record the reading on the Well Sampling Logs.
3. In order to obtain a representative sample of the formation water, the well must be purged of the static water within the well. Prior to purging, the static water level within the well must be measured and the measurement recorded on the Well Sampling Logs. To determine the amount of water necessary to purge, find the

liquid column height in the well to determine the total volume (three liquid column borehole volumes) of liquid to be purged.

4. Purge the well; lower pump slowly into the well until it is below the water surface. In accordance with NYSDEC Guidance, purge waters will be disposed within sealed steel 55 gallon drums.
5. Record the amount of water purged in the field logbook and on the Well Sampling Logs.
6. Water quality meter will be connected to the inflow tubing from the submerged pump inside the well. Water quality parameters including: specific conductance; dissolved oxygen; oxygen reduction potential; pH; temperature and turbidity will be logged on a continuous basis until water quality readings stabilize or the amount of water purged is reached. Wells with high turbidity will be filtered to provide accurate groundwater concentrations (i.e. dissolved phase)..
7. If the well goes dry during pumping, allow for full recovery (measure the water level) and then sample. If recovery takes more than twenty minutes, proceed to next well but return to sample within 24 hours.
8. Fill the appropriate sample bottles according to the sampling schedule for each well. While filling the sample bottles, record the well number, type, volume of container, and the preservatives used on the Well Sampling Logs.
9. If the well should go dry during sampling and the well needs to be re-sampled the next day, the second attempt to sample the well will proceed.
10. The preservatives for the various sampling parameters were previously added to the clean sample bottles by the laboratory. Some parameters may require additional special handling.
11. Volatile organics analyses samples must be free of air bubbles. When a bubble-free sample has been obtained, it must be immediately chilled.
12. Collect the matrix spike duplicates and trip blanks. Duplicate samples will include the field splitting of at least one groundwater sample for each sampling visit. This may require the extraction of twice the amount of water needed for duplication purposes. The creation of trip/field blanks and duplicates shall be performed at least once with each field batch with a minimum of once every twenty samples.
13. Record all pertinent information in field logbook and on the Well Sampling Logs (include color, odor, sediment content of sample, etc.). Any situations at the Site

that have the potential to interfere with the analytical results should also be recorded here.

14. Lock well, inspect well site, and note any maintenance required.
15. Dispose of potentially contaminated materials in designated container for contaminated solids.

Separate trip blanks will be carried into the field on each of the sampling days. The trip blank vials will be prepared by the contracted laboratory and handled in the field similar to the other sampling containers with the exception that the vials will not be opened.

Field Measurement Techniques

Water elevations will be taken on all wells prior to purging and sampling. All measurements will be taken within a 24-hour period to obtain consistent elevations and recorded on well data sheets. The procedure for measuring water levels in the monitoring wells is:

1. Unlock and remove well cap;
2. Test the atmosphere of the well with the calibrated PID, if the gases from the well have caused the air in the breathing zone to read greater than 5 ppm, stop work and refer to the Health and Safety Plan;
3. Measure water level to nearest 0.01 foot with a water level indicator (electronic); and
4. Water level indicators will be decontaminated before moving to next well, the tape and cable are decontaminated by washing in a bucket of distilled water-biodegradable phosphate free-detergent solution, followed by a rinse with distilled water.

Laboratory Analysis

Samples will be collected in appropriate containers for all parameters included in Table A, as provided by the environmental analytical laboratory being used, and immediately placed on ice. Field parameters such as pH, turbidity and specific conductance will be recorded at sample collection.

Laboratory analysis will be conducted by a third-party laboratory that is accredited by the NYSDOH Environmental Laboratory Accreditation Program ("ELAP"). Laboratory analytical methods will include the most current NYSDEC Analytical Services Protocol ("ASP").

Data Usability

Data Usability Summary Report ("DUSR") will be performed by a third-party data consultant using the most recent methods and criteria from the U.S. EPA. The DUSR will assess all sample analytical data, blanks, duplicates and laboratory control samples and evaluate the completeness of the data package.

Custody Procedures

As outlined in NYSDEC Sampling Guidelines and Protocols, a sample is under the following conditions:

- It is in your actual possession;
- It is in your view after being in your physical possession;
- It was in your possession and then you locked or sealed it up to prevent tampering; or
- It is in a secure area

The environmental professional will maintain all chain-of-custody documents that will be completed for all samples that will leave the Site to be tested in the laboratory.

Monitoring Well Repairs, Replacement and Decommissioning

If biofouling or silt accumulation occurs in the monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (as per the Monitoring Plan), if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

APPENDIX F – QUALITY ASSURANCE PROJECT PLAN

Quality Assurance Project Plan

for

ROBERT MOSES PARKWAY – SOUTH

NIAGARA COUNTY

NIAGARA FALLS, NEW YORK

NYSDEC Site Number: 932166

Prepared for:

New York State Office of Parks, Recreation and Historic Preservation

625 Broadway

Albany, New York 12238

Prepared by:

C&S Engineers, Inc.

141 Elm Street Suite 100

Buffalo, New York 14203

C&S Engineers, Inc.
141 Elm Street, Suite 100
Buffalo, New York 14203

September 2019

Table of Contents

1 Introduction

C&S' Quality Control (QC) Program is a vital part of its approach to remedial investigations. Through our thorough QC program, our firm is able to provide accurate and dependable data. QC also provides safe working conditions for field staff.

The QC program contains procedures, which provide for collected data to be properly evaluated, and which document that quality control procedures have been followed in the collection of samples. The QC program represents the methodology and measurement procedures used in collecting quality field data. This methodology includes the proper use of equipment, documentation of sample collection, and sample handling practices.

Procedures used in the firm's QC program are consistent with federal, state, and local regulations, as well as, appropriate professional and technical standards.

This QC program has been organized into the following areas:

- QC Objectives
- Field Sampling Techniques
    - Procedures
    - Preparation
    - Measurement
    - Decontamination
- Sample Management

2 Quality Control Objectives

2.1 Data Quality Objectives

Data Quality Objectives (DQOs) are statements which describe the desired quality of data necessary to meet the objectives of the sampling program. The DQOs for the site sampling program were formulated during the scoping effort and developed as part of this Plan. The general steps followed in preparation of the DQOs were as follows:

- *Identification of the media to be sampled* - Identifies the media being investigated (e.g., ground water, surface soil).

- *Identification of the data uses* - Identifies the intended use of the data according to the following:
  - Site Characterization - Data are used to determine the composition, nature, and extent of contamination.
  - Risk Assessment - Data are used to evaluate the actual or potential risks posed by contaminants determined to be present on-site. Particular attention is given to sampling at locations where human exposure is possible.
  - Health and Safety Plan (HASP) - Data are used to establish the level of protection needed for on-site workers during site characterization activities.
  - Monitoring - Data are used during the monitoring of the remedial action to access the effectiveness of such action.
  - PRP Enforcement - Data are used to help establish potentially responsible parties (PRP's).
  - Evaluation of Alternatives - Data are used to evaluate various proposed remedial technologies and assist in proper design of alternatives.

- *Identification of the data types* - Identifies what types of analyses are to be performed.

- *Sample Collected* - Describes the sample types to be collected.
  - Environmental - Refers to a specific media sampled such as water, soil, air, or biological.
  - Source - Refers to sampling an actual contamination source.
  - Grab - A discrete sample representative of a specific location.
  - Composite - A sample that represents a mixture of a number of grab samples that represents the average properties over the extent of areas sampled.
  - Biased -Sampling that focuses on a specific area of expected contamination or uncontaminated area (background).

- *Identification of the data quality needs* - Identifies the analytical options available to support data collection activities and are identified as follows:
  - Level I: *Field Screening* - portable type instruments which provide real-time data.
  - Level II: *Field Analysis* - portable analytical instruments in an on-site lab or transported to the site.

- Level III: *Standard Analytical Protocols* - standard analytical protocols or without the NYSDEC Analytical Services Protocol (ASP) (2000) deliverables/reportables documentation.
- Level IV: *NYSDEC ASP Reportables/Deliverables* - rigorous QA/QC protocols and reportables/deliverables documentation; NYSDEC ASP (2000) Category B deliverables.
- Level V: *Non-Standard* - methods which have been modified to meet specific site study or remediation needs or by use of some other specialized analytical methods that cannot be obtained through standard or typical avenues of analytical support.

► *Identification of Data Quality Factors* - Describes factors which influence the quality or quantity of data to be collected. Primary contaminants and associated levels of concern are identified concerning ARARs or potential risks. The required detection limit are also given or referenced.

► *Identification of QA/QC Samples* - Specifies additional samples to be collected to support Quality Assurance/Quality Control (QA/QC) procedures. Additional samples to be collected could include:

- *Matrix Spike/Matrix Spike Duplicates* - Matrix spike and matrix spike duplicate samples are collected as a duplicate sample to which the analytical laboratory will add known amounts of target analytes. These QA/QC samples are intended to assess the extraction procedure used by the laboratory.
- *Field Blanks* - Field (equipment) blanks are samples which are obtained by running analyte-free water through the sample collection equipment in a way that is identical to the sample collection procedures. Field blanks may be used during QA/QC procedures to evaluate if sampling equipment has contributed contaminants to the samples.
- *Trip Blanks* - Trip blanks are samples which are prepared prior to the sampling event in the same type of sample container and are kept with the collected samples throughout the sampling event unit analysis. Trip blank vials are not opened in the field and are analyzed for volatile organics only.

2.2 Sampling Procedures

All sampling objectives, locations, and procedures have been included as the Remedial Investigation Work Plan (RIWP) and are further described in Section 3. Items including Field Measurement Techniques, General Field Decontamination, and Sample Management have also been included in Sections 3 and 4.

2.3 Laboratory Certification and Coordination

Contract Laboratory Protocol (CLP) certification is a tier of accreditation issued by the New York State Department of Health (NYSDOH) within the Solid and Hazardous Waste category. Such laboratories have demonstrated that they meet the requirements of the NYSDEC Analytical Services Protocol. All chemical analyses for samples from the site will

be completed by a CLP laboratory capable of performing project specific analyses as indicated in this QA/QC plan. The project Quality Assurance / Quality Control (QA/QC) Officer will also be responsible for all project related laboratory coordination.

2.4 Analytical Methodologies

Sampling and analysis will be performed for the Target Compound List (TCL) parameters including volatiles. The specific analyses will be conducted according to the following NYSDEC ASP 2000 methodologies:

Parameter Group	Analysis Method
Volatiles	8260C
Semivolatiles	8270D
PCBs	8082A
Pesticides	8081B
Herbicides	8151A
Metals / Inorganics	6010D, 7471B, 9010C/9012B, 7196A
PFOA/PFOS	122,537M

Trip blanks accompany each shipment of aqueous samples for VOC analysis. Trip blanks are not necessary for soil samples. If several samples are collected for VOC analysis on any one day, all VOC samples will be packed in the same cooler with the trip blank. All data will be presented in Category B reportables / deliverables format.

2.5 Analytical Quality Control

Analytical quality control for this Project will be consistent with the methodology and quality assurance/quality control requirements in the NYSDEC ASP 2000.

The following tables detail sample volumes, containers, preservation, and holding time for typical analytes.

Table 2.5a
Water Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Holding Time Until Extraction/ Analysis
VOCs	40-ml glass vial with Teflon-backed septum	Two (2); fill completely, no headspace	Cool to 4° C (ice in cooler), Hydrochloric acid to pH <2	14 days
Semi-volatile Organic Compounds (SVOCs)	1,000 or 200-ml amber glass jar	One (1); fill completely	Cool to 4° C (ice in cooler)	7/40 days
Pesticides	1,000-ml amber glass jar	One (1); fill completely	Cool to 4° C (ice in cooler)	7/40 days
Polychlorinated biphenyls (PCBs)	1,000-ml amber glass jar	One (1); fill completely	Cool to 4° C (ice in cooler)	7/40 days
Metals	250-ml HDPE	One (1); fill completely	Cool to 4° C (ice in cooler) Nitric acid to pH <2	180 days (28 for mercury)
Cyanide	1,000-mL HDPE		Cool to 4° C (ice in cooler) Nitric acid to pH <2	14 days

Note:
All sample bottles will be prepared in accordance with USEPA bottle washing procedures.
Consult with laboratory as bottleware may vary by laboratory.
Holding time begins at the time of sample collection.

Table 2.5b
Soil Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Holding Time Until Extraction/ Analysis
VOCs	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	14 days
VOCs via EPA 5035	40 mL vials with sodium bisulfate, methanol, and/or DI water	Three (3), 5 grams each	Cool to 4° C (ice in cooler)	2 days
SVOCs	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	7/40 days
PCBs	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	7/40 days
Pesticides	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	14/40 days
Metals	4-oz. glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	180 days (28 for mercury)
Cyanide	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	14 days

Note:
All sample bottles will be prepared in accordance with USEPA bottle washing procedures.
Consult with laboratory as bottleware may vary by laboratory.
Holding time begins at the time of sample collection.

3 Field Sampling Plan

3.1 Sampling Procedures

The following sections provide procedures for collecting a variety of samples, not all of which will be needed at this site.

3.1.1 Preparation for Sampling

The sample collection technique is of prime importance to assure the integrity of the collected sample. The following techniques include provisions so that:

- A representative sample is obtained;
- Contamination of the sample is minimized;
- The sample is properly preserved; and
- An acceptable Chain-of-Custody record is maintained.

The QA/QC Sampling Component of the Plan includes:

- Incorporation of accepted sampling techniques referenced in the sampling plan;
- Procedures for documenting any field actions contrary to the QA/QC Plan;
- Documentation of all preliminary activities such as equipment check-out, calibrations, and container storage and preparation;
- Documentation of field measurement quality control data (quality control procedures for such measurements shall be equivalent to corresponding QC procedures);
- Documentation of field activities;
- Documentation of post-field activities including sample shipment and receipt, field team debriefing, and equipment check-in;
- Generation of quality control samples including duplicate samples, field blanks, equipment blanks, and trip blanks; and
- The use of these samples in the context of data evaluation with details of the methods employed (including statistical methods) and of the criteria upon which the information generated will be judged.

The personnel responsible for collection of groundwater, soil, miscellaneous media, and petroleum spill remediation/verification samples will be familiar with standard sampling procedures and follow the appropriate protocol. Field records will be maintained in bound notebooks with numbered pages to document daily instrument calibration, locations sampled, field observations, and weather conditions. Each page will be dated and signed by the sampler. Each notebook will be numbered and a log of notebooks will be maintained by the project manager.

Prior to sampling, all equipment must be procured and accommodations for sample container delivery, and sample shipment must be made. The following is a list of general equipment that would be on hand for sampling events. Special equipment for each

sampling event is presented in the section describing that specific sampling event.

General Field Sampling Equipment

- Field Data Sheets
- Chain-of-Custody forms
- Engineers tape and folding ruler with 0.01 foot intervals
- Field Record Sheets
- Latex gloves
- Face-safety shield
- Tyvek coveralls
- Respirators
- Photoionization detector
- Bio-degradable phosphate free detergent
- Coolers and ice
- 55 gallon drums
- Sample bottles
- Aluminum foil
- Duct and filament tape
- Tap water
- Distilled water
- Laboratory grade methanol and hexane
- 5 gallon wash buckets
- Decontamination cloths
- Large disposal containers
- Large plastic sheets

3.1.2 Drilling Equipment and Techniques – Direct Push

Soil borings will be advanced with a Geoprobe direct push sampling system. The use of direct push technology allows for rapid sampling, observation, and characterization of relatively shallow overburden soils. The Geoprobe utilizes a four to five-foot macrocore sampler, with disposable polyethylene sleeves. Soil cores will be retrieved in four or five-foot sections, and can be easily cut from the polyethylene sleeves for observation and sampling. The macrocore sampler will be decontaminated between boring locations using an alconox and water solution.

Prior to initiating drilling activities, the Macrocores, drive rods, and pertinent equipment, will be steam cleaned or washed with an alconox and water solution. This cleaning procedure will also be used between each boring. Throughout and after the cleaning processes, direct contact between the equipment and the ground surface will be avoided. Plastic sheeting and/or clean support structures (e.g., pallets, sawhorses) will be used.

Test borings will be advanced with 2-inch (or larger) inside diameter (ID) direct push Macrocore through overburden soils. Drilling fluids, other than potable water will not be allowed without special consideration and agreement from NYSDEC. The use of lubricants is also not allowed unless approved by the NYSDEC representative.

During the drilling, a properly calibrated photoionization detector (PID) will be used to screen soil cores retrieved from the Macrocores.

3.1.3 Drilling Equipment and Techniques – Hollow Stem Auger

The drilling and installation of monitoring wells will be performed using a rotary drill rig which will have sufficient capacity to perform 4 1/4-inch inside diameter (ID) hollow-stem

auger drilling in the overburden, retrieve Macrocore or split-spoon samples. Equipment sizes and diameters may vary based on project-specific criteria. Any investigative derived waste generated during the advancement of soil borings and monitoring well installations will be containerized and characterized for proper disposal.

Prior to initiating drilling activities, the augers, rods, Macrocore, split spoons, and other pertinent equipment will be steam cleaned or washed with an alconox and water solution. This cleaning procedure will also be used between each boring. Steam cleaning activities will be performed in a designated on-site decontamination area. During and after the cleaning processes, direct contact between the equipment and the ground surface will be avoided. Plastic sheeting and/or clean support structures (e.g., pallets, sawhorses) will be used.

Test borings will be advanced with 4 1/4-inch (ID) hollow stem augers through overburden, driven by truck-, track-, or trailer-mounted drilling equipment. Alternative methods of drilling or equipment may be allowed or requested for project specific criteria, but must be approved by the NYSDEC. Drilling fluids, other than water from a NYSDEC-approved source, will not be allowed without special consideration and agreement from NYSDEC. The use of lubricants is also not allowed unless approved by the NYSDEC representative.

During the drilling, a (PID) will be used to screen soils retrieved from the split spoons or Macrocores.

Hollow stem auger advanced groundwater-monitoring wells typically utilize minimum 2-inch threaded flush joint PVC pipe with 0.010-in. slotted screen or pre-packed well screens. PVC piping used for risers and screens will conform to the requirements of ASTM-D 1785 Schedule 40 pipe. All materials used to construct the wells will be NSF/ASTM approved. Solvent PVC glue shall not be used at any time in the construction of the wells. The bottom of the screen shall be sealed with a treated cap or plug. No lead shot or lead wool is to be employed in sealing the bottom of the well or for sealant at any point in the well.

3.1.4 Groundwater Monitoring Well Construction / Completion

Artificial Sand Pack

When utilized, granular backfill will be chemically and texturally clean, inert, siliceous, and of appropriate grain size for the screen slot size and the host environment The sand pack will be installed using a tremie pipe, when possible (i.e., a tremie pipe may not fit into smaller, 2-in. diameter boreholes). When utilized, the well screen and casing will be installed, and the sand pack placed around the screen and casing to a depth extending at least 2-ft. A pre-packed well screen may be used if pre-approved by the NYSDEC.

Bentonite Seal

A minimum 2-ft. thick seal will be placed directly on top of the sand pack, and care will be taken to avoid bridging. In the event that Site geology does not allow for a 2-ft. seal (e.g., only 1-ft. of space remains between the top of the sand pack and ground surface), the

remaining space in the annulus will be filled with bentonite.

Grout Mixture
Upon completion of the bentonite seal, the well may be grouted with a non-shrinking cement grout (e.g., Volclay R) mix to be placed from the top of the bentonite seal to the ground surface. The cement grout shall consist of a mixture of Portland cement (ASTM C 150) and water, in the proportion of not more than 7 gallons of clean water per bag of cement (1 cubic foot or 94 pounds). Additionally, 3% by weight of bentonite powder may be added.

Surface Protection
At all times during the progress of the work, precautions shall be used to prevent tampering with or the entrance of foreign material into the well. Upon completion of the well, a suitable cap shall be installed to prevent material from entering the well. Where permanent wells are to be installed, the well riser shall be protected by a flush mounted road box set into a concrete pad or locking well cap for stick-up wells. A concrete pad, sloped away from the well, shall be constructed around the flush mount road box or stick-up casing at ground level.

Any well that is to be temporarily removed from service or left incomplete due to delay in construction shall be capped with a watertight cap.

Surveying
Coordinates and elevations will be established for each monitoring well and sampling location. Elevations to the closest 0.01 foot shall be used for the survey. These elevations shall be referenced to a regional, local, or project-specific datum. The location, identification, coordinates, and elevations of the wells will be plotted on maps with a scale large enough to show their location with reference to other structures at each site.

Well Development
After completion of the well, but not sooner than 24 hours after grouting is completed, development will be accomplished using pumping, bailing, or surge blocking. No dispersing agents, acids, disinfectants, or other additives will be used during development or introduced into the well at any other time. During development, water will be removed throughout the entire water column by periodically lowering and raising the pump intake (or bailer stopping point).

Development water will be either properly contained and treated as waste until the results of chemical analysis of samples are obtained or discharged on Site as determined by the Site-specific work plans and/or consultation with the NYSDEC representatives on Site.

The development process will continue until removal of a minimum of 110% of the water lost during drilling, three well volumes; whichever is greater, or as specified in the RIWP. In the event that limited recharge does not allow for the recovery of all drilling water lost in the well or three well volumes, the well will be allowed to stabilize to conditions deemed representative of groundwater conditions. Stabilization periods will vary by project but

will be confirmed with the NYSDEC prior to sampling.

3.1.5 Groundwater Sample Collection

Groundwater samples will be collected using dedicated, disposable low flow pump. All other related sampling equipment will be properly decontaminated in the field. The following equipment will be available for sampling of monitoring wells in addition to the general sampling equipment list:

- Well Data Sheets
- Pump
- Electronic water level indicator
- Water Quality Meter
- Acid resistant gloves

The following activities will be completed before going into the field every day before the start of sampling:

1. Fill out appropriate section on Well Data Sheet for the wells to be sampled;
2. Obtain the sampling schedule for each well to be sampled;
3. Calibrate the Photoionization Detector (PID) with the calibration gas;
4. Determine the amount of sampling to be done for the day and prepare the necessary number of coolers;
5. Each well to be sampled will have designated coolers containing the pre-labeled, certified clean, sample bottles. The groundwater samples will be placed in the cooler labeled for the well from which they were taken. The bottle shall be labeled with large distinguishable letters, so that the groundwater samples will be placed in the proper cooler; and
6. Select the appropriate sample bottles for the day's sampling. The bottles shall be pre-marked with a sample parameter and preservatives. Reusable glass bottles will have been cleaned and prepared at the laboratory. The bottles for the various parameters to be analyzed from each well location will then be placed in a cooler.

The following steps describe the sample collection of groundwater:

1. Unlock and remove the well cap;
2. Test the air at the wellhead with the calibrated PID. If the gases from the well have caused the air in the breathing zone to read greater than 5 ppm, stop work and refer to the HASP. Record the reading on the Well Data Sheet;
3. In order to obtain a representative sample of the formation water, the well must be purged of the static water within the well. Prior to purging, the static water level within the well must be measured and the measurement recorded on the Well Data Sheet. To determine the amount of water necessary to purge, find the liquid column height in the well to determine the total volume (three liquid column borehole volumes) of liquid to be purged;
4. Purge the well; lower pump slowly into the well until it is below the water surface. In accordance with NYSDEC Guidance, purge waters will be disposed within the

vicinity of the respective well.

5. Record the amount of water purged in the field logbook and on the Well Data Sheet.
6. If the well goes dry during pumping, allow for full recovery (measure the water level) and then sample. If recovery takes more than twenty minutes, proceed to next well but return to sample within 24 hours.
7. Fill the appropriate sample bottles according to the sampling schedule for each well. While filling the sample bottles, record the well number, type, volume of container, and the preservatives used on the Ground Water Sampling Analyses form.
8. The preservatives for the various sampling parameters were previously added to the clean sample bottles by the laboratory. Some parameters may require additional special handling.
9. Volatile organics analyses samples must be free of air bubbles. When a bubble-free sample has been obtained, it must be immediately chilled.
10. Collect the matrix spike duplicates and trip blanks. Take samples according to sampling schedule presented in the Work Plan. Duplicate samples will include the field splitting of at least one groundwater sample for each sampling visit. This may require the extraction of twice the amount of water needed for duplication purposes. The creation of trip/field blanks and duplicates shall be performed at least once with each field batch with a minimum of once every twenty samples.
11. Record all pertinent information in field logbook and on the Well Data Sheet (include color, odor, sediment content of sample, etc.). Any situations at the site that have the potential to interfere with the analytical results should also be recorded here.
12. Lock well, inspect well site, and note any maintenance required.
13. Dispose of potentially contaminated materials in designated container for contaminated solids.

3.2 Field Measurement Techniques

Water Level Measurement - Water elevations will be taken on all wells prior to purging and sampling. All measurements will be taken within a 24-hour period to obtain consistent elevations and recorded on well data sheets. The procedure for measuring water levels in the monitoring wells is:

- Unlock and remove well cap;
- Test the atmosphere of the well with the calibrated PID. If the gases from the well have caused the air in the breathing zone to read greater than 5 ppm, stop work and refer to the HASP
- Measure water level to nearest 0.01 foot with a water level indicator (electronic).
- Water level indicators will be decontaminated before moving to next well. The tape and cable are decontaminated by washing in a bucket of distilled water-biodegradable phosphate free-detergent solution, followed by a rinse with distilled water.

Specific Conductance Measurement - A specific conductance meter will be field calibrated daily, using a 1M KCl reference solution, to 1413 µmhos/cm at 25 degrees centigrade.

Sample aliquots for specific conductance and temperature will be obtained directly from the sampling point in 100 ml disposable beakers.

Photoionization Detector (PID) - The PID will be calibrated daily (and more often as required by the manufacturer's data) prior to use in the field, using calibration test gases.

3.3 General Decontamination

The following procedures will be performed for the decontamination of exploration equipment, sampling equipment, and personnel after each drilling/sampling event:

Drill rig, backhoe, and excavator - The drill rig, direct-push rig, backhoe, and/or excavator will be cleaned prior to their entrance and exit of the site. Greases and oils will not be used on any down hole equipment during drilling or exploration activities.

Exploration equipment - To avoid cross contamination, use of a PID meter and cleaning between each sampling site will be employed on backhoe arms, buckets, hollow stem augers, casing drill rods, down-hole tools, and appurtenant equipment.

Split spoon sampler - The split spoon sampler will be scrubbed, cleaned, and put through a series of rinses between each sampling event. A number of split spoon samplers will be used so that one can be utilized for sampling while the others are being cleaned.

Reusable equipment - The following steps will be employed to decontaminate reusable equipment:

- Rinse equipment of soil or foreign material with potable water;
- Immerse and scrub equipment with bio-degradable phosphate-free detergent and potable water;
- Immerse and scrub in a potable water rinse without detergent;
- Immerse and scrub in deionized/distilled water;
- Saturate by spraying or immersion in laboratory-grade hexane;
- Air dry and wrap cleaned equipment in foil to carry to next monitoring site to prevent contamination of equipment during transfer; and
- The decontamination wash and rinse water will not be considered hazardous unless visual inspection or monitoring by the PID and other equipment indicate that contaminants may be present. The rinse waters can be discharged on-site if they are not contaminated. If contaminants are expected to be present, the rinsate waters should be placed in 55 gallon drums and stored on-site.

Disposable equipment - The following steps will be employed to decontaminate disposable equipment:

- Rinse with potable water;
- Remove all standing liquid from the piece of equipment;
- Dispose of the equipment in a dedicated container for contaminated solids; and

- Dispose of rinse water in 55 gallon drums if contaminants are found to be present.

Sample containers - upon filling and capping sample bottles, the outside of the bottle will be wiped off with a clean paper towel. These towels will be disposed of in a dedicated container for contaminated solids.

Personnel decontamination - The following procedures will be used to decontaminate sampling personnel.

- After each sampling event chemical resistant gloves will be disposed of in a dedicated container for contaminated solids;
- At the end of each sampling day, Tyvek™ coveralls will be disposed of in a dedicated container for contaminated solids;
- Boots will be rinsed off with water to remove mud, clay, or any other contaminants; and
- Personnel will be required to follow procedures outlined in the HASP.

4 Sample Management Plan

4.1 Sample Management

This Sample Management Plan provides procedures to document and track samples and results obtained during this work effort. A series of pre-printed forms with the appropriate information serves as a vehicle for documentation and tracking.

In order to accomplish this task, the documentation materials will include sample labels, sample characterization and Chain-of-Custody sheets, daily field reports, and a sample log.

Sample Label - A sample label will be completed for each sample obtained and will be affixed to the sample container. The label is configured in a way to address various types of mediums. Information on the label includes, at a minimum, client name, location, sample description, sample number, date, time, grab sample, composite sample, notes, and sampler's name.

Sample Characterization & Chain-of-Custody Sheet - All pertinent field information will be entered onto the sample characterization and chain-of-custody sheets including client name, sample ID, sample description, location of sample, sampling method, number of containers, container type, analysis required, and preservation. The monitoring well form has space allotted for entering information regarding the well including depth to water, well volume, sample pH, temperature, color, etc. The Chain-of-Custody section of the form will document the sample's pathway of sample shipment which will include names of persons delivering/receiving, dates, and times. The reverse side of this form will be used by the laboratory to document analysis performed on the sample. Copies of the completed forms will be retained by the Engineer and the analytical laboratory. The original sample characterization and Chain-of-Custody sheets will be submitted in the Remedial Investigation report along with the laboratory results.

Daily Field Reports - Daily activities will be recorded on the Inspection Report form. The purpose of this form will be to summarize the work performed on the site each day. The completed forms will be submitted to the Project Manager on a daily basis for short term site activity and on a weekly basis for site activities of a longer duration.

Sample Log - The sample log will be utilized to track each individual sample obtained at the site. The upper portion, "Field Identification" will be completed the day the sample is taken. The form will accompany the sample characterization and Chain-of-Custody form to the laboratory. Personnel at the laboratory will complete the middle section of this form and return it to the Engineer, who will use the document to track incoming results. The bottom of the sheet has space allocated to enter "Recommended Actions" based on laboratory results.

4.2 Sample Handling

Each collected sample will be dispensed into the appropriate sample containers for the

type of analysis to be performed. Appropriate sample preservatives will be added to the sample containers by the contracted analytical laboratory prior to the delivery into the field, except in cases where the sample preservative must be added after sample collection. All samples that require cool storage will be immediately placed in coolers with appropriate packaging materials so as to protect the breakage of sample containers during shipment. The sample coolers will be filled with cubed ice (no "Blue Ice") prior to leaving the sample collection location. In the instance that a local analytical laboratory is contracted, the samples will be hand delivered to the laboratory each sampling day. The chain-of-custody forms will be signed by the laboratory personnel picking up the samples and placed within the coolers. In the instance that an analytical laboratory is contracted which is not based locally and a common carrier is used for sample shipment, the chain-of-custody forms will be signed by the sampler and the carrier personnel and placed inside of the coolers. Careful packaging techniques will be used to prevent sample containers from breakage during shipment. Materials such as cardboard, foam wrap, or Styrofoam may be used as packaging materials. All samples will be delivered to the contracted analytical laboratory on the day they were collected and will be received by the laboratory within 24 hours of sample collection. The samples will be collected with sufficient time allowed at the end of the day for the analytical laboratory to properly process the sample chain-of-custody form.

APPENDIX G – HEALTH AND SAFETY PLAN

A Health and Safety plan (HASP), and associated Community Air Monitoring Plan (CAMP), have been prepared by a qualified person in accordance with the most recently adopted and applicable general industry (29 CFR 1910) and construction (29 CFR 1926) standards of OSHA, the U.S. Department of Labor, as well as any other federal, state or local applicable statutes or regulations. The HASP includes a description of the health and safety procedures associated with both performance monitoring of the remedial system(s) and effectiveness monitoring.

The CAMP was originally developed by Watts Architecture & Engineering in February 2016 to provide a measure of protection for the downwind community, more specifically off-site receptors including residents, park visitors, and workers, from potential airborne contaminant releases as a result of IRM remedial work activities performed at the Site. The CAMP was developed in accordance with the New York State Department of Health (NYSDOH) Generic CAMP (DER-10 Technical Guidance for Site Investigation and Remediation, Appendix 1A). The CAMP developed by Watts is being adopted to provide the same measure of protection for future disturbances of the Site long-term.

A copy of the HASP will be available at the site during the conduct of all activities to which it is applicable.

HEALTH AND SAFETY PLAN

ROBERT MOSES PARKWAY – SOUTH

NIAGARA COUNTY

NIAGARA FALLS, NEW YORK

NYSDEC Site Number: 932166

Prepared for:

New York State Office of Parks, Recreation and Historic Preservation

625 Broadway

Albany, New York 12238

Prepared by:

C&S Engineers, Inc.

141 Elm Street Suite 100

Buffalo, New York 14203

C&S Engineers, Inc.
141 Elm Street, Suite 100
Buffalo, New York 14203

September 2019

DISCLAIMER

This document will address health and safety considerations associated with both performance monitoring of the remedial system(s) and effectiveness monitoring activities that may be conducted on the Site by the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) and it's contractors/consultants. Every contractor/consultant engaged in these types of activities is expected to prepare and implement their own site-specific health and safety plan. This document may be used as a general outline to inform the creation of other health and safety plans for this Site.

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SECTION 1 – GENERAL INFORMATION

The Health and Safety Plan (HASP) described in this document will address health and safety considerations for all those activities that personnel employed by the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) and it's contractors/consultants may be engaged in performance monitoring of the remedial system(s) and effectiveness monitoring activities at the Robert Moses Parkway – South Site, located on southwest of the intersection of John Daly Blvd and Buffalo Avenue in Niagara Falls, Niagara County, New York (Site). Figure 1 shows the approximate location of the Site. This HASP will be implemented by the Health and Safety Officer (HSO).

Compliance with this HASP is required of all personnel who enter this Site. The content of the HASP may change or undergo revision based upon additional information made available to the health, safety, and training (H&S) committee, monitoring results or changes in the technical scope of work. Any changes proposed must be reviewed by the H&S committee.

Responsibilities

Project Manager, Site Health and Safety Officer, Emergency Coordinator, Health and Safety Manager ……..	Andrew C. Giarrizzo, RLA NYSOPRHP 3160 Deveaux Woods Drive Niagara Falls, New York 14305 Office: 716.299.0806 Cell 716.609.0941

Emergency Phone Numbers

Emergency Medical Service	911
Police: Niagara Falls Police Department (NFPD)	911
Hospital: Niagara Falls Memorial Medical Center	(716) 278-4000
Fire: Niagara Falls Fire Department	911
National Response Center	(800) 424-8802
Poison Control Center	(800) 222-1222
Center for Disease Control	(800) 311-3435

NYSDEC Region 9 (Buffalo, New York) .....(716) 851-7220
C&S Engineers.....(716) 847-1630
Site Superintendent ..... TBD
Project Field Office Trailer..... TBD

SECTION 2 - HEALTH AND SAFETY PERSONNEL

2.0 Health and Safety Personnel Designations

The following information briefly describes the health and safety designations and general responsibilities for this Site.

2.1 Project Manager (PM)

The PM is responsible for the overall project including the implementation of the HASP. Specifically, this includes allocating adequate manpower, equipment, and time resources to conduct Site activities safely.

2.2 Health and Safety Manager

- Has the overall responsibility for coordinating and reporting all health and safety activities and the health and safety of Site Workers.
- Must have completed, at a minimum, the OSHA 30-Hour Construction Safety Training, and either the 24-Hour training course for the Occasional Hazardous Waste Site Worker or the 40-Hour training course for the Hazardous Waste Operations Worker that meets OHSA 29 CFR 1910.
- Must have completed the 8-Hour Site supervisor/manager's course for supervisors and managers having responsibilities for hazardous waste Site operations and management.
- Directs and coordinates health and safety monitoring activities.

- Ensures that field teams utilize proper personal protective equipment (PPE).
- Conducts initial on-site specific training prior to Site Workers commencing work.
- Conducts and documents daily and periodic safety briefings.
- Ensures that field team members comply with this HASP.
- Immediately notifies the Construction Manager (CM) Project Manager and Superintendent of all accident/incidents.
- Determines upgrading or downgrading of PPE based on Site conditions and/or real time monitoring results.
- Ensures that monitoring instruments are calibrated daily or as the manufacturer's instructions determine.
- Reports to the CM Project Manager and Superintendent to provide summaries of field operations and progress.
- Submits and maintains all documentation required in this HASP and any other pertinent health and safety documentation.

2.3 Health and Safety Officer (HSO)

- Must be designated to the Health and Safety Manager by each Subcontractor as a Competent Person having, at a minimum, the OSHA 30-Hour Construction Safety Training
- Must schedule and attend a Pre-Construction Safety Meeting with the Health and Safety Manager to discuss the Subcontractor Safety Requirements and must attend the Weekly Subcontractor Coordination Meeting.
- Responsible for ensuring that their lower tier contractors comply with project safety requirements.

- Must make frequent and regular inspections of their work areas and activities and ensure hazards that are under their control are corrected immediately and all other hazards are reported to the Construction Manager's Project Manager and Health and Safety Manager.

- Must report all work related injuries, regardless of severity, to the Construction Manager's Project Manager and the Health and Safety Manager within 24 hours after they occur.

2.4 Emergency Coordinator

- The Emergency Coordinator or his on-site designee will implement the emergency response procedures whenever conditions at the Site warrant such action.

- The Emergency Coordinator or his on-site designee will be responsible for assuring the evacuation, emergency treatment, emergency transport of personnel as necessary, and notification of emergency response units (refer to phone listing in the beginning of this HASP) and the appropriate management staff.

2.5 Site Workers

- Report any unsafe or potentially hazardous conditions to the Health and Safety Manager.

- Maintain knowledge of the information, instructions, and emergency response actions contained in the HASP.

- Comply with rules, regulations, and procedures as set forth in this HASP, including any revisions that are instituted.

- Prevent unauthorized personnel from entering work Site.

SECTION 3 - PERTINENT SITE INFORMATION

3.1 Site Location and General History

The site is located in Niagara Falls, Niagara County, New York and is identified as Section 158 Block 16 and Lot 1-1 on the Niagara County Tax Map. The site is an approximately 16.11-acre area and is bounded by Buffalo Avenue and Riverside Drive to the north, the Niagara River to the south, Robert Moses Parkway to the east and 4th Street to the west.

The Site is located in the eastern portion of NYS OPRHP's larger Niagara Falls State Park. Prior to the creation of the Niagara Falls State Park, various industrial facilities were historically in operation in the area along Niagara River adjacent to the Site. However, no industrial facilities were confirmed to have existed within the boundaries of the Site itself. Since the Niagara Reservation was created in 1885, this area has been park land, but neither mills nor factories were historically shown to exist on the Site.

The Site is currently in the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program Site No. 932166 which is administered by New York State Department of Environmental Conservation (NYSDEC). New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) entered into an Order on Consent on December 15, 2015 with the NYSDEC to remediate the site.

Site History and Suspect Recognized Environmental Conditions

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site.

May 2010, Preliminary Screening Investigation Report for the Hazardous Waste/Contaminated Materials Assessment of Reconstruction of Robert Moses Parkway from John Daly Boulevard to parking Lot #1, prepared by Watts Architecture and Engineering, P.C.

The Preliminary Supporting Document (PSI) documented the potential of contaminated fill and focused on the risk through the Riverway Project area. Assessment activities included a review of government and historical records, a Site inspection, and interviews with government agencies and persons with knowledge of the Site. This report associated known

backfilling operations of the adjacent Hydraulic Canal with similar activities for the Port Day Pond and Niagara River shoreline due west and south of the canal. Various wastes, including municipal waste, building debris, and industrial wastes, were used as backfill throughout the area. The report concluded that further investigation is recommended if excavation would be required for future development.

March 2014, Detailed Site Investigation (DSI) Report for the Robert Moses Parkway (RMP)-South Segment/Riverway Project in Niagara Falls State Park, City of Niagara Falls, Niagara County, New York, Watts Project No. Y8195, prepared by Watts Architecture and Engineering, P.C.

A Detailed Site Investigation (DSI) subsequently followed the PSI. Limited site characterization efforts were conducted in November 2013 and January 2014 to preliminarily assess contaminant concentrations at the Site. The DSI included 37 borings and four test pits throughout the Riverway Project area. Samples were collected from 13 of the testing locations and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), pesticides, metals, cyanide, and hexavalent chromium.

On the Site, the DSI encountered brown-colored fill material and dark grey fill material. The brown fill generally contained no concentrations over the NYSDEC's Restricted Residential SCOs. However, the dark grey material contained high concentrations of VOCs, SVOCs, pesticides, and metals. Elevated concentrations of pesticides and metals were also present in the groundwater. No characteristic hazardous wastes were detected and no elevated levels of radiation were measured.

Of the 13 collected samples, eight were located within the RMP – South Site area of concern under headings of "Old Pond" Area and "New Pond" Area. Seven of these samples were from soil borings, while one was from a test pit. The following contaminant categories were observed as exceeding one or more NYSDEC criteria within the Site:

- Pesticides and metals were detected in soil within the area of concern
- SVOCs in soil at sample location B-8
- VOCs in soil at TP-4
- Pesticides and metals in groundwater at MW-8

A detailed Phase II subsurface investigation in areas of proposed excavation was recommended to document existing conditions, due to the finding of several sites in the project vicinity that were considered potential environmental risks to the project.

August 2014, Final Design Report/Environmental Assessment for the Robert Moses Parkway – South Segment – "Riverway," prepared by Hatch Mott MacDonald

A Design Report/Environmental Assessment (DR/EA) was prepared for the reconstruction of the Robert Moses Parkway. However, significant portions of the DR/EA are not related to the Site, but are instead centered on development design for the entire Riverway Project. However, a small section of the report summarized contaminated and hazardous materials associated with an area in close proximity to John B. Daly Boulevard and the Buffalo Avenue intersection (Site). In general, the report described past uses, including recreational use of the former Port Day Pond and filling operations prior to the creation of environmental laws. As a result, contaminated fill from unknown sources was determined to be likely considering the industrial area surrounding the Site.

March 2018, Remedial Investigation/Feasibility Study Report for Robert Moses Parkway-South Site, prepared by C&S Engineers

In response to the discovery of buried metal drums, chemical product/residue, and significantly stained soils during Park reconstruction activities on the Site, a Remedial Investigation (RI) was planned and implemented to characterize site conditions. Simultaneously, Interim Remedial Measures (IRMs) were implemented in hot spot areas to remove drums, free chemical product/residue, and the most significantly contaminated fill material. The RI for the Site consisted of test pits and the advancement of soil borings to characterize fill material soils, the collection and analysis of surface and subsurface soil samples, and the installation and sampling of groundwater wells to characterize groundwater conditions at the Site. In accordance with New York State Department of Environmental Conservation (NYSDEC) guidance, the analytical results were compared to the Commercial Use Soil Cleanup Objectives (SCOs), which are applicable to the intended use of the Site as a passive park following completion of the Riverway road reconstruction/park redevelopment project.

The surface soil sampling identified six areas with arsenic concentrations above the Commercial Use SCOs. Additional surface soil samples were collected to characterize the extent of the impacts. Subsurface samples were collected throughout the Site. The most significant contaminants detected were pesticides, primarily alpha-hexachlorocyclohexane (alpha-BHC) and beta-BHC, at concentrations exceeding Industrial Use SCOs. SVOCs and metals were also detected at elevated concentrations. SVOCs detected at concentrations exceeding the Commercial Use SCO were hexachlorobenzene and benzo(a)pyrene (above the Industrial Use SCO). Metals detected at concentrations exceeding the Commercial Use SCO were arsenic and lead. The IRMs were implemented to address the presence of these contaminants in subsurface soils, as well as drums and associated free product/residue, encountered during construction activities associated with the Riverway road reconstruction/park redevelopment project.

The most significantly contaminated areas with alpha-BHC and beta-BHC impacts were addressed. Groundwater impacts at the Site are largely absent, although pesticides were detected in two monitoring well samples during the first groundwater sampling event at concentrations that exceeded pertinent water quality standards and guidance values. Similar results were observed during the second groundwater sampling event, with pesticides detected at one monitoring well. Elevated concentrations of SVOCs were detected during the third sampling event, though a fourth event was needed due to sampling errors. During the fourth groundwater sampling event conducted at the Site due to elevated levels of pesticides in previous groundwater sampling events, pesticides were detected in three samples at concentrations above the TOGS standards.

The report also included a Feasibility Study to identify and evaluate remedial alternatives to address the contamination observed in the RI and to select remedial actions to be implemented. Four alternatives were discussed in the report: No Action Alternative, the Commercial Use Alternative A (Site Management and Long-Term Monitoring), the Commercial Use Alternative B (Removal of All Soil Materials Exceeding Commercial Use SCOs at Pertinent Hot Spots, with Site Management and Long-Term Monitoring), and the Unrestricted Use-Complete Fill Removal Alternative.

Commercial Use Alternative A was determined to be a long-term remedy and anticipated to be acceptable to the community. This alternative would establish management practices and procedures to guide future invasive construction activities, including activities such as removal and off-site disposal of the most significantly contaminated material and/or placement of clean fill material over soil materials exceeding Commercial Use SCOs to eliminate potential exposure from the underlying material. These elements would minimize potential exposure to contaminated materials by users of the Site, surrounding residential areas, and by workers engaged in invasive construction activities.

The recommended remedial action for the Site in Commercial Use Alternative A included:

- Placement of soil cover material (backfill that meets Commercial Use SCOs) over soil materials exceeding Commercial Use SCOs.
- A Site Management Plan and Soil/Fill Handling Plan.
- A Declaration of Covenants, Conditions, and Restrictions applied to the entire Site, with specific requirements for those areas where covers are necessary.
- Annual certification that all institutional and engineering controls remain in place and are effective, particularly for the soil covers.

June 2016 – November 2017 – Interim Remedial Measures, managed by C&S Engineers

The following IRM(s) has/have been completed at this site based on conditions observed during the RI.

Construction Zone IRM

Excavation and off-site disposal of waste and contaminated soil from areas in the Riverway Construction Zone. The contamination was addressed as an IRM to allow for continued construction of park and road improvements. The IRM was expanded to include a portion of the former Port Day Pond. The major components of the IRM included:

• Excavation and off-site disposal of approximately 236 tons of surface soil contaminated by arsenic which exceeded commercial soil cleanup objectives (CSCOs) from the northern border of the site;

• Excavation and off-site disposal of approximately 2,800 tons of soil containing pesticide/organochlorine wastes, which exceeded CSCOs, or exhibited nuisance conditions from the former Port Day Pond and Hot Spots 1/3, 2, 4, 4a, and 6. The excavated material was disposed off-site as hazardous waste. CSCOs for pesticides and/or semi-volatile organic compounds (SVOCs) were not achieved in Hot Spots 1/3, 2, and a portion of 4. These remaining areas were covered as part of the IRM activities and will be monitored as required by the final remedy;

• Excavation and off-site disposal of 1.38 tons of solid or semi-solid hazardous substances (pesticide wastes and chlorinated organics), including remnants of drums, from utility trenches and paving areas in Hot Spots 1/3 and 2. CSCOs for pesticides and SVOCs were not achieved in these areas;

• Excavation and off-site disposal of approximately 29,300 tons of residually impacted soil as solid waste. This soil was generated from Hot Spot 5, segregation of material from other hot spots, and general site grading activities; and

• Backfill of excavation areas to meet design grades with approved soil/fill that allows for commercial use; and

• Construction of covers in Hot Spots 1/3, Hot Spot 2, and a portion of Hot Spot 4 south of the AT&T fiber optic line where residual contamination remains exceeding the CSCOs. The cover in these areas consist of either asphalt, concrete, or soil cover. Where a soil cover is used it is a minimum of one foot of soil placed over a demarcation layer.

The IRM excavations were completed in several stages between June 2016 and November 2017. These IRM activities are documented in the IRM Construction Completion Report dated January 2019.

SECTION 5 - TRAINING

5.1 Site-specific Training

Training will be provided that specifically addresses the activities, procedures, monitoring, and equipment for the Site operations prior to going on site. Training will include familiarization with Site and facility layout, known and potential hazards, and emergency services at the Site, and details all provisions contained within this HASP. This training will also allow Site Workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

5.2 Safety Briefings

Project personnel will be given briefings by the HSO on a daily or as needed basis to further assist Site Workers in conducting their activities safely. Pertinent information will be provided when new operations are to be conducted. Changes in work practices must be implemented due to new information made available, or if Site or environmental conditions change. Briefings will also be given to facilitate conformance with prescribed safety practices. When conformance with these practices is not occurring or if deficiencies are identified during safety audits, the project manager will be notified.

SECTION 6 - PERSONAL PROTECTIVE EQUIPMENT

6.1 General

The level of protection to be worn by field personnel will be defined and controlled by the HSO. Depending upon the type and levels of material present or anticipated at the site, varying degrees of protective equipment will be needed. If the possible hazards are unknown, a reasonable level of protection will be taken until sampling and monitoring results can ascertain potential risks. The levels of protection listed below are based on USEPA Guidelines. A list of the appropriate clothing for each level is also provided.

Level A protection must be worn when a reasonable determination has been made that the highest available level of respiratory, skin, eye, and mucous membrane protection is needed.

It should be noted that while Level A provides maximum available protection, it does not protect against all possible hazards. Consideration of the heat stress that can arise from wearing Level A protection should also enter into the decision making process. Level A protection includes:

- Open circuit, pressure-demand self-contained breathing apparatus (SCBA)
- Totally encapsulated chemical resistant suit
- Gloves, inner (surgical type)
- Gloves, outer, chemical protective
- Boots, chemical protective

Level B protection must be used when the highest level of respiratory protection is needed, but hazardous material exposure to the few unprotected areas of the body (e.g., the back of the neck) is unlikely. Level B protection includes:

- Open circuit, pressure-demand SCBA or pressure airline with escape air bottle
- Chemical protective clothing: Overalls and long sleeved jacket; disposal chemical resistant coveralls; coveralls; one or two piece chemical splash suit with hood
- Gloves, inner (surgical type)
- Gloves, outer, chemical protective
- Boots, chemical protective

Level C must be used when the required level of respiratory protection is known, or reasonably assumed to be, not greater than the level of protection afforded by air purifying respirators; and hazardous materials exposure to the few unprotected areas of the body (e.g.., the back of the neck) is unlikely. Level C protection includes:

- Full or half face air-purifying respirator
- Chemical protective clothing: Overalls and long-sleeve jacket; disposable chemical resistant coveralls; coveralls; one or two piece chemical splash suit
- Gloves, inner (surgical type)
- Gloves, outer, chemical protective
- Boots, chemical protective

Level D is the basic work uniform. It cannot be worn on any site where respiratory or skin hazards exist. Level D protection includes:

- Safety boots/shoes
- Safety glasses
- Hard hat with optional face shield

Note that the use of SCBA and airline equipment is contingent upon the user receiving special training in the proper use and maintenance of such equipment.

6.2 Personal Protective Equipment – Site Specific

Level D with some modification will be required when working in the work zone on this Site. In addition to the basic work uniform specified by Level D protection, Nitrile gloves will be required when contact with soil or ground water is likely. Hearing protection will be worn when power equipment is used to perform subsurface investigation work. An upgrade to a higher level (Level C) of protection may occur if determined necessary by the HSO.

SECTION 7 - MONITORING PROCEDURES

7.1 Monitoring During Site Operations

All Site environmental monitoring should be accompanied by periodic meteorological monitoring of appropriate climatic conditions.

7.1.1 Drilling Operations (Monitoring Well Installation and Subsurface Borings) and Test Pit Excavations

Monitoring will be performed by the HSO or drilling observer during the conduct of work. A photoionization detector (PID) equipped with a 10.0 eV lamp will be utilized to monitor for the presence of volatile organic vapors within the breathing zone, the borehole, and subsurface samples upon their retrieval. Drill cuttings and excavation spoils will also be monitored by use of the PID. The PID will be field checked for calibration accuracy three times per day (morning, lunch, and end of day. If subsurface conditions warrant, a combustible gas indicator (CGI) with oxygen alarm may also be used to monitor the borehole

for the presence of combustible gases. Similar monitoring of fluids produced during well development will also be conducted.

7.1.2 Interim Remedial Measures

If future Interim Remedial Measures (IRM) occurs, monitoring will be performed during excavation and sampling operations when C&S personnel are within the work zone. Although historical information previously obtained at the Site indicates low level of volatile organic vapors and compounds, a photoionization detector (PID) will be used during subsurface activities. If an IRM is performed, the, the remedial contractor will be required to employ dust control practices during work.

7.2 Action Levels

If readings on the PID exceed 10 ppm for more than fifteen minutes consecutively, then personal protective equipment should be upgraded to Level C. The air purifying respirator used with Level C protective equipment must be equipped with organic vapor cartridges. If readings on the explosive gas meter are within a range of 10%-25% of the LEL then continuous monitoring will be implemented. Readings above 25% of the LEL indicate the potential for an explosive condition. Sources of ignition should be removed and the Site should be evacuated.

7.3 Personal Monitoring Procedures

Personal monitoring shall be performed as a contingency measure in the event that VOC concentrations are consistently above the 10 ppm action level as detected by the PID. If the concentration of VOCs is above this action level, then amendments to the HASP must be made before work can continue at the Site.

SECTION 8 - COMMUNICATIONS

Cell phones will be the primary means of communicating with emergency support services/facilities.

SECTION 9 - SAFETY CONSIDERATIONS FOR SITE OPERATIONS

9.1 General

Standard safe work practices that will be followed include:

- Do not climb over/under drums, or other obstacles.
- Do not enter the work zone alone.
- Practice contamination avoidance, on and off-site.
- Plan activities ahead of time, use caution when conducting concurrently running activities.
- No eating, drinking, chewing or smoking is permitted in work zones.
- Due to the unknown nature of waste placement at the Site, extreme caution should be practiced during excavation activities.
- Apply immediate first aid to any and all cuts, scratches, abrasions, etc.
- Be alert to your own physical condition. Watch your buddy for signs of fatigue, exposure, etc.
- A work/rest regimen will be initiated when ambient temperatures and protective clothing create a potential heat stress situation.
- No work will be conducted without adequate natural light or without appropriate supervision.
- Task safety briefings will be held prior to onset of task work.
- Ignition of flammable liquids within or through improvised heating devices (barrels, etc.) or space heaters is forbidden.
- Entry into areas of spaces where toxic or explosive concentrations of gases or dust may exist without proper equipment is prohibited.
- Any injury or unusual health effect must be reported to the Site health and safety officer.
- Prevent splashing or spilling of potentially contaminated materials.
- Use of contact lenses is prohibited while on site.
- Beards and other facial hair that would impair the effectiveness of respiratory protection are prohibited if respiratory protection is necessary.
- Field crew members should be familiar with the physical characteristics of investigations, including:

- Wind direction in relation to potential sources
- Accessibility to co-workers, equipment, and vehicles
- Communication
- Hot zones (areas of known or suspected contamination)
- Site access
- Nearest water sources

- The number of personnel and equipment in potentially contaminated areas should be minimized consistent with site operations.

9.2 Field Operations

9.2.1 Intrusive Operations

The HSO or designee will be present on-site during all intrusive work, e.g., drilling operations, excavations, trenching, and will provide monitoring to oversee that appropriate levels of protection and safety procedures are utilized by personnel. The use of salamanders or other equipment with an open flame is prohibited and the use of protective clothing, especially hard hats and boots, will be required during drilling or other heavy equipment operations.

SECTION 10 - DECONTAMINATION PROCEDURES

Decontamination involves physically removing contaminants and/or converting them chemically into innocuous substances. Only general guidance can be given on methods and techniques for decontamination. Decontamination procedures are designed to:

- Remove contaminant(s).
- Avoid spreading the contamination from the work zone.
- Avoid exposing unprotected personnel outside of the work zone to contaminants.

Contamination avoidance is the first and best method for preventing spread of contamination from a hazardous site. Each person involved in site operations must practice the basic methods of contamination avoidance listed below. Additional precautions may be required in the HASP.

- Know the limitations of all protective equipment being used.
- Do not enter a contaminated area unless it is necessary to carry out a specific objective.
- When in a contaminated area, avoid touching anything unnecessarily.
- Walk around pools of liquids, discolored areas, or any area that shows evidence of possible contamination.
- Walk upwind of contamination, if possible.
- Do not sit or lean against anything in a contaminated area. If you must kneel (e.g., to take samples), use a plastic ground sheet.
- If at all possible, do not set sampling equipment directly on contaminated areas. Place equipment on a protective cover such as a ground cloth.
- Use the proper tools necessary to safely conduct the work.

Specific methods that may reduce the chance of contamination are:

- Use of remote sampling techniques.
- Opening containers by non-manual means.
- Bagging monitoring instruments.
- Use of drum grapplers.
- Watering down dusty areas.

Equipment which will need to be decontaminated includes tools, monitoring equipment, and personal protective equipment. Items to be decontaminated will be brushed off, rinsed, and dropped into a plastic container supplied for that purpose. They will then be washed with a detergent solution and rinsed with clean water. Monitoring instruments may be wrapped in plastic bags prior to entering the field in order to reduce the potential for contamination. Instrumentation that is contaminated during field operations will be carefully wiped down. Heavy equipment, if utilized for operations where it may be contaminated, will have prescribed decontamination procedures to prevent contaminant materials from potentially leaving the Site. On-site contractors, such as drillers or backhoe operators, will be responsible for decontaminating all construction equipment prior to demobilization.

SECTION 11 – DISPOSAL PROCEDURES

All discarded materials, waste materials, or other objects shall be handled in such a way as to reduce or eliminate the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left on-site. All potentially contaminated materials, e.g., clothing, gloves, etc., will be bagged or drummed as necessary and segregated for proper disposal. All contaminated waste materials shall be disposed of as required by the provisions included in the contract and consistent with regulatory provisions. All non-contaminated materials shall be collected and bagged for appropriate disposal. Investigation derived waste will be managed consistent with the work plan for this Site and DER-10 Technical Guidance for Site Investigation and Remediation dated May 2010.

SECTION 12 - EMERGENCY RESPONSE PROCEDURES

As a result of the hazards at the Site, and the conditions under which operations are conducted, there is the possibility of emergency situations. This section establishes procedures for the implementation of an emergency plan.

12.1 Emergency Coordinator

The Emergency Coordinator or his on-site designee will implement the emergency response procedures whenever conditions at the Site warrant such action. The Emergency Coordinator or his on-site designee will be responsible for assuring the evacuation, emergency treatment, emergency transport of personnel as necessary, and notification of emergency response units (refer to phone listing in the beginning of this HASP) and the appropriate management staff.

12.2 Evacuation

In the event of an emergency situation, such as fire, explosion, significant release of toxic gases, etc., all personnel will evacuate and assemble in a designated assembly area. The Emergency Coordinator or his on-site designee will have authority to contact outside

services as required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The Emergency Coordinator or his on-site designee must see that access for emergency equipment is provided and that all ignition sources have been shut down once the emergency situation is established. Once the safety of all personnel is established, the Fire Department and other emergency response groups will be notified by telephone of the emergency.

12.3 Potential or Actual Fire or Explosion

Immediately evacuate the Site and notify local fire and police departments, and other appropriate emergency response groups, if LEL values are above 25% in the work zone or if an actual fire or explosion has taken place.

12.4 Environmental Incident (spread or release of contamination)

Control or stop the spread of contamination if possible. Notify the Emergency Coordinator and the Project Manager. Other appropriate response groups will be notified as appropriate.

12.5 Personnel Injury

Emergency first aid shall be applied on-site as necessary. Then, decontaminate (en route if necessary) and transport the individual to nearest medical facility if needed. The ambulance/rescue squad shall be contacted for transport as necessary in an emergency. The directions to the hospital are shown in Section 1 of this HASP and a map is shown on Figure 2.

12.6 Personnel Exposure

- *Skin Contact*: Use copious amounts of soap and water. Wash/rinse affected area thoroughly, and then provide appropriate medical attention. Eyes should be thoroughly rinsed with water for at least 15 minutes.
- *Inhalation*: Move to fresh air and/or, if necessary, decontaminate and transport to emergency medical facility.
- *Ingestion*: Decontaminate and transport to emergency medical facility.

- *Puncture Wound/Laceration*: Decontaminate, if possible, and transport to emergency medical facility.

12.7 Adverse Weather Conditions

In the event of adverse weather conditions, the HSO will determine if work can continue without sacrificing the health and safety of field workers.

12.8 Incident Investigation and Reporting

In the event of an incident, procedures discussed in the Medical Emergency/Incident Response Protocol, presented in Appendix B of this HASP, shall be followed.

SECTION 13 - COMMUNITY RELATIONS

13.1 Community Health and Safety Plan

13.1.1 Community Health and Safety Monitoring

This HASP document addresses health and safety considerations for all those activities that personnel employed by the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) and it's contractors/consultants may be engaged in performance monitoring of the remedial system(s) and effectiveness monitoring activities at the Robert Moses Parkway – South Site. During completion of these tasks, potential for health and safety risks to off-site landowners or the local community are not anticipated.

During completion of any future intrusive efforts at or adjacent to the Site, health and safety monitoring efforts will be concentrated on the area or areas in which intrusive efforts are being completed. Since the air pathway is the most available and likely avenue for the release of potential contaminants to the atmosphere at or near the Site, in addition to limiting public or community access to the areas in which intrusive efforts are completed, health and safety measures will primarily consist of monitoring the air pathway for worker exposure.

13.1.2 Community Air Monitoring Plan

Efforts will be taken to complete field work in a manner which will minimize the creation of airborne dust or particulates. Under dry conditions, work areas may be wetted to control dust. During periods of extreme wind, intrusive field work may be halted until such time as the potential for creating airborne dust or particulate matter as a result of investigation activities is limited. Periodic monitoring following the guidelines of the site's Community Air Monitoring Plan - CAMP (Attachment A) will be implemented during all non-intrusive, and future intrusive, Site activities, including performance monitoring of the remedial system(s) and effectiveness monitoring activities, and collection of groundwater samples from groundwater monitoring wells.

These air monitoring activities will include establishment of background conditions, continuous monitoring for volatile organic compounds and/or particulates at the downwind work area (exclusion zone) perimeter, recording of monitoring data, and institution and documentation of Response Levels and appropriate actions in accordance with NYSDOH guidance.

SECTION 14 - AUTHORIZATIONS

Personnel authorized to enter the Site while operations are being conducted must be approved by the HSO. Authorization will involve completion of appropriate training courses, medical examination requirements, and review and sign-off of this HASP. Each site visitor should check in with the HSO or Project Manager prior to coming onsite.

FIGURE 1

SITE LOCATION MAP

C&S ENGINEERS

FIGURE 2

MAP AND DIRECTIONS TO HOSPITAL

ATTACHMENT A

CAMP

C&S ENGINEERS

Appendix A

EXCAVATION/TRENCHING GUIDELINE

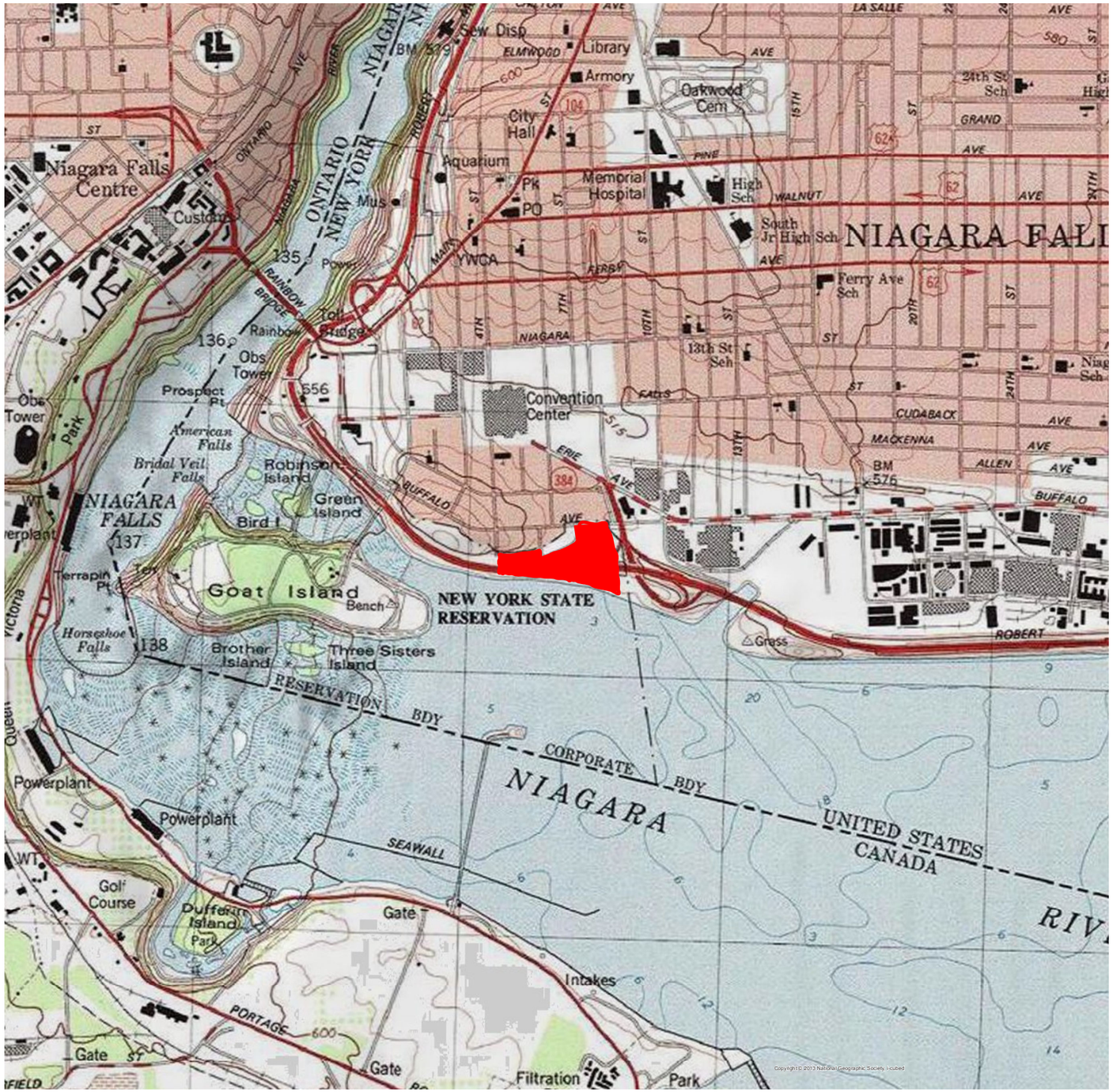
C&S ENGINEERS

Appendix B

GUIDANCE ON INCIDENT INVESTIGATION

AND REPORTING

C&S ENGINEERS



LEGEND

SITE LOCATION

NOTES

1) BASE MAPPING IS PROVIDED BY THE UNITED STATES GEOLOGICAL SURVEY.

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FEET

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NEW YORK STATE OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION
ROBERT MOSES PARKWAY - SOUTH SITE
INTERIM REMEDIAL MEASURES
NIAGARA FALLS, NEW YORK

MARK	DATE	DESCRIPTION
	4/19/18	Title Update

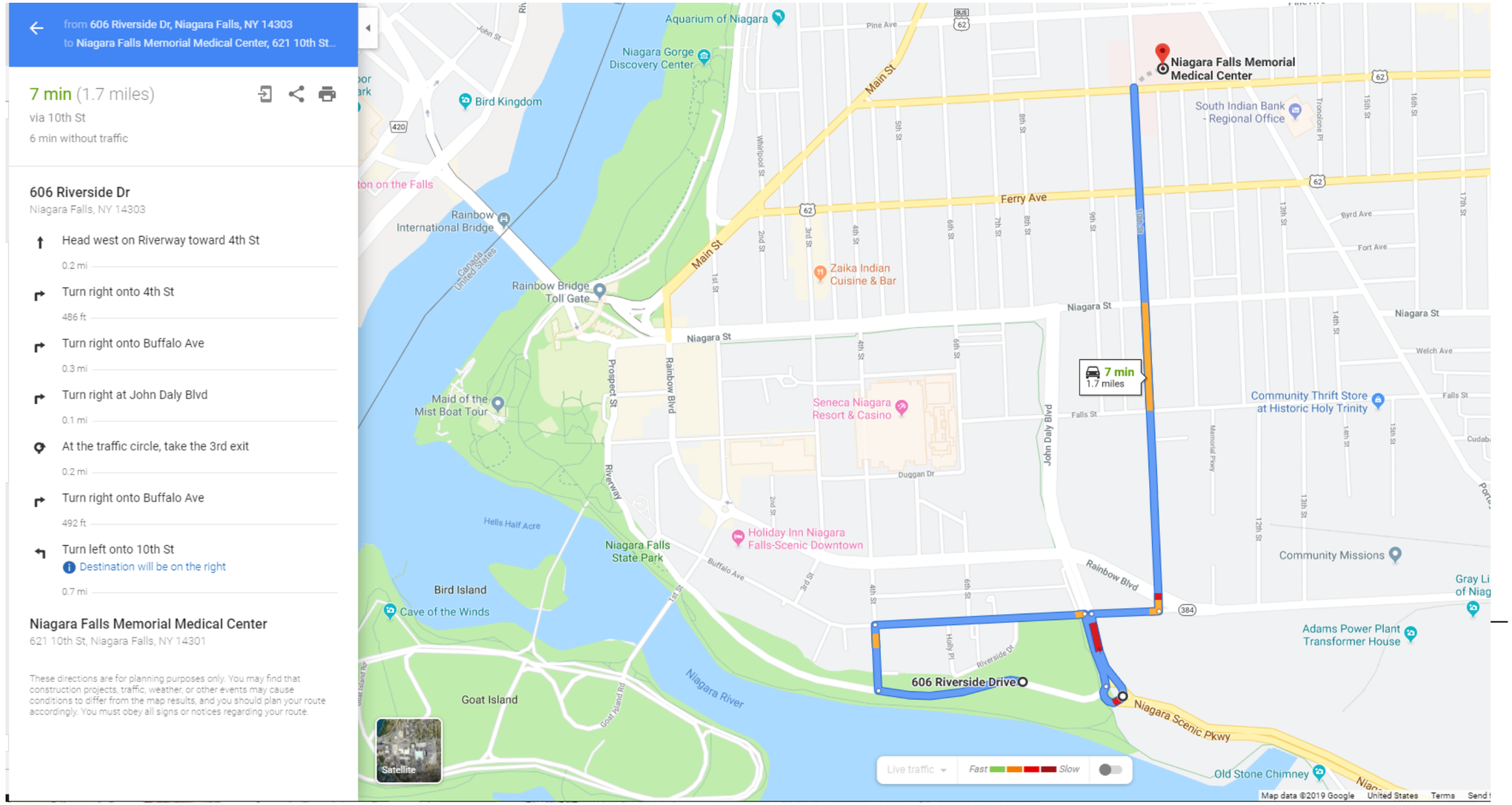
REVISIONS

PROJECT NO:	190720009
DATE:	FEBRUARY 23, 2016
DRAWN BY:	A. DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	D. RIKER

SITE LOCATION MAP

FIGURE 1

Path: F:\Project\190F - New York State Office of Parks\2014-16 Term Agreement for Alleg, Gen, & Niag Regions\190720004 - Contaminated Soils Plan for NFSP-Riverway\Planning-Study\CADD_GIS\Projects\IRM\FIGURE_1.mxd



Courtesy: Google Maps

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NEW YORK STATE OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION
ROBERT MOSES PARKWAY - SOUTH SITE
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PROJECT NO:	190720009
DATE:	FEBRUARY 23, 2016
DRAWN BY:	A. DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	D. RIKER

Map & Directions to Hospital

Figure 2

APPENDIX H

SITE MANAGEMENT FORMS

This Appendix includes all site specific site management forms including site inspection forms, routine operation and maintenance forms and non-routine operations and maintenance forms for the site. The forms will be completed during site maintenance activities and provided to the NYSDEC in electronic format in accordance with the reporting requirements specified in Section 7.0 of this SMP. All forms presented are subject to approval of the NYSDEC and will include the minimum reporting requirements as described in Section 7.0.

The following site management forms are included in this appendix:

- Monitoring/Inspection Form
- Routine/Non-Routine Maintenance Form

ROBERT MOSES PARKWAY – SOUTH
NIAGARA COUNTY
NIAGARA FALLS, NEW YORK
NYSDEC Site Number: 932166

MONITORING/INSPECTION REPORT

Inspector's Name/Company: **Weather Conditions:**

Inspection Date: **Temperature (^{o}F):**

Inspection Time:

General Comments/Activities Performed:

General Site Condition at Time of Inspection

Inspection being performed in the event of an emergency? If yes, describe:

Photos/Sketches Attached?

Annual Monitoring Well Sampling Conducted? If yes, complete attached Well Sampling Log

Pre Inspection Checklist

- Review previous annual inspections
- Meet with the site representative to solicit comments/concerns regarding the operation of the Engineering Controls over the past 12 months.
- All equipment in hand to perform sampling activities?

Comments:

Cover System Inspection

1. **Walk and inspect all three soil cover areas: Hot Spot 1/3, Hot Spot 2, Hot Spot 4**
   - Are there any signs of significant cracks, settlement or deterioration of paved areas.
   - Has any of the pavement material been removed?
   - Have any structures been constructed on the unpaved areas?
   - Are there any signs of soil washing or erosion (gullies, soil washed out onto the pavement)?
   - Are there any signs of intrusive activities (drilling, digging, trenching, grading, excavating, etc.)?
2. **Walk and inspect the4 NW asphalt pavement cover areas**
   - Are there any signs of significant cracks, settlement or deterioration of the paved areas.
   - Has any of the pavement material been removed?
   - Are there any signs of intrusive activities (drilling, digging, trenching, grading, excavating, etc.)?

Comments:

Repair

Summarize needed/completed repairs to the Engineering Controls:

Inspector's Signature: _____

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Fax: 716-847-1454
www.cscos.com

Well Sampling Field Data Sheet

Well Casing Unit Volume (gal/l.f.)		
1¼" = 0.08	2" = 0.17	3" = 0.38
4" = 0.66	6" = 1.5	8" = 2.6

Client Name: _____

Site Name: _____

Project No.: _____

Field Staff: _____

WELL DATA

Date									
Well Number									
Diameter (inches)									
Total Sounded Depth (feet)									
Static Water Level (feet)									
H_2O Column (feet)									
Pump Intake (feet)									
Well Volume (gallons)									
Amount to Evacuate (gallons)									
Amount Evacuated (gallons)									

FIELD READINGS

Date	Stabilization Criteria								
Time									
Volume Extracted	gallons								
pH (Std. Units)	+/-0.1								
Conductivity (mS/cm)	3%								
Turbidity (NTU)	10%								
D.O. (mg/L)	10%								
Temperature (ºC) (ºF)	3%								
ORP[3](mV)	+/-10 mv								
Appearance									
Free Product (Yes/No)									
Odor									
Comments									

C = Clear T = Turbid ST = Semi Turbid VT = Very Turbid

ROBERT MOSES PARKWAY – SOUTH
NIAGARA COUNTY
NIAGARA FALLS, NEW YORK
NYSDEC Site Number: 932166

ROUTINE/NON-ROUTINE MAINTENANCE REPORT

Routine or Non-Routine Maintenance?:

Maintenance Person Name/Company: **Weather Conditions:**

Maintenance Date: **Temperature (^{o}F):**

Maintenance Time:

General Comments/Activities Performed:

General Site Condition at Time of Maintenance

Photos/Sketches Attached?

Invoices/Receipts Attached?

General Comments/Activities Performed:

Signature: _____

APPENDIX I

O&M MANUAL (FOR EACH ACTIVE EC)

The O&M Manual provides protocols for the operation and maintenance of active remedial system. No active engineering controls are currently in place on the site and/or included in the Record of Decision.

If active engineering controls are added in the future, the O&M Manual will be revised on a periodic basis and kept up to date by the remedial party. The O&M Manual will revised to include all as-built drawings and catalog-cuts on all fixed and mobile equipment necessary to operate and maintain the remedial system including any pumps, blower, air strippers, etc. Catalog-cuts will include maintenance procedures, spare parts lists, and any special tool requirement as well as vendor/service contact/local dealer information, including address and telephone numbers.

APPENDIX J

REMEDIAL SYSTEM OPTIMIZATION
TABLE OF CONTENTS

REMEDIAL SYSTEM OPTIMIZATION FOR: Robert Moses Parkway-South Site Southwest of the Intersection of John Daly Blvd and Buffalo Avenue (SBL #158.16-1-1) Niagara Falls, Niagara County, New York, Site No. 932166

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APPENDIX K - IRM Work Plan

INTERIM REMEDIAL MEASURES (IRM) WORK PLAN

FOR THE

ROBERT MOSES PARKWAY RIVERWAY CONSTRUCTION ZONE PROJECT

AS PART OF THE

ROBERT MOSES PARKWAY INTERCHANGE CONSTRUCTION PROJECT
NYSDOT PIN 5410.54.30, CONTRACT NO. D262671
CITY OF NIAGARA FALLS, NIAGARA COUNTY, NEW YORK

MARCH 16, 2016

PREPARED BY:
WATTS ARCHITECTURE AND ENGINEERING
95 PERRY STREET
SUITE 300
BUFFALO, NEW YORK, 14203

FOR:
NEW YORK STATE DEPARTMENT OF TRANSPORTATION
REGION 5
100 SENECA STREET
BUFFALO, NEW YORK, 14203

FOR SUBMISSION TO:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
270 MICHIGAN AVENUE
BUFFALO, NEW YORK, 14203

WATTS ARCHITECTURE & ENGINEERING
95 Perry Street, Suite 300
Buffalo, New York 14203
p: 716.206.5100
f: 716.206.5199

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

BUD	Beneficial Use Determination
CAMP	Community Air Monitoring Plan
CMHP	Contractor's Site-Specific Contaminated Material Handling Plan
C-SCOs	NYSDEC Part 375 Commercial Soil Cleanup Objectives
DER	Division of Environmental Remediation
EIC	Engineer in Charge
ESC	Erosion and Sediment Control
FID	Flame-Ionization Detector
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
mg/kg	Milligram Per Kilogram
ND	Non-Detect
NYPA	New York Power Authority
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
OPRHP	New York State Office of Parks Recreation and Historic Preservation
PID	Photoionization Detector
PPE	Personal Protective Equipment
ppm	Parts Per Million
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
TAL	Target Analyte List
TCL	Target Compound List
TEQ	Toxic Equivalent
TSDF	Treatment, Storage, or Disposal Facility
USEPA	United States Environmental Protection Agency
Watts	Watts Architecture & Engineering

1.0 INTRODUCTION

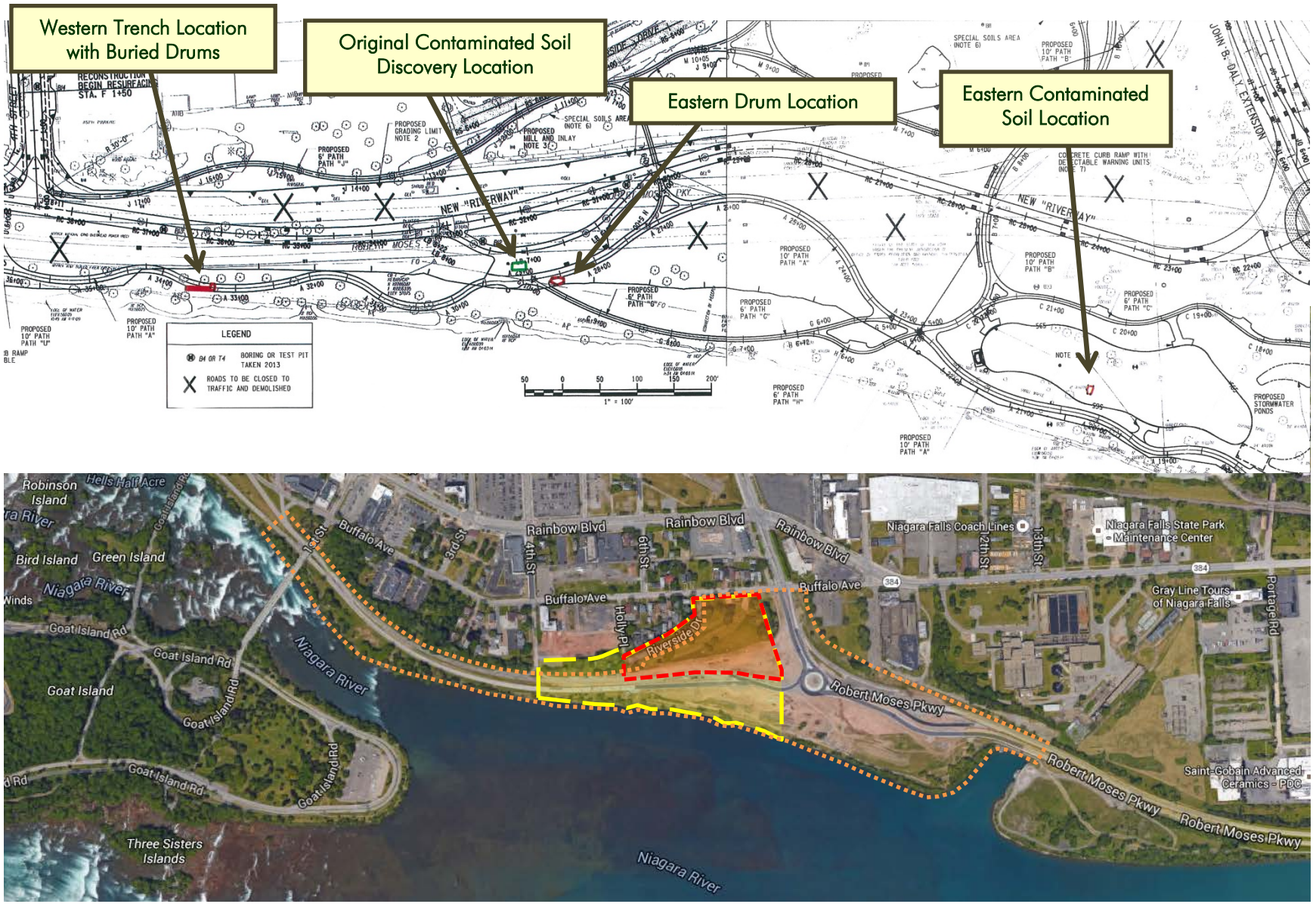
The New York State Department of Transportation (NYSDOT) has requested that Watts Architecture & Engineering (Watts) develop an Interim Remedial Measure (IRM) Work Plan for the Riverway Construction Zone area that is within the overall larger New York State Department of Environmental Conservations (NYSDEC) Robert Moses Parkway-South Site, #932166, remedial project located in the City of Niagara Falls, Niagara County, New York. The NYSDEC Robert Moses Parkway South Site remediation project is a portion of the NYSDOT Robert Moses Parkway, South Segment, Riverway Project (NYSDOT PIN 5410.54.301, Contract No. D262671. See **Figure 1** for the project location map and **Attachment A** for the NYSDEC Site Sub-Areas plan.

The NYSDEC Robert Moses Parkway South Site includes areas of the Niagara Falls State Park west of John Daly Boulevard and east of Fourth Street surrounding the former Robert Moses Parkway. The overall site is made up of two areas which are referenced as, the Former Pond area and the Riverway Construction Zone area. While these areas are part of the same overall NYSDEC site, investigation and/or IRM activities for each of the areas will proceed at different schedules, as approved by DEC.

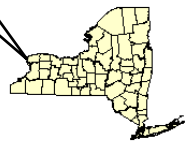
The NYSDOT is administering the construction of the Robert Moses Parkway, South Segment, Riverway Project which involves the excavation of 1.4 miles of the Robert Moses Parkway-South on land owned by the NYS Office of Parks and Recreation (OPRHP) and the New York Power Authority (NYPA). The Robert Moses Parkway-South was constructed on land that consists mainly of fill from undocumented sources in a historically industrial area known for previous discoveries of contamination at a variety of sites. One of the areas of previously known contamination is the Former Pond area within the NYSDEC Robert Moses Parkway South Site.

Contamination has been discovered at the site during reconstruction at the NYSDOT Robert Moses Parkway Interchange Construction project outside the area of the Former Pond. Buried drums and contaminated soil has been discovered at multiple areas. As a result, NYSDEC has enlarged the Robert Moses Parkway South Site to include the Riverway Construction Zone area. The Former Pond and Riverway Construction Zone areas are a portion of the larger NYSDOT project.

A Remedial Investigation/Feasibility Study (RI/FS) Work Plan is being developed to determine the nature and extent of the contamination. However, during the investigation limited areas of contamination may be removed as an interim remedial measure (IRM) to protect human health and environment, and facilitate continuation of the ongoing NYSDOT Robert Moses Parkway Interchange Construction project. Remedial activities at the Former Pond area are being handled separately from the NYSDOT project.



Project Location



APPROXIMATE PROJECT AREAS

= NYSDOT Robert Moses Parkway, South Segment, Riverway Project, PIN 5410.54.301

= NYSDEC Robert Moses Parkway South Site

= NYSDEC Former Pond Area

= NYSDEC Riverway Construction Area

Source: Google Maps 2016.

Watts AE
95 Perry Street
Buffalo, New York

FIGURE 1 – PROJECT LOCATION MAP

Robert Moses Parkway, South Segment,
Riverway Project, PIN 5410.54.301, D031059
Niagara Falls, Niagara County, New York

Not to Scale | March 2016

2.0 INTERIM REMEDIAL MEASURE

2.1 Purpose and Need

The purpose of this IRM is to clean up isolated contaminated soil areas (hot spots) which will protect human health and the environment, and facilitate the continuation of the ongoing roadway construction project (NYSDOT Robert Moses Parkway, South Segment, Riverway Project, PIN 5410.54.301) within the remediation area. If field indicators of contamination such as odor, drums or elevated organic vapor readings are encountered in areas outside the remediation area this IRM will also serve as a guide at those locations during excavation activities.

Previous laboratory analysis of samples collected from the hot spots detected several volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), organochlorine pesticides, and metals in excess of the Part 375 Soil Cleanup Objectives (SCOs). Several of the constituents were detected in concentrations exceeding the Part 375 industrial SCOs. Most notable were the elevated results for multiple variations of chlorobenzene compounds (both volatile and semivolatile) and multiple organochlorine pesticides including Lindane and Alpha-, Beta-, and Delta-Benzene hexachlorides (BHC).

It should also be noted that significant levels of dioxins/furans were detected within a sample of a tar-like substance found within a buried/crushed drum. The tar-like substance was coated in yellow powder; therefore, it is unknown whether the detected dioxins/furans were from the tar-like substance or the yellow powder.

Several constituents were detected at levels with a potential to exceed the RCRA toxicity characteristic limits. Subsequent TCLP testing was requested and conducted. While the analytical data indicated that the results and concentrations of the analyzed constituents were below RCRA hazardous levels for toxicity characteristic hazardous waste, the assemblage of the various elevated constituents that were detected within the samples indicate contamination resulting from pesticide production, which would involve listed hazardous wastes.

Based upon the analytical results and subsequent discussions with NYSDEC, the solid materials and soils associated with these samples is considered a listed hazardous waste due to the presence of compounds connected with the historical manufacturing of organochlorine pesticides. All waste associated with these samples must be properly handled, stored, labeled, transported, and disposed of as a listed hazardous waste. As a result of the volume of material that must be processed, the Generator of this waste (OPRHP) must utilize their EPA ID number from the U.S. Environmental Protection Agency.

2.2 General Excavation Constraints

The procedures described herein are meant to summarize the procedures that have been agreed upon regarding handling of soils at the Riverway Construction Zone in the remediation area. These procedures have been derived from meetings, emails and conversations between interested parties. NYSDEC personnel will be notified at least five days in advance of IRM actions.

All persons working in close proximity or in contact with the contaminated soil will require appropriate personal protective equipment (PPE) and an appropriate organic vapor/dust particle respirator and gloves at a minimum. However, please note that this document does not address Health and Safety and is not meant to supersede the Contractor's (Mark Cerrone, Inc.) Site-Specific Contaminated Material Handling Plan (CMHP) already in place for this project.

It has been determined that the earliest field indicator of contamination is odor. Therefore, excavations in areas that are not known to be contaminated (i.e. without field indicators -odor, organic vapor readings from a photoionization detector (PID) or flame-ionization detector (FID), and visual-evidence of contamination) can continue without full-time organic vapor monitoring. If odor is detected in an excavation, all excavation activities will be immediately halted in that area, the contractor will notify the Engineer in Charge (EIC), mark the area, and move to another location to allow work to continue.

Sample collection locations and contaminated soil areas encountered will be surveyed for documentation.

The isolated contaminated soil areas (hot-spots) that have been encountered to-date appear to have similar characteristics and the current evidence supports that these contaminated materials were likely from various waste streams from the same facility, for the following reasons:

a. Each of the locations exhibited the same distinct odor.
b. Many of the locations (in or near the drums) contained a similar looking distinct yellow powder or black tarry substance.
c. The analytical results show that the sampled locations have a similar list of detected contaminants.

If contaminated soils with other characteristics are identified during excavation the EIC should be notified immediately. If slag is encountered during excavations, the use of a radiation detector will be explored (to test the slag for potential radioactivity).

To allow for continued excavation at the site, it was determined that excavated soil will be segregated into the following 3 waste streams:

- Waste Stream 1 – This waste stream will consist of drum carcasses and associated solid materials (e.g. black tarry material, yellow powder/solids, and contact soils). The solid materials will be generally segregated from the soil; however, soils in contact (within approximately 1 foot) shall also be included in Waste Stream 1. This material shall be placed into appropriate roll-off containers or dump trucks to allow for disposal at a properly permitted off-site facility. Disposal of this waste stream may require additional handling in the form of drum overpacking. Disposal requirements are the responsibility of the Contractor (Cerrone), see "Reuse and Disposal Options" section below.

- Waste Stream 2 – This waste stream will consist of soil that has either an organic vapor reading above background, a chemical odor, or visual indicators of contamination. This material shall be placed into appropriate roll-off containers or dump trucks to allow for eventual disposal at a properly permitted off-site facility. Disposal requirements are the responsibility of Cerrone, see "Reuse and Disposal Options" section below.

- Waste Stream 3 – This waste stream will consist of all excavated soils within the Riverway Construction Zone remediation area that are not near hot-spots and have no field indicators of contamination such as elevated organic vapor readings, visual, or olfactory. This waste stream will be either directly reused on-site (e.g. trench backfill or embankment) or stockpiled in piles of 1000 cubic yards or less within the project limits. Remediated hot-spot excavation sidewall and bottom soils may become Waste Stream 3 material after confirmation sampling demonstrates compliance with SCOs. Note that analytical for this waste stream is only required if the soil is from the edge of an excavation to remove contamination (i.e. a confirmation sample) or if the soil is being transported off-site (to determine what reuse or disposal is appropriate). If the analytical indicates that reuse is not an option, off-site disposal requirements will be the responsibility of Cerrone, see "Reuse and Disposal Options" section below.

2.3 Remediation of "Hot-Spots"

For remediation of hot-spots (i.e. Waste Stream 1 or Waste Stream 2), excavation will take place in areas of known contamination and continue until PID or FID organic vapor readings at the excavation edge/bottom are less than ten ppm and there are no visual or olfactory indicators that contamination remains. At this point excavation should stop and confirmation samples (number depending on excavation size and per NYSDEC on a case by case basis) should be collected. Confirmation sampling will include a number of soil samples from the walls and floor of the excavation to allow for closure. Analysis results from soil at the edge of the hot-spot excavation will be compared to the NYSDEC Part 375 Commercial Soil Cleanup Objectives (C-SCOs). If results are greater than C-SCOs then the excavation will need to be expanded to

remove the additional contamination. If results are less than C-SCOs then the excavation is considered complete, and the sidewall and/or bottom soil may be left in-place or reused on-site in the excavation it is adjacent to. If results of the confirmation sampling from the expanded excavation walls are close to meeting the C-SCOs, NYSDEC will be consulted regarding further closure options.

An electromagnetic survey will be conducted by New York State Parks in an effort to identify additional buried drums that may be present at the site. If additional drums are identified, remediation of these additional hot-spots will be handled in this same manner as identified in this IRM Work Plan.

Confirmation samples will be collected at a frequency following DER-10 Section 5.4(b). Given the history of this area, NYSDEC has requested the following analysis schedule for future investigatory and confirmation samples at this site:

- Target Compound List (TCL) Volatiles (EPA method 8260)
- TCL Semi-Volatiles (EPA method 8270)
- TCL Pesticides (EPA method 8081)
- Total RCRA Metals (EPA method 6010/7470A) plus tri- and hexavalent chromium (EPA method 7196A), cyanide (EPA method 335.2)

In addition, if excess Waste Stream 3 piles are to be potentially reused off-site, the analyses schedule for these piles will include the following (not including the potential disposal analysis that the Contractor may have to perform if the soils are found to be contaminated):

- Target Compound List (TCL) Volatiles (EPA method 8260)
- TCL Semi-Volatiles (EPA method 8270)
- TCL Pesticides (EPA method 8081)
- TCL Herbicides (EPA method 8151)
- TCL PCBs (EPA method 8082)
- TAL metals (EPA method 6010/7470A) plus tri- and hexavalent chromium (EPA method 7196A), cyanide (EPA method 335.2).

After excavation is deemed complete by NYSDEC and all involved parties, the excavation pit shall be back filled with soil that meets NYSDEC requirements. Any imported backfill material will meet residential SCOs. Excess on-site material (aka Waste Stream 3) may be reused as backfill if it meets commercial SCOs (see section 2.5).

Soil that contains low levels of hazardous waste may be eligible for a 'contained-in determination' that allows for the soil to be managed as a solid waste. Soil that is granted this condition is still a solid waste, and subject to regulation under 6 NYCRR Part 360 unless the material is also granted a beneficial use determination (BUD). A BUD could potentially allow site soils to be used as backfill for the remediated hot spot areas. If these processes are deemed necessary, they will be handled as a separate task outside of this IRM.

2.4 Segregation and Stockpiling

It has been established that monitoring for organic vapors (VOCs) will be performed with either a PID or an FID, in areas that exhibit field indicators of contamination as described above.

Soil stockpiles from **Waste Stream 3** can be placed anywhere on-the-site, on poly, that is convenient as long as appropriate erosion and sediment control (ESC) measures are in place. No confirmation soil sampling (beneath the poly) will be required after stockpiles from **Waste Stream 3** have been removed. All soil stockpiles related to **Waste Stream 3** shall be marked and identified by Cerrone as to where the soil came from to allow for future handling and coordination with the Owner (a.k.a. generator - NYSOPRHP).

If stockpiles of **Waste Stream 1** or **Waste Stream 2** are placed on poly on the ground, confirmation soil sampling (beneath the poly) will be required after stockpiles have been removed. Prior to the start of IRM excavations, proper storage methods and/or containers will be identified for materials associated with **Waste Stream 1** and **Waste Stream 2**. Note that **Waste Streams 1 and 2** are considered hazardous wastes and will need to comply with the United States Environmental Protection Agency (USEPA) Resource Conservation and Recovery Act (RCRA) storage and disposal requirements.

2.5 Reuse and Disposal Options

Soil from **Waste Stream 3** may be reused on-site for backfill within the same excavation without analytical sampling; however, if on-site reuse is not an option, excess soils will require sampling to determine appropriate offsite reuse or disposal. Sampling for determination of appropriate off-site reuse shall follow NYSDEC's recommendations in DER-10. If the analytical indicates that reuse is not an option, off-site disposal requirements will be the responsibility of Cerrone.

Note that sampling for **Waste Stream 3** should only be conducted for soils that are within the remediation area and will not be reused on-site. If sampling is performed on a **Waste Stream 3** pile, the results will need to meet the C-SCOs in order to be reused on-site.

- If analytical testing is performed on the piles from **Waste Stream 3** and listed hazardous waste compounds are identified but below C-SCOs, the soil may only be reused in the excavation it originated from. However, for soil containing listed hazardous waste, moving material from one excavation on the site to another is not permitted and is considered "active waste management".

- Waste Stream 3 material that contains a listed hazardous waste and is actively managed must be managed as a hazardous waste, regardless if it meets SCOs. This material is potentially eligible for a contained-in-determination.
- If the analytical shows contaminants above the lower of the groundwater and residential use Part 375 SCOs, offsite reuse shall be restricted (potentially requiring landfill disposal) and agreed upon by NYSDOT on a case-by-case basis.

Active waste management is defined as follows:

- Active waste management occurs when remediation waste is stored (even briefly) in a tank or container, removed from the area of contamination and treated ex-situ, either on-site or off-site, or removed from an area of contamination and placed onto another separate and distinct area of contamination.
- Active waste management does not occur as a result of remediation waste: being consolidated (i.e., excavated, temporarily stockpiled, re-deposited, graded, and/or leveled) within the same area of contamination, in an area of contamination being capped in-place, including grading prior to capping, or in an area of contamination being treated in-situ.

Listed hazardous wastes (HW) such as Lindane (Gamma BHC) and other BHC's are known to be present on this site. Soil from this site with a listed waste may potentially be considered a HW regardless of the concentration of the listed constituent. Soil at this site is only considered a HW if it contains listed waste(s) and is actively managed. For example:

- If soil analytical contains a listed waste above C-SCOs and has nuisance characteristics (odor, drum/barrel), it cannot be left on site and it is considered a HW.
- If soil analytical contains a listed waste above C-SCOs with no nuisance characteristics and it is removed from the site, it is considered a HW.
- If soil analytical contains listed waste above C-SCOs with no nuisance characteristics (drum/barrel, odor or PID/FID reading), and it is not actively managed, it is not considered a HW and can be reused in the same excavation on site. These areas must be surveyed and locations documented.

2.6 Transportation

The Contractor will be responsible for transportation and containment controls during the offsite transport of materials in accordance with federal, State, and local requirements. Materials will be covered and conveyed during transportation in equipment that is properly designed, equipped, operated, and maintained to prevent leakage, spillage or airborne emissions during transport.

Cerrone is responsible for disposal sampling and other arrangements required for landfill disposal under the disposal of contaminated (NYSDOT Item 205.050201) and hazardous (NYSDOT Item 205.0501nn) soil items. Analytical results from samples collected at the site by NYSDOT or the Owner shall be shared with Cerrone. Disposal arrangements should be prearranged to make sure that appropriate landfills are selected. Some landfills may not be able to accept these contaminated soils based on the constituents and concentrations identified. All materials removed from the site that contain listed waste (thus are hazardous waste) need to be disposed at a permitted treatment, storage, or disposal facility (TSDF). The TSDF should be selected prior to excavation to ensure that all shipping, labeling, and other facility specific requirements are adequately addressed. Also, based on the concentrations observed to date it is likely that some waste, mainly from Waste Stream 1 will require treatment (likely incineration) prior to final land disposal at a TSDF.

2.7 Material Tracking

The Contractor will be responsible for waste management tracking including generation and disposal information. The Contractor will provide documentation including transported manifests, final waste facility manifests, and Certificates of Disposal to record the location and disposition of materials transported offsite.

2.8 Site Safety and Monitoring

Site access must be restricted by physical barriers and/or signs to all pedestrians, residents, and non-related site personnel during all IRM excavations. The IRM Contractor conducting the site work will be required to develop a HASP that specifically addresses health and safety procedures for all aspects of the remediation work. The HASP must include a Contingency Plan that addresses potential site-specific emergencies. A member of the Contractor's field team will be designated to serve as the on-site Health and Safety Officer and will monitor Health and Safety activities throughout the IRM program.

This project will meet the requirements of the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Program (CAMP) from NYSDEC's DER-10. The NYSDOH Generic CAMP is attached to this document as Attachment B.

3.0 IRM REPORTING

Standard daily reporting procedures will include preparation of a daily work report, and when appropriate, problem identification and corrective measures report. Information that may be included on the daily report form includes:

- Approximate sampling locations (sketches) and sample designations.
- Processes and locations of activities under way.
- Equipment and personnel working in the area, including subcontractors.
- Approximate volume and description of materials removed (i.e., soil, cake, powder, drums, other).
- Number and type of truckloads of materials removed from the site.

The completed reports will be submitted to the NYSDEC as part of the IRM Closure Report. Photo documentation of the IRM activities will be prepared throughout the duration of the project as necessary to convey typical work activities and whenever changed conditions or unexpected circumstances are encountered.

3.1 IRM Closure Reporting

Details of completion of IRM activities will be documented in an IRM Closure Report submitted to the NYSDEC. The results of all sampling and analysis will be presented. The Report will present a detailed summary of site physical conditions, chemical conditions and potential risks to human health or the environment. The IRM Report will include (at a minimum):

- Text describing the IRM activities performed; a description of any deviations from the Work Plan and associated corrective measures taken; and other pertinent information necessary to document that site activities were carried out in accordance with this Work Plan.
- A site map showing the sampling locations with sample identification; drum locations; areas of contaminated soils; and significant site features.
- Tabular quantity summaries of volume of materials removed.
- Documentation on the disposition of material removed from the site.
- Tabular comparison of soil sampling and disposal characterization analytical results to disposal criteria, respectively.
- Tabular comparison of confirmation analytical results to SCGs.
- Copies of daily inspection reports and, if applicable, problem identification and corrective measure reports.
- Photo documentation of IRM activities.

APPENDIX A

Figure: NYSDEC's Site Sub-Areas Plan

Author: Ben McPherson Revised: 1/11/2016 \\gis-serv\workspace\private\R9\Robert Moses\Robert Moses Parkway- Exhibit A.mxd

APPENDIX B

New York State Department of Health (NYSDOH) Generic Community Air Monitoring Program (CAMP) from NYSDEC's Division of Environmental Remediation (DER)-10

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

Appendix 1C
DEC Permits Subject to Exemption

In accordance with section 1.10, exemptions from the following permit programs may be granted to the person responsible for conducting the remedial programs undertaken pursuant to section 1.2:

Air - Title 5 permits
Air - State permits
Air - Registrations
Ballast Discharge
Chemical Control
Coastal Erosion Hazard Areas
Construction of Hazardous Waste Management Facilities
Construction of Solid Waste Management Facilities
Dams
Excavation and Fill in Navigatable Waters (Article 15)
Flood Hazard Area Development
Freshwater Wetland
Hazardous Waste
Long Island Wells
Mined Land Reclamation
Navigation Law - Docks
Navigation Law - Floating Objects
Navigation Law - Marinas
Non-Industrial Waste Transport
Operation of Solid Waste Management Facilities
Operation of Hazardous Waste Management Facilities
State Pollution Discharge Elimination Systems (SPDES)
Stream Disturbance
Tidal Wetlands
Water Quality Certification
Water Supply
Wild, Scenic and Recreational Rivers

APPENDIX L

COMMUNITY AIR MONITORING PLAN (CAMP)

WATTS ARCHITECTURE & ENGINEERING
architecture | engineering | environmental

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Transmitted via email to: Peter.Nielsen@Stantec.com

February 11, 2016

Peter Nielsen, P.E., Sr. Associate – Environmental Services
Stantec
61 Commercial Street, Suite 100
Rochester, NY 14614

Re: PIN 5410.54.301
Robert Moses Parkway Interchange Construction
Niagara Falls, Niagara County, New York
HMARD Contract D031059
Interim Remedial Measure (IRM) Community Air Monitoring Plan (CAMP)
Watts Project Number 1302905

Dear Mr. Nielsen:

Watts Architecture & Engineering (Watts), in conjunction with Stantec, is pleased to provide this Community Air Monitoring Plan (CAMP) for the impending Interim Remedial Measures (IRM) to take place at the above-captioned project site under the terms and conditions of New York State Department of Transportation (NYSDOT) Hazardous Materials and Remediation Design Contract D031059. The services described below are in response to a request for consultant services requested on February 8, 2016 from Ms. Janine Shepherd of NYSDOT Region 5.

BACKGROUND

The New York State Department of Transportation (NYSDOT) has requested that Watts Architecture & Engineering (Watts) develop a CAMP for remedial activities to take place under the Interim Remedial Measure (IRM) Work Plan for the Riverway Construction Zone area that is within the overall larger New York State Department of Environmental Conservations (NYSDEC) Robert Moses Parkway South Site remedial project located in the City of Niagara Falls, Niagara County, New York. The NYSDEC Robert Moses Parkway South Site remediation project is a portion of the NYSDOT Robert Moses Parkway, South Segment, Riverway Project (NYSDOT PIN 5410.54.301, Contract No. D262671. See **Figure 1** for the project location map.

The NYSDEC Robert Moses Parkway South Site includes areas of the Niagara Falls State Park west of John Daly Boulevard and east of Fourth Street surrounding the former Robert Moses Parkway. There are two areas that make up the larger site, the Former Pond and the Riverway Construction Zone areas. While these areas are part of the same overall NYSDEC site,

investigation and/or IRM activities for each of the areas will proceed at different schedules, as approved by DEC.

The NYSDOT is administering the construction of the Robert Moses Parkway, South Segment, Riverway Project which involves the excavation of 1.4 miles of the Robert Moses Parkway-South on land owned by the NYS Office of Parks and Recreation (OPRHP) and the New York Power Authority (NYPA). The Robert Moses Parkway-South was constructed on land that consists mainly of fill from undocumented sources in a historically industrial area known for previous discoveries of contamination at a variety of sites. One of the areas of previously known contamination is the Former Pond area within the NYSDEC Robert Moses Parkway South Site.

Contamination has been discovered at the site during reconstruction at the NYSDOT Robert Moses Parkway Interchange Construction project outside the area of the Former Pond. Buried drums and contaminated soil has been discovered at multiple areas. As a result, NYSDEC has enlarged the Robert Moses Parkway South Site to include the Riverway Construction Zone area. The Former Pond and Riverway Construction Zone areas are a portion of the larger NYSDOT project.

A Remedial Investigation/Feasibility Study (RI/FS) Work Plan is being developed to determine the nature and extent of the contamination. However, during the investigation limited areas of contamination may be removed as an IRM to protect human health and environment, and facilitate continuation of the ongoing NYSDOT Robert Moses Parkway Interchange Construction project. Remedial activities at the Former Pond area are being handled separately from the NYSDOT project.

The IRM will consist of excavation, transport and disposal of contaminated soil at the Site. As part of the IRM this CAMP has been developed in accordance with the New York State Department of Health (NYSDOH) Generic CAMP (DER-10 Technical Guidance for Site Investigation and Remediation, Appendix 1A).

PURPOSE

The purpose of this CAMP is to provide a measure of protection for the downwind community, more specifically off-site receptors including residents, park visitors, and workers, from potential airborne contaminant releases as a result of IRM remedial work activities performed at the Site.

The purpose of the IRM is to clean up isolated contaminated soil areas (hot spots) which will protect human health and the environment, and facilitate the continuation of the ongoing roadway construction project (NYSDOT Robert Moses Parkway, South Segment, Riverway Project, PIN 5410.54.301) within the remediation area. This CAMP will be implemented during the excavation and removal of soils and solids during execution of the IRM.

PARTICULATE AIR MONITORING

Particulate monitoring will be conducted during ground intrusive activities at the Site in accordance with the Fugitive Dust and Particulate Monitoring from DER-10 Technical Guidance for Site Investigation and Remediation-Appendix 1B (attached).

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. Dust monitoring may be suspended during periods of precipitation. One monitoring station will be placed upwind of the intrusive activity and two monitoring stations will be placed downwind of the intrusive activity. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. All 15-minute readings must be recorded and be available for State personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

VOLATILE ORGANIC COMPOUND AIR MONITORING

Volatile organic compound (VOC) air monitoring will be conducted in accordance with the NYSDOH Generic CAMP (attached) in conjunction with the dust monitoring program for ground intrusive (continuous monitoring) and non-intrusive activities (periodic monitoring).

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the exclusion zone at temporary monitoring stations on a continuous basis or as otherwise specified. One monitoring station will be placed upwind of the intrusive activity and two monitoring stations

will be placed downwind of the intrusive activity. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The downwind VOC monitoring device will also be checked periodically throughout the day to assess emissions and the need for corrective action. The monitoring work should be performed using a photoionization detector (PID). The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below:

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less -but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

DOCUMENTATION AND CALIBRATION

The volatile organic compound air monitoring device shall be calibrated prior to daily field activities according to manufacturer's instructions and standard industrial hygiene practices. In addition, monitoring instruments will be checked for "drift" upon completion of daily field activities. Calibration measurements will be recorded on a NYSDOT daily work report. Field measurements will be recorded and available for State personnel to review.

The particulate monitoring device is factory calibrated on an annual basis.

Upon completion of field activities, available monitored data recorded will be downloaded, evaluated and summarized in the Remedial Investigation Report.

WEATHER CONDITIONS

Weather conditions, including the prevailing wind direction, will be observed and recorded for each day of site activities. As work and weather conditions change throughout the day, the locations where the particulate and VOC monitoring devices are set up may be adjusted accordingly.

To evaluate wind direction, a windsock, wind vane, or other equivalent equipment will be used. Wind direction will be established at the start of each work day, and may be reestablished during the day should a significant shift in wind direction be noted. Wind direction will be utilized to position the particulate monitoring and VOC monitoring equipment in appropriate upwind and downwind locations. Wind direction and location of the monitoring stations will be noted on NYSDOT daily work reports.

We trust this submittal is sufficient for your needs, but should you have any questions or comments, please contact me at (716) 206-5129.

Sincerely,

Watts Architecture & Engineering

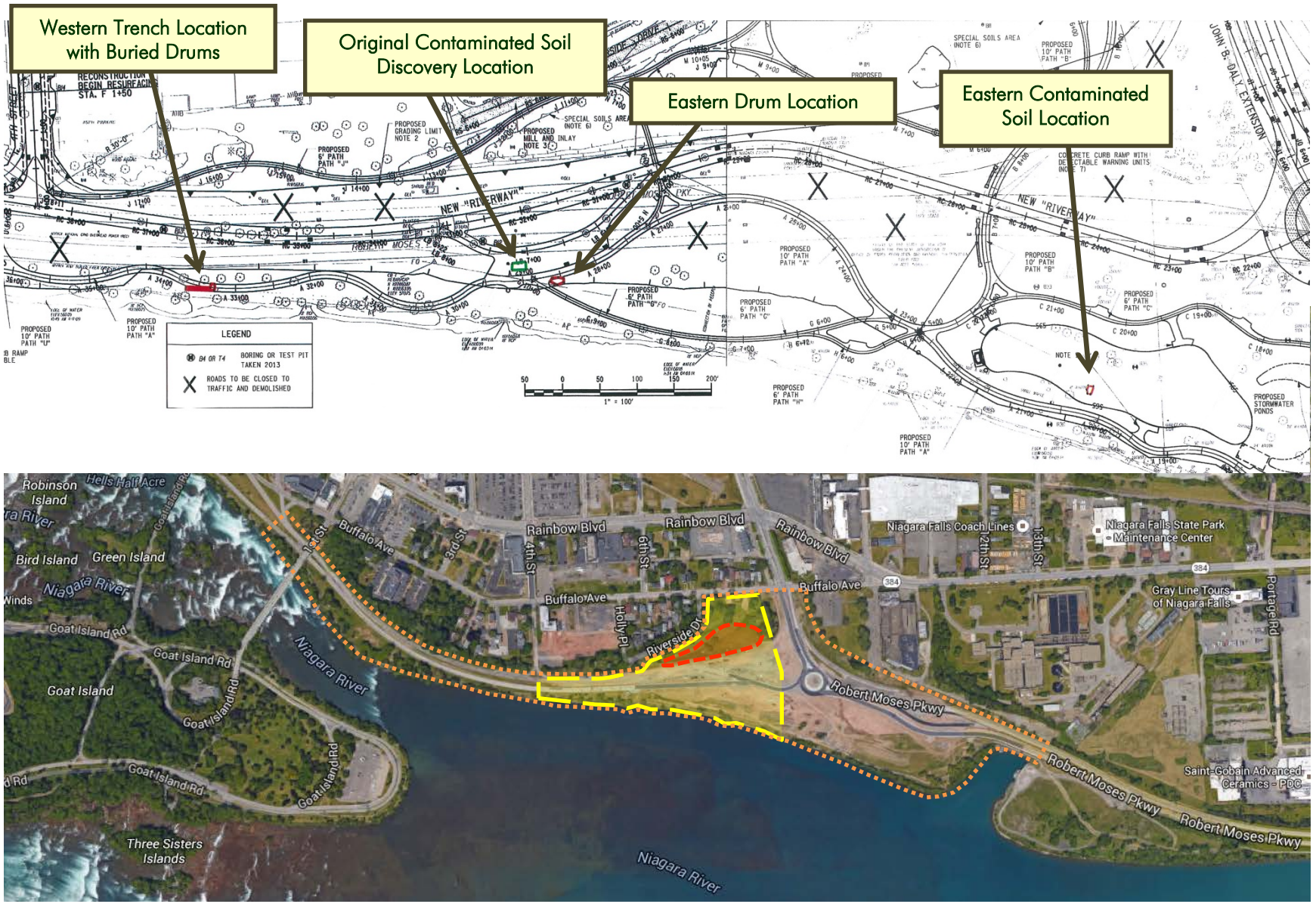
Justin K. Kellogg, M.S., Q.E.P.

Project Manager (Environmental Engineer III)

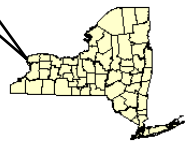
Attachments

- Figure 1 – Project Location Map
- Appendix 1A: NYSDOH Generic CAMP from DER-10 Technical Guidance for Site Investigations and Remediation
- Appendix 1B: Fugitive Dust and Particulate Monitoring from DER-10 Technical Guidance for Site Investigations and Remediation

cc:
Frank Garbe, NYSDOT Region 5
Janine Shepherd, NYSDOT Region 5
Tony Palumbo, NYSDOT Albany
Bob Mahoney, Stantec



Project Location



APPROXIMATE PROJECT AREAS

= NYSDOT Robert Moses Parkway, South Segment, Riverway Project, PIN 5410.54.301

= NYSDEC Robert Moses Parkway South Site

= NYSDEC Former Pond Area

= NYSDEC Riverway Construction Area

Source: Google Maps 2016.

Watts AE
95 Perry Street
Buffalo, New York

FIGURE 1 – PROJECT LOCATION MAP

Robert Moses Parkway, South Segment,
Riverway Project, PIN 5410.54.301, D031059
Niagara Falls, Niagara County, New York

Not to Scale | February 2016

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

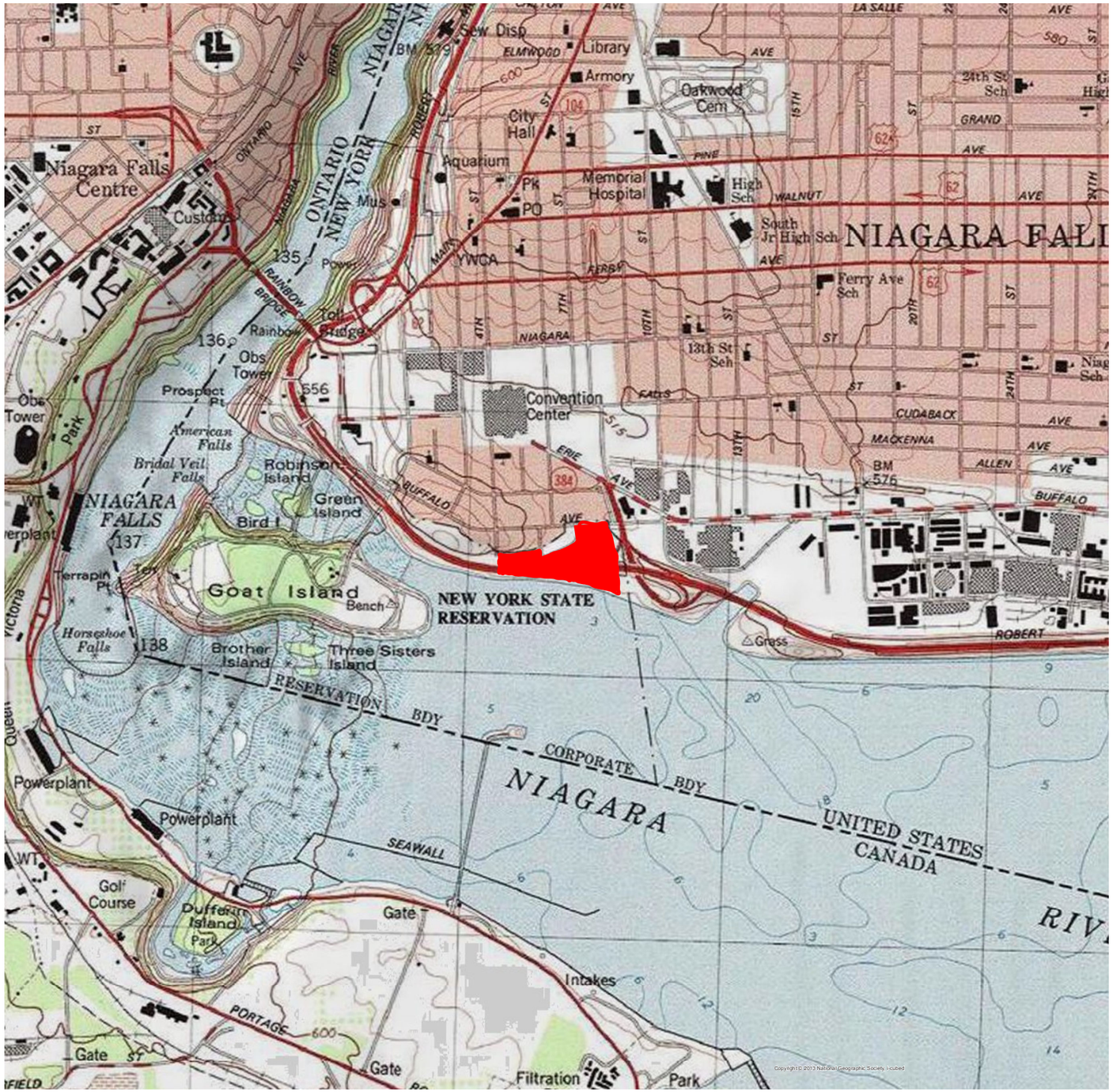
7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

FIGURES



LEGEND

SITE LOCATION

NOTES

1) BASE MAPPING IS PROVIDED BY THE UNITED STATES GEOLOGICAL SURVEY.

0 750 1,500 3,000 FEET

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N

NEW YORK STATE OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION
ROBERT MOSES PARKWAY - SOUTH SITE
NIAGARA FALLS, NEW YORK

MARK	DATE	DESCRIPTION
	4/19/18	Title Update

REVISIONS

PROJECT NO:	190720009
DATE:	FEBRUARY 23, 2016
DRAWN BY:	A. DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	D. RIKER

SITE LOCATION MAP

FIGURE 1

LEGEND

- SITE BOUNDARY
- OUTLINE OF FORMER POND

NOTES

1) COORDINATE SYSTEM: NAD 1983 STATEPLANE NY WEST FIPS 3103
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983
UNITS: FOOT US

2) THE SITE BOUNDARY INCLUDES ALL LAND UP TO THE WATER'S EDGE, DESPITE THE BOUNDARY SET BY THE TAX PARCEL.

0 100 200 400
FEET

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NEW YORK STATE OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION
ROBERT MOSES PARKWAY - SOUTH SITE
NIAGARA FALLS, NEW YORK

MARK	DATE	DESCRIPTION
	4/19/18	Updates
	7/5/17	Updates

REVISIONS

PROJECT NO:	190720009
DATE:	FEBRUARY 23, 2016
DRAWN BY:	A. DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	D. RIKER

SITE BOUNDARY MAP

FIGURE 2

Path: F:\Project\190F - New York State Office of Parks\2014-16 Term Agreement for Alleg, Gen. & Niag Regions\190720004 - Contaminated Soils Plan for NFSP-Riverway\Planning-Study\CADD_GIS\Projects\IRM\FIGURE_2.mxd

LEGEND

- SITE BOUNDARY
- GROUNDWATER MONITORING WELL LOCATIONS
- INFERED DIRECTION OF GROUNDWATER FLOW
- NIAGARA RIVER GAUGE LOCATION

NOTES

1) COORDINATE SYSTEM: NAD 1983 STATEPLANE NY WEST FIPS 3103
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983
UNITS: FOOT US

2) THE SITE BOUNDARY INCLUDES ALL LAND UP TO THE WATER'S EDGE, DESPITE THE BOUNDARY SET BY THE TAX PARCEL.

3) GROUNDWATER ELEVATION IS SHOWN IN FEET ABOVE MEAN SEA LEVEL. WT-MW-1 AND WT-MW-2 ELEVATIONS WERE EXCLUDED WHEN THIS CONTOUR MAP WAS GENERATED AND ARE DENOTED WITH A TRANSPARENT SYMBOL. WATER LEVELS BASED ON SAMPLING CONDUCTED IN AUGUST 2016.

0 100 200 400
FEET

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NEW YORK STATE OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION
ROBERT MOSES PARKWAY - SOUTH SITE
NIAGARA FALLS, NEW YORK

MARK	DATE	DESCRIPTION
	3/20/18	Updates
	7/5/17	Updates

REVISIONS

PROJECT NO:	190720009
DATE:	DECEMBER 2, 2016
DRAWN BY:	A. DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	D. RIKER

GROUNDWATER CONTOURS - AUGUST 2016

FIGURE 3A

LEGEND

- SITE BOUNDARY
- GROUNDWATER MONITORING WELL LOCATION
- NIAGARA RIVER GAUGE LOCATION
- INFERED DIRECTION OF GROUNDWATER FLOW
- 555.0 GROUNDWATER ELEVATION (FEET)

NOTES

1) COORDINATE SYSTEM: NAD 1983 STATEPLANE NY WEST FIPS 3103
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983
UNITS: FOOT US

2) THE SITE BOUNDARY INCLUDES ALL LAND UP TO THE WATER'S EDGE, DESPITE THE BOUNDARY SET BY THE TAX PARCEL.

3) GROUNDWATER ELEVATION IS SHOWN IN FEET ABOVE MEAN SEA LEVEL. NO ELEVATION RECORDED FROM MW-1 WHICH WAS BROKEN AT THE TIME AND DENOTED WITH A TRANSPARENT SYMBOL. AMERICAN FALLS, NY GAUGE STATION ID 9063009 USED FOR NIAGARA RIVER WATER LEVEL. WATER LEVELS BASED ON SAMPLING CONDUCTED IN APRIL 2017.

0 100 200 400 FEET

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NEW YORK STATE OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION
ROBERT MOSES PARKWAY - SOUTH SITE
REMEDIAL INVESTIGATION
NIAGARA FALLS, NEW YORK

MARK	DATE	DESCRIPTION
	8/23/18	Edits
	2/7/18	Edits
	7/5/17	Updates

REVISIONS

PROJECT NO:	190720009
DATE:	JUNE 12, 2017
DRAWN BY:	A. SVIRGUN
DESIGNED BY:	A. SVIRGUN
CHECKED BY:	D. RIKER

GROUNDWATER CONTOURS - APRIL 2017

FIGURE 3B

LEGEND

- SITE BOUNDARY
- GROUNDWATER MONITORING WELL LOCATION
- NIAGARA RIVER GAUGE LOCATION
- INFERED DIRECTION OF GROUNDWATER FLOW
- 555.0 GROUNDWATER ELEVATION (FEET)

NOTES

1) COORDINATE SYSTEM: NAD 1983 STATEPLANE NY WEST FIPS 3103
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983
UNITS: FOOT US

2) THE SITE BOUNDARY INCLUDES ALL LAND UP TO THE WATER'S EDGE, DESPITE THE BOUNDARY SET BY THE TAX PARCEL.

3) GROUNDWATER ELEVATION SHOWN IN FEET ABOVE MEAN SEA LEVEL. NIAGARA RIVER USED AS A CONSTANT HEAD BOUNDARY TO BETTER REFLECT HYDROGEOLOGICAL SITE FEATURES. KRIGING USED FOR INTERPOLATION. WATER LEVELS BASED ON SAMPLING CONDUCTED IN DECEMBER 2017.

0 100 200 400
FEET

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ROBERT MOSES PARKWAY - SOUTH SITE
INTERIM REMEDIAL MEASURE CLOSURE
NIAGARA FALLS, NEW YORK

MARK	DATE	DESCRIPTION
	1/4/2018	Update Contours

REVISIONS

PROJECT NO:	190720009
DATE:	DECEMBER 2, 2016
DRAWN BY:	A. DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	D. RIKER

GROUNDWATER CONTOURS - DECEMBER 2017

FIGURE 3C

Path: F:\Project\190F - New York State Office of Parks\2014-16 Term Agreement for Alleg, Gen, & Niag Regions\190720004 - Contaminated Soils Plan for NFSP-Riverway\Planning-Study\CADD_GIS\Projects\RIFS\FIGURE_7C.mxd

LEGEND

- SITE BOUNDARY
- SAMPLE - ABOVE COMMERCIAL USE SCOS
- SAMPLE - BELOW COMMERCIAL USE SCOS
- ARSENIC DELINEATION EXCAVATION
- BOUNDARY OF NEW POND
- SOIL COVER MATERIAL

NOTES

1) COORDINATE SYSTEM: NAD 1983 STATEPLANE NY WEST FIPS 3103
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983
UNITS: FOOT US

2) THE SITE BOUNDARY INCLUDES ALL LAND UP TO THE WATER'S EDGE, DESPITE THE BOUNDARY SET BY THE TAX PARCEL.

3) THE AREA BETWEEN THE COVER OF HOT SPOT 2 AND THE BANK OF THE NIAGARA RIVER IS COMPRISED OF BOLDERS AND NO SOIL IS PRESENT THAT WOULD REQUIRE A COVER.

4) THE NORTHERN BOUNDARY OF THE SOIL COVER AT HOT SPOT 2 EXTENDED TO THE SOUTHERN EDGE OF CONSTRUCTION FOR THE ROADWAY IMPROVEMENT PROJECT IN THAT AREA.

0 75 150 300 FEET

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NEW YORK STATE OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION
ROBERT MOSES PARKWAY - SOUTH SITE
REMEDIAL INVESTIGATION/INTERIM REMEDIAL MEASURES
NIAGARA FALLS, NEW YORK

MARK	DATE	DESCRIPTION
	10/16/18	DEC REQUESTED REV

REVISIONS

PROJECT NO:	190720009
DATE:	FEBRUARY 7, 2018
DRAWN BY:	A. SVIRGUN
DESIGNED BY:	A. SVIRGUN
CHECKED BY:	D. RIKER

OVERALL EXTENT OF CONTAMINATION - SURFACE SOIL

Site Management Plan (SMP)

FIGURE 4

LEGEND

- SITE BOUNDARY
- SAMPLE - ABOVE COMMERCIAL USE SCOS
- LIGHT POLE SAMPLE LOCATION - ABOVE COMMERCIAL USE SCOS
- SAMPLE - BELOW COMMERCIAL USE SCOS
- TEST PIT LOCATION - ABOVE COMMERCIAL USE SCOS
- TEST PIT LOCATION - BELOW COMMERCIAL USE SCOS
- NYSDOT-UTILITY RELATED TEST PIT LOCATION-BELOW COMMERCIAL USE SCOS
- BOUNDARY OF NEW POND
- SOIL COVER MATERIAL

EXCAVATED AREAS

- DSI TP4 EXCAVATION
- HOT SPOTS 1&3 EXCAVATION
- HOT SPOTS 4, 4A, 5, AND 6 FINAL EXCAVATION[3)]
- UTILITY TRENCHES
- HOT SPOT 2 EXCAVATION

NOTES

1) COORDINATE SYSTEM: NAD 1983 STATEPLANE NY WEST FIPS 3103
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983
UNITS: FOOT US

2) THE SITE BOUNDARY INCLUDES ALL LAND UP TO THE WATER'S EDGE, DESPITE THE BOUNDARY SET BY THE TAX PARCEL.

3) HOT SPOTS 4, 4A, 5, AND 6 WERE REMOVED FROM THE ON-SITE PORTION OF THE NEW POND FOOTPRINT.

4) UNEXCAVATED SAMPLE LOCATIONS THAT ARE ABOVE COMMERCIAL USE SCOS ARE VISIBLE AND IN RED. WHILE SOME TEST PIT LOCATIONS AND ADDITIONAL SAMPLE LOCATIONS THAT WERE BELOW COMMERCIAL USE SCOS ARE SHOWN, MORE DETAILED SAMPLING CAN BE FOUND ON FIGURES 12-15.

0 75 150 300
FEET

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PROJECT NO:	190720009
DATE:	FEBRUARY 7, 2018
DRAWN BY:	A. SVIRGUN
DESIGNED BY:	A. SVIRGUN
CHECKED BY:	D. RIKER

OVERALL EXTENT OF CONTAMINATION - SUBSURFACE SOIL

Figure 5

Path: F:\Project\190F - New York State Office of Parks\2014-16 Term Agreement for Alleg, Gen, & Niag Regions\190720004 - Contaminated Soils Plan for NFSP-Riverway\Planning-Study\CADD_GIS\Projects\IRM\FIGURE_4_REV.mxd

LEGEND

SITE BOUNDARY

GROUNDWATER MONITORING WELL LOCATION

NIAGARA RIVER GAUGE LOCATION

LABEL LEGEND

MW-1

0.027 ug/l

NYTOGS

NOTES

1. COORDINATE SYSTEM: NAD 1983 STATEPLANE NY WEST FIPS 3103 PROJECTION: TRANSVERSE MERCATOR DATUM: NORTH AMERICAN 1983 UNITS: FOOT US

2. THE SITE BOUNDARY INCLUDES ALL LAND UP TO THE WATER'S EDGE DESPITE THE BOUNDARY SET BY THE TAX PARCEL.

3. EACH WELL SHOWS THOSE EXCEEDANCES FOR THE MOST RECENT SAMPLING EVENT IN THAT LOCATION. THESE SAMPLING EVENTS INCLUDE:
   - EVENT 1 AUGUST 2015
   - EVENT 2 JANUARY 2016
   - EVENT 3 APRIL 2016
   - EVENT 4 DECEMBER 2016

FOR A COMPLETE DATA RESULTS LIST INCLUDING NATURALLY OCCURRING METALS SUCH AS IRON, MAGNESIUM, MANGANESE, SODIUM, ALUMINUM, ETC. SEE TABLE

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ROBERT MOSES PARKWAY - SOUTH SITE INTERIM REMEDIAL MEASURES

NIAGARA FALLS, NEW YORK

Figure 6

TABLES

Table 2 – Post-IRM Surface Soil (0-2") Sampling Results

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted Use SCG (ppm)	Frequency Exceeding Unrestricted Use SCG[b]	Restricted Use SCG (ppm)	Frequency Exceeding Restricted Use SCG[c]
Metals Part 375					
Arsenic	2.05 – 15.8	13	7/41	16	0/41
Copper	9.39 – 1970	50	1/11	270	1/11
Lead	20.8 – 120	63	3/11	1000	0/11
Mercury	0.0755 – 0.837	0.18	6/11	2.8	0/11
Nickel	9.41 – 96.4	30	1/11	310	0/11
Selenium	1 – 5.34	3.9	3/11	1500	0/11
Zinc	49.9 – 366	109	7/11	10000	0/11
Pesticides/PCBs PART 375					
Aldrin	0.0106 – 0.0283	0.005	2/11	0.68	0/11
Alpha-BHC (Alpha Hexachlorocyclohexane)	0.002 – 0.275	0.02	6/11	3.4	0/11
Beta-BHC (Beta Hexachlorocyclohexane)	0.004 – 1.67	0.036	5/11	3	0/11
Delta-BHC (Delta Hexachlorocyclohexane)	0.00209 – 0.0477	0.04	1/11	500	0/11
P,P'-DDD	0.0025 – 0.0111	0.0033	1/11	92	0/11
P,P'-DDE	0.0012 – 0.0242	0.0033	3/11	62	0/11
P,P'-DDT	0.00272 – 0.0156	0.0033	4/11	47	0/11
SVOC PART 375					
Benzo(A)Anthracene	0.229 – 1.38	1	1/11	500	0/11
Benzo(A)Pyrene	0.0918 – 1.4	1	1/11	1	1/11
Benzo(B)Fluoranthene	0.11 – 1.32	1	1/11	500	0/11
Benzo(K)Fluoranthene	0.177 – 1.1	0.8	1/11	500	0/11
Chrysene	0.24 – 1.45	1	1/11	5.6	0/11
Dibenz(A,H)Anthracene	0.11 – 0.361	0.33	1/11	5.6	0/11
Indeno(1,2,3C,D)Pyrene	0.18 – 0.646	0.5	2/11	500	0/11
1,2,4,5 Tetrachlorobenzene	0.466 – 0.466	N/A	-	N/A	-
VOC PART 375					
Hexachlorobenzene	0.252 – 1.23	0.33	1/11	6	0/11

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial
_____ - indicates unrestricted and restricted use SCG exceedances for remaining contamination near Hot Spot 2 (covered with clean cover materials (material meeting Commercial SCOs) as part of IRM implementation.

Table 3 – Post-IRM Subsurface Soil Sampling Results

Detected Constituents	Concentration Range Detected (ppm)a	Unrestricted Use SCG (ppm)	Frequency Exceeding Unrestricted Use SCGb	Restricted Use SCG (ppm)	Frequency Exceeding Restricted Use SCGc	Location of SCG Excedance (Remaining Contamination Only)
Metals PART 375						
Arsenic	0.984 – 32	13	3/53	16	2/53	Hot Spot 1/3
Cadmium	0.165 – 4.91	2.5	5/53	9.3	0/53	
Copper	6.58 – 117	50	6/36	270	0/36	
Lead	4.55 – 3330	63	13/53	1000	2/53	
Mercury	0.00805 – 3.69	0.18	32/61	2.8	2/61	Hot Spot 1/3
Nickel	5.91 – 45.5	30	5/36	310	0/36	
Zinc	41.4 – 1520	109	23/36	10000	0/36	
Pesticides/PCBs PART 375						
Aldrin	0.00176 – 1.07	0.005	24/81	0.68	3/81	Hot Spot 1/3
Alpha-BHC (Alpha Hexachlorocyclohexane)	0.00178 – 26.4	0.02	43/81	3.4	4/81	Hot Spot 4
Beta-BHC (Beta Hexachlorocyclohexane)	0.0022 – 6.75	0.036	36/81	3	4/81	Hot Spot 4
cis-Chlordane	0.00235 – 0.105	0.094	1/81	24	0/81	
Delta-BHC (Delta Hexachlorocyclohexane)	0.00204 – 0.202	0.04	9/81	500	0/81	
Dieldrin	0.00223 – 0.066	0.005	9/81	1.4	0/81	
Endrin	0.00168 – 0.187	0.014	18/81	89	0/81	
Heptachlor	0.00187–0.0761	0.042	5/81	15	0/81	
P,P'-DDD	0.00168 – 0.12	0.0033	23/81	92	0/81	
P,P'-DDE	0.0018 – 0.0519	0.0033	5/81	62	0/81	
P,P'-DDT	0.00188 – 0.123	0.0033	16/81	47	0/81	
SVOC PART 375						
1,2,4,5 Tetrachlorobenzene	0.466 – 0.466	N/A	-	N/A	-	
Benzo(A)Anthracene	0.15 – 4.2	1	6/75	5.6	0/75	
Benzo(A)Pyrene	0.12 – 2.5	1	5/75	1	5/75	
Benzo(B)Fluoranthene	0.11 – 2.9	1	5/75	5.6	0/75	
Benzo(K)Fluoranthene	0.254 – 1.58	0.8	5/75	56	0/75	
Chrysene	0.11 – 3.3	1	5/75	56	0/75	
Dibenz(A,H)Anthracene	0.12 – 0.422	0.33	1/75	0.56	0/75	
Indeno(1,2,3C,D)Pyrene	0.14 – 2.5	0.5	4/75	5.6	0/75	
VOC PART 375						
Acetone	0.01 – 0.359	0.05	9/50	500	0/50	
Hexachlorobenzene	0.13 – 18.5	0.33	23/75	6	4/75	Hot Spot 1/3

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial

Table 4 – Post-IRM Groundwater Sampling Results

Detected Constituents	Concentration Range Detected (ppb)	SCG (ppb)	Frequency Exceeding SCG	Location of SCG Exceedance (Remaining Contamination Only)[c]
Metals NYS CLASS GA				
Chromium, Total	2.81 – 71.8	50	1/5	
Iron	116 – 40900	300	4/5	MW-5, 6
Lead	0.450 – 303.7	25	4/5	MW-6
Magnesium	25900 – 272000	35000	2/5	MW-5,6
Manganese	6.40 – 2340	300	4/5	MW-6
Mercury	ND – 1.41	0.7	1/5	
Selenium	ND – 20.0	10	2/5	MW-6
Sodium	5300 – 29900	20000	2/5	MW-5, 6
Pesticides/PCBs NYS CLASS GA				
Alpha-BHC (Alpha Hexachlorocyclohexane)	ND – 1.83	0.01	6/17	MW-2, 4, WATTS-MW-2
Beta-BHC (Beta Hexachlorocyclohexane)	ND – 1.13	0.04	10/17	MW-2, WATTS-MW-2
Delta-BHC (Delta Hexachlorocyclohexane)	ND – 0.0180	0.04	0/17	
Dieldrin	ND – 0.04	0.004	2/17	
Gamma-BHC (Lindane)	ND – 0.0220	0.05	0/17	
SVOC NYS CLASS GA				
Benzo(A)Anthracene	ND – 0.620	0.002	4/5	MW-6
Benzo(A)Pyrene	ND – 0.720	0	1/5	
Benzo(B)Fluoranthene	ND – 1.00	0.002	4/5	MW-6
Benzo(K)Fluoranthene	ND – 0.360	0.002	1/5	
Chrysene	ND – 0.600	0.002	3/5	MW-6
Indeno(1,2,3C,D)Pyrene	ND – 0.600	0.002	2/5	
VOC NYS CLASS GA				
None Detected Above Standards				

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b - SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).
c Exceeding SCG.