STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

OLD MYERS SOLAR PROJECT

TOWN OF WAPPINGER
DUTCHESS COUNTY, NEW YORK

IN COMPLIANCE WITH THE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION GENERAL PERMIT GP-0-20-001
FOR
STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

Prepared for:

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Table of Contents:

List of Tables:

Appendices:

1.0 Introduction

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared by TRC Engineers, Inc. (TRC) for NY Solar 1001 LLC regarding construction activities associated with the Old Myers Solar Project (the Project).

The purpose of this SWPPP is to establish requirements and instructions for the management of construction-related stormwater discharges from the Project Site. Erosion and sediment controls have been designed and shall be installed and maintained to minimize the discharge of pollutants and prevent a violation of the water quality standards.

2.0 Regulatory Requirements

This SWPPP has been prepared in accordance with the "New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity" General Permit GP-0-20-001, effective January 29, 2020 through January 28, 2025. The NYSDEC requires coverage under GP-0-20-001 for any "construction activities involving soil disturbances of one or more acres; including disturbances of less than one acre that are part of a larger common plan of development or sale that will ultimately disturb one or more acres of land; excluding routine maintenance activity that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility."

The Project is classified as a renewable energy project with an increase in impervious cover, per Table 2 of GP-0-20-001 Appendix B. The Project involves construction activities that require the preparation of a SWPPP that includes post-construction stormwater management practices designed in conformance with Part III.B.2 of the permit. A copy of the General Permit GP-0-20-001 is provided in Appendix B of this SWPPP.

The Project shall comply with all applicable local, state, and federal regulations. The Project requires a review by the town under New York's State Environmental Quality Review (SEQR) Act permitting process.

3.0 Permit Coverage Information

This SWPPP serves as the minimum requirements necessary to address soil exposure and stormwater management during construction activities. This SWPPP is a living document that may be amended for unforeseen circumstances. If unanticipated site conditions warrant changes or additions to existing practices, the Owner/Operator and the Contractor(s), in consultation with the Qualified Inspector or Project Engineer, will be required to implement those measures in accordance with the New York State Standards and Specifications for Erosion and Sediment Control (SSESC) and the New York State Stormwater Management Design Manual (SMDM) and amendments to the SWPPP shall be made as appropriate. The SWPPP and associated documentation must be kept current to ensure the erosion and sediment control practices are accurately documented.

In accordance with GP-0-20-001, documented site inspections will be performed to ensure the required erosion and sediment control measures have been installed properly and are in good condition. Inspections will occur for the duration of construction, until earth-disturbing construction activities have ceased, and final stabilization has been achieved.

4.0 SWPPP Amendments

This SWPPP has been prepared in accordance with the General Permit, SSESC and the SMDM. The SWPPP and associated documents must be kept current at all times. Amendments to the SWPPP and associated documents, including construction drawings, should be made:

- Whenever the current provisions are ineffective in minimizing impacts to the stormwater discharge from the Project Site;
- Whenever there is a change in design or construction activities and sequencing that has or could have an impact to the stormwater discharge; and
- To address deficiencies or issues identified during monitoring and inspection.

Refer to GP-0-20-001 for additional information on SWPPP amendment procedures and requirements. Amendments to the SWPPP shall be documented in Appendix M.

5.0 Project Site Information

The Project Site is located west of Myers Corners Road in the Town of Wappinger, Dutchess County, New York. The Project Site is located within the NYSDEC Region 3 jurisdiction and the 2019 Wappinger, NY, United States Geological Survey (USGS) 7.5 Minute Topographic Quadrangle. The Project Site location is depicted in Figure 1 of Appendix E.

The Project proposes the installation of a solar array within an approximate 13.8-acre disturbance area. The general scope of work for the Project which may result in soil disturbance including, but is not limited to, clearing and grubbing, grading, and installation of equipment pads, electric utility infrastructure, installation of a limited-use pervious access road, perimeter fencing installation, landscaping, and temporary erosion and sediment control installation and maintenance.

The existing groundcover of the Project Site is composed primarily of grass lawn, hay pastures, and forested hedgerows. Delineated wetlands and natural resources were identified on the property outside of the limits of disturbance. Land use of abutting parcels consists of developed land to the west, agricultural land to the east, and a transmission line and forested land to the north. The site topography is generally less than 10% in slope at the central and southern portions of the site, with a ridge located at the north of the site where slopes exceed 3H:1V. The Existing Conditions & Site Preparation Plan included with the Construction Drawings in Appendix F includes a slope analysis that denotes areas at slope ranges from 0 to 10%, 10% to 15%, and >15%. The Site generally slopes to the north and has elevation ranges from approximately 178 to 203 feet above mean sea level. Refer to the Construction Drawings in Appendix F and for additional Project Site land cover, environmental resource, and topographic information.

Runoff from the Project Site drains to Wappinger Creek, a tributary of the Hudson River, through a series of unnamed streams. The Project Site does not discharge to a closed storm sewer associated with the Wappinger MS4. The Project Site does not directly discharge to a 303(d) waterbody segment identified in Appendix E of GP-0-20-001, and is not located within a restricted watershed, an AA or AA-s watershed, or a Sole Source Aquifer (SSA).

5.1 Soils Classification

Review of the United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey indicated the predominant soil series mapped within the Project Site are Dutchess-Cardigan Complex – Undulating, Rocky (DwB),, Hydrologic Soil Group (HSG) rating C; and Dutchess-Cardinan Complex – Rolling, Rocky (DwC), HSG rating C. The Soil Conservation Service defines the HSGs as follows:

- Type A Soils: Soils having a high infiltration rate (low runoff potential).
- Type B Soils: Soils having a moderate infiltration rate.
- Type C Soils: Soils having a slow infiltration rate.
- Type D Soils: Soils having a very slow infiltration rate (high runoff potential).

Refer to Appendix E for the USDA NRCS Soil Resource Report for the Project Site.

5.2 Rainfall Information

Project specific rainfall information for the 90% rainfall event was obtained from Figure 4.1 of the SMDM. The 90% rainfall event is used to determine the volume (WQv) of runoff generated from the 90th percentile (90%) rainfall event. Rainfall data for the 1-, 10-, and 100-year rainfall events was obtained from the Northeast Regional Climate Center's Extreme Precipitation Tables. These values were used to evaluate the pre- and post-development stormwater hydraulic and hydrologic characteristics. Table 1, below, details the 24-hour rainfall amounts for the Project Site.

Table 1 – Rainfall Event Quantities

Rainfall Event	24-Hour Rainfall Amount (inches)
90%	1.40
1-Year	2.61
10-Year	4.67
100-Year	8.20

The precipitation information obtained from the Northeast Regional Climate Center is included in Appendix E.

6.0 Contract Documents

The Contractor is responsible for the implementation of this SWPPP throughout construction, as well as the installation, construction, repair, replacement, inspection and maintenance of erosion and sediment control practices. Each Contractor shall sign the Contractor Certification Form provided in Appendix C prior to the commencement of construction activities.

This SWPPP and associated documentation, including but not limited to, a copy of the GP-0-20-001, NOI, NYSDEC NOI Acknowledgement Letter, Contractor Certification Form, Construction Drawings, inspection reports, and permit eligibility forms, must be maintained in a secure location for the duration of the Project.

7.0 Personnel Contact List

The Construction Personnel Contact List for the Project is provided in Appendix C. The listed personnel are responsible for ensuring compliance with the SWPPP and associated permit conditions. Personnel responsibilities include, but are not limited to, the following:

- Implement the SWPPP;
- Oversee maintenance practices identified in the SWPPP;
- Conduct or provide for inspection and monitoring activities;
- Identify potential erosion, sedimentation, and pollutant sources during construction and ensure issues are addressed appropriately and in a timely manner;
- Identify necessary amendments to the SWPPP and ensure proper implementation; and,
- Document activities associated with the implementation of this SWPPP and supporting documents.

Refer to GP-0-20-001 for information regarding specific personnel responsibilities.

8.0 SWPPP Construction Requirements and Sequencing

This section provides the Owner/Operator and the Contractor with a suggested order of construction that will minimize erosion and the transport of sediments. The individual objectives of the construction techniques described herein shall be considered an integral component of the Project design. The construction sequence is not intended to prescribe definitive construction methods and should not be interpreted as a construction specification document.

The Contractor shall follow the general principles outlined below throughout the construction phase:

- Protect and maintain existing vegetation wherever possible. Filter Strips used for stormwater management treatment shall be marked in the field and protected throughout construction;
- Minimize the area of disturbance;
- To the extent possible, route unpolluted flows from upgradient areas around disturbed areas;
- Install approved erosion and sediment control devices as early as possible;
- Minimize the time disturbed areas are left un-stabilized; and,
- Maintain erosion and sediment control devices in proper condition.

The Contractor should use the suggested construction sequence and techniques as a general guide and modify the suggested methods and procedures as required to best suit seasonal and

site-specific physical constraints for the purpose of minimizing the environmental impact due to construction.

The Project is anticipated to involve three stages of work: site preparation, construction, and site restoration. Prior to the commencement of construction activities, temporary erosion and sediment control measures shall be installed per the Construction Drawings provided in Appendix F. The Project stages are detailed below.

Stage 1: Project Site Preparation

- Establish access to the Project Site including the stabilized construction entrances and access roads;
- Stake/flag construction limits, staging/storage areas, concrete washout locations, environmentally sensitive areas, vegetated filter strips, and other associated work areas;
- Mark existing utilities and infrastructure;
- Conduct tree clearing and vegetation management, if necessary, and grading of work areas, as required; and,
- Install the erosion and sediment controls as detailed on the Erosion and Sediment Control Plans as soon as possible. Initial earth disturbance should be limited to only what is required for installation of perimeter sediment controls. Once perimeter controls are in-place, the remaining portions of Stage 1 earth disturbances can commence.

Stage 2: Construction

The construction stage of solar array development involves multiple disciplines that typically work in a sequenced approach, i.e. once one discipline is done working in an area the next discipline commences lagging behind the preceding task through project completion. Tasks outlined below are generally the sequence in which work is conducted however, some of the work will be conducted concurrently but in different areas of the site.

- Some grading is proposed in localized areas and as necessary to meet racking tolerances, build suitable access roads, and construct a level area for the small isolated equipment pads. Conduct earthwork as necessary prior to solar array installation;
- Install perimeter fencing and gates;
- Conduct pile driving and/or post installation for array racking;
- Assemble and install single-axis tracker racking frames;
- Module installation and wiring;
- Install tracker motors, DC combiner boxes, and other incidentals of DC system;
- Install low- voltage underground electric cable to equipment pads;
- Construct concrete equipment pads and complete installation of inverters and transformers;
- Install underground medium-voltage AC collector line;

- Construct overhead generation lead collector line and coordinate construction of interconnection equipment with Utility Owner;
- Complete planting of landscaping in accordance with the project specific landscaping plan; and
- Once array construction and significant vehicle traffic ceases, complete construction of limited use pervious haul road surficial stone layer.

Stage 3: Project Site Restoration

- Remove and dispose of Project related waste material at an approved disposal facility;
- Stabilize permanent topsoil stockpiles with seed and mulch. Topsoil shall not be exported from the Project site.
- Prepare soils as needed (restoration of original grade, de-compaction, soil amendments, etc.), and seed and mulching all disturbed areas. Restore disturbed soils per NYSDEC standards and specifications;
- Remove the temporary erosion and sediment controls when 80% of natural vegetative cover has been achieved and erosion issues are no longer present;
- Submit the Notice of Termination (NOT) to the NYSDEC in accordance with the General Permit.

9.0 Stormwater Management and Pollution Controls

Prior to the commencement of construction activities, temporary erosion and sediment controls shall be installed to prevent erosion of the soils and prevent water quality degradation in wetlands and waterbodies. Erosion and sediment controls will be utilized to limit, control, and mitigate construction related impacts. The stormwater management and pollution controls shall include practices that involve runoff control, soil stabilization practices, and sediment control.

The erosion and sediment controls utilized at the Project Site must be installed and maintained in accordance with GP-0-20-001, the SSESC and the SMDM. Improper installation of practices may result in an increase in water quality impacts to nearby waterbodies or sedimentation impacts to undisturbed lands. Deviations from the SSESC and SMDM standards should be discussed with the Qualified Inspector/Qualified Professional prior to utilizing the alternative practice. If the alternative practice is acceptable, documentation is required to detail the reasoning for the alterative practice and the provide evidence that the alternative design is equivalent to the technical standard. The SWPPP shall be amended as appropriate to incorporate the alternative practice. In the event that an alternative practice fails and a standard SSESC practice is required, the Contractor shall install the required practice upon approval from the Qualified Inspector/ Qualified Professional and Owner/Operator. The SWPPP shall be amended as appropriate to document changes to the practice.

The following sections detail potential stormwater contamination sources due to construction related activities and the temporary and permanent erosion and sediment controls to be utilized throughout the construction of the Project to mitigate impacts. Refer to the SSESC and SMDM for additional guidance on installation, maintenance and removal.

9.1 Potential Impacts for Stormwater Contamination

Construction activities and processes that result in either increased stormwater runoff or the potential to add pollutants to runoff are subject to the requirements of this SWPPP. These activities may include areas of land disturbed by grading, excavation, construction, or material storage. Water that comes in contact with the surface of the Project Site as a result of precipitation (snow, hail, rain, etc.) is classified as stormwater associated with the Project and is subject to the requirements of this SWPPP.

Construction activities that may negatively impact stormwater include, but are not limited to, the following:

- Tree Clearing and Vegetation Removal: Removal of vegetation can expose and weaken soils and may result in erosion.
- Construction Site Entrance: Vehicles leaving the Project Site can track soils onto public roadways.
- Grading Operations: Exposed soils have the potential for erosion and sedimentation when not stabilized.
- Fugitive Dust: Dust generated by vehicles or from strong winds during a drought period can be deposited in wetlands, waterways, and other environmentally sensitive areas, or may negatively impact the air quality.
- General Site Construction Activities: Maintenance and heavy use of access roads can expose soils, creating significant erosion potential. Soil stockpiling from site excavations and grading may promote erosion and sedimentation. Dewatering activities may result in concentrated flows and has the potential to increase erosion.
- Construction Vehicles and Equipment: Refueling of vehicles may result in spilling or dripping gasoline and diesel fuel onto the ground. On-site maintenance of excavating equipment may result in hydraulic oil, lubricants, or antifreeze dripping onto the ground. Sediment tracking and the spread of invasive species may occur if construction vehicles are improperly maintained. Ruts caused by equipment can create paths for concentrated water flows.
- Waste Management Practices: Typical construction projects often generate significant quantities of solid waste, such as wrappings, personnel-generated trash and waste, and construction debris.

Proper utilization of staging and storage areas, stockpiling areas, and erosion and sediment controls will mitigate potential impacts to the stormwater. Refer to Section 10.1 for additional information on spill prevention and waste management procedures for the Project.

9.2 Protection of Existing Vegetation

Natural vegetation shall be preserved to the maximum extent practicable. Preserving natural vegetation will reduce soil erosion and maintain the inherent integrity of the Project Site. Protection practices may include barrier fencing to prevent equipment and vehicle traffic in vegetated and environmentally sensitive areas. Where tree clearing and vegetation is proposed, grubbing shall only be performed in locations within the array fencing, footprint of access roads, utilities, or in location of proposed grading. Areas of proposed clearing outside

of these areas shall be to the ground surface only and stumps shall remain in-place to minimize disturbance of soils.

9.3 Temporary Erosion and Sediment Controls

Temporary erosion and sediment controls shall be utilized to reduce erosion, sedimentation, and pollutants in stormwater discharges, and to prevent impacts to undisturbed areas, natural resources, wetlands, waterbodies, and downstream areas. Both stabilization techniques and structural methods will be utilized, as needed, to meet these objectives.

Temporary erosion and sediment control measures shall be applied during construction to:

- Minimize soil erosion and sedimentation through the stabilization of disturbed areas and removal of sediment from construction site discharges.
- Preserve existing vegetation to the maximum extent practicable and establish permanent vegetation on exposed soils following the completion of soil disturbance activities.
- Minimize the area and duration of soil disturbance through site preparation activities and construction sequencing.

Table 2, below, lists the erosion and sediment controls anticipated to be utilized at the Project Site.

Table 2 - Proposed Erosion and Sediment Control Measures

Construction Road Stabilization	Concrete Truck Washout
Dust Control	Protecting Vegetation During Construction
Site Pollution Prevention	Stabilized Construction Access
Temporary Access Waterway Crossing	Winter Stabilization
Check Dam	Flow Diffuser
Grassed Waterway	Lined Waterway
Land grading	Anchored Stabilization Matting
Permanent Construction Area Planting	Mulching
Temporary Construction Area Seeding	Soil Restoration
Compost Filter Sock	Topsoiling
Silt Fence	Geotextile Filter Bag
Straw Bale Dike	Rip Rap Culvert Inlet/Outlet Apron

The standards and specification for the erosion and sediment control measures listed in Table 2 are provided in Appendix G. Refer to the SSESC and SMDM for the Standards and

Specifications of alternate measures and practices, as needed. The temporary erosion and sediment control measures not detailed in the SSESC or SMDM are detailed below.

9.3.1 Temporary Stockpiling

Temporary stockpiling of granular material (gravel, excavated spoils, select backfill, topsoil, etc.) is expected on-site throughout the construction process. Stockpiling of materials is not permitted in areas where health or safety risks are present, or where impacts to water quality may occur. Stockpiling is not permitted in wetland or wetland buffer areas.

Stockpile areas shall be contained and protected with the proper erosion and sediment controls such as silt fencing and mulch. Soil stockpiles shall be stabilized with vegetation, geotextile fabric or plastic covers if not utilized for seven (7) days.

Stockpile areas should be inspected and maintained as needed or directed by the Project Engineer (or Qualified Inspector/Qualified Professional).

9.3.2 Temporary Spoil Stockpiling

Spoil material shall be segregated, conserving topsoil for revegetation and disposing of the inorganic sub-soils. Spoils shall be free of construction debris including foreign chunks of concrete, and other construction-related materials.

A spoil disposal plan shall be developed prior to excavation, including the proposed quantities of spoil and the proposed location(s) and procedures for disposal. Spoils shall not be disposed of within wetlands, waterbodies, agricultural areas, or other environmentally sensitive areas. Excess topsoil is encouraged to be spread within the immediate disturbed areas, including agricultural areas, if the material is free of rocks. Inorganic spoils shall be buried and capped with the previously stripped, native topsoil to ensure revegetation. Additional topsoil may be required to adequately cover the spoil area. If additional space is needed for on-site disposal, the SWPPP shall be amended as appropriate. For spoils needing to be disposed of off-site, the disposal plan shall detail the location of the spoil disposal at an authorized facility off-site.

If the disposal plan does not detail the spoil stockpiling or disposal information, the SWPPP shall be amended as appropriate to document the necessary procedures. The amendment shall include the anticipated amount of spoils, the spoil stockpiling location, and the disposal method and location.

9.3.3 Construction Matting

Construction matting is often utilized to distribute vehicle loads on agricultural, lawn, and wetland areas. The matting aids in reducing rutting, soil compaction, and restoration activities in protected areas. Poorly drained upland soils, such as wetland transitional areas, may be matted to reduce rutting and sediment tracking.

An additional benefit of matting in wetlands is that mats can be arranged to act as a containment surrounding excavations. This may be especially helpful in standing water situations were conventional erosion and sediment controls are not practicable. The

Contractor should be cognizant of the hydrology of the area by recognizing water staining and bank full indicators. The Qualified Inspector can assist in this identification.

Headers and stringers shall be used in deeper or open water wetlands to allow wetland inundation under the matted drivable surface. The SWPPP specified wetland access does not account for poorly drained or poorly structured soils that are not wetlands. Transitional areas may experience severe rutting due to high traffic associated with the installation of the wetland access matting. Additional matting is recommended to reduce track out and restoration efforts, however it is not required for access.

Submerged wetland matting can create a "pumping" effect as vehicles pass, resulting in disturbed wetland soils, turbidity and sedimentation. This disturbance is a violation of the associated wetland permits. Although the presence of matting in this situation is still better than the alternative, pumping mats will require additional stabilization and sediment control practices not planned for in the Construction Drawings. Matting will need to be re-installed, or access will be shut down until water recedes to eliminate the erosion concern.

Refer to Appendix G for additional information regarding timber matting.

9.4 Temporary Stabilization for Frozen Conditions

Winter stabilization standards apply to construction activities with ongoing soil disturbance and exposure between November 15th and April 1st. Temporary winter stabilization measures shall be employed prior to frozen conditions, as detailed in the SSESC.

Erosion and sediment control measures shall be inspected to ensure proper performance and winter stabilization function. Repairs should be made as necessary to prevent erosion and sedimentation during thawing or rain events.

10.0 Post-Construction Stormwater Management

The SMDM details a five-step process for the site planning and Stormwater Management Practice (SMP) selection. The steps include the following:

1. Site planning to preserve natural site features and reduce impervious cover.
2. Calculate the Water Quality Volume (WQv) of the Project Site.
3. Meet the Runoff Reduction Volume (RRv) through runoff reduction techniques and SMPs with RRv capacity.
4. Use standard SMPs, where applicable, to treat the WQv not reduced through RRv techniques and SMPs with RRv capacity.
5. Design for peak volume and runoff rates, where required.

The five steps have been classified as Site Planning to Preserve Natural Features, Water Quality Volume, Runoff Reduction Volume, Channel Protection Volume, and Overbank Flood and Extreme Storm Attenuation. These items will be addressed in the sections below.

10.1 Design Justification

The proposed Project will result in greater than one acre of soil disturbance and results in an increase in impervious surface, therefore post-construction stormwater management practices are required for the Project.

The WQv and stormwater quantity requirements shall be met by projects requiring post-construction stormwater controls. The SMDM describes the stormwater management practices that may be implemented at the Project Site to aid in the reduction of stormwater effects to newly developed areas. Effects from new development may include changes in runoff volume, flow rates, timing of runoff, habitat destruction, and degradation of receiving waterbodies and downstream areas.

The Project has been classified as a new development site with an increase of approximately 160 ft^2 (0.0037 acres) of impervious cover. The proposed site access roads will use a permeable cross-section not considered by NYSDEC to be an impervious surface, and therefore does not require water quality treatment. The SMDM defines a new development as any land disturbance that is not classified as a redevelopment activity. The SMDM defines redevelopment as the disturbance and reconstruction of existing impervious area, including impervious areas removed from the Project Site within the last five years.

The following site constraints were considered when determining the appropriate stormwater management practices to be implemented on the Project Site:

- Practices cannot impact existing structures or utilities;
- Areas of steep slopes greater than 15%;
- The proposed new development conditions need to mimic the existing runoff patterns to the maximum extent practicable.

The peak runoff rates for the pre-development and post-development conditions have been analyzed to aid in maintaining the pre-development runoff rates. Regulating the runoff rate will minimize the impacts to adjacent and downstream properties and waterbodies and minimize impacts to the stormwater runoff quality.

10.2 Stormwater Quality Analysis

10.2.1 Water Quality Volume (WQv) Analysis

The Project requires treatment of the WQv, which is intended to improve water quality by capturing and treating runoff from small, frequent storm events. The NYSDEC has defined WQv as the volume of runoff generated from the 90th percentile (90%) rainfall event. Practices sized to treat the WQv will capture and treat 90% of all 24-hour rainfall events. The WQv is determined using the following equation:

$$WQ_v = \frac{P * R_v * A}{12}$$

Where:

- WQv = Water Quality Volume (acre-feet)

- P = 90% Rainfall Event Number, 1.40-in
- Rv = 0.05 + 0.009(I), where I is percent impervious cover
- A = Site Area (acres)

The 90% rainfall event number has been obtained from Figure 4.1 of the SMDM. The WQv is directly correlated to the amount of impervious cover at the Project Site. The calculated WQv for each subcatchment within the Project Site is detailed below and summarized in in Table 3, below.

$$Subcatchment\ 1S-\ WQ_v = \frac{1.4 * 0.95 * 0.000ac,}{12} = 0.0000\ acre - ft$$

$$Subcatchment\ 2S-\ WQ_v = \frac{1.4 * 0.95 * 0.0037ac,}{12} = 0.0004\ acre - ft$$

$$Subcatchment\ 3S-\ WQ_v = \frac{1.4 * 0.95 * 0.000ac,}{12} = 0.0000\ acre - ft$$

Table 3 – Calculated WQv

Subcatchment Number	Calculated Water Quality Volume (WQv)	
	ft³	ac-ft
1S	0	0
2S	17.7	0.0004
3S	0	0
Total WQv	17.7	0.0004

10.2.2 Runoff Reduction Volume (RRv) Analysis

The RRv is intended to reduce the WQv through infiltration, groundwater recharge, reuse, recycle, evaporation/evapotranspiration of the post-development runoff in order to replicate the pre-development hydrology. Replication of the pre-development hydrology includes maintaining pre-construction infiltration, peak runoff flow, discharge volume and minimizing concentrated flow through the use of runoff control techniques.

The RRv is determined using the following equation:

$$RR_v = \frac{[(P)(R_v^*)(A_i)]}{12}$$

Where:

- RRv = Minimum Runoff Reduction Volume (acre/feet)
- P = 90% Rainfall Event Number
- Rv^* = 0.05 + 0.009(I), where I is 100% impervious

- A_i = Impervious cover targeted for runoff reduction, calculated as $A_i = (S)(A_{ic})$
- S = Specific Runoff Reduction Factor (per HSG)
- A_{ic} = Total area of new impervious cover

The runoff reduction techniques have been selected based on the proposed Project use type and the existing site constraints as detailed in Section 10.1, above.

New development Projects that cannot achieve 100% runoff reduction for the WQv due to site limitations, must direct runoff from newly constructed impervious areas to runoff reduction or SMP practices, unless infeasible. The percentage of reduction required is determined from the specific reduction factor (S), which is based on the site's HSG. Table 4, below, details the specific reduction factors per HSG.

Table 4 - RRv Reduction by Soil Type

HSG	Specific Reduction Factor (S)
A	0.55
B	0.40
C	0.30
D	0.20

Subcatchment 2S is the only subcatchment with proposed impervious surfaces. The RRv for subcatchment 2S is 7 ft^3 as demonstrated in the Runoff Reduction Worksheets included in Appendix L.

10.2.3 Stormwater Management Practice (SMP) Analysis

The stormwater management plan must demonstrate that green infrastructure planning and design options were evaluated in order to meet the RRv requirement. The SMDM details acceptable runoff reduction techniques to meet the RRv requirement. The runoff reduction techniques utilized for the Project include:

- Conservation of Natural Areas: Retain the pre-development hydrologic and water quality characteristics of undisturbed natural areas and stream and wetland buffers by restoring and/or permanently conserving these areas on site. This practice will be utilized across the maximum extent practicable.
- Land Surface Cover Maintained as Meadow Under the Arrays: Areas under the arrays will be seeded with a mixture of tall grasses and not mowed, to slow and control stormwater runoff from some areas of a development Project.

10.3 Post-Construction Stormwater Control Practices Utilized

The total area of disturbance for the Project will be approximately 13.8 acres, 160 ft^2 (0.004 acres) of which will have impervious cover consisting of a central concrete equipment pad. The total contributing drainage area for the Project Site, which includes off-site areas, is approximately 32.38 acres.

The composite WQv for the Project Site was calculated to be 18 ft^3 for the new development area. The total minimum RRv for the Project Site was calculated to be 5 ft^3. The source of the runoff requiring treatment is limited to the concrete equipment pad. The runoff from the equipment pad will sheet flow to a grass buffer strip for pre-treatment and eventually drain to an infiltration trench. As demonstrated in the runoff reduction worksheet included in Appendix L, the proposed infiltration trench will be 1.5' deep, 2' wide with a minimum length of 20 ' and will provide sufficient treatment of the WQ and RRv.

10.4 Stormwater Quantity Analysis

The SMDM requires the Project to meet the following separate stormwater quantity criteria:

- Channel Protection Volume (Cpv): The Cpv requirement is designed to protect stream channels from erosion by providing 24 hours of extended detention for a 1-year, 24-hour storm event.
- Overbank Flood Control (Qp): The Qp requirement is designed to prevent an increase in frequency and magnitude of out-of-bank flooding generated by urban development. The overbank control requires storage to attenuate the post-development 10-year, 24-hour peak discharge rate to pre-development rates.
- Extreme Flood Control (Qf): The Qf requirement is designed to prevent the increased risk of flood damage from large storm events, maintain boundaries of the pre-development 100-year floodplain, and protect the physical integrity of the stormwater management practices. The extreme flood control requires storage to attenuate the post-development 100-year, 24-hour peak discharge rate to pre-development rates.

Stormwater runoff was estimated using HydroCAD, Version 10.20-2d. HydroCAD software is based on methodologies developed by the USDA NRCS, namely "Urban Hydrology for Small Watersheds", Technical Release 55 and Technical Release 20 (TR-50 and TR-20, respectively), in conjunction with other hydrologic and hydraulic calculations. Based on site specific information, including land cover, slopes, soils, and rainfall data, the program calculates inflow and outflow hydrographs for subcatchments, reach routing, and pond routing.

For the HydroCAD analysis, the Project Site was divided by watershed and drainage systems, which contribute to the overall stormwater network. The watersheds and drainage systems were classified by the following components:

- Subcatchment: Utilized to model the runoff from a given area of land.
- Pond: Used to model a reservoir, dam, catch basin, manhole, drywell, storage chamber, vault, or other impoundment that fills with water. Ponds may empty through a weir, culvert, orifice, or other outlet device.
- Reach: Used to perform independent routing through an open channel or overland flows.
- Link: A multi-purpose node used to link a hydrograph to another system.

The pre-development and post-development conditions for the Project Site were divided into three subcatchments, which depict the watershed conditions, methods of collection, conveyance, points of discharge and topography. In addition, the drainage pattern, drainage structures, soil types, and ground covers are utilized to analyze the rate of runoff in the existing

and proposed conditions. The subcatchments include off-site contributing areas as determined by the site topography and site features. The pre-development Project Site was divided into three subcatchments and the post-development Project Site was divided into three subcatchments.

In order to compare the pre-development and post-development runoff conditions, design points were selected across the Project Site. The overall bounds of the study area and study points remain unchanged from the pre-development condition. The following design points were selected for the Project Site in both the pre-development and post-development conditions:

Design Point 1 (DP1):

Design Point 1 encompasses subcatchment 1S and is located at the northern boundary of the Project site. Stormwater reaches DP1 via overland flow through the existing field and then through the adjacent forested area via a series of wetlands and a jurisdictional stream. Land-use directly downgradient of DP1 is undeveloped forested area.

Design Point 2 (DP2):

Design Point 2 encompasses subcatchment 2S and is located at the eastern boundary of the Project site. Stormwater reaches DP2 via overland flow through the existing field. The area immediately downgradient of DP2 is an agricultural field.

Design Point 3 (DP2):

Design Point 3 encompasses subcatchment 3S and is located at the southwestern boundary of the Project site. Stormwater reaches DP3 via overland flow through the existing field and then through the adjacent forested area. The area immediately downgradient of DP3 is a transmission corridor with significant undergrowth. The area directly adjacent to DP3 is a commercial parking lot servicing multiple businesses.

The pre- and post-development conditions were evaluated at each design point for the 1-, 10-, and 100-year storm events. Table 5, below, details the pre- and post-development peak discharge rates for each design point and storm event analyzed.

Table 5 - Peak Discharge Rate (cfs) Comparison

Design Point	1-Year Rainfall Event		10-Year Rainfall Event		100-Year Rainfall Event	
	Pre-	Post-	Pre-	Post-	Pre-	Post-
DP1	0.4	0.4	5.7	5.7	23.3	23.3
DP2	0.5	0.4	5.8	5.5	20.8	20.4
DP3	0.5	0.4	3.5	3.4	11.0	10.8

The runoff model demonstrates that the proposed Project will not alter the hydrologic or hydraulic characteristics of the Project Site, therefore negative impacts to downstream areas due to this Project are not anticipated. Subcatchment mapping and the HydroCAD model are provided for the pre-development condition in Appendix J, and for the post-development condition in Appendix K. As a result, the construction of structural BMPs to manage stormwater quantity will not be provided for this development.

11.0 Construction Pollution Prevention

Proper material storage, handling, and disposal practices shall be implemented during construction to reduce the risk of exposure of materials and hazardous substances to stormwater and environmental resources. The storage, handling, and disposal procedures to be enforced by the Owner/Operator, Contractor(s) and the Qualified Inspector are described below.

11.1 Management of Spills and Releases

The Owner/Operator must be notified in the event of a non-stormwater (fuel, oil, chemical, etc.) spill or release to ensure proper reporting and clean up. The Owner/Operator shall proceed as appropriate in accordance with the Owner/Operator's, local, state, and federal environmental policies and procedures.

A spill or release shall be reported to the NYSDEC Spill Hotline (1-800-457-7362), as applicable, within two hours of the release. The Contractor is responsible for retaining documentation containing the NYS spill number and spill information to provide to the Owner/Operator and the Qualified Inspector. The Contractor is responsible for the cleanup and response actions, in accordance with the on-site spill prevention procedures manual. Contaminated soil shall be removed from the Project Site and disposed of in accordance with the product specific Safety Data Sheets (SDS) and environmental guidance.

Potential pollutant sources are likely to be stored on the construction site. Bulk petroleum storage (1,100 gallon above ground tank and/or 110 below ground tank) and chemical storage (185 gallon above ground tank and/or any below ground tank) shall not be present onsite. Construction materials typically present on construction sites, as noted in the National Pollutant Discharge Elimination System (NPDES) Construction General Permit, include, but are not limited to, the following:

- Building Products: Asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures, and gravel and/or mulch stockpiles;
- Chemicals: Pesticides, herbicides, insecticides, fertilizers, and landscape materials;
- Petroleum Products: Diesel fuel, oil, hydraulic fluids, gasoline, etc.;
- Hazardous or Toxic Waste: Paints, caulks, sealants, fluorescent light ballasts, solvents, petroleum-based products, wood preservatives, additives, curing compounds, and acids;
- Sanitary Facilities: Portable toilets; and,
- Construction Debris: Fill, vegetative debris, stumps, and construction waste.

Specific quantities cannot be estimated until construction methodology and contractor(s) are secured for construction.

Spill cleanup and response guidance is provided in Appendix H of this SWPPP.

11.2 Construction Housekeeping

The Owner/Operator or the Contractor shall coordinate with local fire officials regarding on-site fire safety and emergency response. The Contractor shall keep the Construction Supervisor and the Qualified Inspector/Qualified Professional aware of chemicals and waste present on site. The Contractor shall periodically conduct safety inspections at the Project Site to identify housekeeping issues and employ spill prevention procedures.

11.2.1 Material Stockpiling

Material resulting from clearing and grubbing, grading, and other construction activities, or new material delivered to the Project Site, shall be stockpiled upslope of disturbed areas. The stockpile areas shall have the proper erosion and sediment controls installed to prevent the migration of sediments and materials.

11.2.2 Staging, Storage, and Marshalling Areas

Construction materials and equipment should be stored in designated staging areas as indicated on the Construction Drawings or as directed by the Project Engineer (or Qualified Inspector). The staging, storage, and marshalling areas should be located in an area which minimizes impacts to stormwater quality.

Chemicals, solvents, fertilizers, and other toxic materials must be stored in waterproof containers and must be kept in the proper storage facilities, except during use or application. Runoff containing such materials must be collected and disposed of at an approved solid waste or chemical disposal facility.

Bulk storage of materials will be staged at the Project marshalling yard per SDS specification and Environmental Health and Safety Standards, whichever is more restrictive. Contractor marshalling yards may be associated with other projects not covered under this SWPPP and General Permit. If the marshalling area is associated with this SWPPP, the yard shall be inspected by the Qualified Inspector until Project related activities have ceased. A Qualified Inspector shall inspect the marshalling yard to assess for environmental impacts prior to and throughout its use. If additional marshalling yards are required, they must abide by this SWPPP and GP-0-20-001. Amendments shall be made to the SWPPP, as necessary, for the additional marshalling areas.

11.2.3 Equipment Cleaning and Maintenance

All on-site construction vehicles, including employee vehicles, shall be monitored for leaks and shall receive regular preventative maintenance to reduce the risk of leakage. Any equipment leaking oil, fuel, or hydraulic fluid shall be repaired immediately or removed from the Project Site. Construction equipment and Contractor personal vehicles shall be parked, refueled and serviced at least 100 feet from a wetland, waterbody, or other ecologically sensitive area, at an upland location away from conveyance channels, unless approved by the Qualified Inspector/Qualified Professional.

Where there is no reasonable alternative, refueling may occur within these setbacks, but only under the observation of the Qualified Inspector or Trained Contractor and after proper precautions are taken to prevent an accidental spill. The Contractor shall take precautions to ensure that drips, spills, or seeps do not enter the ground. The use of

absorbent towels and/or a portable basin beneath the fuel tank is recommended. Refueling activities shall be performed under continual surveillance with extreme care. In the event of a release, the spill shall be promptly cleaned up in accordance with the spill response and clean up procedures.

Petroleum products and hydraulic fluids that are not in vehicles shall be stored in tightly sealed containers that are clearly labeled. All gasoline and fuel storage vessels with greater than a 25-gallon capacity must have secondary containment constructed of an impervious material and be capable of holding 110% of the vessel capacity.

11.2.4 Concrete Washout Areas

Designated concrete washout areas should be provided as needed to allow concrete trucks to wash out or discharge surplus concrete and wash water on site. The concrete washout areas shall be a diked impervious area, located a minimum of 100 feet from a drainage way, waterbody, or wetland area. The concrete washout areas should be designed to prevent contact between the concrete wash and stormwater. The concrete washout areas shall have the proper signage to indicate the location of the facility. The Contractor is responsible for the maintenance of the concrete washout areas. Waste collected at the concrete washout areas shall be disposed of as non-hazardous construction waste material.

The washout facility should have sufficient volume to contain the concrete waste resulting from washout and a minimum freeboard of 12 inches. The washout areas should not be filled beyond 95% capacity and shall be cleaned out once 75% capacity has been met unless a new facility has been constructed. Refer to the SSESC and SMDM for guidance on the construction and use of concrete washout areas.

All concrete waste shall be removed from the site when stable. In no instance should concrete washout be buried onsite.

11.3 Waste Management

The Contractor shall comply with all required regulations governing the on-site management and off-site disposal of solid and hazardous waste generated during construction of the Project. Substances and materials with the potential to pollute surface and groundwaters must be handled, controlled, and contained as appropriate to ensure they do not discharge from the Project Site.

A solid waste management program will be implemented to support proper solid waste disposal and recycling practices. Solid waste and debris that cannot be recycled, reused, or salvaged shall be stored in on-site containers for off-site disposal. The containers shall be emptied periodically by a licensed waste transport service and hauled away from the site for proper disposal. No loose materials shall be allowed at the Project Site and all waste material shall be disposed of promptly and properly. The burning of crates, waste, and other refuse is not permitted.

If a hazardous material spill occurs, it must be contained and disposed of immediately. Contaminated soil shall be removed from the Project Site and disposed of in accordance with product specific SDS and associated guidelines. Reporting spills to the NYSDEC may be

required per 17 New York Code, Rules and Regulations (NYCRR) 32.3 and 32.4, and the Environmental Conservation Law (ECL) 17-1734.

12.0 Maintenance Inspections and Reporting Requirements

12.1 Pre-Construction Inspection

A site assessment shall be conducted by the Qualified Inspector prior to commencement of construction activities to ensure erosion and sediment controls have been adequately and appropriately installed. The Contractor is responsible for contacting the Qualified Inspector for the pre-construction inspection following the installation of the erosion and sediment control measures.

12.2 Construction Phase Inspections

A Qualified Inspector shall conduct regular site inspections for the implementation of this SWPPP through final stabilization of the Project Site. Inspections shall occur at an interval of once every seven calendar days unless greater than five acres of soil is disturbed at any one time or if the Project Site directly discharges to a 303(d) waterbody segment or is located in one of the watersheds listed in Appendix C of GP-0-20-001, in which inspections shall occur at least twice per every seven calendar days. The two inspections shall be separated by a minimum of two full calendar days. Written authorization from the NYSDEC is required prior to disturbance of greater than five acres. If a portion of the Project Site is permanently stabilized, inspections can cease in that area as long as the condition has been documented by amending the SWPPP.

The Qualified Inspector shall conduct site inspections to assess the performance of the erosion and sediment controls and identify areas requiring modification or repair. The Qualified Inspector shall complete an inspection report following each inspection.

The Owner/Operator and the Contractor(s) must ensure the erosion and sediment control practices implemented at the Project Site have been maintained in accordance with GP-0-20-001, the SSESC and SMDM. The trained Contractor shall regularly inspect the erosion and sediment control practices and pollution prevention measures to ensure they are being maintained in effective operating condition at all times. Within one business day of the completion of an inspection, the qualified inspector shall notify the owner or operator and contractor of any corrective actions that need to be taken. The contractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

The Qualified Inspector/Qualified Professional shall inspect the debris removal on a continual basis during construction to ensure proper management and disposal. When construction and restoration are complete, the Contractor is responsible for ensuring the Project Site is free of all construction debris and materials.

12.3 Temporary Construction Activity Suspension

The Contractor must temporarily stabilize all disturbed areas prior to temporary suspension of construction activities. For construction sites where soil disturbance activities have been

temporarily suspended (e.g. winter shutdown) and the appropriate temporary stabilization measures have been installed and applied to all disturbed areas, the Qualified Inspector shall begin conducting site inspections in accordance with Part IV.C.2 of GP-0-20-001. The trained Contractor may cease the regular maintenance inspections until soil disturbance activities resume.

The Owner/Operator must notify the NYSDEC Division of Water (DOW) Program contact at the Regional Office in writing prior to reducing the frequency of inspections. Correspondence with the NYSDEC DOW shall be included in Appendix D of this SWPPP.

12.4 Partial Project Completion

Construction sites where soil disturbance activities have been shut down with partial Project completion, the Qualified Inspector can stop conducting inspections once all disturbed areas have achieved final stabilization in conformance with this SWPPP.

The Owner/Operator must notify the NYSDEC DOW Program contact at the Regional Office in writing prior to shut down. Correspondence with the NYSDEC DOW shall be included in Appendix D of this SWPPP.

If soil disturbance activities have ceased for two years from the date of shutdown, the Owner/Operator shall have the Qualified Inspector complete a final inspection to certify final stabilization has been achieved and all temporary erosion and sediment control measures have been removed. The Owner/Operator shall complete the NOT form and submit the form to the NYSDEC. A copy of the completed NOT shall be included in Appendix A of this SWPPP.

12.5 Reporting Requirements

Inspection and maintenance reports shall be prepared in accordance with GP-0-20-001 from the commencement of construction activities until the NOT has been submitted to the NYSDEC. The Qualified Inspector shall provide a copy of the completed inspection report to the Owner/Operator and the Contractor(s) within one business day of inspection. A copy of the inspection report shall be included Appendix N of the on-site SWPPP. A blank SWPPP Inspection Form is provided in Appendix N.

12.6 Post-Construction Operation and Maintenance Record Archiving

Post-construction operation and maintenance (O&M) activities shall be performed in accordance with the O&M Manual provided in Appendix I of this SWPPP and the requirements outlined in the Section 3.5 of the SMDM. Post-construction operation and maintenance shall occur once stormwater management practices have been installed and are in operation, and the disturbed areas have achieved final stabilization.

12.7 Records Archiving

The Owner/Operator shall retain a copy of the SWPPP, permit coverage forms and associated documentation that were prepared in conjunction with GP-0-20-001 for a period of at least five years from the date that the NYSDEC received the competed NOT.

Appendix A – SWPPP Permit Coverage Forms

- Notice of Intent (NOI) -

- SWPPP Preparer Certification Form -

- Owner/Operator Certification Form -

- NYSDEC NOI Acknowledgement Letter for Permit Coverage -

- Notice of Termination (NOT) Form -

Appendix A – Notice of Intent (NOI)

Appendix A – SWPPP Preparer Certification Form

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

SWPPP Preparer Certification Form

SPDES General Permit for Stormwater Discharges From Construction Activity (GP-0-20-001)

Project Site Information

Project/Site Name

Old Myers Solar

Owner/Operator Information

Owner/Operator (Company Name/Private Owner/Municipality Name)

NY Solar 1001 LLC

Certification Statement – SWPPP Preparer

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-20-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Thomas	N	Daniels, Jr.
First name	MI	Last Name

	February 2, 2023
Signature	Date

Appendix A – Owner/Operator Certification Form

Appendix A – NYSDEC NOI Acknowledgement Letter for Permit Coverage

Appendix A – Notice of Termination (NOT) Form

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505
(NOTE: Submit completed form to address above)

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity

Please indicate your permit identification number: NYR ___ ___ ___ ___ ___ ___

I. Owner or Operator Information

1. Owner/Operator Name:

2. Street Address:

3. City/State/Zip:

4. Contact Person: | 4a.Telephone:

4b. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

III. Reason for Termination

9a. □ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP. ***Date final stabilization completed** (month/year): _____

9b. □ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR ___ ___ ___ ___ ___ ___
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. □ Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? □ yes □ no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? □ yes □ no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

_____

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? □ yes □ no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

□ Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.

□ Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).

□ For post-construction stormwater management practices that are privately owned, a mechanism is in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the owner or operator's deed of record.

□ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university or hospital), government agency or authority, or public utility; policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? _____ (acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4? □ yes □ no

(If Yes, complete section VI - "MS4 Acceptance" statement

V. Additional Information/Explanation:

(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:

Title/Position:

Signature:	Date:

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

VII. Qualified Inspector Certification - Final Stabilization:

I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):

I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

IX. Owner or Operator Certification

I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

(NYS DEC Notice of Termination - January 2015)

Appendix B – General Permit GP-0-20-001

Appendix C – Construction Personnel Contact List

- Construction Contact List -

- Contractor Certification Form -

Appendix C – Construction Contact List

SWPPP Construction Contact List

Name	Title/Role	Company	Phone Number
	Project Engineer		
	Project Field Construction Coordinator		
	Project Environmental Engineer		
	Division Environmental Engineer (Spill Reporting)		
	SWPPP Preparer		
	Qualified Inspector		

Appendix C – Contractor Certification Form

Appendix D – Agency Correspondence and Notifications

(To be provided once available)

Appendix E – Environmental Background Information

- Figure 1: Site Location Map -

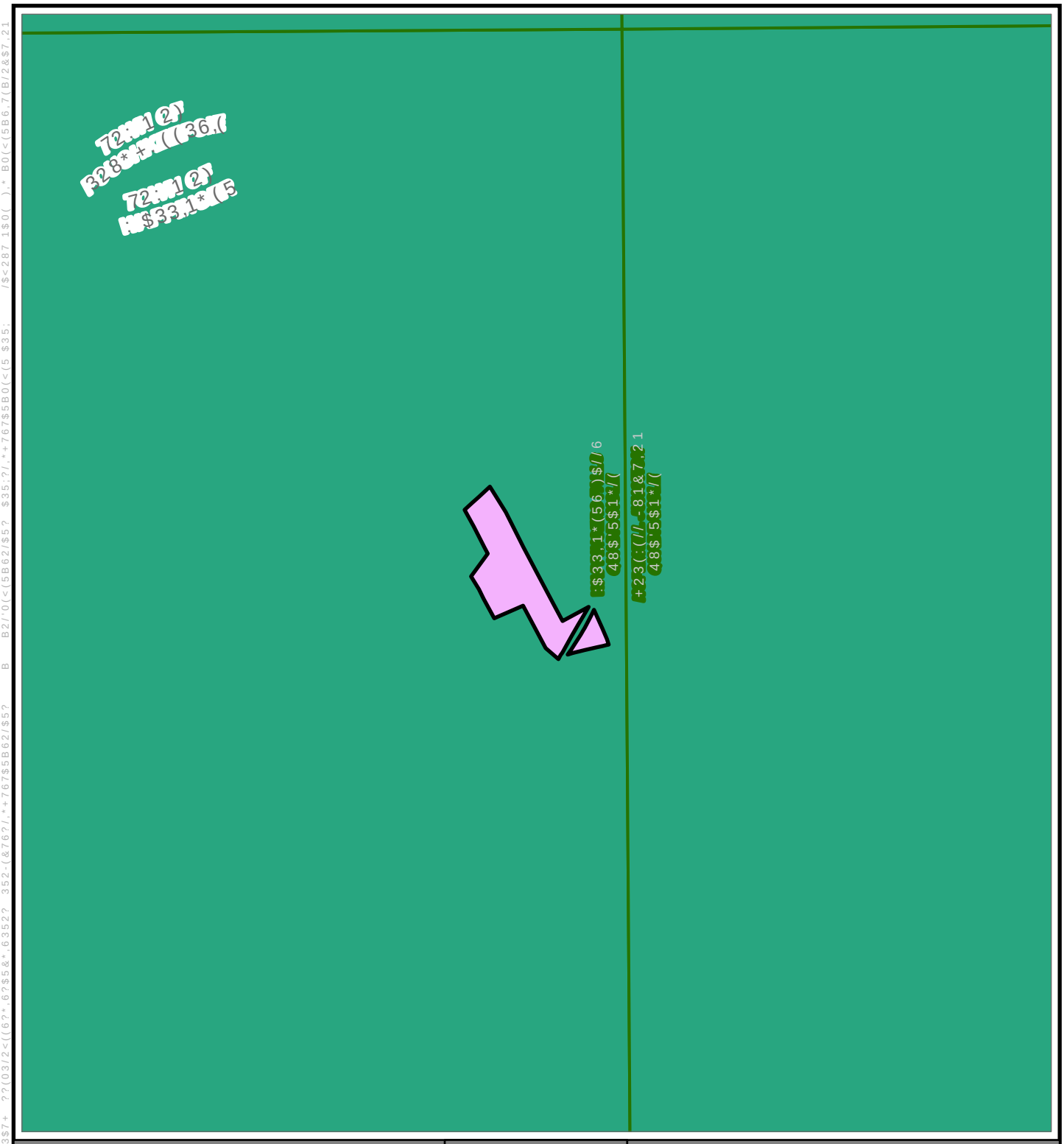
-Environmental and Cultural Resource Information –

-State Historic Preservation Office (SHPO) Cultural Resource Information System (CRIS) Maps

- USDA NRCS Soil Resource Report -

- Northeast Regional Climate Center's Extreme Precipitation Tables -

Appendix E – Figure 1: Site Location Map



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Appendix E – Environmental and Cultural Resource Information

Appendix E – State Historic Preservation Office (SHPO) Cultural Resource Information Systems (CRIS)

Appendix E – USDA NRCS Soil Resource Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Dutchess County, New York

January 4, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

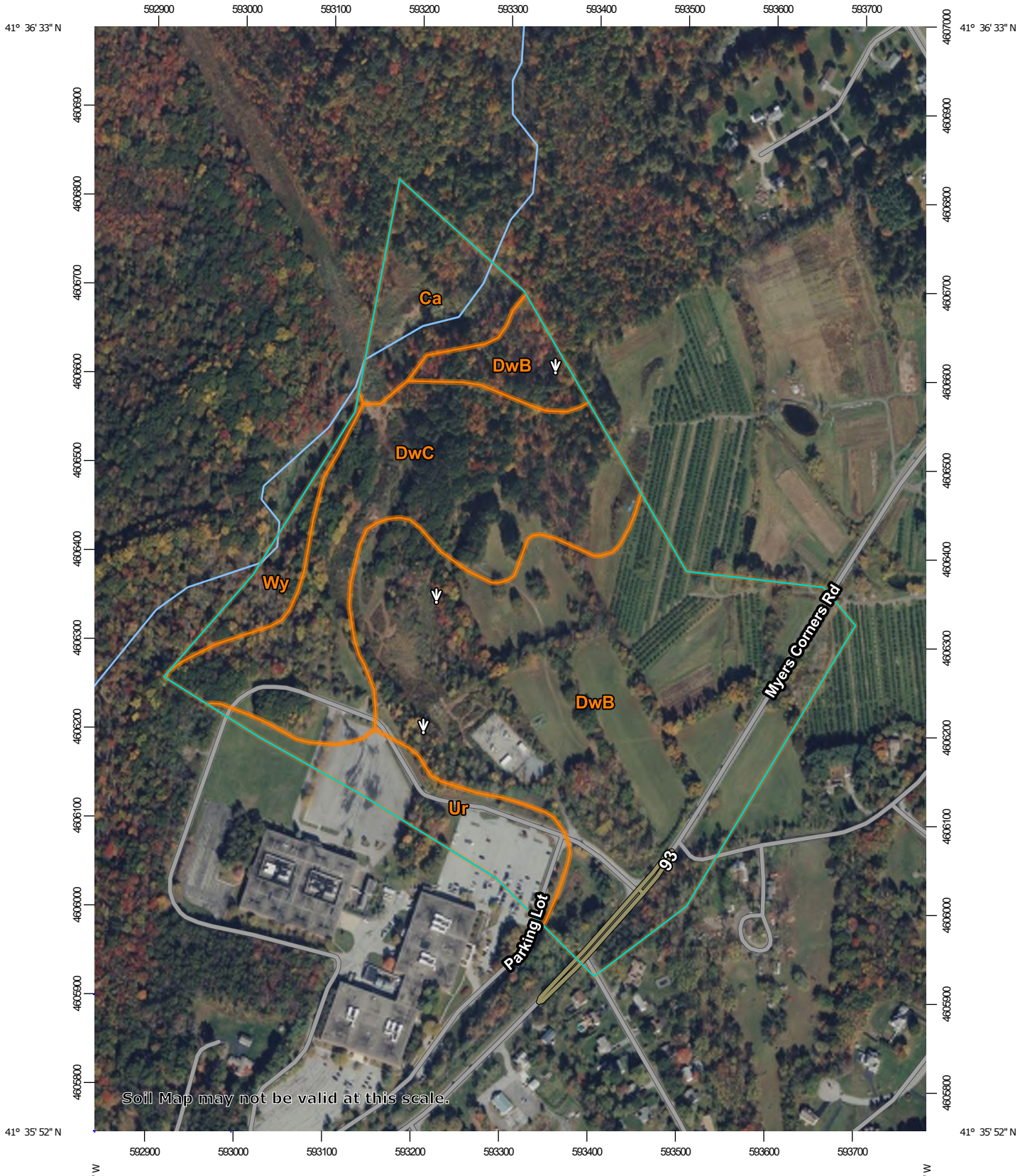
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



Map Scale: 1:6,060 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 250 500 1000 1500

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Dutchess County, New York
Survey Area Data: Version 19, Sep 10, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 8, 2020—Oct 14, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ca	Canandaigua silt loam, neutral substratum	5.9	7.5%
DwB	Dutchess-Cardigan complex, undulating, rocky	43.3	55.3%
DwC	Dutchess-Cardigan complex, rolling, rocky	20.6	26.3%
Ur	Urban land	6.2	7.9%
Wy	Wayland silt loam	2.4	3.1%
Totals for Area of Interest		**78.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Dutchess County, New York

Ca—Canandaigua silt loam, neutral substratum

Map Unit Setting

National map unit symbol: 9rds
Elevation: 100 to 1,200 feet
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Canandaigua and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canandaigua

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 40 inches: silt loam
H3 - 40 to 72 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F101XY010NY - Wet Lake Plain Depression
Hydric soil rating: Yes

Minor Components

Raynham

Percent of map unit: 5 percent
Landform: Depressions

Hydric soil rating: Yes

Sun

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Livingston

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Kingsbury

Percent of map unit: 3 percent
Hydric soil rating: No

Punsit

Percent of map unit: 2 percent
Hydric soil rating: No

DwB—Dutchess-Cardigan complex, undulating, rocky

Map Unit Setting

National map unit symbol: 9rfn
Elevation: 0 to 1,330 feet
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Dutchess and similar soils: 40 percent
Cardigan and similar soils: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dutchess

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from phyllite, slate, schist, and shale

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 28 inches: silt loam
H3 - 28 to 86 inches: channery silt loam

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Cardigan

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till or colluvium derived from phyllite, slate, shale, and schist

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 20 inches: channery loam
H3 - 20 to 30 inches: channery silt loam
H4 - 30 to 34 inches: unweathered bedrock

Properties and qualities

Slope: 1 to 6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Georgia

Percent of map unit: 10 percent

Hydric soil rating: No

Nassau

Percent of map unit: 9 percent
Hydric soil rating: No

Massena

Percent of map unit: 9 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: Unranked

Sun

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

DwC—Dutchess-Cardigan complex, rolling, rocky

Map Unit Setting

National map unit symbol: 9rfp
Elevation: 0 to 1,330 feet
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Dutchess and similar soils: 40 percent
Cardigan and similar soils: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dutchess

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from phyllite, slate, schist, and shale

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 28 inches: silt loam
H3 - 28 to 86 inches: channery silt loam

Properties and qualities

Slope: 5 to 16 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Cardigan

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till or colluvium derived from phyllite, slate, shale, and schist

Typical profile

H1 - 0 to 8 inches: channery silt loam
H2 - 8 to 20 inches: channery loam
H3 - 20 to 30 inches: channery silt loam
H4 - 30 to 34 inches: unweathered bedrock

Properties and qualities

Slope: 5 to 16 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Georgia

Percent of map unit: 10 percent

Hydric soil rating: No

Massena
Percent of map unit: 9 percent
Hydric soil rating: No

Nassau
Percent of map unit: 9 percent
Hydric soil rating: No

Rock outcrop
Percent of map unit: 1 percent
Hydric soil rating: Unranked

Sun
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Ur—Urban land

Map Unit Setting
National map unit symbol: 9rjb
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition
Urban land: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Typical profile
H1 - 0 to 6 inches: variable

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Udorthents, smoothed
Percent of map unit: 5 percent
Hydric soil rating: No

Udorthents, wet substratum
Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed soils, undisturbed
Percent of map unit: 1 percent
Hydric soil rating: Unranked

Rock outcrop
Percent of map unit: 1 percent
Hydric soil rating: Unranked

Wy—Wayland silt loam

Map Unit Setting
National map unit symbol: 9rjf
Elevation: 200 to 1,500 feet
Mean annual precipitation: 41 to 47 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 115 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition
Wayland and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wayland

Setting
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty and clayey alluvium washed from uplands that contain some calcareous drift

Typical profile
H1 - 0 to 9 inches: silt loam
H2 - 9 to 80 inches: silt loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: NoneFrequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: F144AY016MA - Very Wet Low Floodplain
Hydric soil rating: Yes

Minor Components

Linlithgo

Percent of map unit: 5 percent
Hydric soil rating: No

Pawling

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: No

Palms

Percent of map unit: 3 percent
Landform: Swamps, marshes
Hydric soil rating: Yes

Fluvaquents

Percent of map unit: 3 percent
Landform: Flood plains
Hydric soil rating: Yes

Carlisle

Percent of map unit: 2 percent
Landform: Marshes, swamps
Hydric soil rating: Yes

Udifluvents

Percent of map unit: 2 percent
Hydric soil rating: No

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Appendix E – Northeast Regional Climate Center's Extreme Precipitation Tables

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New York
Location	
Longitude	73.878 degrees West
Latitude	41.601 degrees North
Elevation	0 feet
Date/Time	Thu, 05 Jan 2023 10:33:11 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.32	0.49	0.61	0.80	1.00	1.25	**1yr**	0.87	1.17	1.43	1.75	2.14	2.61	2.94	**1yr**	2.31	2.83	3.28	3.97	4.57	**1yr**
2yr	0.38	0.59	0.73	0.97	1.21	1.51	**2yr**	1.05	1.41	1.73	2.13	2.59	3.15	3.56	**2yr**	2.79	3.42	3.92	4.63	5.26	**2yr**
5yr	0.45	0.70	0.88	1.18	1.51	1.90	**5yr**	1.31	1.74	2.19	2.68	3.26	3.94	4.50	**5yr**	3.49	4.33	4.98	5.76	6.50	**5yr**
10yr	0.51	0.80	1.02	1.38	1.79	2.27	**10yr**	1.55	2.04	2.61	3.20	3.88	4.67	5.39	**10yr**	4.13	5.18	5.97	6.80	7.64	**10yr**
25yr	0.60	0.95	1.22	1.68	2.24	2.86	**25yr**	1.93	2.53	3.31	4.06	4.90	5.84	6.84	**25yr**	5.16	6.57	7.61	8.48	9.46	**25yr**
50yr	0.69	1.10	1.41	1.98	2.66	3.42	**50yr**	2.30	2.97	3.95	4.84	5.82	6.92	8.19	**50yr**	6.12	7.87	9.14	10.02	11.13	**50yr**
100yr	0.78	1.27	1.64	2.32	3.16	4.08	**100yr**	2.73	3.49	4.73	5.79	6.94	8.20	9.81	**100yr**	7.26	9.43	10.98	11.84	13.09	**100yr**
200yr	0.90	1.46	1.90	2.72	3.76	4.88	**200yr**	3.25	4.11	5.66	6.92	8.27	9.72	11.76	**200yr**	8.61	11.31	13.21	14.00	15.41	**200yr**
500yr	1.09	1.79	2.34	3.39	4.74	6.18	**500yr**	4.09	5.10	7.17	8.75	10.42	12.19	14.96	**500yr**	10.79	14.38	16.87	17.49	19.14	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.27	0.42	0.51	0.68	0.84	1.05	**1yr**	0.73	1.02	1.24	1.57	1.96	2.42	2.53	**1yr**	2.14	2.43	2.61	3.62	3.58	**1yr**
2yr	0.37	0.57	0.70	0.95	1.18	1.39	**2yr**	1.01	1.36	1.58	2.01	2.54	3.04	3.46	**2yr**	2.69	3.33	3.80	4.50	5.12	**2yr**
5yr	0.42	0.65	0.80	1.10	1.40	1.63	**5yr**	1.21	1.59	1.84	2.37	2.95	3.67	4.14	**5yr**	3.25	3.98	4.60	5.29	6.02	**5yr**
10yr	0.47	0.72	0.89	1.25	1.61	1.82	**10yr**	1.39	1.78	2.07	2.66	3.29	4.18	4.74	**10yr**	3.70	4.56	5.30	5.97	6.75	**10yr**
25yr	0.54	0.83	1.03	1.47	1.93	2.10	**25yr**	1.67	2.06	2.40	2.97	3.80	4.97	5.65	**25yr**	4.40	5.43	6.39	6.99	7.86	**25yr**
50yr	0.61	0.93	1.16	1.66	2.24	2.34	**50yr**	1.93	2.29	2.71	3.30	4.26	5.65	6.44	**50yr**	5.00	6.19	7.38	7.86	8.82	**50yr**
100yr	0.69	1.04	1.31	1.89	2.59	2.63	**100yr**	2.24	2.57	3.05	3.67	4.78	6.43	7.34	**100yr**	5.69	7.05	8.51	8.85	9.87	**100yr**
200yr	0.79	1.18	1.50	2.17	3.03	2.94	**200yr**	2.61	2.87	3.44	4.09	5.35	7.31	8.34	**200yr**	6.47	8.02	9.84	9.95	11.03	**200yr**
500yr	0.94	1.41	1.81	2.63	3.74	3.42	**500yr**	3.22	3.35	4.05	4.73	6.24	8.65	9.89	**500yr**	7.66	9.51	11.93	11.58	12.69	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.36	0.55	0.67	0.91	1.11	1.34	**1yr**	0.96	1.31	1.50	1.93	2.40	2.87	3.19	**1yr**	2.54	3.07	3.52	4.24	4.90	**1yr**
2yr	0.40	0.62	0.76	1.03	1.27	1.52	**2yr**	1.09	1.48	1.72	2.22	2.77	3.27	3.70	**2yr**	2.90	3.56	4.06	4.80	5.44	**2yr**
5yr	0.49	0.75	0.93	1.28	1.63	1.93	**5yr**	1.41	1.89	2.23	2.86	3.62	4.24	4.91	**5yr**	3.75	4.72	5.40	6.28	7.05	**5yr**
10yr	0.58	0.89	1.10	1.54	1.99	2.34	**10yr**	1.72	2.29	2.71	3.50	4.44	5.21	6.09	**10yr**	4.61	5.85	6.72	7.69	8.60	**10yr**
25yr	0.73	1.10	1.37	1.96	2.58	3.02	**25yr**	2.23	2.95	3.54	4.73	5.84	6.88	8.14	**25yr**	6.09	7.82	8.97	10.07	11.21	**25yr**
50yr	0.86	1.31	1.63	2.34	3.15	3.68	**50yr**	2.71	3.59	4.34	5.86	7.17	8.49	10.16	**50yr**	7.51	9.77	11.20	12.37	13.74	**50yr**
100yr	1.02	1.54	1.93	2.79	3.83	4.48	**100yr**	3.31	4.38	5.32	7.27	8.82	10.48	12.70	**100yr**	9.28	12.21	13.98	15.20	16.82	**100yr**
200yr	1.21	1.82	2.31	3.34	4.66	5.44	**200yr**	4.02	5.32	6.52	8.99	10.84	12.96	15.90	**200yr**	11.47	15.29	17.46	18.74	20.67	**200yr**
500yr	1.53	2.28	2.93	4.25	6.05	7.05	**500yr**	5.22	6.89	8.53	11.96	14.25	17.14	21.43	**500yr**	15.17	20.60	23.47	24.69	27.23	**500yr**

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Appendix F – Construction Drawings

Appendix G – Standards and Specifications for Erosion and Sediment Controls

Appendix H – Spill Cleanup and Reporting Guidance

-NYSDEC Technical Field Guidance: Spill Reporting and Initial Notification Requirements -

- NYSDEC CP-51: Soil Cleanup Guidance -

Appendix H – NYSDEC Technical Field Guidance: Spill Reporting and Initial Notification Requirements

TECHNICAL

FIELD GUIDANCE

SPILL REPORTING AND INITIAL NOTIFICATION REQUIREMENTS

NOTES

Spill Reporting and Initial Notification Requirements

GUIDANCE SUMMARY AT-A-GLANCE

- Reporting spills is a crucial first step in the response process.
- You should understand the spill reporting requirements to be able to inform the spillers of their responsibilities.
- Several different state, local, and federal laws and regulations require spillers to report petroleum and hazardous materials spills.
- The state and federal reporting requirements are summarized in Exhibit 1.1-1.
- Petroleum spills must be reported to DEC unless they meet all of the following criteria:
  - The spill is known to be less than 5 gallons; and
  - The spill is contained and under the control of the spiller; and
  - The spill has not and will not reach the State's water or any land; and
  - The spill is cleaned up within 2 hours of discovery.

  All reportable petroleum spills and most hazardous materials spills must be reported to DEC hotline (1-800-457-7362) within New York State; and (1-518 457-7362) from outside New York State. For spills not deemed reportable, it is strongly recommended that the facts concerning the incident be documented by the spiller and a record maintained for one year.
- Inform the spiller to report the spill to other federal or local authorities, if required.
- Report yourself those spills for which you are unable to locate the responsible spiller.
- Make note of other agencies' emergency response telephone numbers in case you require their on-scene assistance, or if the response is their responsibility and not BSPR's.

NOTES

1.1.1 Notification Requirements for Oil Spills and Hazardous Material Spills

Spillers are required under state law and under certain local and federal laws to report spills. These various requirements, summarized in Exhibit 1.1-1, often overlap; that is, a particular spill might be required to be reported under several laws or regulations and to several authorities. Under state law, all petroleum and most hazardous material spills must be reported to DEC Hotline (1-800-457-7362), within New York State, and to 1-518-457-7362 from outside New York State. Prompt reporting by spillers allows for a quick response, which may reduce the likelihood of any adverse impact to human health and the environment. Yo will often have to inform spillers of there responsibilities.

Although the spiller is responsible for reporting spills, other persons with knowledge of a spill, leak, or discharge is required to report the incident (see Appendices A and B). You will often have to inform spillers of their responsibilities. You may also have to report spills yourself in situations where the spiller is not known or cannot be located. However, it is the legal responsibility of the spiller to report spills to both state and other authorities.

BSPR personnel also are responsible for notifying other response agencies when the expertise or assistance of other agencies is needed. For example, the local fire department should be notified of spills that pose a potential explosion and/or fire hazard. If such a hazard is detected and the fire department has not been notified, call for their assistance immediately. Fire departments are trained and equipped to respond to these situations; you should not proceed with your response until the fire/safety hazard is eliminated. For more information on interagency coordination in emergency situations see Part 1, Section 3, Emergency Response.

Another important responsibility is notifying health department officials when a drinking water supply is found to be contaminated as a result of a spill. It will be the health department's responsibility to advise you on the health risk associated with any contamination.

Exhibits 1.1-1 and 1.1-2 list the state and federal requirements to report petroleum and hazardous substance spills, respectively. The charts describe the type of material covered, the applicable act or regulation, the agency that must be notified, what must be reported, and the person responsible for reporting. New York state also has a emergency notification network for spill situations (e.g., major chemical releases) that escalate beyond the capabilities of local and regional response agencies/authorities to provide adequate response. The New York State Emergency Management Office (SEMO) coordinates emergency response activities among local, state, and federal government organizations in these cases.

Exhibit 1.1-1

State and Federal Reporting Requirements for Petroleum Spills, Leaks, and Discharges

Materials Covered	Act or Regulation	Agency to Notify	What Must Be Reported and When	Who Must Report
Petroleum from any source	Navigation Law Article 12; 17 NYCRR 32.3 and 32.4	DEC Hotline 1-800-457-7362	The notification of a discharge must be immediate, but in no case later than two hours after discharge. 1. Name of person making report and his relationship to any person which might be responsible for causing the discharge. 2. Time and date of discharge. 3. Probable source of discharge. 4. The location of the discharge, both geographic and with respect to bodies of water. 5. Type of petroleum discharges. 6. Possible health or fire hazards resulting from the discharge. 7. Amount of petroleum discharged. 8. All actions that are being taken to clean up and remove the discharge. 9. The personnel presently on the scene. 10. Other government agencies that have been or will be notified.	Any person causing discharge of petroleum. Owner or person in actual or constructive control must notify DEC unless that person has adequate assurance that such notice has already been given.
All aboveground petroleum and underground storage facilities with a combined storage capacity of over 1100 gallons.	ECL §17-1007; 6 NYCRR §613.8	DEC Hotline 1-800-457-7362	1. Report spill incident within two hours of discovery. 2. Also when results of any inventory, record, test, or inspection shows a facility is leaking, that fact must be reported within two hours of discovery.	Any person with knowledge of a spill, leak, or discharge.
Petroleum contaminated with PCB.	Chemical Bulk Storage Act 6 NYCRR Parts 595, 596, 597	DEC Hotline 1-800-457-7362	Releases of a reportable quantity of PCB oil.	Owner or person in actual or constructive possession or control of the substance, or a person in contractual relationship, who inspects, tests, or repairs for owner.

Exhibit 1.1-1

State and Federal Reporting Requirements for Petroleum Spills, Leaks, and Discharges (continued)

Materials Covered	Act or Regulation	Agency to Notify	What Must Be Reported and When	Who Must Report
Any liquid (petroleum included) that if released would be likely to pollute lands or waters of the state.	ECL §17-1743	DEC Hotline 1-800-457-7362	Immediate notification that a spill, release, or discharge of any amount has occurred. Owner or person in actual or constructive possession or control of more than 1,100 gallons of the liquid.	
Petroleum Discharge in violation of §311(b)(3) of the Clean Water Act	40 CFR §110.10 (Clean Water Act)	1. National Response Center (NRC) 1-800-424-8802. 2. If not possible to notify NRC, notify Coast Guard or predesignated on-scene coordinator. 3. If not possible to notify either 1 or 2, reports may be made immediately to nearest Coast Guard units, provided NRC notified as soon as possible.	Immediate notification as soon as there is knowledge of an oil discharge that violates water quality standards or causes sheen on navigable waters. Procedures for notice are set forth in 33 CFR Part 153, Subpart B, and in the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300, Subpart E.	Person in charge of vessel or on-shore or off-shore facility.
Petroleum, petroleum by-products or other dangerous liquid commodities that may create a hazardous or toxic condition spilled into navigable waters.	33 CFR 126.29 (Ports and Waters Safety Act)	Captain of the Port or District Commander	As soon as discharge occurs, owner or master of vessel must immediately report that a discharge has occurred.	Owner or master of vessel or owner or operator of the facility at which the discharge occurred.

Exhibit 1.1-1

State and Federal Reporting Requirements for Petroleum Spills, Leaks, and Discharges (continued)

Materials Covered	Act or Regulation	Agency to Notify	What Must Be Reported and When	Who Must Report
Petroleum or hazardous substance from a vessel, on-shore or off-shore facility in violation of §311(b)(3) of the Clean Water Act.	33 CFR 153.203 (Clean Water Act)	1. NRC U.S. Coast Guard, 2100 Second Street, SW, Washington, DC 20593; 1-800-424-8802. 2. Where direct reporting not practicable, reports may be made to the Coast Guard (District Offices), the 3rd and 9th district of the EPA regional office at 26 Federal Plaza, NY, NY 10278; 1-201-548-8730. 3. Where none of the above is possible, may contact nearest Coast Guard unit, provided NRC notified as soon as possible.	Any discharger shall immediately notify the NRC of such discharge.	Person in charge of vessel or facility.

Exhibit 1.1-2

State and Federal Reporting Requirements for Hazardous Substance Spills, Leaks, and Discharges

Materials Covered	Act or Regulation	Agency to Notify	What Must Be Reported and When	Who Must Report
Any hazardous substance pursuant to Article 37. Does not include petroleum.	Chemical Bulk Storage Act 6 NYCRR Parts 595, 596, 597; ECL 40-0113(d)	DEC Hotline 1-800-457-7362	Releases of a reportable quantity of a hazardous substance.	Owner or person in actual or constructive possession or control of the substance, or a person in contractual relationship, who inspects, tests, or repairs for owner.
Hazardous materials or substances as defined in 49 CFR §171.8 that are transported. (See federal reporting requirements.)	Transportation Law 14(f); 17 NYCRR 507.4(b)	Local fire department or police department or local municipality	Immediate notification must be given of incident in which any of the following occurs as a direct result of a spill of hazardous materials: 1. Person is killed. 2. Person receives injuries requiring hospitalization. 3. Estimated damage to carrier or other property exceeds $50,000. 4. Fire, breakage, spillage, or suspected contamination due to radioactive materials. 5. Fire, breakage, spillage, or suspected contamination involving etiologic agents. 6. Situation is such that, in the judgment of the carrier, a continuing danger to life or property exists at the scene of the incident.	All persons and carriers engaged in the transportation of hazardous materials.

Exhibit 1.1-2
State and Federal Reporting Requirements for Hazardous Substance Spills, Leaks, and Discharges
(continued)

Materials Covered	Act or Regulation	Agency to Notify	What Must Be Reported and When	Who Must Report
Hazardous materials (wastes included) that are transported, whose carrier is involved in an accident.	Department of Transportation Regulations 49 CFR 171.15; 17 NYCRR Part 924; 17 NYCRR Part 507	1. U.S. Department of Transportation 1-800-424-8802 2. DEC Hotline 1-800-457-7362 3. Rail Carrier <u>On-Duty</u> 518-457-1046 <u>Off-Duty</u> 518-457-6164 4. Notify local police or fire department.	Notice should be given by telephone at the earliest practicable moment and should include: 1. Name of reporter. 2. Name and address of carrier represented by reporter. 3. Phone number where reporter can be contacted. 4. Date, time, and location of incident. 5. The extent of injuries, if any. 6. Classification, name and quantity of hazardous materials involved, if available. 7. Type of incident and nature of hazardous material involved and whether a continuing danger to life exists at scene. 8. Each carrier making this report must also make the report required by §171.16.	Each carrier that transports hazardous materials involves in an accident that causes any of the following as a direct result: 1. A person is killed 2. A person receives injuries requiring hospitalization 3. Estimated damage to carrier or other property exceeds $50,000 4. Fire, breakage, spillage, suspected or otherwise involving radioactive material. 5. Fire, breakage, spillage, suspected contamination involving etiologic agents. 6. Situation is such that carrier thinks it should be reported in accordance with paragraph b.

Exhibit 1.1-2
State and Federal Reporting Requirements for Hazardous Substance Spills, Leaks, and Discharges
(continued)

Materials Covered	Act or Regulation	Agency to Notify	What Must Be Reported and When	Who Must Report
Reportable quantity of a hazardous substance into navigable waters or adjoining shorelines. Substances are listed in 40 CFR 302.4.	Department of Transportation Regulations 49 CFR §171.16 as authorized by the Hazardous Materials Transportation Act	U.S. Coast Guard National Response Center (NRC), 1-800-424-8802 or 1-202-267-2675	As soon as person in charge becomes aware of a spill incident, he must notify NRC and provide the following information: 1. The information required by 49 CFR §171.15 (see above). 2. Name of shipper of hazardous substance. 3. Quantity of hazardous substance discharged, if known. 4. If person in charge is incapacitated, carrier shall make the notification. 5. Estimate of quantity of hazardous substance removed from the scene and the manner of disposition of any unremoved hazardous substance shall be entered in Part (H) of the report required by 49 CFR 171.16 (see above).	Person in charge of aircraft, vessel, transport vehicle, or facility. Must inform NRC directly, or indirectly through carrier.
Reportable quantity of a hazardous substance from vessel, on-shore or off-shore facility. Substances and requirements specified in 40 CFR §117.3.	40 CFR §117.21 as authorized under the FWPCA	NRC 1-800-424-8802. If not practicable report may be made to the Coast Guard (3rd or 9th Districts) District Offices or to EPA, designated On-Scene Coordinator, Region II, 26 Federal Plaza, NY, NY 10278; 1-201-548-8730	Immediate notification is required.	Person in charge of vessel, or on-shore or off-shore facility

Exhibit 1.1-2
State and Federal Reporting Requirements for Hazardous Substance Spills, Leaks, and Discharges
(continued)

Materials Covered	Act or Regulation	Agency to Notify	What Must Be Reported and When	Who Must Report
Facilities where a hazardous chemical is produced, used, or stored, and there is a reportable quantity of any extremely hazardous substance as set out in Appendix A to 40 CFR 355 or a CERCLA hazardous substance as specified in 40 CFR 302.4. (This section does not apply to a release that does not go beyond the facility, that emanates from a facility that is federally permitted, is continuous as defined under §103(f) of CERCLA or to any release exempt from CERCLA §103(a) reporting under §101(22) of CERCLA.)	40 CFR 355.40 (SARA) Releases of CERCLA Hazardous Substances are subject to release reporting requirements of CERCLA §103, codified at 40 CFR Part 302, in addition to being subject to the requirements of this Part.	Community emergency coordinator for the local emergency planning committee of any area likely to be affected and the State Emergency Response Commission of any state likely to be affected by the release. If there is no local emergency planning commission notification shall be made to relevant local emergency response personnel.	Immediately notify agencies at left and provide the following information when available: 1. Chemical name or identity of any substance involved in the release. 2. Indication of whether the substance is an extremely hazardous substance. 3. An estimate of the quantity released. 4. Time and duration of release. 5. Medium or media into which the release occurred. 6. Known health risks associated with emergency and where appropriate advice regarding medical attention for those exposed. 7. Proper precautions/actions that should be taken, including evacuation. 8. Names and telephone numbers of person to be contacted for further information. As soon as practicable after release, followup notification by providing the following information: 1. Actions taken to respond to and contain the release. 2. Health risks. 3. Advice on medical attention for exposed individuals.	Owner or operator of facility

Exhibit 1.1-2
State and Federal Reporting Requirements for Hazardous Substance Spills, Leaks, and Discharges
(continued)

Materials Covered	Act or Regulation	Agency to Notify	What Must Be Reported and When	Who Must Report
Hazardous liquids transported in pipelines, a release of which results in any circumstances as set out in 195.50(a) through (f). Also any incident that results in circumstances listed in 195.52(g).	49 CFR 195.50, 195.52 and 195.54 (Hazardous Liquid Pipeline Safety Act).	NRC, 1-800-424-8802	Notice must be given at the earliest practicable moment and the following information provided: 1. Name and address of the operator. 2. Name and telephone number of the reporter. 3. Location of the failure. 4. The time of the failure. 5. The fatalities and personal injuries, if any. 6. All other significant facts known by the operator that are relevant to the cause of the failure or extent of the damages.	Operator of system.
Hazardous wastes in transport	40 CFR §263.30(a) (RCRA)	1. Local authorities 2. If required by 49 CFR 171.15, notify the NRC at 1-800-424-8802 or 1-202-426-2675 3. Report in writing to Director of Hazardous Materials Regulations, Materials Transportation Bureau, Department of Transportation, Washington, DC 20590	Notification must be immediate. For discharge of hazardous waste by air, rail, highway, or water, the transporter must: 1. Give notice as in 49 CFR 161.15 (if applicable). 2. Report in writing as in 49 CFR 171.16. Wastes transporter (bulk shipment) must give same notice as required by 33 CFR 153.20.	Transporter by air, rail, highway, or water.

Exhibit 1.1-2
State and Federal Reporting Requirements for Hazardous Substance Spills, Leaks, and Discharges
(continued)

Materials Covered	Act or Regulation	Agency to Notify	What Must Be Reported and When	Who Must Report
Vinyl Chloride from any manual vent valve, or polyvinyl chloride plants	Clean Air Act 40 CFR 61.64	Administrator of EPA	Within 10 days of any discharge from any manual vent valve, report must be made, in writing, and the following information provided: 1. Source, nature and cause of the discharge 2. Date and time of the discharge 3. Approximate total vinyl chloride loss during discharge 4. Method used for determining loss 5. Action taken to prevent the discharge 6. Measures adopted to prevent future discharges.	Owner or operator of plant.
Radioactive Materials	6 NYCRR §380.7	Commissioner of DEC	1. Notify immediately by telephone when concentration, averaged over a 24-hour period, exceeds or threatens to exceed 5000 times the limits set forth in Schedule 2 of 380.9 (in uncontrolled areas). 2. Notify within 24 hours by telephone when concentration, averaged over 24- hour period, exceeds or threatens to exceed 500 times the limits set forth in Schedule 2 above (in uncontrolled areas). 3. Report within 30 days the concentration and quantity of radioactive material involved, the cause of the discharge, and corrective steps taken or planned to ensure no recurrence of the discharge.	Operator of the radiation installation.

Exhibit 1.1-2
State and Federal Reporting Requirements for Hazardous Substance Spills, Leaks, and Discharges
(continued)

Materials Covered	Act or Regulation	Agency to Notify	What Must Be Reported and When	Who Must Report
Low Level radioactive wastes in transport. Any suspected or actual uncontrolled releases.	6 NYCRR 381.16 ECL §27-0305 Waste Transporter Permits	DEC and Department of Health	Immediate notification.	Transporter

TECHNICAL

FIELD GUIDANCE

SPILL REPORTING AND INITIAL NOTIFICATION
ENFORCEMENT OF SPILLER RESPONSIBILITY

NOTES

Spill Reporting and Initial Notification -
Enforcement of Spiller Responsibility

GUIDANCE SUMMARY-AT-A-GLANCE

Use the "Notification Procedures Checklist" (Exhibit 1.1-3) to document conversations with the responsible party or potentially responsible party (PRP/RP) concerning his or her clean-up responsibilities.

The steps to follow when you inform the PRP/RP of his or her legal responsibility are:

-- Give your name and identify yourself as a DEC employee;

-- Inform them that they have been identified as the party responsible for the spill;

-- Inform PRP/Rps of their liability for all clean-up and removal costs. (If necessary, cite Section 181 of the Navigation Law);

-- Ask PRP/Rps "point blank" if they will accept responsibility for the cleanup; and

-- If the PRP/RP does not accept responsibility, or does not admit to being the PRP/RP, inform him or her that DEC will conduct the cleanup and send the bill to whoever is the PRP/RP. Also inform them that a DEC-conducted cleanup could be more costly than a PRP/RP-conducted cleanup, and that the PRP/RP could face interest charges and penalties for refusing to clean up the spill.

If the PRP/RP accepts responsibility for the cleanup:

(1) Send the PRP/RP a "Spiller Responsibility Letter" (Exhibit 1.1-5) and an "Acceptance of Financial Responsibility Form" (Exhibit 1.1-6) and

(2) Send the PRP/RP an "Option Letter," which should outline the options available to the PRP/RP to clean up the spill. See Exhibit 1.1-4 for a summary of how and when to use these forms and what they may include.

NOTES

1.1.2 Spill Reporting and Initial Notification - Enforcement of Spiller Responsibility

This section provides guidance on those steps you take to inform responsible parties or potentially responsible parties (PRP/Rps) or spillers of their responsibility under state law for cleaning up spills. This guidance applies to all contacts (by phone, by mail, or in person) you have with Rps throughout the response process concerning their fulfillment of this legal responsibility. The possible consequences of an RP's refusal or inability to conduct the spill response are also discussed.

1. State Law and Policy

Under Article 12 of the Navigation Law and Article 71 of the Environmental Conservation law (ECL), those parties responsible for a petroleum release are liable for all costs associated with cleaning up the spill as well as third party damages (see Introduction-A for more information). Section 181 of the Navigation Law states:

> *Any person who has discharged petroleum shall be strictly liable, without regard to fault, for all cleanup and removal costs and all direct damages, no matter by whom sustained as defined in this section.*

There are two ways by which PRP/RPs can pay for the costs associated with cleanups. First, the PRP/RP can reimburse the state for site investigation, clean-up, and remediation costs incurred by the State Oil Spill Fund or federal Leaking Underground Storage Tank (LUST) Trust Fund. Second, the PRP/RP can assume full responsibility for the cleanup from the beginning and bear all costs throughout the clean-up process. It is DEC's policy to make every effort to have PRP/RPs pay for cleanups from the outset.[1]

To achieve PRP/RP-directed and PRP/RP-financed cleanups, your responsibilities are to: (1) identify the PRP/RP(s), (2) inform them of their legal responsibilities for the spill, and (3) ensure that they carry out these responsibilities. All investigations of spills and PRP/RPs should be pursued vigorously and without prejudice. Use to your advantage the argument that having the PRP/RP assume responsibility for clean-up costs benefits both DEC and the spiller. It saves DEC the expense of cost-recovery procedures. It also allows the PRP/RP to be more involved in clean-up decisions (e.g., choosing their clean-up contractors) and, more significantly, it usually results in lower clean-up costs. Because the PRP/RP is responsible for all indirect costs incurred if DEC conducts the cleanup, the spiller will pay for the DEC contractor's clean-up work, as well as the supervision costs incurred by DEC, any third-party claims associated with the spill, and any punitive fines levied.

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[1] Spillers are not only responsible for assuming the costs of a cleanup, but also can be subject to a $25,000 per day fine for not paying the clean-up costs (among other violations). The Navigation Law provides for these penalties in Section 192, which states:

> Any person who knowingly gives or causes to be given any false information as a part of, or in response to, any claim made pursuant to this article for cleanup and removal costs, direct or indirect damages resulting from a discharge, or who otherwise violates any of the provisions of this article or any rule promulgated thereunder or who fails to comply with any duty created by this article shall be liable to a penalty of not more than twenty-five thousand dollars for each offense in court of competent jurisdiction. If the violation is of a continuing nature each day during which it continues shall constitute an additional, separate, and distinct offense. (emphasis added)

NOTES

2. Notification Process

Part 1, Section 4, of this manual discusses the process of identifying the PRP/RP as part of the spill investigation for a particular site. Once you identify the PRP/RP, follow the guidance provided below for informing the PRP/RP of his or her responsibilities for spill cleanup. If you are uncertain about who the PRP/RP is, apply the procedures outlined below with all suspected RPs until the responsible party or parties are identified.

a. Informing RPs of Their Responsibility at the Spill Scene

It is important to inform PRP/RPs of their legal responsibility to clean up a spill as soon as possible. When you arrive at a spill site, you should immediately inform the representative of any PRP/RP of their liability under the Navigation Law and the Environmental Conservation Law. In doing so, follow the steps covered in the "Notification Procedures Checklist" (Exhibit 1.1-3).

Document completion of the notification steps, and identify your contact(s).

Although you should be firm and direct in informing the PRP/RP of their responsibility, you should make every attempt to avoid an adversarial relationship with the RP. The full cooperation of the PRP/RP will result in a more efficient and effective cleanup.

b. Informing Spillers of Their Responsibility in Writing

You should send three different letters to the PRP/RP to inform them of their responsibility (see Exhibit 1.1-4, "Notification Forms Summary"). If a site response was initiated and you are able to confirm the spill visually, the "Spiller Responsibility Letter" (Exhibit 1.1-5) along with an "Acceptance of Financial Responsibility Form" (Exhibit 1.1-6) should be sent as soon as possible. In addition, an "Option Letter" that informs the PRP/RP of their possible options for addressing a spill should be sent. These letters should be kept as part of the Corrective Action Plan (CAP) (see Part 1, Section 5, "Corrective Action Plans.")

Exhibit 1.1-3
Notification Procedures Checklist

Completed	Step	Date	Contact(s)
_____	1. Give your name and identify yourself as a DEC employee.		
_____	2. Inform the PRP/RP that he/she has been identified as the party responsible for the spill.		
_____	3. Inform PRP/RPs of their responsibility to pay for all clean-up costs. (As necessary, cite Section 181 of the Navigation Law or Article 71 of the ECL.)		
_____	4. Ask PRP/RPs "point blank" if they will accept responsibility for the cleanup. Response: _____ _____ _____ _____ _____		
_____	5. If the PRP/RP does not accept responsibility, or does not admit to being the spiller, inform him/her that DEC will conduct the cleanup and send the bill to whoever is the spiller.		
_____	6. If the PRP/RP does not accept responsibility also inform him or her that a DEC-conducted cleanup could be more costly than a spiller-conducted cleanup, and that the spiller could face interest charges and a fine for refusing to pay for the billed clean-up costs.		

Exhibit 1-A-4

Notification Forms Summary
(Send Forms by Certified Mail)

Notification Form	When and How to Use	Information to be Included
Spiller Responsibility Letter	Send by certified mail to PRP/RP for confirmed spill.	# Spill location; # Spiller's responsibility under the Navigation Law; # Penalties that can be levied if the spiller does not cooperate; and # Deadline for spiller to begin containment and removal of the spill.
Acceptance of Spiller Responsibility Form	Send by certified mail to PRP/RP for confirmed spill.	# Request for spiller's signature acknowledging his or her acceptance of responsibility for the spill cleanup.
Option Letter	Send by certified mail to PRP/RP for confirmed or suspected release (e.g., failed tightness test).	# Spill number; # Date spill was discovered or reported; # Exact location of the spill; # Authority of Article 12 of the Navigation Act; and # Penalties for noncompliance.

Exhibit 1.1-5

Spiller Responsibility Letter

[Date]

[Addressee]
[Address]

Dear [ ]:

This is to inform you that as a result of investigation by our Department, we consider you responsible for Petroleum Spill Number _____, dated _____, at _____. Under Article 12 of the Navigation Law, Section 192, any person who discharges petroleum without a permit and fails to promptly clean up such prohibited discharge may be subject to a penalty of up to $25,000 a day.

Containment and removal of this spill must be initiated within _____ hours.

Your failure to initiate timely spill cleanup and removal, in addition to the penalty stated above, will result in your being billed for all actual costs incurred by New York State as set forth in Section 181 of the Navigation Law. These costs include cleanup and removal, all direct and indirect damages, including damages incurred by third parties.

Sincerely,

Regional Spill Engineer
Region

Exhibit 1.1-6
Acceptance of Spiller Responsibility Letter

[Date]

SPILL #_____

ACCEPTANCE OF FINANCIAL RESPONSIBILITY

_____, hereby assumes responsibility for containment and
(Name of Company and Person)

cleanup of _____ discharged from_____
(Substance) (Source)

on _____, and recognizes that the determination of the adequacy and propriety of
(Date)

the containment and cleanup operation continues to rest with the New York State

Department of Environmental Conservation On-Scene Coordinator.

_____
(Authorized Signature and Title)

_____
(Name and Title Printed)

_____
(Address of Company)

_____
(Date and Time)

_____
(Witness)

NOTES

The "Spiller Responsibility Letter" informs spillers of their responsibility under the Navigation Law and explains the penalties that can be levied if the spiller does not cooperate. It should be sent to the spiller or suspected spiller as soon as a petroleum spill has been confirmed. The letter notifies the spiller that he or she is required to initiate containment and removal of the spill within a period of time you specify.

There are at least three factors you should consider when specifying a deadline in this letter:

- The size and nature of the spill;

- The proximity of the spill to, or its possible effects on, water supplies (surface or ground water), nearby homes and other structures, and/or sensitive environmental areas; and The possible environmental, safety, and/or human health effects of delaying containment and removal.

The "Acceptance of Spiller Responsibility Form" requires the spiller's signature acknowledging his or her responsibility for containment and cleanup of the spill. This form and the "Spiller Responsibility Letter" should be sent by certified mail.

The "Option Letter" outlines the possible options available to the PRP/RP for cleanup of the spill. The contents of this letter can vary somewhat depending on how the release was discovered (e.g., through a complaint or a failed tightness test), the extent and type of spill, and the policies and procedures of your regional office. There is, however, some information that should appear in every "Option Letter." All "Option Letters" should contain the following: spill number, date the spill was discovered, and exact location of the spill. In addition, the letter should cite the response authority provided DEC by Article 12 of the Navigation Act and describe the penalties for noncompliance.

Each "Option Letter" should outline clearly the options open to the PRP/RP to address the spill and the information you wish submitted, and may also specify certain deadlines for taking action. However, it is up to you to determine the particular options, information requirements, and dates you include in the letter. Depending on the circumstances, you may list in your letter one or several options from which the PRP/RP can choose. For example, when an UST fails an initial tank test the following options could be included:

- Conduct separate integrity tests on the piping and the tanks in order to verify the release source within the tank system.

- Remove the "non-tight" tank and either remove and dispose of all contaminated soils, or install monitoring wells.

NOTES

- Install monitoring wells and abandon the "non-tight" tank in-place.

- Remove the tank within 30 days, according to the requirements for tank removal (outline these requirements in the letter).

The "Option Letter" should always be sent by certified mail. In addition, you should have the PRP/RP inform you as soon as possible about the option(s) he or she has chosen.

Several examples of possible "Option Letters" are included as Exhibits 1.1-7 through 1.1-12. These are provided as examples only; you should use "Option Letters" developed by your own office, or develop your own.

Exhibit 1.1-7 is a sample option letter to an PRP/RP for removal of contaminated soil from an UST release. Note that this option letter includes: (a) specific requirements for removal of the contaminated soil; (b) dates for when the removal must be completed, and (c) requirements for the PRP/RP to forward to DEC copies of the landfill disposal receipt and ample test results. The additional sample option letters apply to the following situations: when an UST has failed an initial tightness test (Exhibit 1.1-8), when an UST fails an isolation tank test (Exhibit 1.1-9), when an UST fails a Petro-tite Systems Test (Exhibit 1.1-10), and ground-water contamination cleanup (Exhibit 1.1-11).

3. Dealing with Uncooperative Spillers

There are generally two ways in which an PRP/RP may fail to fulfill his or her legal responsibilities for spill cleanup: (1) a PRP/RP may refuse from the beginning to accept responsibility, or (2) an PRP/RP may fail to conduct a cleanup in the manner, or in as timely a fashion, as agreed upon with the DEC. If a PRP/RP refuses to cooperate from the outset, try again to change the RP's mind. Send additional notices of spiller responsibility (Exhibit 1.1-12) and/or initiate phone conversations with PRP/RPs to inform them again of the consequences of not cooperating (i.e., higher clean-up costs and possible penalties). If a party claims not to be the PRP/RP, you should inform them of your reasons for believing they are the PRP/RP under the Navigation Law.

If a PRP/RP agrees to conduct and pay for the cleanup and then does not proceed in the manner agreed upon or as quickly as agreed upon, you should inform the PRP/RP immediately that you are dissatisfied with the progress of the cleanup and that DEC is considering taking it over. There are no hard-and-fast rules for deciding when you should take over a cleanup. If possible, you should always work toward having the PRP/RP continue the cleanup in the agreed-upon manner. Attempt to determine why the cleanup is not proceeding as planned and consider means of helping the PRP/RP-directed cleanup get back on track.

Exhibit 1.1-7

Sample Option Letter:
Soil Cleanup Spill

[Date]

[Addressee]
[Address]

Dear [ ]:

This letter is to confirm your - (site meeting) (telephone conversation) with _____ of this Department on _____,
(Name) (day) (date) (year)
in regards to the above-mentioned spill site. This site involves _____
(explanation)
The following items were discussed and agreed upon:

1. All contaminated material must be removed and stored on site until it can be properly disposed of at a properly permitted landfill.

2. All contaminated material must be sampled for _____ _____. The results must be
(analyses)
negative for the material to be considered non-hazardous oily debris. You must contact your selected sanitary landfill to verify the sample analyses that they require for disposal.

3. A hauler with a Part 364 permit must be used to haul the contaminated soil to your selected landfill.

4. Please notify this Department after the work is completed but prior to any backfilling of the spill area so that an inspection of the excavation may be made.

5. Please forward to us a copy of the landfill disposal receipt and the sample results.

A schedule for this work is required by _____.
(day) (date) (year)
Cleanup must be performed by no later than _____.
(day) (date) (year)

If you have any questions, please feel free to contact _____
(Name)
at 847-4590. Your cooperation will be appreciated.

Very truly yours,

Senior Sanitary Engineer

Exhibit 1.1-8

Sample Option Letter:
Initial Tank Failure

[Date]

[Addressee]
[Address]

Dear [ ]:

This Department received notification on _____ that (a)
(day) (date) (year)
_____ tank(s) failed its (their) tank test performed by
(gallons) (product stored)
_____. On _____, Mr._____ of this Department
(contractor) (date) (name)
discussed with _____ that one of the following options must be done concerning this tank.
(person)

OPTION 1:

1. The tank is to be immediately isolated from the piping and is to be retested. If the tank tests tight, it may remain in service.
2. The lines are to be repaired, if necessary, and retested by a state-approved method. Exposed piping may be air tested.
3. A copy of any test results are to be sent to this office.

OPTION 2: If the tank fails the retest, or if you decide not to retest, the following must now be done:

1. All product must be immediately removed from the tank.
2. The tank itself must be removed within thirty days. A Petroleum Bulk Storage form must be submitted to this Department prior to tank removal.
3. The interior surface of the tank must be cleaned, and all sludge and residue generated by this process must be properly disposed. The tank must be cut open to allow for this work and to ensure proper ventilation of the tank interior.
4. All safety precautions regarding the opening, cleaning and entering of the tank must be followed. The interior atmosphere of the tank may be explosive and proper procedures must be followed.
5. Once the tank has been cleaned out, it may be disposed as scrap.

Mr._____ must be notified when you have a firm date for retesting or removal. Please note, we must be present when this tank is removed to determine if any groundwater or soil contamination exists. If groundwater or soil contamination is found, further remedial work will be required.

If you have any questions, please contact_____ at 847-4590. Your cooperation will be appreciated.

Sincerely,

[ ]

Exhibit 1.1-9

Sample Option Letter:
Retest Failure, Tank Removal

[Date]

[Addressee]
[Address]

Dear [ ]:

On_____, a _____gallon _____, underground store storage tank at the
(day) (date) (year) (#) (material)
above-mentioned address failed a system tank test. On_____, this tank failed an isolation tank test.
(day) (date) (year)

Since the tank failed the retest, the following must now be done:

1. All product must be immediately removed from the tank.

2. The tank itself must be removed within thirty days. A Petroleum Bulk Storage form (enclosed) must be submitted to this Department prior to tank removal.

3. The interior surface of the tank must be cleaned, and all sludge and residue generated by this process must be properly disposed. The tank must be cut open to allow for this work and to ensure proper ventilation of the tank interior.

4. All safety precautions regarding the opening, cleaning and entering of the tank must be followed. The interior atmosphere of the tank may be explosive and proper procedures must be followed.

5. Once the tank has been cleaned out, it may be disposed as scrap.

_____of this Department must be notified when you have a firm
(Name)
date for removal. We must be present when this tank is removed to determine if any groundwater or soil contamination exists. If groundwater or soil contamination is found, further remedial work will be required.

For your use, enclosed is a list of contractors that are known by this Department to do this type of work. This list is by no means complete. Any contractor may be used by you for this work.

If you have any questions, please feel free to call _____at 847-4590.
(Name)
Your cooperation will be appreciated.

Sincerely,

[ ]

Exhibit 1.1-10

Sample Option Letter:
Failed Tank Test

[Date]

CERTIFIED - RETURN RECEIPT REQUESTED

[Addressee]
[Address]

RE: Spill No.

Gentlemen:

This office has been informed by (Name) that (tank) failed a Petrotite systems test. In accordance with Article 12 of the New York State Navigation Law, I must determine if there has been any harm to the lands or the groundwater of the State. In order for me to make this determination, you have three options:

1. Prove that it was not a leaking tank by removing all the piping from the tank and separately Petrotite test the tank. If the tank passes the Petrotite test, it is a piping leak. The tank may then be abandoned or the piping can be repaired, attached to the tank, and the system Petrotite tested.

2. Excavate and remove the tank in the presence of a representative from this office so that an inspection of the tank and the soil can be made. If the tank is sound, and there is no evidence of product loss, nothing further need be done. If there is a problem, proceed as in 3 below.

3. Abandon the tank in-place and install several four (4) inch diameter PVC site wells extending five (5) feet into the groundwater with a screen length of ten (10) feet, with slot size of .020 inches. The exact location and number of wells will be determined by a representative from this office. These wells will be checked for a period of twelve months by New York State, and if there is no evidence of product for that period, the spill will be removed from our listing. If free or dissolved product appears, cleanup must begin immediately.

If cleanup does not begin by (Date) by the responsible party, the State will begin the cleanup and bill the responsible party.

Sincerely,

[ ]

Exhibit 1.1-11

Sample Option Letter:
Ground-water Cleanup

[Date]

[Addressee]
[Address]

Dear [ ]:

This letter is to confirm your (site meeting) (telephone conversation) with (Name) of this Department on (day) (date) (year) . Groundwater at this spill site is contaminated with (free floating oil) (dissolved oil components). The following items were discussed and agreed upon:

1. (#) additional four-inch monitoring wells will be installed at the agreed upon locations. A sketch of a typical monitoring well is enclosed for your use.

2. One recovery well will be installed to recover oil product. Groundwater must be pumped to depress the groundwater table. The groundwater must be pumped to an oil-water separator tank. Accumulated oil may be recovered from the well by bailing or by a second pump. A second type of recovery well pumps both oil and water to a separator tank. Oil from the tank is then recovered. You should check with your contractor to determine the best method for the recovery well. Groundwater must be pumped to depress the groundwater table.

3. The discharge water must be sampled for (Contaminates) . Dependent upon the sampling results, it may be discharged with a SPDES permit to (Name) . The water must at all times be sheenless. An air stripper or a carbon filter may be necessary for the discharge water.

4. All collected oil must be properly disposed. Copies of receipts indicating the disposal site must be forwarded to this office.

It was also agreed that these actions be completed by (Date) . Should you have any questions, please do not hesitate to contact (Name) at 847-4590. Your cooperation will be appreciated.

Sincerely,

[ ]

Exhibit 1.1-12

Sample Option Letter:
Soil Disposal, Soil Still On Site

[Date]

[Addressee]
[Address]

Dear [ ]:

A recent inspection by (Name) of this office indicated that the contaminated soil at your facility still remains on site. We are requesting this oil be removed by (day) (date) (year) to an acceptable landfill. Please send a copy of the disposal receipt to this office.

If you cannot remove the soil by that date, please contact this office immediately. If you do not contact this office and the soil still remains on site past (Date) , DEC will have the soil removed from your site. You will then be billed for the costs of removal and disposal as well any relevant penalties.

If you have any questions, please feel free to contact (Name) at 847-4590. Your cooperation will be appreciated.

Very truly yours,

Senior Sanitary Engineer

NOTES

If all efforts to encourage a PRP/RP to continue the cleanup fail, send a certified letter (Exhibit 1.1-13) notifying them that their actions have been unsatisfactory and that DEC will assume responsibility for the cleanup. This letter again informs the PRP/RP of his or her liability for all costs incurred by DEC during its cleanup.

Exhibit 1.1-13

Unsatisfactory Cleanup Notice Letter

[Date]

CERTIFIED MAIL SPILL #

[Addressee]
[Address]

Dear Sir:

My letter of (Date) notified you of New York State's interest in a pollution incident for which you are presently considered responsible.

You are hereby given notice that your actions to remove the pollutant and mitigate its effects have been evaluated as unsatisfactory. Effective (Date), the New York State Department of Environmental Conservation will conduct all cleanup activities under the authority of Article 12 of the Navigation Law. Removal will be effected in accordance with the regulations of the Department of Environmental Conservation. You will be billed for all actual costs incurred by New York State as set forth in Section 181 of the Navigation Law, as well as interest and penalties.

Should you require further information concerning this matter, contact: (Name)
.

Sincerely,

[ ]

Received and Acknowledged

_____ _____ _____

Time Date

TECHNICAL

FIELD GUIDANCE

SPILL REPORTING AND INITIAL NOTIFICATIONS - ACCESS AND RIGHT-OF-ENTRY

NOTES

Spill Reporting and Initial Notifications - Access and Right-of-Entry

GUIDANCE SUMMARY AT-A-GLANCE

- Section 178 of the Navigation Law gives you the authority to enter private property to investigate or clean up a suspected spill.

- In general, you should inform the property owner of your right to enter onto private property and obtain consent from the owner. This consent can be either written or verbal.

- Detailed information and procedures for access and right-of-entry is considered confidential for spill responders. This information is contained in Appendix L, and is marked confidential.

NOTES

1.1.3 Access and Right-of-Entry

This section addresses the right of NYSDEC personnel to enter private property on which a spill has occurred or is suspected, for the purpose of investigating, containing, and/or cleaning up the spill. Detailed information and procedures of access and right-of-entry are considered confidential. Therefore, this information can be found in Appendix L, including your legal rights to enter property and the procedures to follow to ensure that no charges of trespassing are brought against the Department.

1. State Law and Policy

You have the authority, under the Navigation Law, to enter property to investigate or clean up a real or suspected spill. Specifically, Section 178 of the Navigation Law states:

> *The department is hereby authorized to enter and inspect any property or premises for the purpose of inspecting facilities and investigating either actual or suspected sources of discharges or violation of this article or any rule or regulations promulgated pursuant to this article. The department is further authorized to enter on property or premises in order to assist in the cleanup or removal of the discharge. Any information relating to secret processes or methods of manufacture shall be kept confidential.*

In any emergency or non-emergency, you must possess information supporting a reasonable belief to suspect that a spill has occurred or is occurring, or that the spill is impacting the premises for which access is sought. A reasonable belief may be based on a report of a spill or visual observation. For example, if a gasoline station operator reports an unexpected loss of product from his underground storage tanks that are located near private household wells, you might want to investigate those wells and check the water.

Although you have the authority to enter the premises, *it is always advisable to obtain the consent of the property owner or his or her agent before entering the property.* This consent can be either written or verbal. Obtaining this consent may help avoid civil or criminal charges for trespass being logged. In cases where the owner/agent is not available or not ascertainable, entry should be made.

Appendix H – NYSDEC CP-51: Soil Cleanup Guidance

CP-51 / Soil Cleanup Guidance

New York State Department of Environmental Conservation

DEC Policy

Issuing Authority: Alexander B. Grannis, Commissioner

Date Issued: October 21, 2010	**Latest Date Revised:**

I. Summary

This policy provides the framework and procedures for the selection of soil cleanup levels appropriate for each of the remedial programs in the New York State Department of Environmental Conservation (DEC) Division of Environmental Remediation (DER). This policy applies to the Inactive Hazardous Waste Disposal Site Remedial Program, known as the State Superfund Program (SSF); Brownfield Cleanup Program (BCP); Voluntary Cleanup Program (VCP); Environmental Restoration Program (ERP); Spill Response Program - Navigation Law (NL) section 176 (SRP); and the Resource Conservation and Recovery Act (RCRA) Corrective Action Program. It replaces *Technical and Administrative Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels* (January 24, 1994); the *Petroleum Site Inactivation and Closure Memorandum* (February 23, 1998); and Sections III and IV of *Spill Technology and Remediation Series (STARS) #1* (August 1992).

This document is used in conjunction with the applicable statutes, regulations and guidance. Site-specific soil cleanup levels, determined in accordance with this guidance, are only applied after:

- the site, or area of concern, is fully investigated to determine the nature and extent of contamination;
- all sources of contamination are addressed consistent with the hierarchy provided in 6 NYCRR 375-1.8(c) or consistent with the RCRA Corrective Action Program (as appropriate);
- groundwater, if contaminated, has been evaluated for appropriate remedial actions consistent with 6 NYCRR 375-1.8(d) or consistent with the RCRA Corrective Action Program (as appropriate); and
- impacts on adjacent residential properties, surface water, aquatic ecological resources are evaluated, as well as indoor air, soil vapor, vapor intrusion and other appropriate media.

II. Policy

It is DEC's policy, consistent with applicable statutes and regulations, that all remedies will be protective of public health and the environment. DEC's preference is that remedial programs, including the selection of soil cleanup levels, be designed such that the performance standard results in the implementation of a permanent remedy resulting in no future land use restrictions. However, some of

DEC's remedial programs are predicated on future site use. Further, it is not always feasible to return to a condition where no restrictions are required.

The procedures set forth herein are intended for the use and guidance of both DEC and remedial parties to provide a uniform and consistent process for the determination of soil cleanup levels. This guidance is not intended to create any substantive or procedural rights, enforceable by any party in administrative or judicial litigation with DEC. DEC reserves the right to act at variance with these procedures to address site-specific circumstances and to change the procedures in this guidance at any time.

Please note that this guidance focuses only on soil cleanup levels. All remedies must be fully protective of public health and the environment and must prevent further off-site migration to the extent feasible, with special emphasis on preventing or minimizing migration onto adjacent residential properties. A remedial party is required to evaluate and investigate, if necessary, all environmental media including soil, groundwater, surface water, sediments, soil vapor, ambient air, and biota. [See 6 NYCRR 375-1.8(a)(6) or RCRA Corrective Action Program (as appropriate)]. This investigation will determine if any of the referenced media are, or may be, impacted by site contamination. Applicable guidance should be consulted for media other than soil.

Nothing contained in this guidance, in itself, forms the basis for changes to previously selected remedies. However, a change in the site remedy may be considered consistent with *DER-2: Making Changes to Selected Remedies* (April 1, 2008). [See Section VI, Related References.] To the extent that a change to a selected remedy at a site in one of DER's remedial programs is necessary as provided in DER-2, as applicable, the Soil Cleanup Objectives (SCOs) may be considered in the evaluation of appropriate changes to the selected remedy. For sites in other programs, applicable regulations and guidance must be used.

III. Purpose and Background

DEC has a number of different remedial programs that were developed over time based on separate and distinct authorities. These programs use different procedures to determine the extent of soil cleanup necessary to satisfy the remedial program goals. The purpose of this document is to set forth how soil cleanup levels are selected for the different programs.

Legislation establishing New York State's Brownfield Cleanup Program (Article 27, Title 14 of the Environmental Conservation Law [ECL]) required DEC, in consultation with the New York State Department of Health (NYSDOH), to develop an approach for the remediation of contamination at brownfield sites. The resulting regulation includes seven sets of SCOs. Four sets provide for the protection of public health for different land uses (residential, restricted residential, commercial, and industrial); two sets provide for the protection of other resources (groundwater and ecological resources); and one set includes SCOs for protection of public health and the environment for all uses (unrestricted use).

With the promulgation of the SCOs, it is necessary to discuss how the SCOs, and soil cleanup levels generally, are arrived at for a specific site. Some key definitions in understanding how cleanup levels for soil are arrived at follow.

Feasible, which means suitable to site conditions, capable of being successfully carried out with available technology, implementable and cost effective [see 6 NYCRR 375-1.2(s)].

Presumptive remedy, which means a technology or technique where experience has shown the remedy to be a proven solution for specific types of sites and/or contaminant classes [See *DER-15: Presumptive/Proven Remedial Technologies* February 27, 2007. Refer to Section VI, Related References.]

Soil cleanup level, which means the concentration of a given contaminant for a specific site that must be achieved under a remedial program for soil. Depending on the regulatory program, a soil cleanup level may be based on the regulation [6 NYCRR 375-6.8(a) or (b)], modified from the regulatory value based on site-specific differences, or based on other information, including background levels or feasibility. Soil cleanup levels may include:

- SCOs promulgated at 6 NYCRR 375-6;
- Supplemental Soil Cleanup Objectives (SSCOs);
- a "totals" approach for a family of contaminants known as Polycyclic Aromatic Hydrocarbons (PAHs);
- Presumptive remedy for Polychlorinated Biphenyls (PCBs); and
- Nuisance Condition.

Soil Cleanup Objective (SCO), which means the chemical concentrations for soil cleanup of individual chemicals contained in 6 NYCRR 375-6.8(a) or (b). The SCOs were developed using the process outlined in the Technical Support Document (TSD). The SCOs and the SSCOs defined below are applicable statewide and do not account for many site-specific considerations which could potentially result in higher levels. Soil concentrations that are higher than the SCOs and SSCOs are not necessarily a health or environmental concern. When an SCO (or SSCO) is exceeded, the degree of public health or environmental concern depends on several factors, including the magnitude of the exceedance, the accuracy of the exposure estimates, other sources of exposure to the contaminant, and the strength and quality of the available toxicological information on the contaminant.

Supplemental Soil Cleanup Objective (SSCO), which means a) an existing soil cleanup level for a contaminant which had been included in former TAGM 4046 and was not included in 6 NYCRR 375-6; b) has been developed using the same process used for development of the SCOs; and c) new cleanup levels for soil developed by the remedial party following the approach detailed in Appendix E of the TSD. The TSD provides information relative to the development of cleanup objectives for soil that are not set forth in 6 NYCRR 375-6. Cleanup objectives that have been established at the direction of DEC or the election of remedial parties are included in Table 1.

Technical Support Document (TSD), which refers to the document dated December 2006 detailing the development of the SCOs that were promulgated in 6 NYCRR 375-6. It provides the technical background and provides a detailed discussion of the considerations for development of the SCOs for the different land uses and exposure pathways. The TSD is available on DEC's website [see Section VI, Related References].

The purpose of this guidance is NOT to focus on media other than soil. Accordingly, the remedial program may require remedial activities to address media other than soil (e.g., groundwater, surface

water, sediment, and vapor). Applicable guidance should be consulted for media other than soil. This guidance is to be used in conjunction with the applicable statutes, regulations and guidance. Site-specific soil cleanup levels, determined in accordance with this guidance, are only applied after:

- the site, or area of concern, is fully investigated to determine the nature and extent of contamination;
- all sources of contamination are addressed consistent with the hierarchy provided in 6 NYCRR 375-1.8(c) or consistent with the RCRA Corrective Action Program (as appropriate);
- groundwater, if contaminated, has been evaluated for appropriate remedial actions consistent with 6 NYCRR 375-1.8(d) or consistent with the RCRA Corrective Action Program (as appropriate); and
- an evaluation of impacts on adjacent residential properties, surface water, aquatic ecological resources, as well as indoor air, soil vapor, vapor intrusion and other appropriate media.

IV. Responsibility

The responsibility for maintaining and updating this policy lies with DER. DEC staff are responsible for implementing this policy, with input (as applicable) from NYSDOH.

V. Procedures

A. General Approaches to the Selection of Soil Cleanup Levels

The determination of soil cleanup levels for a site is dependent on:

1. The regulatory program pursuant to which the site is being addressed;
2. Whether the groundwater beneath or down gradient of the site is, or may become contaminated with site-related contaminants;
3. Whether ecological resources constitute an important component of the environment at or adjacent to a site, and which are, or may be, impacted by site-related contaminants; and
4. Other impacted environmental media such as surface water, sediment, and soil vapor.

After fully evaluating the nature and extent of soil contamination associated with a site, the soil cleanup levels will be based on one, or a combination of, the following four approaches.

Approach 1: **Utilize the Unrestricted Use Soil Cleanup Objectives** [see 6 NYCRR Table 375-6.8(a)]. Under this approach, the soil cleanup levels will be established consistent with the SCOs set forth in 6 NYCRR Table 375-6.8(a). For contaminants of concern which are not included in the rule, DEC may direct development of a soil cleanup level which is protective of public health and the environment without restrictions following the procedure outlined in Appendix E of the TSD. Under this approach, the unrestricted SCOs are applied throughout the soil matrix to the top of bedrock (including the saturated zone).

Approach 2: **Utilize the Restricted Use Soil Cleanup Objectives** [see 6 NYCRR Table 375-6.8(b)]. Under this approach, soil cleanup levels will be established consistent with the SCOs set forth in 6 NYCRR Table 375-6.8(b) selecting the lowest SCO in the categories described in A

through C below. Generally, after source removal, the soil cleanup levels do not need to be achieved to more than 15 feet below ground surface or to the top of bedrock, whichever is shallower.

A. Select the applicable land use category for the protection of public health (residential, restricted residential, commercial or industrial);

B. Determine if the SCOs for the protection of groundwater are applicable (see Section V.D); and

C. Determine if the SCOs for the protection of ecological resources are applicable (see Section V.C).

Approach 3: **Limited Site-Specific Modifications to Soil Cleanup Objectives.** This approach allows for consideration of site-specific information to modify the SCOs promulgated in 6 NYCRR Tables 375-6.8 (a) and (b) following the approach detailed in Appendix E of the TSD. The equations and basic methodology specified for calculating the 6 NYCRR 375-6.8 (a) and (b) values may not be modified under this approach. However, in instances where site-specific parameters were used in the calculation of the SCOs, site data different from the assumptions used to calculate the SCOs may be used to modify the soil cleanup levels for a specific site. These instances are very limited and occur only in certain pathways that are listed below.

- Protection of groundwater pathway
- Particulate inhalation pathway
- Volatile inhalation pathway
- Protection of ecological resources pathway

It should be noted that even if site-specific data modifies these pathways, it may not result in modifying the SCOs because the lowest value from all applicable pathways is used to determine each SCO. The inhalation pathway is very seldom the controlling pathway in the determination of the protection of public health. The specific parameters that can be modified are identified in Appendix E of the TSD (e.g., inhalation dispersion terms, fraction of organic carbon in soil, etc.).

The remedial party should consider the cost of collecting the data necessary to support a request to modify the SCOs with the potential for deriving a higher SCO that provides an appropriate level of protection. The remedial party may be required to submit additional data to support the use of modified SCOs. Once DEC approves one or more modified SCOs, they are applied in the manner described under Approach 2.

Approach 4: **Site-Specific Soil Cleanup Objectives.** Under this approach, the remedial party may propose site-specific cleanup levels or approaches for soil which are protective of public health and the environment based on other information. This approach sets forth a flexible framework to develop soil cleanup levels by allowing the remedial party to conduct a more detailed evaluation of site information in an effort to calculate protective soil cleanup levels or approaches unique to a site. Under this approach, the remedial party may propose a remedy that does not include specific soil cleanup levels (e.g., excavate the top 6 feet in an area extending 75 feet in all directions from boring B12); modify the input parameters used in the SCO calculations; use site data to improve or confirm predictions of exposures to receptors to contaminants of concern; analyze site-specific risks using

risk assessments; use toxicological information available from alternate sources; or consider site background and historic fill. Data supporting these site-specific adjustments or use of alternate methodologies must also be provided to DEC for review and approval to ensure that the resulting soil cleanup levels are protective.

The Approach 4 framework leaves DEC with discretion to determine whether a different approach is appropriate for the site and, if a different approach is to be used, the proper method of implementation. The remedial party should consider the cost of collecting the data necessary to develop site-specific soil cleanup levels (or approaches) with the potential for deriving a soil cleanup level which is higher than a particular SCO and which provides an appropriate level of protection. The remedial party may also be required to submit additional data to support the use of methodologies in the calculation of site-specific soil cleanup levels or to support the proposed approach.

B. Application of Soil Cleanup Levels for the Specific Remedial Programs: Soil cleanup levels are determined on a site-specific basis depending on the program under which the site is being remediated. In some cases (e.g., BCP Track 1 or Track 2), the soil cleanup levels are the SCOs taken directly from 6 NYCRR 375-6. In other cases, soil cleanup levels may be derived from the Part 375 SCOs but modified based on other information. In yet other cases, the soil cleanup levels may have no relationship or connection to the SCOs, but rather be developed in accordance with DEC-approved methodologies or approaches.

1. <u>Inactive Hazardous Waste Disposal Site Remedial Program (State Superfund Program)</u>: The goal of the remedial program for a specific site is to restore that site to pre-disposal conditions, to the extent feasible. The unrestricted use SCOs are considered to be representative of pre-disposal conditions unless an impact to ecological resources has been identified (see 6 NYCRR 375-2.8(b)(2)). However, it must be recognized that achievement of this goal may not be feasible in every case. At a minimum, all remedies must be protective of public health and the environment. The following procedure is used to determine the most feasible remedy.

(a) The remedial party shall evaluate, and if feasible, implement a cleanup utilizing Approach 1 (application of unrestricted SCOs).

(b) Where DEC determines that achieving unrestricted SCOs is not feasible as documented in a feasibility study, the remedial party may evaluate alternatives to remediate the site to the greatest extent feasible (see *DER-10: Technical Guidance for Site Investigation and Remediation*, Chapter 4.3). [See Section VI, Related References.] In this event, the remedial party may propose soil cleanup levels in accordance with any of the general approaches. However, when considering restricted use soil cleanup levels, the remedial party should apply the least restrictive use category feasible. For purposes of this discussion, residential use is the least restrictive use and industrial use is the most restrictive category. This process starts with consideration of residential use, followed by restricted residential use, commercial use, and then industrial use. The evaluation proceeds through the different land uses until a feasible remedy is found. This evaluation is not bound to the SCOs in regulation or SSCOs set forth in this guidance but may result in a site-specific soil cleanup level that is between the SCOs or soil cleanup level for two different land uses (e.g., above the restricted residential SCO and below the commercial SCO).

2. <u>Brownfield Cleanup Program</u> The remedy shall be fully protective of public health and the environment, including, but not limited to, groundwater according to its classification pursuant to ECL 17-0301, drinking water, surface water, air (including indoor air), sensitive populations (including children), and ecological resources (including fish and wildlife). Soil cleanup levels corresponding to the cleanup track under which the site is being remediated are required to be met. The four cleanup tracks are:

<u>Track 1</u>: Cleanups pursuant to this track must achieve unrestricted use of the site. This track requires that the remedial party implement a cleanup utilizing Approach 1. Institutional and engineering controls are allowed only for periods of less than five years (defined as short-term controls) except in the limited instance where a volunteer has conducted remedial activities resulting in a bulk reduction in groundwater contamination to asymptotic levels.

<u>Track 2</u> : Cleanups pursuant to this track may consider the current, intended, or reasonably anticipated future use in determining the appropriate cleanup levels for soil. This track requires that the remedial party implement a cleanup that achieves the SCOs in the tables in 6 NYCRR 375-6.7(b) for the top 15 feet of soil (or bedrock if less than 15 feet). This track follows approach 2. Institutional and engineering controls are allowed for soil (for the top 15 feet of soil or bedrock if less than 15 feet) for less than five years (defined as short-term controls). Institutional and engineering controls which limit site use and the use of onsite groundwater can be used without regard to duration. Track 2 cleanups at restricted residential, commercial or industrial use sites require site management plans to ensure that material removed from the site (post remedial action) is managed appropriately and to ensure that any buffer zone protecting adjacent residential use sites or ecological resources is maintained.

<u>Track 3</u>: Cleanups pursuant to this track may consider the current, intended, or reasonably anticipated use in determining the appropriate cleanup levels for soil. This track requires that the remedial party implement a cleanup utilizing Approach 3 for those SCOs which the remedial party seeks to modify an established SCO. Institutional and engineering controls are allowed for soil (for the top 15 feet of soil or bedrock if less than 15 feet) for less than 5 years (defined as short-term controls). Institutional and engineering controls which limit site use and the use of on-site groundwater can be used without regard to duration. Track 3 cleanups at restricted residential, commercial or industrial use sites require site management plans to ensure that material removed from the site (post remedial action)is managed appropriately and to ensure that any buffer zone protecting adjacent residential use sites or ecological resources is maintained.

<u>Track 4</u>: Cleanups pursuant to this track may consider the current, intended, or reasonably anticipated use in determining the appropriate cleanup levels for soil. This track allows for the development of site-specific soil cleanup levels below the cover system in accordance with Approach 4. Track 4 remedies must address all sources as a component of the remedy. Short- and long-term institutional and engineering controls are allowed to achieve protection of public health and the environment. The remedy under Track 4 must provide a cover system over exposed residual soil contamination. Soils which are not otherwise covered by structures such as buildings, sidewalks or pavement (i.e., exposed surface soils) must be covered with soil that complies with the use-based SCOs in 6 NYCRR Table 375-6.8(b) levels for the top one foot (non-residential uses) or top two feet (restricted residential use).

3. Environmental Restoration Program: The goal of the program for a specific site is to select a remedy that is protective of public health and the environment, including, but not limited to, groundwater according to its classification pursuant to ECL 17-0301, drinking water, surface water and air (including indoor air), sensitive populations (including children) and ecological resources (including fish and wildlife). At a minimum, the remedy selected shall eliminate or mitigate all significant threats to public health and to the environment presented by contaminants disposed at the site through the proper application of scientific and engineering principles. Soil cleanup levels may be developed in accordance with Approaches 1 – 4 without restriction.

4. Voluntary Cleanup Program: The goal of the program for a specific site is to select a remedy that is protective of public health and the environment for the contemplated use. The soil cleanup levels may be developed in accordance with Approaches 1 – 4 without restriction.

5. Petroleum Spill Response Program: The goal of the Petroleum Spill Response Program is to achieve pre-spill conditions [6 NYCRR 611.6(a)(4)]. Remedial activities under this program shall be undertaken relative to the petroleum contamination that was released along with any co-mingled contamination from other sources. The remedial party shall achieve, to the extent feasible, the unrestricted SCOs for petroleum-related contaminants listed in 6 NYCRR Table 375-6.8(a). For petroleum contaminants not included in 6 NYCRR Table 375-6.8(a) (discussed in Section E below), the remedial party shall apply, to the extent feasible, the soil cleanup levels provided in Table 1. For ease of implementation, two lists of petroleum contaminants (Gasoline and Fuel Oil, Tables 2 and 3) are attached. The tables combine the applicable petroleum-related SCOs from 6 NYCRR 375-6.8(a) and the applicable petroleum related SSCOs from Table 1. Where DEC determines that it is not feasible to achieve the soil cleanup levels as set forth in this paragraph, the remedial party may propose soil cleanup levels in accordance with any of the general approaches. However, when considering restricted use soil cleanup levels, the remedial party should apply the least restrictive use category feasible.

For purposes of this discussion, residential use is the least restrictive use, and industrial use is the most restrictive category. This process starts with consideration of residential use, followed by restricted residential use, commercial use, and then industrial use. The evaluation proceeds through the different land uses until a feasible remedy is found. If the protection of groundwater or ecological SCOs apply, the lower of the applicable protection of the public health SCO or the applicable protection of groundwater or ecological SCO should be achieved to the extent feasible. This evaluation is not bound to the SCOs in regulation or the SSCOs set forth in this guidance but may result in a site-specific soil cleanup level that is between the SCOs or soil cleanup level for two different land uses (e.g., above the restricted residential SCO and below the commercial SCO).

6. RCRA Corrective Action Program: The RCRA program was promulgated to regulate facilities that actively manage hazardous waste. DER administers the RCRA Corrective Action Program, with a goal of achieving soil cleanup levels at Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) that eliminate risks to public health and the environment (i.e., clean the site to unrestricted use) or control said risks (i.e., clean the site or unit(s) to the lowest possible soil cleanup objective, regardless of site use), to the extent feasible. This goal takes into account that certain units at the facility may be permitted to manage hazardous waste under New York State's Hazardous Waste Management (HWM) regulations (6 NYCRR Part 373). The requirements of active HWM facilities, as well as the site's history, will be considered when soil cleanup levels are determined. Selected remedies must be protective of public health and the environment. Soil cleanup levels will be selected using the following procedure.

(a) The remedial party shall evaluate, and if feasible, implement a cleanup utilizing Approach 1. Under this approach, the unrestricted SCOs apply to the entire soil matrix to the top of bedrock. For contaminants not listed in 6 NYCRR 375-6, a new or existing SSCO may be used.

(b) If DEC determines that achieving unrestricted SCOs is not feasible, the remedial party may evaluate other alternatives to remediate the site. In this event, the remedial party may propose soil cleanup levels in accordance with any of the general approaches. However, when considering restricted use soil cleanup levels, the remedial party shall apply the use category which is both feasible and least restricted. For purposes of this discussion, residential use is the least restricted category and industrial use is the most restricted category. A soil cleanup level between two different land uses (e.g., residential and restricted residential) may be determined to be feasible, and if selected, must be achieved.

Any soil cleanup levels specified in regulation (i.e., 6 NYCRR 373-2.6(b)-(k) for "regulated units" as defined in 6 NYCRR 373-2.6 (a)(1)(ii)) or in a DEC enforceable document (Part 373 permits, Consent Orders, etc.) shall take precedence over the soil cleanup levels which could be established through use of this document.

C. Determination of Whether Ecological Resources SCOs Apply to a Site: SCOs developed to protect ecological resources (ESCOs) are incorporated in the Unrestricted Use SCO in 6 NYCRR Table 375-6.8(a) and are included as a separate category in 6 NYCRR Table 375-6.8(b). For contaminants of concern which do not have a calculated ESCO in regulation, DEC may direct the remedial party to develop a soil cleanup level which is protective of ecological resources where appropriate, based on the process outlined in Appendix E of the TSD.

The presence of ecological resources and any impact to those resources will be assessed during the remedial investigation. For sites where there is the potential for an ecological resource impact to be present, or where it is likely to be present, an assessment of fish and wildlife resource impacts will be performed. For sites in DER's SSF, BCP, VCP and ERP, the assessment will be performed in accordance with DEC's guidance, *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites*, October, 1994, as described in DER-10, Section 3.10. For sites in the RCRA Corrective Action Program, the assessment will be performed using the above referenced fish and wildlife impact analysis document as guidance, and by consulting with appropriate personnel in DEC's Division of Fish, Wildlife and Marine Resources.

Soil cleanup levels which are protective of ecological resources must be considered and applied, as appropriate, for the upland soils (not sediment) at sites where DEC determines, based on the foregoing analysis, that:

- ecological resources are present, or will be present, under the reasonably anticipated future use of the site, and such resources constitute an important component of the environment at, or adjacent to, the site;

- an impact or threat of impact to the ecological resource has been identified; and

- contaminant concentrations in soil exceed the ESCOs as set forth in 6 NYCRR 375-6.8(b) or the Protection of Ecological Resources SSCOs contained in this document.

Sites or portions thereof that will be covered by buildings, structures or pavement are not subject to the ESCOs. Further, ecological resources do not include pets, livestock, agricultural or horticultural crops, or landscaping in developed areas. (See 6 NYCRR 375-6.6 for more detail.)

D. Determination of Whether Protection of Groundwater SCOs Apply: SCOs developed to protect groundwater are incorporated in the Unrestricted Use SCOs in 6 NYCRR Table 375-6.8(a) and are included as a separate category in 6 NYCRR Table 375-6.8(b). For contaminants of concern which do not have a protection of groundwater SCO, DEC may direct the remedial party to develop a soil cleanup level which is protective of groundwater using the process in Appendix E of the TSD.

1. Except as provided for in (2) below, the protection of groundwater SCOs will be applicable where:

   (i) contamination has been identified in on-site soil by the remedial investigation; and
   (ii) groundwater standards are, or are threatened to be, contravened by the presence of soil contamination at concentrations above the protection of groundwater SCOs.

2. DEC may provide an exception to the applicability of the protection of groundwater SCOs, as set forth in 6 NYCRR 375-6.5(a)(1), when (i), (ii), and (iii) exist and either (iv) or (v) also apply, as described below.

   (i) The groundwater standard contravention is the result of an on-site source which is addressed by the remedial program.
   (ii) An environmental easement or other institutional control will be put in place which provides for a groundwater use restriction.
   (iii) DEC determines that contaminated groundwater at the site:
      (a) is not migrating, nor is likely to migrate, off-site; or
      (b) is migrating, or is likely to migrate, off-site; however, the remedy includes active groundwater management to address off-site migration.
   (iv) DEC determines the groundwater quality will improve over time.
   (v) The groundwater contamination migrating from the site is the result of an off-site source of contamination, and site contaminants are not contributing consequential amounts to the groundwater contamination.

3. In determining whether to provide the exemption set forth in subparagraph 2 above, DEC will consider:

   (i) all of the remedy selection criteria at 6 NYCRR 375-1.8(h) or in the RCRA Corrective Action program;
   (ii) the amount of time that the groundwater will need to be actively managed for the protection of public health and the environment; and
   (iii) the potential impact that groundwater contamination may have on media not specifically addressed by the SCOs (e.g., vapor intrusion, protection of surface water, and protection of aquatic ecological resources).

E. Supplemental Soil Cleanup Objectives: SSCOs are either existing cleanup levels in Table 1 or are new soil cleanup levels developed by the remedial party as part of its remedial program. These SSCOs are in addition to the SCOs that are included in Part 375.

Existing SSCOs: The Table 1 list of SSCOs includes contaminants from former TAGM 4046 that were not included in 6 NYCRR 375-6.8 and soil cleanup levels developed using the process detailed in Appendix E of the TSD but not promulgated. For those contaminants which were part of the former TAGM 4046, soil cleanup levels exist for the protection of public health (based on ingestion) and for the protection of groundwater. In some cases, to be determined on a site-by-site basis, evaluation of other factors is likely needed for the protection of public health, especially when the use of a site includes residential use.

These other factors include other exposure pathways (e.g., homegrown vegetable ingestion, inhalation and dermal contact), potential non-site exposures to the contaminant and current toxicological data on the contaminant. In these instances, DEC (in consultation with NYSDOH) will determine if the additional factors have been adequately addressed. The SSCOs identified in Table 1 (subject to the limitation described above) may be used as if they were included in Part 375. A remedial party is not required to use the SSCOs set forth in Table 1. In lieu of applying an SSCO, the remedial party may elect to develop a soil cleanup level (using the process described in Appendix E of the TSD and discussed below.) Table 1 also includes SSCOs that were developed for some pathways using the same process detailed in the TSD. A remedial party may elect to use those SSCOs directly or confirm that the calculated value for that pathway is correct.

New SSCOs: The remedial party may elect to, or DEC may direct a remedial party to, develop a contaminant-specific SCO for any contaminant not included in 6 NYCRR Tables 375-6.8(a) or (b). Generally, DEC will request that an SCO be developed only where the contaminant is a predominant contaminant of concern (COC) at the site and is not otherwise being addressed to DEC's satisfaction as part of the proposed remedy. This could happen, for example, when a remedial party is seeking a Track 1 cleanup and non-SCO/SSCO contaminants are present and may not be satisfactorily addressed by the remedial activities addressing the SCOs or SSCOs. Guidance on the process for developing new SCOs is provided in Appendix E of the TSD. DEC will include all newly developed soil cleanup levels, developed and approved pursuant to this paragraph in a revised Table 1. The developed SSCO must:

1. be developed utilizing the same methodologies that were used by DEC to develop SCOs that are set forth in Part 375; and

2. apply the maximum acceptable soil concentrations (caps), as set forth in section 9.3 of the TSD.

F. Use of SCOs and SSCOs as a Screening Tool: The SCOs and SSCOs may be used to identify areas of soil contamination and to determine the extent of soil contamination. As noted in Section V.K, consideration of other media is required to determine if remedial action is needed.

1. At sites or areas of concern where contaminant concentrations are equal to or below the unrestricted SCOs in 6 NYCRR Table 375-6.8(a), no action or study is warranted because of soil contamination.

2. The exceedance of one or more applicable SCOs or SSCOs, (which is the lower of protection of public health, protection of groundwater, or protection of ecological resources soil cleanup objectives as described in Section III below), alone does not trigger the need for remedial action, define "unacceptable" levels of contaminants in soil, or indicates that a site qualifies for any DEC remedial program (e.g., BCP, SSF). As noted in the definition of SCO above, SCOs and SSCOs are applicable statewide and do not account for many site-specific considerations which could potentially result in higher levels. Therefore, soil concentrations that are higher than the applicable SCOs or SSCOs are not necessarily health or environmental concerns.

3. When an applicable SCO or SSCO is exceeded, the degree of public health or environmental concern depends on several factors, including:

    - magnitude of the exceedance;
    - accuracy of the exposure estimates;
    - other sources of exposure to the contaminant; and
    - strength and quality of the available toxicological information on the contaminant.

G. Soil Cleanup Levels for Nuisance Conditions: Experience has shown that contaminants in soil that meets the DEC-approved soil cleanup levels can exhibit a distinct odor or other type of nuisance (e.g., staining). This is true even though the contaminants will not leach from the soil (e.g., certain soils with more insoluble substances at higher concentrations). When DEC determines that soil remaining after the remedial action will result in the continuation of a nuisance (e.g., odors, staining, etc), DEC will require that additional remedial measures be evaluated, and may require additional remedial actions be taken to address the nuisance condition.

H. Subsurface Soil Cleanup for Total Polycyclic Aromatic Hydrocarbons: For non-residential use sites (i.e., commercial or industrial use sites) where the ESCOs are not applicable, DEC may approve a remedial program which achieves a soil cleanup level of 500 parts per million (ppm) for total PAHs for all subsurface soil. The 500 ppm soil cleanup level is in lieu of achieving all of the PAH-specific SCOs in 6 NYCRR 375-6. For purposes of this provision, subsurface soil shall mean the soil beneath permanent structures, pavement, or similar cover systems; or at least one foot of soil cover (which must meet the applicable SCOs). Institutional controls (e.g., an environmental easement) along with a site management plan will be required when this soil cleanup level is employed at a site. This cleanup level is determined to be feasible and protective based on DEC's experience in its various remedial programs. This approach has existed in TAGM 4046 since it was first issued in 1992.

I. Soil Cleanup for PCBs: DEC may approve a remedial program which achieves a soil cleanup level for PCBs as set forth herein:

1. **For Non-BCP sites:** An acceptable presumptive remedy for soil where neither the unrestricted SCOs nor the ESCOs are applied in the remedial program may include a soil cleanup level for PCBs of 1 ppm in the surface soils and 10 ppm in subsurface soils.

2. **For BCP sites:** An acceptable presumptive remedy for soil may include a soil cleanup level for PCBs of 1 ppm (the applicable SCO) in the surface soils and 10 ppm in subsurface in limited circumstances as follows:

- cleanup track is Track 4;
- site use will be restricted residential, commercial or industrial; and
- ESCOs do not apply.

3. **At industrial use sites,** a level of 25 ppm for PCBs provided that access is limited and individual occupancy is restricted to less than an average of 6.7 hours per week.

For purposes of this provision, subsurface soil shall mean:

- soil beneath permanent structures, pavement, or similar cover systems;
- soil beneath 1 foot of soil cover for commercial and industrial uses; or
- soil beneath 2 feet of soil cover for residential and restricted residential uses.

Institutional controls (i.e., an environmental easement), along with a site management plan, will be required when this soil cleanup level is employed at a site. As with all presumptive remedies, just because a remedy is presumptive does not mean that it will work at every site. For example, this presumptive remedy for PCBs in soil is not applicable at most landfills. This cleanup level is determined to be feasible and protective based on DEC's experience in its various remedial programs. Further, this approach has existed in TAGM 4046 since it was first issued in 1992.

J. Sampling and Compliance with Soil Cleanup Levels: The number of samples to determine if the SCOs have been achieved should be sufficient to be representative of the area being sampled. See attached Table 4 for suggested sampling frequency and subdivision 5.4(e) of DER-10 for details. This frequency can be used for confirmatory samples or for backfill. It is DEC's goal that all confirmatory samples demonstrate that the remedy has achieved the DEC-approved soil cleanup levels. However, recognizing the heterogeneity of contaminated sites and the uncertainty of sampling and analysis, DEC project manager has limited discretion to determine that remediation is complete where some discrete samples do not meet the soil cleanup levels established for a site. See DER-10 for more information regarding the determination that remediation is complete.

K. Other Considerations: All remedies must be fully protective of public health and the environment and prevent off-site migration to the extent feasible with special emphasis for the prevention or minimization of migration onto adjacent residential properties or into ecological resources. A remedial party is required to investigate all environmental media including soil, groundwater, surface water, sediments, soil vapor, indoor air, and biota. (See 6 NYCRR 375-1.8(a)(6) or RCRA Corrective Action Program). This investigation will determine if any of the referenced media are, or may be, impacted by site contamination. However, the SCOs do not directly address these other media. DEC may require remedial actions to address such media and impacts, including but not limited to the application of lower soil cleanup levels or buffer zones where it determines, based on the investigation, that any of these media are, or may be, impacted by site contamination.

VI. Related References:

- Environmental Conservation Law, Article 27 Titles 3, 5, 9, 13 and 14.

- Article 12 of the Navigation Law, Section 178.

- 6 NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.
- 6 NYCRR Subparts 373-1, 373-2 and 373-3, Requirements for Hazardous Waste Management Facilities. September 6, 2006.
- 6 NYCRR Part 611, Environmental Priorities and Procedures in Petroleum Cleanup and Removal. November 5, 1984 (amended).
- Development of Soil Cleanup Objectives: Technical Support Document. New York State Department of Environmental Conservation. December 14, 2006.
- Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency. Publication 9285.7-081. May 1992.
- New York State Guidelines for Urban Erosion and Sediment Control. 1997.
- Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites. New York State Department of Environmental Conservation. October 1994.
- Program Policy DER-2, *Making Changes to Selected Remedies*. New York State Department of Environmental Conservation. April 1, 2008.
- Program Policy DER-10, *Technical Guidance for Site Investigation and Remediation*. New York State Department of Environmental Conservation. May 3, 2010.
- Program Policy DER-15, *Presumptive/Proven Remedial Technologies*. New York State Department of Environmental Conservation. February 27, 2007.

TABLES

1 - Supplemental Soil Cleanup Objectives
2 - Soil Cleanup Levels for Gasoline Contaminated Soils
3 - Soil Cleanup Levels for Fuel Oil Contaminated Soils
4 - Recommended Number of Soil Samples for Soil Imported to or Exported From a Site

Table 1

Supplemental Soil Cleanup Objectives
(ppm)

Contaminant	CAS Number	Residential	Restricted Residential	Commercial	Industrial	Protection of Ecological Resources	Protection of Ground-water
METALS							
Aluminum	7429-90-5					10,000 [a,b]	
Antimony	7440–36-0					12[c]	
Boron	7440-42-8					0.5	
Calcium	7440-70-2					10,000 [a,b]	
Cobalt	7440-48-4	30				20	
Iron	7439-89-6	2,000					
Lithium	7439-93-2					2	
Molybdenum	7439-98-7					2	
Technetium	7440-26-8					0.2	
Thallium	7440-28-0					5 [c]	
Tin	7440-31-5					50	
Uranium	7440-61-1					5	
Vanadium	7440-62-2	100 [a]				39[b]	
PESTICIDES							
Biphenyl	92-52-4					60	
Chlordecone (Kepone)	143-50-0					0.06	
Dibenzofuran	132-64-9						6.2
2,4-D (2,4-Dichloro-phenoxyacetic acid)	94-75-7	100 [a]					0.5
Furan	110-00-9					600	
Gamma Chlordane	5103-74-2	0.54					14
Heptachlor Epoxide	1024-57-3	0.077					0.02
Methoxychlor	72-43-5	100 [a]				1.2	900

Contaminant	CAS Number	Residential	Restricted Residential	Commercial	Industrial	Protection of Ecological Resources	Protection of Ground-water
Parathion	56-38-2	100 [a]					1.2
2,4,5-T	93-76-5	100 [a]					1.9
2,3,7,8-TCDD	1746-01-6					0.000001	
2,3,7,8-TCDF	51207-31-9					0.000001	
SEMIVOLATILE ORGANIC COMPOUNDS							
Aniline	62-53-3	48	100[a]	500[a]	1000[a]		0.33[b]
Bis(2-ethylhexyl) phthalate	117-81-7	50				239	435
Benzoic Acid	65-85-0	100[a]					2.7
Butylbenzyl-phthalate	85-68-7	100 [a]					122
4-Chloroaniline	106-47-8	100 [a]					0.22
Chloroethane	75-00-3						1.9
2-Chlorophenol	95-57-8	100 [a]				0.8	
3-Chloroaniline	108-42-9					20	
3-Chlorophenol	108-43-0					7	
Di-n-butyl-phthalate	84-74-2	100 [a]				0.014	8.1
2,4-Dichlorophenol	120-83-2	100 [a]				20	0.40
3,4-Dichlorophenol	95-77-2					20	
Diethylphthalate	84-66-2	100 [a]				100	7.1
Di-*n*-hexyl-phthalate	84-75-3					0.91	
2,4-Dinitrophenol	51-28-5	100 [a]				20	0.2
Dimethylphthlate	131-11-3	100 [a]				200	27
Di-n-octylphthlate	117-84-0	100 [a]					120
1,2,3,6,7,8-HCDF	57117-44-9					0.00021	
Hexachloro-benzene	118-74-1	0.41					1.4
2,6-Dinitrotoluene	606-20-2	1.03					1.0
Isophorone	78-59-1	100 [a]					4.4

Contaminant	CAS Number	Residential	Restricted Residential	Commercial	Industrial	Protection of Ecological Resources	Protection of Ground-water
4-methyl-2-pentanone	108-10-1						1.0
2-methyl-naphthalene	91-57-6	0.41					36.4
2-Nitroaniline	88-74-4						0.4
3-Nitroaniline	99-09-2						0.5
Nitrobenzene	98-95-3	3.7	15	69	140	40	0.17[b]
2-Nitrophenol	88-75-5					7	0.3
4-Nitrophenol	100-02-7					7	0.1
Pentachloroaniline	527-20-8					100	
2,3,5,6-Tetrachloroaniline	3481-20-7					20	
2,3,4,5-Tetrachlorophenol	4901-51-3					20	
2,4,5-Trichloroaniline	636-30-6					20	
2,4,5-Trichlorophenol	95-95-4	100 [a]				4	0.1
2,4,6-Trichlorophenol	88-06-2					10	
VOLATILE ORGANIC COMPOUNDS							
2-Butanone	78-93-3	100 [a]					0.3
Carbon Disulfide	75-15-0	100 [a]					2.7
Chloroacetamide	79-07-2					2	
Dibromochloro-methane	124-48-1					10	
2,4-Dichloro aniline	554-00-7					100	
3,4-Dichloroaniline	95-76-1					20	
1,2-Dichloropropane	78-87-5					700	
1,3-Dichloropropane	142-28-9						0.3
2,6-Dinitrotoluene	606-20-2	1.03					0.17[b]
Ethylacetate	141-78-6					48	

Contaminant	CAS Number	Residential	Restricted Residential	Commercial	Industrial	Protection of Ecological Resources	Protection of Ground-water
4-methyl-2-pentanone	108-10-1						1.0
113 Freon (1,1,2- TFE)	76-13-1	100 [a]					6
isopropylbenzene	98-82-8	100 [a]					2.3
p-isopropyltoluene	99-87-6						10
Hexachlorocyclo-pentadiene	77-47-4					10	
Methanol	67-56-1					6.5	
N-nitrosodiphenyl-amine	86-30-6					20	
Pentachloro-benzene	608-93-5					20	
Pentachloronitro-benzene	82-68-8					10	
Styrene	100-42-5					300	
1,2,3,4-Tetrachlorobenzene	634-66-2					10	
1,1,2,2-Tetrachloroethane	79-34-5	35					0.6
1,1,2,2-Tetrachloroethylene	127-18-4					2	
1,2,3-Trichlorobenzene	87-61-6					20	
1,2,4-Trichlorobenzene	120-82-1					20	3.4
1,2,3-Trichloropropane	96-18-4	80					0.34

[a] SCOs for organic contaminants (volatile organic compounds, semivolatile organic compounds, and pesticides) are capped at 100 ppm for residential use, 500 ppm for commercial use, 1000 ppm for industrial use. SCOs for metals are capped at 10,000 ppm.

[b] Based on rural background study

[c] SCO limited by contract required quantitation limit.

Table 2

Soil Cleanup Levels for Gasoline Contaminated Soils

Contaminant	CAS Registry Number	Soil Cleanup Level (ppm)
Benzene	71-43-2	0.06
n-Butylbenzene	104-51-8	12.0
sec-Butylbenzene	135-98-8	11.0
Ethylbenzene	100-41-4	1.0
Isopropylbenzene	98-82-8	2.3
p-Isopropyltoluene	99-87-6	10.0
Methyl-Tert-Butyl-Ether	1634-04-4	0.93
Naphthalene	91-20-3	12.0
n-Propylbenzene	103-65-1	3.9
Tert-Butylbenzene	98-06-6	5.9
Toluene	108-88-3	0.7
1,2,4-Trimethylbenzene	95-63-6	3.6
1,3,5-Trimethylbenzene	108-67-8	8.4
Xylene (Mixed)	1330-20-7	0.26

Table 3

Soil Cleanup Levels for Fuel Oil Contaminated Soil

Contaminant	CAS Registry Number	Soil Cleanup Level (ppm)
Acenaphthene	83-32-9	20
Acenaphthylene	208-96-8	100
Anthracene	120-12-7	100
Benz(a)Anthracene	56-55-3	1.0
Dibenzo(a,h)Anthracene	53-70-3	0.33
Benzene	71-43-2	0.06
n-Butylbenzene	104-51-8	12.0
sec-Butylbenzene	135-98-8	11.0
Tert-Butylbenzene	98-06-6	5.9
Chrysene	218-01-9	1.0
Ethylbenzene	100-41-4	1.0
Fluoranthene	206-44-0	100
Benzo(b)Fluoranthene	205-99-2	1.0
Benzo(k)Fluoranthene	207-08-9	0.8
Fluorene	86-73-7	30
Isopropylbenzene	98-82-8	2.3
p-Isopropyltoluene	99-87-6	10.0
Naphthalene	91-20-3	12.0
n-Propylbenzene	103-65-1	3.9
Benzo(g,h,i)Perylene	191-24-2	100
Phenanthrene	85-01-8	100
Pyrene	129-00-0	100
Benzo(a)Pyrene	50-32-8	1.0
Indeno(1,2,3-cd)Pyrene	193-39-5	0.5
1,2,4-Trimethylbenzene	95-63-6	3.6
1,3,5-Trimethylbenzene	108-67-8	8.4
Toluene	108-88-3	0.7
Xylene (Mixed)	1330-20-7	0.26

Table 4

Recommended Number of Soil Samples for Soil Imported To or Exported From a Site

Contaminant	VOCs[a]	SVOCs, Inorganics & PCBs/Pesticides	
Soil Quantity (cubic yards)	**Discrete Samples**	**Composite**	**Discrete Samples/Composite**
0-50	1	1	Each composite sample for analysis is created from 3-5 discrete samples from representative locations in the fill.
50-100	2	1	
100-200	3	1	
200-300	4	1	
300-400	4	2	
400-500	5	2	
500-800	6	2	
800-1000	7	2	
➢ 1000	Add an additional 2 VOC and 1 composite for each additional 1000 Cubic yards or consult with DER.[b]		

[a] VOC samples cannot be composited. Discrete samples must be taken to maximize the representativeness of the results.

[b] For example, a 3,000 cubic yard soil pile to be sampled and analyzed for VOCs would require 11 discrete representative samples. The same pile to be sampled for SVOCs would require 4 composite samples with each composite sample consisting of 3-5 discrete samples.

Appendix I – Post-Construction Operation and Maintenance (O&M) Manual

Post-Construction Operation and Maintenance Manual: Maintenance Inspection Form

Project Name:	
Inspection Date:	
Inspection Time:	
Inspector's Name:	

Inspection Item	Inspection Frequency	Maintenance Required?	Comments
Swale(s)			
Free of trash, debris, and pollutants?	Monthly		
Erosion and/or sedimentation observed?	Annually		
Spillway is stable and is free of erosion or sedimentation?	Annually		
Channel dewaters between storm events?	Monthly		
Blockage of flow present in the swale, culverts or underdrains?	Monthly		
Vegetation is healthy and sufficient ground cover is observed?	Monthly		
Vegetation is mowed to a minimum height of 8 inches?	Monthly		
Infiltration Facilities			
Facility is functioning properly?	Annually		
Free of trash, debris, and pollutants?	Monthly		
System is draining properly?	Monthly		
Sediment accumulation has reached 2 inches or greater?	Annually		
Vegetation is healthy and sufficient ground cover is observed?	Annually		
Vegetation is mowed to a minimum height of 8 inches?	Annually		
Overflow area is in good condition?	Annually		
Energy Dissipaters (Flow Diffuser)			
Free of trash, debris, and pollutants?	Annually		
Erosion and/or sedimentation observed?	Annually		
Facility is operating properly?	Annually		
Storm Culverts and Drainage Pipes			
Free of trash, debris, and pollutants?	Annually		
Culvert/pipe is free of obstructions and functioning properly?	Annually		
Vegetation at the inlet and outlet is properly maintained?	Annually		
Culvert/pipe is not damaged (cracked, warped, corroded, etc.)?	Annually		

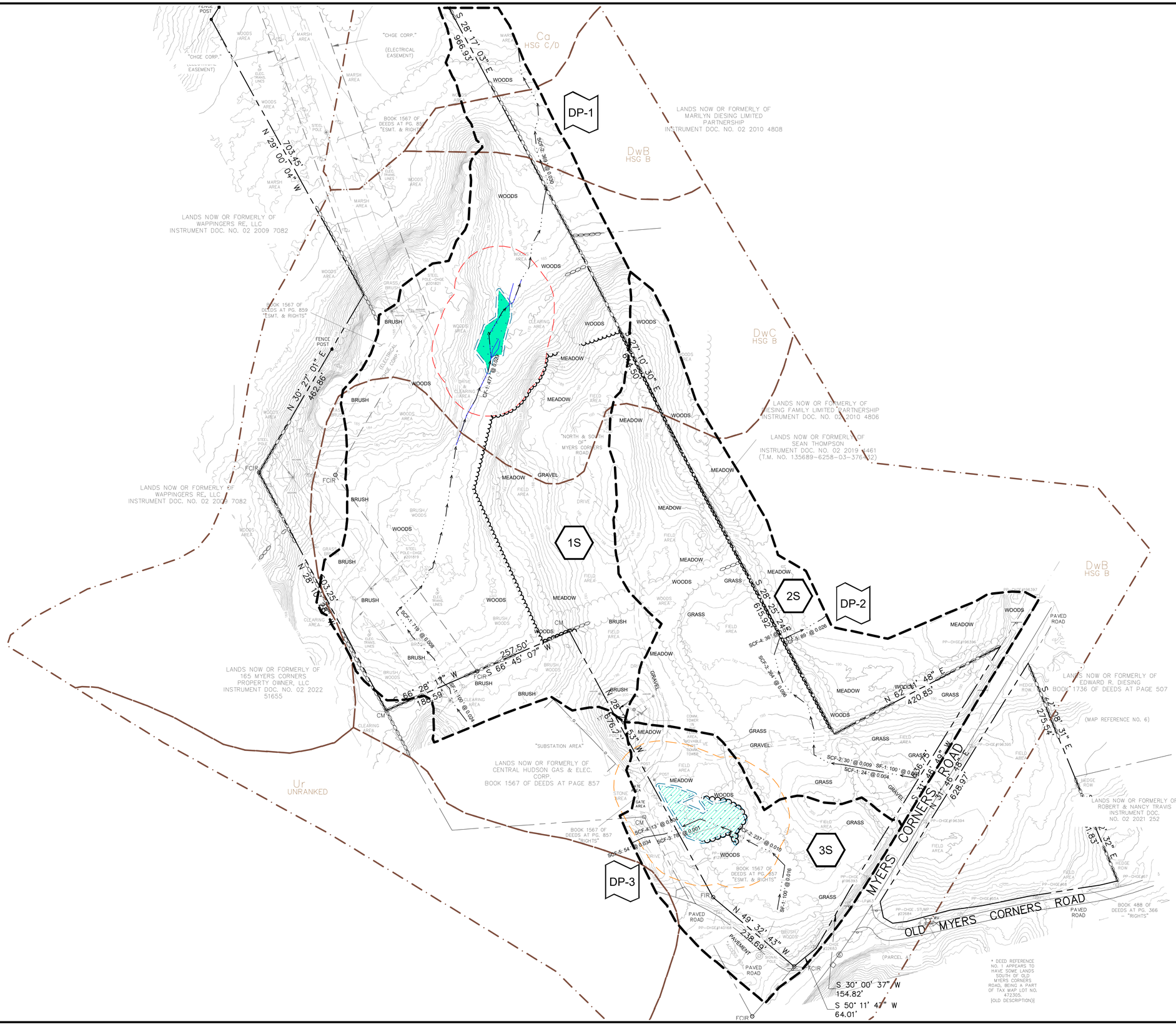
Inspection Item	Inspection Frequency	Maintenance Required?	Comments
25% or more of the culvert/pipe structure has been compromised?	Annually		
End Sections			
Free of trash, debris, and pollutants?	Semi-Annually		
Erosion and/or sedimentation is observed?	Semi-Annually		
Rocks at the outlet have not been displaced or are insufficient?	Semi-Annually		
Vegetation is impeding the flow of stormwater from the structure?	Semi-Annually		
Fences, Gates, and Signage			
Fencing and gates are in working order and are not damaged?	Annually		
Signage is legible and displayed clearly?	Annually		
Vegetation is maintained to not impede gated access or block signage?	Annually		
Access Roads			
Road surface is free of riling?	Annually		
Geo-web/grid is not exposed?	Annually		
Gravel cover is sufficient, and the road has maintained the proper grade?	Annually		
Erosion and/or sedimentation observed?	Annually		
Free of trash, debris, and pollutants?	Annually		
Vegetation is healthy and sufficient ground cover is observed?	Annually		
Vegetation is mowed to a minimum height of 4 inches?	Annually		
Pervious Access Roads			
Road surface is free of riling?	Annually		
Geo-web/grid is not exposed?	Annually		
Gravel cover is sufficient, and the road has maintained the proper grade?	Annually		
Erosion and/or sedimentation observed?	Annually		
Free of trash, debris, and pollutants?	Annually		
Vegetation is healthy and sufficient ground cover is observed?	Annually		
Vegetation is mowed to a minimum height of 4 inches?	Annually		

Appendix J – Pre-Development Modeling

- Pre-Development Subcatchment Map -

- Pre-Development HydroCAD Model -

Appendix J – Pre-Development Subcatchment Map



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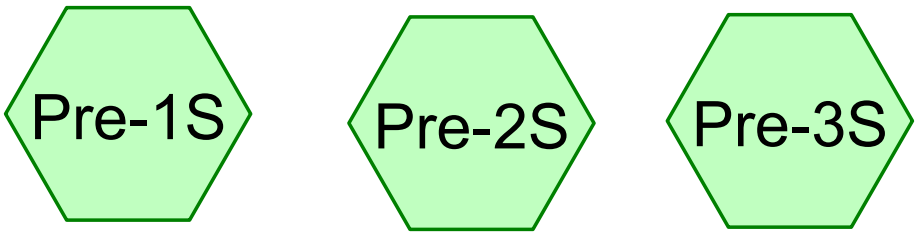
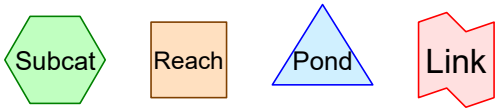
DRAWING NAME: \\auguste-fp1\environmental\RM\env rmd projects\lightstar renewables llc\488729 - old myers solar - wappinger, ny\10-DWG\ 488729 - STORM HYDRO.dwg -- PLOT DATE: February 01, 2023 - 8:27PM -- LAYOUT: SW-100 PRE-DEVELOPMENT SUBCATCHMENT PLAN
Version: 2017-10-21

Appendix J – Pre-Development HydroCAD Model

PRE-DEVELOPMENT





Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 7083 NY Orange

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
21,403	61	>75% Grass cover, Good, HSG B (Pre-1S, Pre-2S, Pre-3S)
517	80	>75% Grass cover, Good, HSG D (Pre-3S)
128,701	48	Brush, Good, HSG B (Pre-1S)
20,187	96	Compacted Gravel (Pre-1S, Pre-2S, Pre-3S)
493,658	58	Meadow, non-grazed, HSG B (Pre-1S, Pre-2S, Pre-3S)
19,298	98	Pavement (Pre-2S, Pre-3S)
473,292	60	Woods, Fair, HSG B (Pre-1S, Pre-2S, Pre-3S)
221,575	55	Woods, Good, HSG B (Pre-1S)
31,838	77	Woods, Good, HSG D (Pre-1S, Pre-3S)
1,410,469	**59**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
1,338,629	HSG B	Pre-1S, Pre-2S, Pre-3S
0	HSG C	
32,355	HSG D	Pre-1S, Pre-3S
39,485	Other	Pre-1S, Pre-2S, Pre-3S
1,410,469		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
0	21,403	0	517	0	21,920	>75% Grass cover, Good	
0	128,701	0	0	0	128,701	Brush, Good	
0	0	0	0	20,187	20,187	Compacted Gravel	
0	493,658	0	0	0	493,658	Meadow, non-grazed	
0	0	0	0	19,298	19,298	Pavement	
0	473,292	0	0	0	473,292	Woods, Fair	
0	221,575	0	31,838	0	253,413	Woods, Good	
0	**1,338,629**	**0**	**32,355**	**39,485**	**1,410,469**	**TOTAL AREA**	

Time span=0.00-120.00 hrs, dt=0.05 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Pre-1S: Runoff Area=738,954 sf 0.00% Impervious Runoff Depth=3.15"
Tc=56.7 min CN=57 Runoff=23.3 cfs 193,681 cf

Subcatchment Pre-2S: Runoff Area=456,333 sf 0.59% Impervious Runoff Depth=3.48"
Tc=36.9 min CN=60 Runoff=20.8 cfs 132,491 cf

Subcatchment Pre-3S: Runoff Area=215,182 sf 7.72% Impervious Runoff Depth=3.94"
Tc=37.9 min CN=64 Runoff=11.0 cfs 70,676 cf

Total Runoff Area = 1,410,469 sf Runoff Volume = 396,849 cf Average Runoff Depth = 3.38"
98.63% Pervious = 1,391,171 sf 1.37% Impervious = 19,298 sf

Summary for Subcatchment Pre-1S:

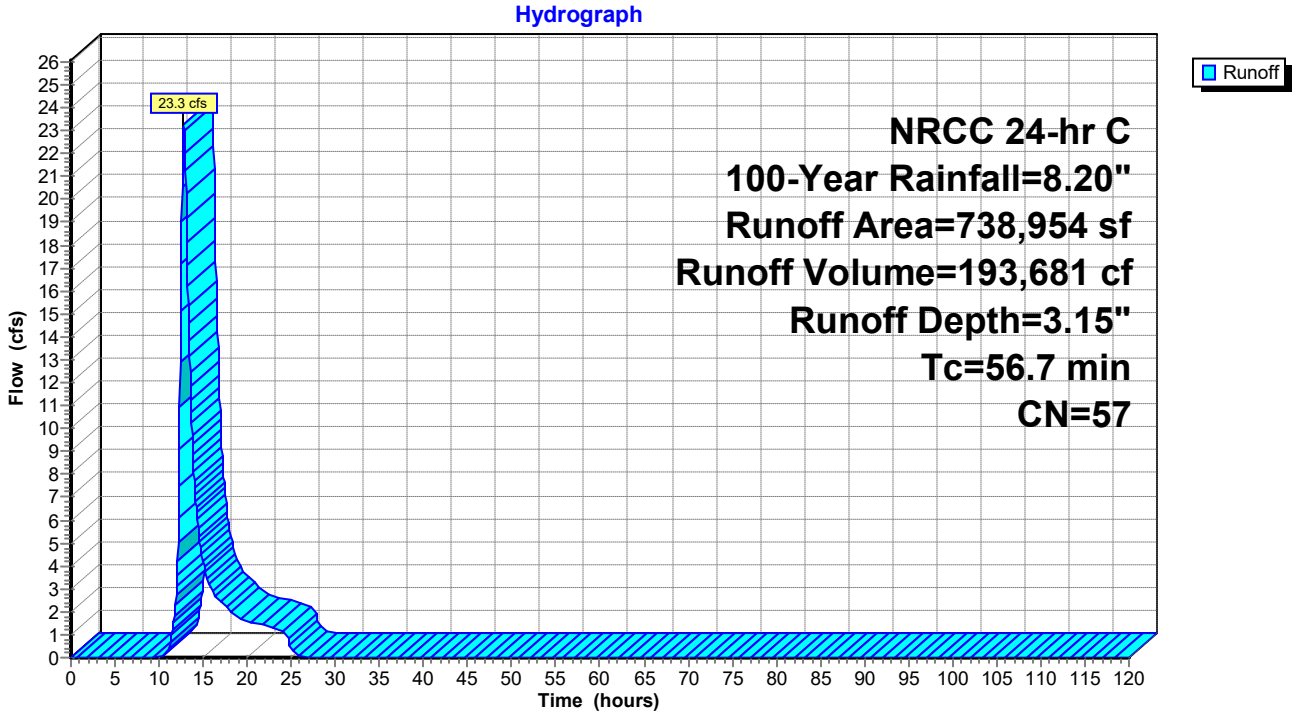
Runoff = 23.3 cfs @ 12.80 hrs, Volume= 193,681 cf, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.20"

	Area (sf)	CN	Description
*	3,859	96	Compacted Gravel
	31,148	77	Woods, Good, HSG D
	1,643	61	>75% Grass cover, Good, HSG B
	238,090	60	Woods, Fair, HSG B
	113,938	58	Meadow, non-grazed, HSG B
	221,575	55	Woods, Good, HSG B
	128,701	48	Brush, Good, HSG B
	738,954	57	Weighted Average
	738,954		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
56.7					**Direct Entry, See Tc Calculation Sheets**

Subcatchment Pre-1S:



Summary for Subcatchment Pre-2S:

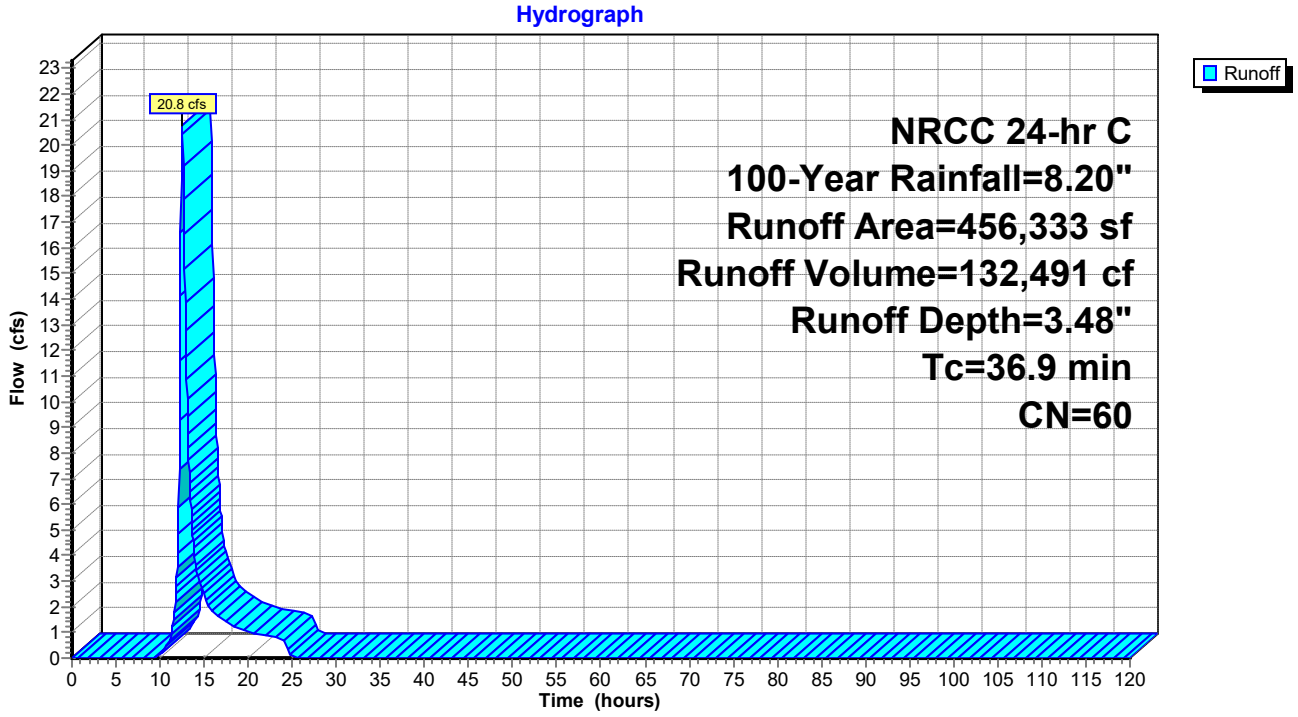
Runoff = 20.8 cfs @ 12.52 hrs, Volume= 132,491 cf, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.20"

	Area (sf)	CN	Description
*	2,688	98	Pavement
*	8,482	96	Compacted Gravel
	130,905	60	Woods, Fair, HSG B
	623	61	>75% Grass cover, Good, HSG B
	313,635	58	Meadow, non-grazed, HSG B
	456,333	60	Weighted Average
	453,645		99.41% Pervious Area
	2,688		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.9					**Direct Entry, See Tc Calculation Sheets**

Subcatchment Pre-2S:



Summary for Subcatchment Pre-3S:

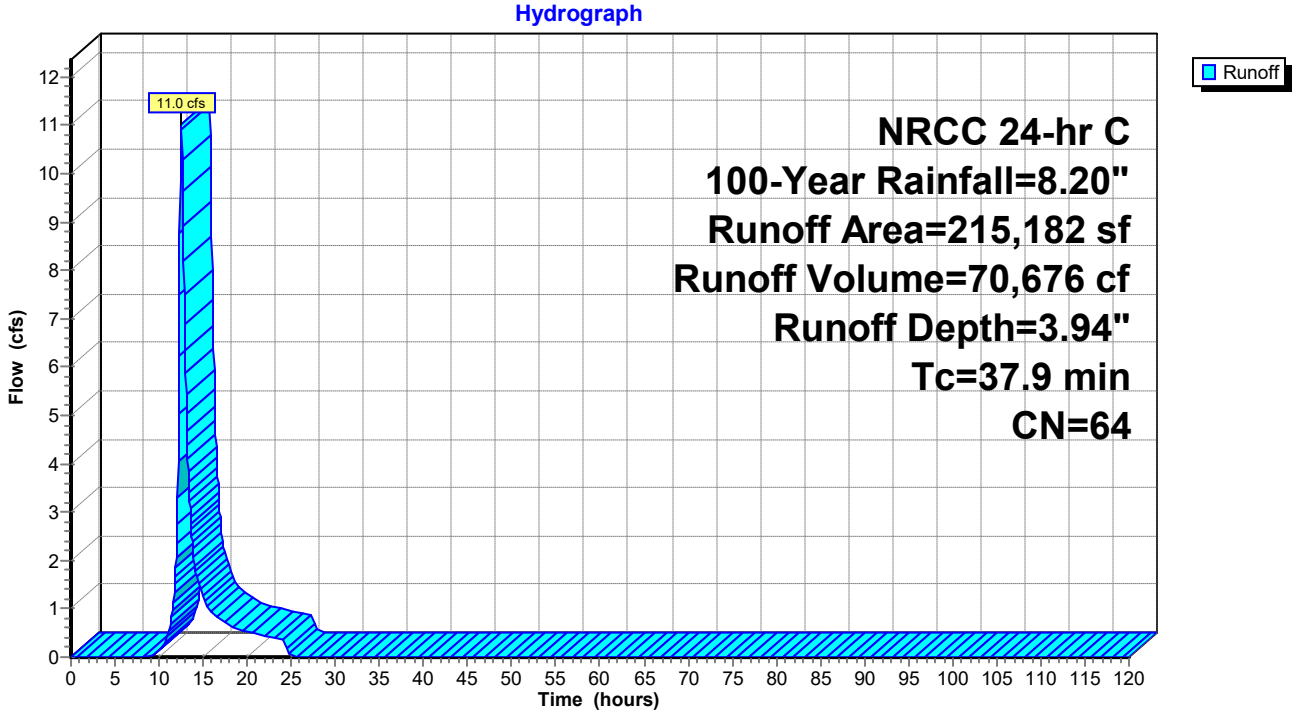
Runoff = 11.0 cfs @ 12.53 hrs, Volume= 70,676 cf, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.20"

	Area (sf)	CN	Description
*	16,610	98	Pavement
*	7,846	96	Compacted Gravel
	517	80	>75% Grass cover, Good, HSG D
	690	77	Woods, Good, HSG D
	19,137	61	>75% Grass cover, Good, HSG B
	104,297	60	Woods, Fair, HSG B
	66,085	58	Meadow, non-grazed, HSG B
	215,182	64	Weighted Average
	198,572		92.28% Pervious Area
	16,610		7.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.9					**Direct Entry, See Tc Calculation Sheets**

Subcatchment Pre-3S:

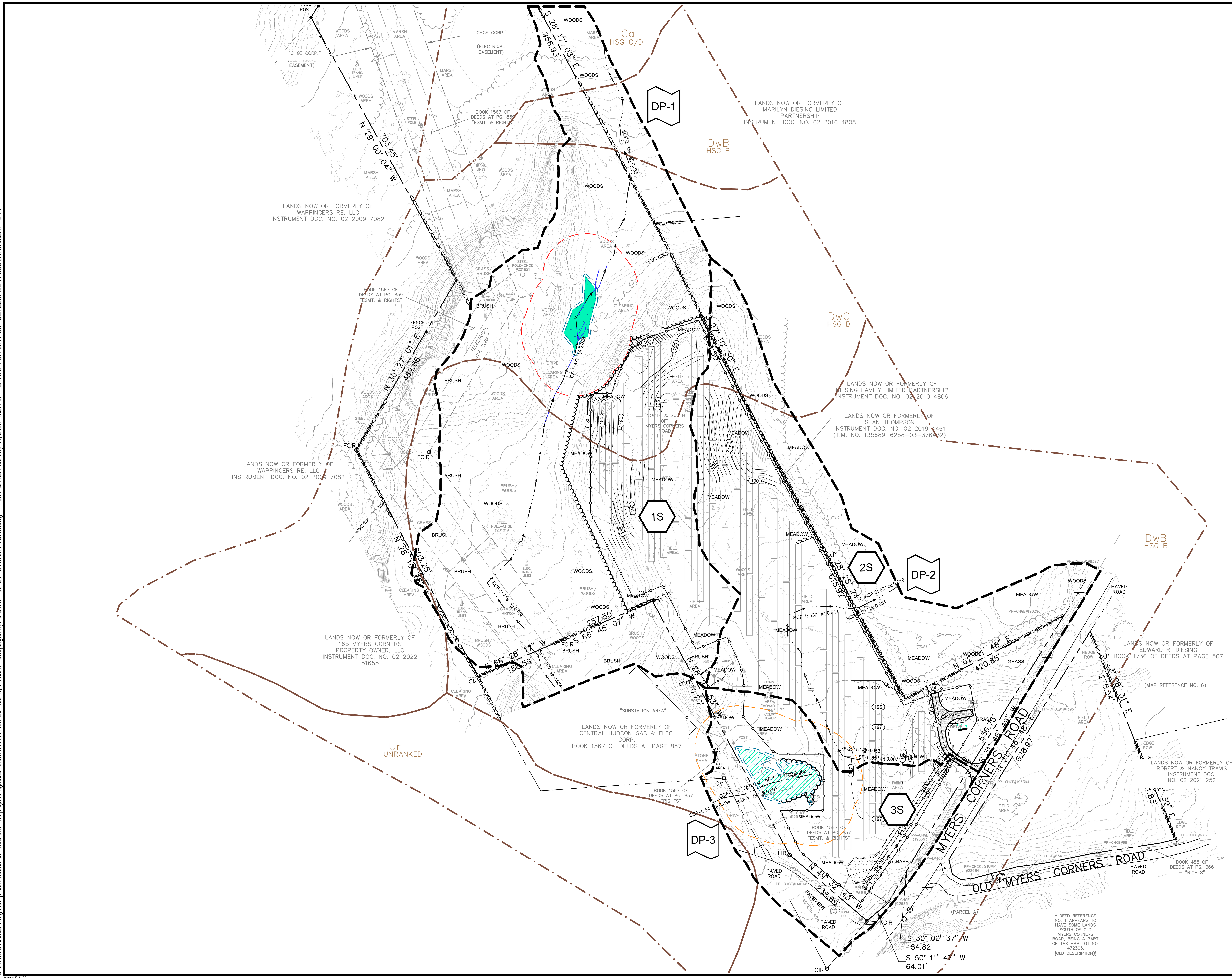


Appendix K – Post-Development Modeling

- Post-Development Subcatchment Map -

- Post-Development HydroCAD Model -

Appendix K – Post-Development Subcatchment Map



LEGEND

- PROPERTY BOUNDARY
- SUBCATCHMENT BOUNDARY
- DwB HSG B — NRCS SOIL MAP UNITS & ID
- TIME OF CONCENTRATION FLOW PATH
- 1S — SUBCATCHMENT NODE ID
- DP-1 — ANALYSIS POINT NODE ID

SEAL:

UNDER NEW YORK STATE EDUCATION LAW ARTICLE 145 (ENGINEERING), SECTION 7209 (2), IT IS A VIOLATION OF THE LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

NO.	BY	DATE	REVISION	APP'D.
0	JRP	02/02/2023	ISSUED FOR PERMITTING	TND

PROJECT:
NY SOLAR 1001 LLC
OLD MYERS SOLAR PROJECT
MYERS CORNER RD, WAPPINGER, DUTCHESS CO., NY

TITLE:
PERMITTING
POST-DEVELOPMENT SUBCATCHMENT PLAN

DRAWN BY:	JRP	PROJ NO.:	488729
CHECKED BY:	TND		
APPROVED BY:	TND		SW-200
DATE:	FEBRUARY 2023		

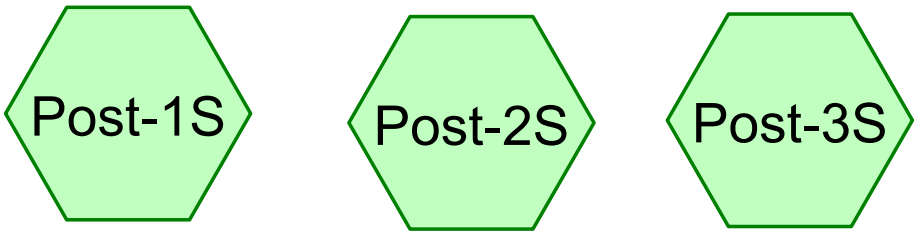
TRC
249 Western Ave.
Augusta, ME 04330
Phone: 207.621.7000
www.trccompanies.com

FILE NO.: 488729 - STORM HYDRO.dwg

DRAWING NAME: \\augusta-fp1\environmental\RMD\env rmd projects\lightstar renewables llc\488729 - old myers solar - wappinger, ny\10-DWG\488729 - STORM HYDRO.dwg --- PLOT DATE: February 01, 2023 - 8:27PM --- LAYOUT: SW-200 POST-DEVELOPMENT SUBCATCHMENT PLAN

Appendix K – Post-Development HydroCAD Model

POST-DEVELOPMENT



Subcat Reach Pond Link

Routing Diagram for Old Myers Solar - Hydrologic Analysis
Prepared by TRC, Printed 1/13/2023

Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 7083 NY Orange

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
21,403	61	>75% Grass cover, Good, HSG B (Post-1S, Post-2S, Post-3S)
517	80	>75% Grass cover, Good, HSG D (Post-3S)
115,953	48	Brush, Good, HSG B (Post-1S)
12,208	96	Compacted Gravel (Post-2S, Post-3S)
160	98	Concrete (Post-2S)
667,074	58	Meadow, non-grazed, HSG B (Post-1S, Post-2S, Post-3S)
19,076	98	Pavement (Post-2S, Post-3S)
320,667	60	Woods, Fair, HSG B (Post-1S, Post-2S, Post-3S)
221,574	55	Woods, Good, HSG B (Post-1S)
31,838	77	Woods, Good, HSG D (Post-1S, Post-3S)
1,410,470	**59**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
1,346,671	HSG B	Post-1S, Post-2S, Post-3S
0	HSG C	
32,355	HSG D	Post-1S, Post-3S
31,444	Other	Post-2S, Post-3S
1,410,470		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
0	21,403	0	517	0	21,920	>75% Grass cover, Good	
0	115,953	0	0	0	115,953	Brush, Good	
0	0	0	0	12,208	12,208	Compacted Gravel	
0	0	0	0	160	160	Concrete	
0	667,074	0	0	0	667,074	Meadow, non-grazed	
0	0	0	0	19,076	19,076	Pavement	
0	320,667	0	0	0	320,667	Woods, Fair	
0	221,574	0	31,838	0	253,412	Woods, Good	
0	**1,346,671**	**0**	**32,355**	**31,444**	**1,410,470**	**TOTAL AREA**	

Time span=0.00-120.00 hrs, dt=0.05 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment Post-1S: Runoff Area=739,848 sf 0.00% Impervious Runoff Depth=3.15"
Tc=56.7 min CN=57 Runoff=23.3 cfs 193,916 cf

Subcatchment Post-2S: Runoff Area=453,670 sf 0.57% Impervious Runoff Depth=3.37"
Tc=35.5 min CN=59 Runoff=20.4 cfs 127,432 cf

Subcatchment Post-3S: Runoff Area=216,952 sf 7.67% Impervious Runoff Depth=3.83"
Tc=37.6 min CN=63 Runoff=10.8 cfs 69,181 cf

Total Runoff Area = 1,410,470 sf Runoff Volume = 390,529 cf Average Runoff Depth = 3.32"
98.64% Pervious = 1,391,234 sf 1.36% Impervious = 19,236 sf

Summary for Subcatchment Post-1S:

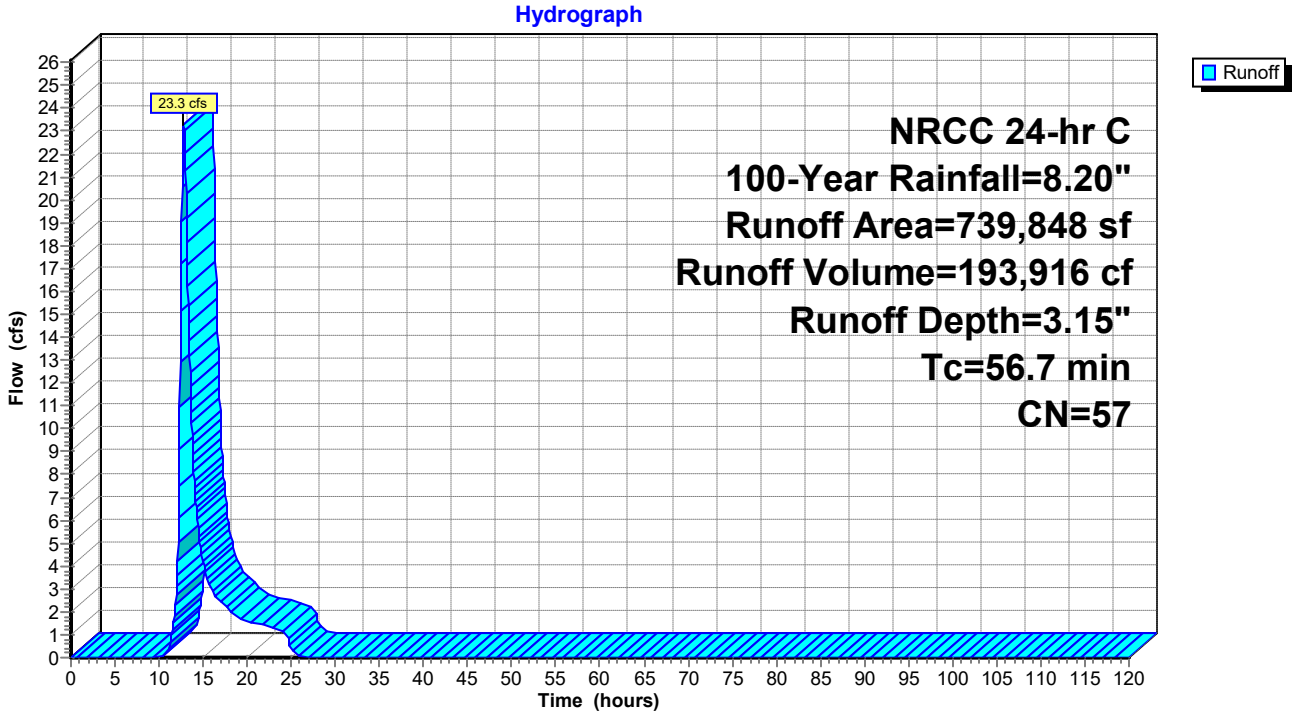
Runoff = 23.3 cfs @ 12.80 hrs, Volume= 193,916 cf, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.20"

	Area (sf)	CN	Description
*	0	96	Compacted Gravel
	31,148	77	Woods, Good, HSG D
	1,643	61	>75% Grass cover, Good, HSG B
	190,664	60	Woods, Fair, HSG B
	178,866	58	Meadow, non-grazed, HSG B
	221,574	55	Woods, Good, HSG B
	115,953	48	Brush, Good, HSG B
	739,848	57	Weighted Average
	739,848		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
56.7					**Direct Entry, See Tc Calculation Sheets**

Subcatchment Post-1S:



Summary for Subcatchment Post-2S:

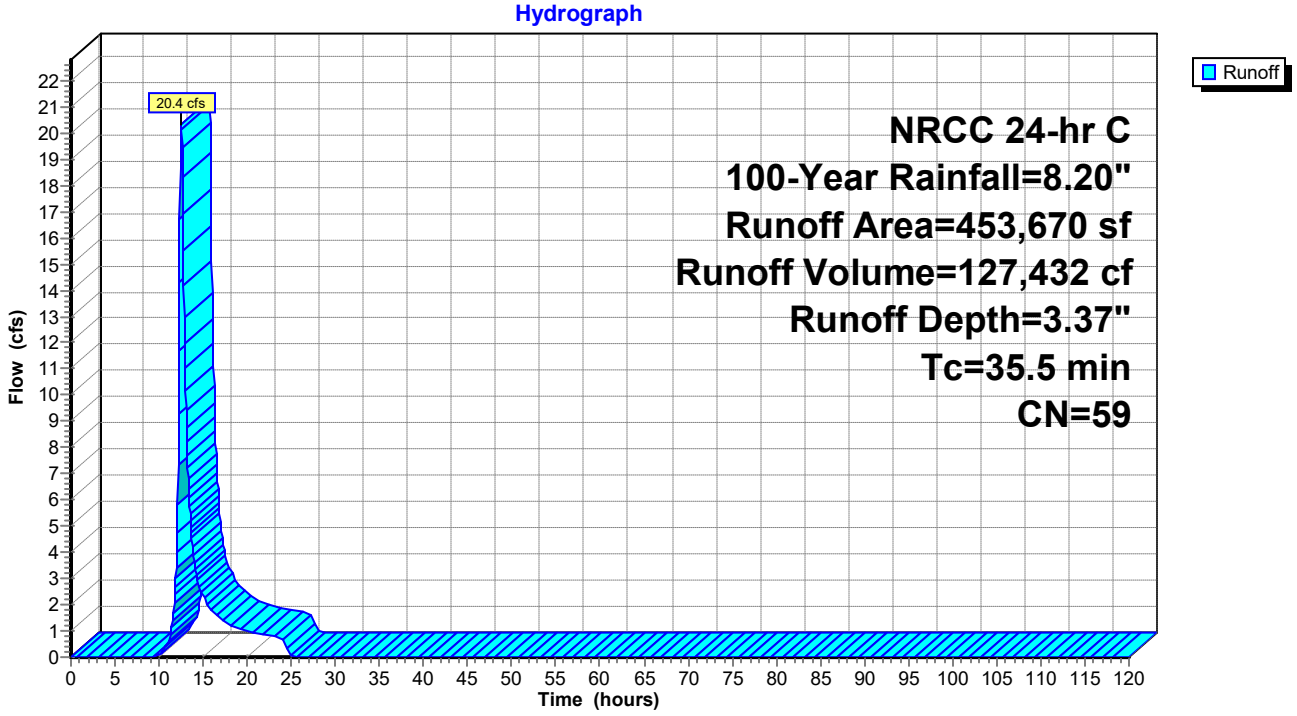
Runoff = 20.4 cfs @ 12.51 hrs, Volume= 127,432 cf, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.20"

	Area (sf)	CN	Description
*	2,425	98	Pavement
*	160	98	Concrete
*	5,336	96	Compacted Gravel
	623	61	>75% Grass cover, Good, HSG B
	86,342	60	Woods, Fair, HSG B
	358,784	58	Meadow, non-grazed, HSG B
	0	55	Woods, Good, HSG B
	453,670	59	Weighted Average
	451,085		99.43% Pervious Area
	2,585		0.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.5					**Direct Entry, See Tc Calculation Sheets**

Subcatchment Post-2S:



Summary for Subcatchment Post-3S:

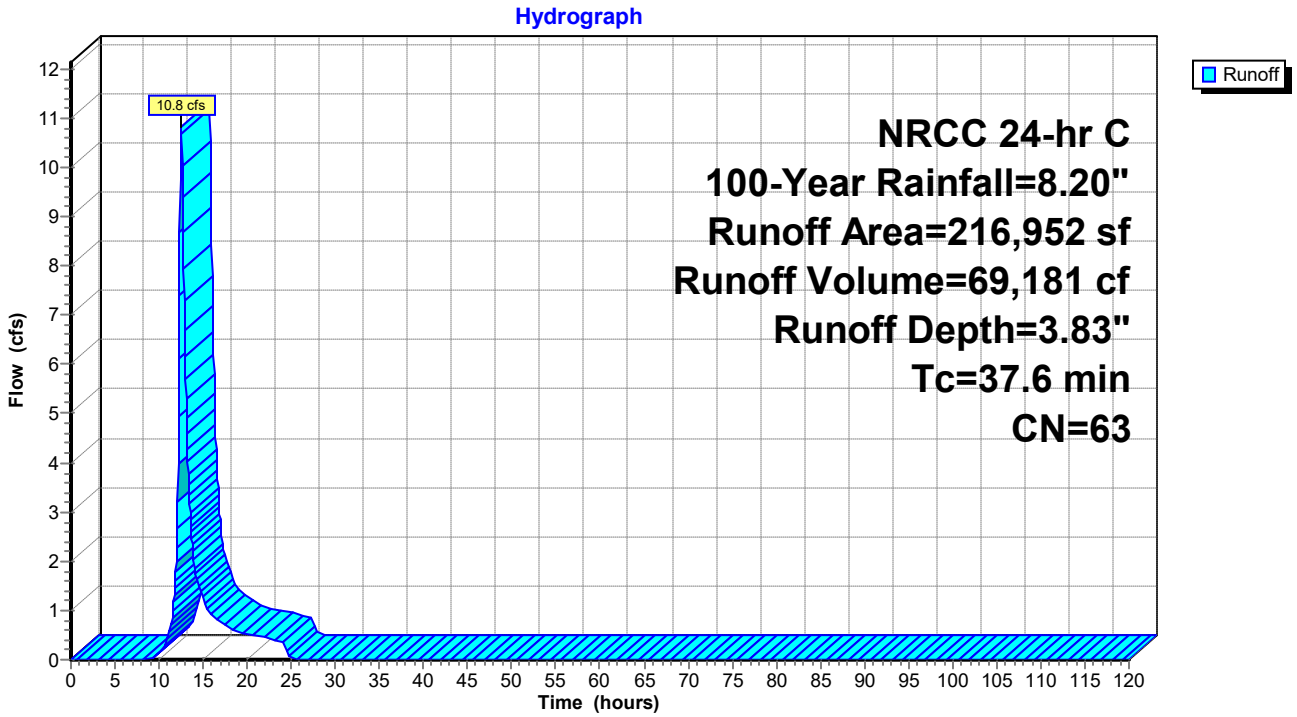
Runoff = 10.8 cfs @ 12.53 hrs, Volume= 69,181 cf, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-120.00 hrs, dt= 0.05 hrs
NRCC 24-hr C 100-Year Rainfall=8.20"

	Area (sf)	CN	Description
*	16,651	98	Pavement
*	6,872	96	Compacted Gravel
	517	80	>75% Grass cover, Good, HSG D
	690	77	Woods, Good, HSG D
	19,137	61	>75% Grass cover, Good, HSG B
	43,661	60	Woods, Fair, HSG B
	129,424	58	Meadow, non-grazed, HSG B
	0	55	Woods, Good, HSG B
	216,952	63	Weighted Average
	200,301		92.33% Pervious Area
	16,651		7.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.6					**Direct Entry, See Tc Calculation Sheets**

Subcatchment Post-3S:



Appendix L – Stormwater Design Calculation

PRE- AND POST-DEVELOPMENT LAND USE COMPARISON TABLE

OVERALL SITE WATERSHED

PRE-DEVELOPMENT CONDITIONS			*POST-DEVELOPMENT CONDITIONS*			
Cover Description	***CN***	***Area (Ac.)***	***Cover Description***	***CN***	***Area (Ac.)***	***NET CHANGE (Ac.)***
Pavement	98	0.443	Pavement	98	0.438	-0.005
Concrete	98	0.000	Concrete	98	0.004	0.004
Compacted Gravel	96	0.464	Compacted Gravel	96	0.280	-0.184
>75% Grass cover, Good, HSG D	80	0.012	>75% Grass cover, Good, HSG D	80	0.012	0.000
Woods, Good, HSG D	77	0.731	Woods, Good, HSG D	77	0.731	0.000
>75% Grass cover, Good, HSG B	61	0.491	>75% Grass cover, Good, HSG B	61	0.491	0.000
Woods, Fair, HSG B	60	10.864	Woods, Fair, HSG B	60	7.361	-3.503
Meadow, non-grazed, HSG B	58	11.333	Meadow, non-grazed, HSG B	58	15.314	3.981
Woods, Good, HSG B	55	5.087	Woods, Good, HSG B	55	5.087	0.000
Brush, Good, HSG B	48	2.955	Brush, Good, HSG B	48	2.662	-0.293
Total:	**58.9**	**32.380**	**Total**	**58.5**	**32.380**	**0.000**

Notes: Soils identified by published NRCS soils data as having dual hydrologic soil groups (i.e., HSG A/D, C/D) are modeled as the undrained condition (HSG D).

PRE- AND POST-DEVELOPMENT LAND USE COMPARISON TABLE

Subcatchment ID: 1S

PRE-DEVELOPMENT CONDITIONS			*POST-DEVELOPMENT CONDITIONS*			
Cover Description	***CN***	***Area (Ac.)***	***Cover Description***	***CN***	***Area (Ac.)***	***NET CHANGE (Ac.)***
Compacted Gravel	96	0.089	Compacted Gravel	96	0.000	-0.089
Woods, Good, HSG D	77	0.715	Woods, Good, HSG D	77	0.715	0.000
>75% Grass cover, Good, HSG B	61	0.038	>75% Grass cover, Good, HSG B	61	0.038	0.000
Woods, Fair, HSG B	60	5.465	Woods, Fair, HSG B	60	4.377	-1.088
Meadow, non-grazed, HSG B	58	2.616	Meadow, non-grazed, HSG B	58	4.106	1.490
Woods, Good, HSG B	55	5.087	Woods, Good, HSG B	55	5.087	0.000
Brush, Good, HSG B	48	2.955	Brush, Good, HSG B	48	2.662	-0.293
Total:	**57.0**	**16.965**	**Total**	**56.9**	**16.985**	**0.020**

Notes: Soils identified by published NRCS soils data as having dual hydrologic soil groups (i.e., HSG A/D, C/D) are modeled as the undrained condition (HSG D).

PRE- AND POST-DEVELOPMENT LAND USE COMPARISON TABLE

Subcatchment ID: 2S

PRE-DEVELOPMENT CONDITIONS			*POST-DEVELOPMENT CONDITIONS*			
Cover Description	*CN*	*Area (Ac.)*	*Cover Description*	*CN*	*Area (Ac.)*	*NET CHANGE (Ac.)*
Pavement	98	0.062	Pavement	98	0.056	-0.006
Concrete	98	0.000	Concrete	98	0.004	0.004
Compacted Gravel	96	0.195	Compacted Gravel	96	0.122	-0.073
>75% Grass cover, Good, HSG B	61	0.014	>75% Grass cover, Good, HSG B	61	0.014	0.000
Woods, Fair, HSG B	60	3.005	Woods, Fair, HSG B	60	1.982	-1.023
Meadow, non-grazed, HSG B	58	7.200	Meadow, non-grazed, HSG B	58	8.237	1.037
Woods, Good, HSG B	55	0.000	Woods, Good, HSG B	55	0.000	0.000
Total:	**59.5**	**10.476**	**Total**	**59.1**	**10.415**	**-0.061**

Notes: Soils identified by published NRCS soils data as having dual hydrologic soil groups (i.e., HSG A/D, C/D) are modeled as the undrained condition (HSG D).

PRE- AND POST-DEVELOPMENT LAND USE COMPARISON TABLE

Subcatchment ID: 3S

PRE-DEVELOPMENT CONDITIONS			*POST-DEVELOPMENT CONDITIONS*			
Cover Description	***CN***	***Area (Ac.)***	***Cover Description***	***CN***	***Area (Ac.)***	***NET CHANGE (Ac.)***
Pavement	98	0.381	Pavement	98	0.382	0.001
Compacted Gravel	96	0.180	Compacted Gravel	96	0.158	-0.022
>75% Grass cover, Good, HSG D	80	0.012	>75% Grass cover, Good, HSG D	80	0.012	0.000
Woods, Good, HSG D	77	0.016	Woods, Good, HSG D	77	0.016	0.000
>75% Grass cover, Good, HSG B	61	0.439	>75% Grass cover, Good, HSG B	61	0.439	0.000
Woods, Fair, HSG B	60	2.394	Woods, Fair, HSG B	60	1.002	-1.392
Meadow, non-grazed, HSG B	58	1.517	Meadow, non-grazed, HSG B	58	2.971	1.454
Total:	**63.8**	**4.939**	**Total**	**63.1**	**4.980**	**0.041**

Notes: Soils identified by published NRCS soils data as having dual hydrologic soil groups (i.e., HSG A/D, C/D) are modeled as the undrained condition (HSG D).

OLD MYERS SOLAR
Time of Concentration Summary

Description: This worksheet provides the equations and constants used to determine the time of concentrations calculated in the subsequent worksheets using the Natural Resources Conservation Service (NRCS) (formerly the Soil Conservation Service (SCS)) velocity method.

Time of Concentration Equations:

1. Where	$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} S^{0.4}}$	from NRCS TR-55 where P_2 = 2-Year, 24 Hour Rainfall (in)	For Sheet Flow (300 feet or less, typically no more than 100 feet) (Somerset County (south), ME: P2= 2.7 inches)
2. Where	$T_t = \frac{\ell}{3{,}600V}$	from the SCS Upland Method *Channel Flow Chart*	Travel time equation
3. Where	$V = 20.328(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Shallow Concentrated Flow - Paved surfaces
4. Where	$V = 16.1345(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Shallow Concentrated Flow - Unpaved surfaces and grassed waterways
5. Where	$V = 6.962(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Shallow Concentrated Flow - Short-grass pasture
6. Where	$V = 5.032(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Shallow Concentrated Flow - Woodlands
7. Where	$V = 12(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Channel Flow - Waterways and swamps, no channels
8. Where	$V = 15(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Channel Flow - Grassed waterways and roadside ditches
9. Where	$V = 21(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Channel Flow - Small tributary & swamp w/ channels
10. Where	$V = 35(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Channel Flow - Large tributary
11. Where	$V = 60(s)^{0.5}$	from the SCS Upland Method *Channel Flow Chart*	For Channel Flow - Main river
12. Where	$V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n}$		For Channel Flow - Culvert flow

Manning's Roughness Coefficients for Sheet Flow

Surface Description	n - value
Smooth surface	0.011
Crushed stone/Substation yard	0.025
Fallow	0.050
Cultivated: Residue<=20%	0.060
Cultivated: Residue>20%	0.170
Grass: Short	0.150
Grass: Dense	0.240
Grass: Bermuda	0.410
Range	0.130
Woods: Light underbrush	0.400
Woods: Dense underbrush	0.800

Subcatchment ID:	Pre-Development 1S								
	Seg 1	**Seg 2**	**Seg 3**	**Seg 4**	**Seg 5**	**Seg 6**	**Seg 7**	**Seg 8**	
SHEET FLOW	SF-1								
Manning's No.	0.400								
Length, ft	100								
P_2, in	3.15								
Slope, ft/ft	0.024								
T_t[1], hr	0.335								0.3354
SHALLOW CONCENTRATED FLOW									
Paved		SCF-2	SCF-3						
Length, ft									
Slope, ft/ft									
Velocity[3], ft/sec									
T_t[2], hr									0.0000
Unpaved Surfaces & Grassed Waterways									
Length, ft									
Slope, ft/ft									
Velocity[4], ft/sec									
T_t[2], hr									0.0000
Short-Grass Pasture	SCF-1								
Length, ft									
Slope, ft/ft									
Velocity[5], ft/sec									
T_t[2], hr									0.0000
Woodland									
Length, ft		719		369					
Slope, ft/ft		0.008		0.030					
Velocity[6], ft/sec		0.4441		0.8688					
T_t[2], hr		0.450		0.118					0.5677
CHANNEL FLOW									
Waterways & Swamps, No Channels									
Length, ft									
Slope, ft/ft									
Velocity[7], ft/sec									
T_t[2], hr									0.0000
Grassed Waterways/Roadside Ditches									
Length, ft									
Slope, ft/ft									
Velocity[8], ft/sec									
T_t[2], hr									0.0000
Small Tributary & Swamp w/Channels									
Length, ft			477						
Slope, ft/ft			0.023						
Velocity[9], ft/sec			3.189						
T_t[2], hr			0.042						0.0415
Large Tributary									
Length, ft									
Slope, ft/ft									
Velocity[10], ft/sec									
T_t[2], hr									0.0000
Main River									
Length, ft									
Slope, ft/ft									
Velocity[11], ft/sec									
T_t[2], hr									0.0000
Culvert									
Diameter, ft									
Area, ft^2									
Wetted Perimeter, ft									
Hydraulic Radius, R, ft									
Slope, ft/ft									
Manning's No.									
Velocity[12], ft/sec									
Length, L, ft									
T_t[2], hr									0.0000
								Time of Concentration, T_c, hr:	0.945
								Time of Concentration, T_c, min:	**56.68**

OLD MYERS SOLAR
Time of Concentration Calc. Worksheet

Subcatchment ID:	Pre-Development 2S

	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Seg 6	Seg 7	Seg 8	
SHEET FLOW	SF-1								
Manning's No.	0.240								
Length, ft	100								
P_2, in	3.15								
Slope, ft/ft	0.004								
T_t[1], hr	0.456								0.4563
SHALLOW CONCENTRATED FLOW									
Paved		SCF-2	SCF-3						
Length, ft									
Slope, ft/ft									
Velocity[3], ft/sec									
T_t[2], hr									0.0000
Unpaved Surfaces & Grassed Waterways									
Length, ft									
Slope, ft/ft									
Velocity[4], ft/sec									
T_t[2], hr									0.0000
Short-Grass Pasture	SCF-1								
Length, ft		24		364		89			
Slope, ft/ft		0.004		0.023		0.018			
Velocity[5], ft/sec		0.4494		1.0513		0.9335			
T_t[2], hr		0.015		0.096		0.026			0.1375
Woodland									
Length, ft			30		36				
Slope, ft/ft			0.033		0.025				
Velocity[6], ft/sec			0.9187		0.7956				
T_t[2], hr			0.009		0.013				0.0216
CHANNEL FLOW									
Waterways & Swamps, No Channels									
Length, ft									
Slope, ft/ft									
Velocity[7], ft/sec									
T_t[2], hr									0.0000
Grassed Waterways/Roadside Ditches									
Length, ft									
Slope, ft/ft									
Velocity[8], ft/sec									
T_t[2], hr									0.0000
Small Tributary & Swamp w/Channels									
Length, ft									
Slope, ft/ft									
Velocity[9], ft/sec									
T_t[2], hr									0.0000
Large Tributary									
Length, ft									
Slope, ft/ft									
Velocity[10], ft/sec									
T_t[2], hr									0.0000
Main River									
Length, ft									
Slope, ft/ft									
Velocity[11], ft/sec									
T_t[2], hr									0.0000
Culvert									
Diameter, ft									
Area, ft^2									
Wetted Perimeter, ft									
Hydraulic Radius, R, ft									
Slope, ft/ft									
Manning's No.									
Velocity[12], ft/sec									
Length, L, ft									
T_t[2], hr									0.0000

Time of Concentration, T_c, hr:	0.615
Time of Concentration, T_c, min:	**36.93**

OLD MYERS SOLAR
Time of Concentration Calc. Worksheet

Subcatchment ID:	Pre-Development 3S

	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Seg 6	Seg 7	Seg 8	
SHEET FLOW	SF-1								
Manning's No.	0.400								
Length, ft	100								
P_2, in	3.15								
Slope, ft/ft	0.016								
T_t[1], hr	0.394								0.3944
SHALLOW CONCENTRATED FLOW									
Paved		SCF-2	SCF-3						
Length, ft									
Slope, ft/ft									
Velocity[3], ft/sec									
T_t[2], hr									0.0000
Unpaved Surfaces & Grassed Waterways									
Length, ft				13					
Slope, ft/ft				0.004					
Velocity[4], ft/sec				1.000619213					
T_t[2], hr				0.004					0.0036
Short-Grass Pasture	SCF-1								
Length, ft			78						
Slope, ft/ft			0.001						
Velocity[5], ft/sec			0.2493						
T_t[2], hr			0.087						0.0869
Woodland									
Length, ft		237			54				
Slope, ft/ft		0.010			0.034				
Velocity[6], ft/sec		0.5064			0.9314				
T_t[2], hr		0.130			0.016				0.1461
CHANNEL FLOW									
Waterways & Swamps, No Channels									
Length, ft									
Slope, ft/ft									
Velocity[7], ft/sec									
T_t[2], hr									0.0000
Grassed Waterways/Roadside Ditches									
Length, ft									
Slope, ft/ft									
Velocity[8], ft/sec									
T_t[2], hr									0.0000
Small Tributary & Swamp w/Channels									
Length, ft									
Slope, ft/ft									
Velocity[9], ft/sec									
T_t[2], hr									0.0000
Large Tributary									
Length, ft									
Slope, ft/ft									
Velocity[10], ft/sec									
T_t[2], hr									0.0000
Main River									
Length, ft									
Slope, ft/ft									
Velocity[11], ft/sec									
T_t[2], hr									0.0000
Culvert									
Diameter, ft									
Area, ft^2									
Wetted Perimeter, ft									
Hydraulic Radius, R, ft									
Slope, ft/ft									
Manning's No.									
Velocity[12], ft/sec									
Length, L, ft									
T_t[2], hr									0.0000

Time of Concentration, T_c, hr:	0.631
Time of Concentration, T_c, min:	**37.86**

OLD MYERS SOLAR
Time of Concentration Calc. Worksheet

Subcatchment ID:	Post-Development 1S								
	Seg 1	**Seg 2**	**Seg 3**	**Seg 4**	**Seg 5**	**Seg 6**	**Seg 7**	**Seg 8**	
SHEET FLOW	SF-1								
Manning's No.	0.400								
Length, ft	100								
P_2, in	3.15								
Slope, ft/ft	0.024								
T_t[1], hr	0.335								0.3354
SHALLOW CONCENTRATED FLOW									
Paved		SCF-2	SCF-3						
Length, ft									
Slope, ft/ft									
Velocity[3], ft/sec									
T_t[2], hr									0.0000
Unpaved Surfaces & Grassed Waterways									
Length, ft									
Slope, ft/ft									
Velocity[4], ft/sec									
T_t[2], hr									0.0000
Short-Grass Pasture	SCF-1								
Length, ft									
Slope, ft/ft									
Velocity[5], ft/sec									
T_t[2], hr									0.0000
Woodland									
Length, ft		719		369					
Slope, ft/ft		0.008		0.030					
Velocity[6], ft/sec		0.4441		0.8688					
T_t[2], hr		0.450		0.118					0.5677
CHANNEL FLOW									
Waterways & Swamps, No Channels									
Length, ft									
Slope, ft/ft									
Velocity[7], ft/sec									
T_t[2], hr									0.0000
Grassed Waterways/Roadside Ditches									
Length, ft									
Slope, ft/ft									
Velocity[8], ft/sec									
T_t[2], hr									0.0000
Small Tributary & Swamp w/Channels									
Length, ft			477						
Slope, ft/ft			0.023						
Velocity[9], ft/sec			3.189						
T_t[2], hr			0.042						0.0415
Large Tributary									
Length, ft									
Slope, ft/ft									
Velocity[10], ft/sec									
T_t[2], hr									0.0000
Main River									
Length, ft									
Slope, ft/ft									
Velocity[11], ft/sec									
T_t[2], hr									0.0000
Culvert									
Diameter, ft									
Area, ft^2									
Wetted Perimeter, ft									
Hydraulic Radius, R, ft									
Slope, ft/ft									
Manning's No.									
Velocity[12], ft/sec									
Length, L, ft									
T_t[2], hr									0.0000

Time of Concentration, T_c, hr:	0.945
Time of Concentration, T_c, min:	**56.68**

Subcatchment ID:	Post-Development 2S								
	Seg 1	**Seg 2**	**Seg 3**	**Seg 4**	**Seg 5**	**Seg 6**	**Seg 7**	**Seg 8**	
SHEET FLOW	SF-1								
Manning's No.	0.240	0.24							
Length, ft	85	15							
P_2, in	3.15	3.2							
Slope, ft/ft	0.007	0.053							
T_t[1], hr	0.319	0.036							0.3549
SHALLOW CONCENTRATED FLOW									
Paved		SCF-2	SCF-3						
Length, ft									
Slope, ft/ft									
Velocity[3], ft/sec									
T_t[2], hr									0.0000
Unpaved Surfaces & Grassed Waterways									
Length, ft									
Slope, ft/ft									
Velocity[4], ft/sec									
T_t[2], hr									0.0000
Short-Grass Pasture	SCF-1								
Length, ft			537		89				
Slope, ft/ft			0.011		0.018				
Velocity[5], ft/sec			0.7316		0.9217				
T_t[2], hr			0.204		0.027				0.2307
Woodland									
Length, ft				21					
Slope, ft/ft				0.034					
Velocity[6], ft/sec				0.9317					
T_t[2], hr				0.006					0.0063
CHANNEL FLOW									
Waterways & Swamps, No Channels									
Length, ft									
Slope, ft/ft									
Velocity[7], ft/sec									
T_t[2], hr									0.0000
Grassed Waterways/Roadside Ditches									
Length, ft									
Slope, ft/ft									
Velocity[8], ft/sec									
T_t[2], hr									0.0000
Small Tributary & Swamp w/Channels									
Length, ft									
Slope, ft/ft									
Velocity[9], ft/sec									
T_t[2], hr									0.0000
Large Tributary									
Length, ft									
Slope, ft/ft									
Velocity[10], ft/sec									
T_t[2], hr									0.0000
Main River									
Length, ft									
Slope, ft/ft									
Velocity[11], ft/sec									
T_t[2], hr									0.0000
Culvert									
Diameter, ft									
Area, ft^2									
Wetted Perimeter, ft									
Hydraulic Radius, R, ft									
Slope, ft/ft									
Manning's No.									
Velocity[12], ft/sec									
Length, L, ft									
T_t[2], hr									0.0000

Time of Concentration, T_c, hr:	0.592
Time of Concentration, T_c, min:	**35.51**

Subcatchment ID:	Post-Development 3S

	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Seg 6	Seg 7	Seg 8	
SHEET FLOW	SF-1								
Manning's No.	0.400								
Length, ft	100								
P_2, in	3.15								
Slope, ft/ft	0.008								
T_t[1], hr	0.520								0.5204
SHALLOW CONCENTRATED FLOW									
Paved		SCF-2	SCF-3						
Length, ft									
Slope, ft/ft									
Velocity[3], ft/sec									
T_t[2], hr									0.0000
Unpaved Surfaces & Grassed Waterways									
Length, ft			13						
Slope, ft/ft			0.004						
Velocity[4], ft/sec			1.000619213						
T_t[2], hr			0.004						0.0036
Short-Grass Pasture	SCF-1								
Length, ft		78							
Slope, ft/ft		0.001							
Velocity[5], ft/sec		0.2493							
T_t[2], hr		0.087							0.0869
Woodland									
Length, ft				54					
Slope, ft/ft				0.034					
Velocity[6], ft/sec				0.9314					
T_t[2], hr				0.016					0.0161
CHANNEL FLOW									
Waterways & Swamps, No Channels									
Length, ft									
Slope, ft/ft									
Velocity[7], ft/sec									
T_t[2], hr									0.0000
Grassed Waterways/Roadside Ditches									
Length, ft									
Slope, ft/ft									
Velocity[8], ft/sec									
T_t[2], hr									0.0000
Small Tributary & Swamp w/Channels									
Length, ft									
Slope, ft/ft									
Velocity[9], ft/sec									
T_t[2], hr									0.0000
Large Tributary									
Length, ft									
Slope, ft/ft									
Velocity[10], ft/sec									
T_t[2], hr									0.0000
Main River									
Length, ft									
Slope, ft/ft									
Velocity[11], ft/sec									
T_t[2], hr									0.0000
Culvert									
Diameter, ft									
Area, ft^2									
Wetted Perimeter, ft									
Hydraulic Radius, R, ft									
Slope, ft/ft									
Manning's No.									
Velocity[12], ft/sec									
Length, L, ft									
T_t[2], hr									0.0000

Time of Concentration, T_c, hr:	0.627
Time of Concentration, T_c, min:	**37.62**

Version 1.8
Last Updated: 11/09/2015

Total Water Quality Volume Calculation
WQv(acre-feet) = [(P)(Rv)(A)] /12

Is this project subject to Chapter 10 of the NYS Design Manual (i.e. WQv is equal to post-development 1 year runoff volume)?.....	
Design Point:	DP-2
P=	1.40 *inch*

Breakdown of Subcatchments

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Description
1	0.00	0.00	100%	0.95	18	Infiltration Trench
2						
3						
4						
5						
6						
7						
8						
9						
10						
Subtotal (1-30)	0.00	0.00	100%	0.95	**18**	**Subtotal 1**
Total	0.00	0.00	100%	0.95	**18**	**Initial WQv**	**0.00**	**af**

Identify Runoff Reduction Techniques By Area

Technique	Total Contributing Area *(Acre)*	Contributing Impervious Area *(Acre)*	Notes
Conservation of Natural Areas	0.00	0.00	*minimum 10,000 sf*
Riparian Buffers	0.00	0.00	*maximum contributing length 75 feet to 150 feet*
Filter Strips	0.00	0.00	
Tree Planting	0.00	0.00	*Up to 100 sf directly connected impervious area may be subtracted per tree*
Total	**0.00**	**0.00**	

Recalculate WQv after application of Area Reduction Techniques

	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Runoff Coefficient Rv	WQv *(ft^3)*		
"<<Initial WQv"	0.00	0.00	100%	0.95	18		
Subtract Area	0.00	0.00					
WQv adjusted after Area Reductions	**0.00**	**0.00**	100%	0.95	18		
Disconnection of Rooftops		0.00					
Adjusted WQv after Area Reduction and Rooftop Disconnect	0.00	0.00	100%	0.95	**18**	**0.00**	**af**
WQv reduced by Area Reduction techniques					0	**0.00**	**af**

Total Water Quality Volume Calculation
WQv(acre-feet) = [(P)(Rv)(A)] /12

Additional Subcatchments								
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Description**		
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
Subtotal	0.00	0.00			**0**	**Subtotal**	**0.00**	**af**

Total Water Quality Volume Calculation

WQv(acre-feet) = [(P)(Rv)(A)] /12

All Subcatchments						
Catchment	**Total Area** *(Acres)*	**Impervious Cover** *(Acres)*	**Percent Impervious** *%*	**Runoff Coefficient** *Rv*	**WQv** *(ft^3)*	**Description**
1	0.00	0.00	1.00	0.95	17.73	Infiltration
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

Runoff Reduction Volume and Treated volumes						
	Runoff Reduction Techiques/Standard SMPs		**Total Contributing Area**	**Total Contributing Impervious Area**	**WQv Reduced (RRv)**	**WQv Treated**
			(acres)	**(acres)**	**cf**	**cf**
Area/Volume Reduction	Conservation of Natural Areas	RR-1	0.00	0.00		
	Sheetflow to Riparian Buffers/Filter Strips	RR-2	0.00	0.00		
	Tree Planting/Tree Pit	RR-3	0.00	0.00		
	Disconnection of Rooftop Runoff	RR-4		0.00		
	Vegetated Swale	RR-5	0.00	0.00	0	
	Rain Garden	RR-6	0.00	0.00	0	
	Stormwater Planter	RR-7	0.00	0.00	0	
	Rain Barrel/Cistern	RR-8	0.00	0.00	0	
	Porous Pavement	RR-9	0.00	0.00	0	
	Green Roof (Intensive & Extensive)	RR-10	0.00	0.00	0	
Standard SMPs w/RRv Capacity	Infiltration Trench	I-1	0.00	0.00	18	0
	Infiltration Basin	I-2	0.00	0.00	0	0
	Dry Well	I-3	0.00	0.00	0	0
	Underground Infiltration System	I-4				
	Bioretention & Infiltration Bioretention	F-5	0.00	0.00	0	0
	Dry swale	O-1	0.00	0.00	0	0
Standard SMPs	Micropool Extended Detention (P-1)	P-1				
	Wet Pond (P-2)	P-2				
	Wet Extended Detention (P-3)	P-3				
	Multiple Pond system (P-4)	P-4				
	Pocket Pond (p-5)	P-5				
	Surface Sand filter (F-1)	F-1				
	Underground Sand filter (F-2)	F-2				
	Perimeter Sand Filter (F-3)	F-3				
	Organic Filter (F-4	F-4				
	Shallow Wetland (W-1)	W-1				
	Extended Detention Wetland (W-2	W-2				
	Pond/Wetland System (W-3)	W-3				
	Pocket Wetland (W-4)	W-4				
	Wet Swale (O-2)	O-2				
Totals by Area Reduction →			0.00	0.00	0	
Totals by Volume Reduction →			0.00	0.00	0	
Totals by Standard SMP w/RRV →			0.00	0.00	18	0
Totals by Standard SMP →			0.00	0.00		0
Totals (Area + Volume + all SMPs) →			0.00	0.00	18	0
	Impervious Cover √	okay				
	Total Area √	okay				

Minimum RRv

Enter the Soils Data for the site		
Soil Group	Acres	S
A	0.00	55%
B	0.00	40%
C	0.00	30%
D	**0.00**	20%
Total Area	0.003673095	
Calculate the Minimum RRv		
S =	**0.40**	
Impervious =	0.00	*acre*
Precipitation	1.4	*in*
Rv	0.95	
Minimum RRv	**7**	***ft3***
	0.00	af

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	18	*0.000*
30	Total RRV Provided	18	*0.000*
31	Is RRv Provided ≥WQv Required?	Yes	
32	Minimum RRv	7	*0.000*
32a	Is RRv Provided ≥ Minimum RRv Required?	Yes	
33a	Total WQv Treated	0	*0.000*
34	Sum of Volume Reduced & Treated	18	*0.000*
34	Sum of Volume Reduced and Treated	18	*0.000*
35	Is Sum RRv Provided and WQv Provided ≥WQv Required?	Yes	

100.00%

Apply Peak Flow Attenuation			
36	Channel Protection	*Cpv*	
37	Overbank	*Qp*	
37	Extreme Flood Control	*Qf*	
	Are Quantity Control requirements met?	*Yes*	Plan Completed

Infiltration Trench Worksheet

Design Point:	DP-2

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
1	0.00	0.00	1.00	0.95	18	1.40	Infiltration Trench
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	100%	0.95	18	<<WQv after adjusting for Disconnected Rooftops	

Design Elements Pretreatment Techniques to Prevent Clogging			
Infiltration Rate	0.57	*in/hr*	*Okay*
Pretreatment Sizing	25%	*of WQv*	*25% minimum* *50% if >2 in/hr;* *100% if >5in/hour*
Required Pretreatment Volume	4	ft^3	
Pretreatment Provided	5	ft^3	
Pretreatment techniques utilized	*Grass Buffer Strip*		*Pretreatment can be provided in the form of a sedimentation basin, sump pit, grass channel, plunge pool or other measure*

Size the Infiltration Trench Ap = Vw / (ndt)				
Design Volume	Vw	18	ft^3	
Porosity	n	0.4		
Design Depth	dt	1.5	*ft*	*maximum of four feet*
Depth to Groundwater		6.0	*ft*	>3 feet from seasonally high water table
Required Surface Area	Ap	30	ft^2	
Width	W	2	*ft*	*Provide the dimensions here*
Length	L	20	*ft*	*Provide the dimensions here*
Surface Area Provided		40	ft^2	*Okay*
Volume Provided		24	ft^3	*Storage Volume provided in infiltration trench not including pretreatment.*

Determine Runoff Reduction			
RRv	**18**	***ft^3***	***90% of the storage provided***
Volume Treated	0	ft^3	*This is the portion of the WQv that is not reduced/infiltrated*

Infiltration Trench Worksheet

Design Point:	DP-2

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
Enter Impervious Area Reduced					<<WQv after adjusting for		
Exceeds Maximum Drainage Area							

Design Elements Pretreatment Techniques to Prevent Clogging			
Infiltration Rate		*in/hr*	
Pretreatment Sizing	25%	*of WQv*	*25% minimum* *50% if >2 in/hr;* *100% if >5in/hour*
Required Pretreatment Volume		*ft^3*	
Pretreatment Provided		*ft^3*	
Pretreatment techniques utilized			*Pretreatment can be provided in the form of a sedimentation basin, sump pit, grass channel, plunge pool or other measure*

Size the Infiltration Trench Ap = Vw / (ndt)				
Design Volume	Vw		*ft^3*	
Porosity	n			
Design Depth	dt		*ft*	*maximum of four feet*
Depth to Groundwater			*ft*	>3 feet from seasonally high water table
Required Surface Area	Ap		*ft^2*	
Width	W		*ft*	*Provide the dimensions here*
Length	L		*ft*	*Provide the dimensions here*
Surface Area Provided		0	*ft^2*	
Volume Provided		0	*ft^3*	*Storage Volume provided in infiltration trench not including pretreatment.*

Determine Runoff Reduction			
RRv	**0**	***ft^3***	***90% of the storage provided***
Volume Treated		*ft^3*	*This is the portion of the WQv that is not reduced/infiltrated*

Infiltration Trench Worksheet

Design Point:	DP-2

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
Enter Impervious Area Reduced					<<WQv after adjusting for		
Exceeds Maximum Drainage Area							

Design Elements Pretreatment Techniques to Prevent Clogging			
Infiltration Rate		*in/hr*	
Pretreatment Sizing	25%	*of WQv*	*25% minimum* *50% if >2 in/hr;* *100% if >5in/hour*
Required Pretreatment Volume		*ft^3*	
Pretreatment Provided		*ft^3*	
Pretreatment techniques utilized			*Pretreatment can be provided in the form of a sedimentation basin, sump pit, grass channel, plunge pool or other measure*

Size the Infiltration Trench Ap = Vw / (ndt)				
Design Volume	Vw		*ft^3*	
Porosity	n			
Design Depth	dt		*ft*	*maximum of four feet*
Depth to Groundwater			*ft*	>3 feet from seasonally high water table
Required Surface Area	Ap		*ft^2*	
Width	W		*ft*	*Provide the dimensions here*
Length	L		*ft*	*Provide the dimensions here*
Surface Area Provided		0	*ft^2*	
Volume Provided		0	*ft^3*	*Storage Volume provided in infiltration trench (not including pretreatment.*

Determine Runoff Reduction			
RRv	**0**	***ft^3***	***90% of the storage provided***
Volume Treated		*ft^3*	*This is the portion of the WQv that is not reduced/infiltrated*

Infiltration Trench Worksheet

Design Point:	DP-2

Enter Site Data For Drainage Area to be Treated by Practice							
Catchment Number	**Total Area** *(Acres)*	**Impervious Area** *(Acres)*	**Percent Impervious** *%*	**Rv**	**WQv** *(ft^3)*	**Precipitation** *(in)*	**Description**
Enter Impervious Area Reduced					<<WQv after adjusting for		
Exceeds Maximum Drainage Area							

Design Elements Pretreatment Techniques to Prevent Clogging			
Infiltration Rate		*in/hr*	
Pretreatment Sizing	25%	*of WQv*	*25% minimum 50% if >2 in/hr; 100% if >5in/hour*
Required Pretreatment Volume		*ft^3*	
Pretreatment Provided		*ft^3*	
Pretreatment techniques utilized			*Pretreatment can be provided in the form of a sedimentation basin, sump pit, grass channel, plunge pool or other measure*

Size the Infiltration Trench Ap = Vw / (ndt)				
Design Volume	Vw		*ft^3*	
Porosity	n			
Design Depth	dt		*ft*	*maximum of four feet*
Depth to Groundwater			*ft*	>3 feet from seasonally high water table
Required Surface Area	Ap		*ft^2*	
Width	W		*ft*	*Provide the dimensions here*
Length	L		*ft*	*Provide the dimensions here*
Surface Area Provided		0	*ft^2*	
Volume Provided		0	*ft^3*	*Storage Volume provided in infiltration trench (not including pretreatment.*

Determine Runoff Reduction			
RRv	**0**	***ft^3***	***90% of the storage provided***
Volume Treated		*ft^3*	*This is the portion of the WQv that is not reduced/infiltrated*

Infiltration Trench Worksheet

Total RRV	17.73
Total Area	0.00
Total Impervious Area	0.00
Total Volume Treated	0.00
Rooftop Disconnect Impervious Area Total	0.00

Appendix M – SWPPP Amendments

The Owner/Operator shall have a Qualified Professional amend the SWPPP when one or more of the following occur:

- There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
- The SWPPP proves to be ineffective in:
    - Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
    - Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and

Additionally, the SWPPP shall be amended to identify any new Contractor or Subcontractor that will implement any measure of the SWPPP.

The following information should be documented in this section:

- Dates when major grading activities occur;
- Dates when construction activities temporarily or permanently cease on a portion of the Project Site; and
- Dates when stabilization measures (temporary and permanent) are initiated.

Appendix N – SWPPP Inspection Reports

- Blank SWPPP Inspection Form -

- Completed SWPPP Inspection Reports -

Appendix N – Blank SWPPP Inspection Form

General Project Information					
Project Name:					
SPDES Permit Number:				**Type of Construction Activities Being Completed:**	
Date of Inspection:					
Inspector's Name:					
Time On Site:				**Inspection Type:**	
Time Off Site:					
General Project Notes:					
SWPPP Amendment Required:	☐ Yes	☐ No	**If yes, describe:**		

Weather Information		
Has there been a storm event since the last inspection?	☒ Yes	☐ No
If yes, what was the approx. amount of precipitation (inches) since the last inspection:		
Weather conditions at the time of inspection?	Temperature:	°F
☐ Clear ☐ Cloudy ☐ Rain ☐ Sleet ☐ Snow ☐ Fog ☐ High Winds		
Does the Project Site discharge to natural surface waterbodies located within or immediately adjacent to the Project area?	☐ Yes	☐ No
If yes, describe:		
Were there any discharges observed at the time of inspection?	☐ Yes	☐ No
If yes, were sediment laden discharges observed?	☐ Yes	☐ No
Describe:		
If yes, was erosion or sedimentation observed at the discharge location?	☐ Yes	☐ No
Describe:		
Soil Condition:		
Were areas of soil disturbance observed at the time of inspection?	☐ Yes	☐ No
If yes, describe:		

Maintaining Water Quality

Water Quality Observations	Yes	No	N/A
Is there an increase in turbidity causing a substantial visual contrast to natural conditions?	☐	☐	☐
Is there residue from oil and floating substances, visible oil film, or grease or globules?	☐	☐	☐
Are all disturbances within the approved limits, as outlined on the plans?	☐	☐	☐
Have receiving waterbodies and/or wetland been impacted by the Project?	☐	☐	☐
Are the concrete washout facilities located a minimum of 100 feet from sensitive areas and properly maintained?	☐	☐	☐
Comments:			

General Housekeeping

Site Conditions	Yes	No	N/A
Is construction site litter and debris appropriately managed?	☐	☐	☐
Are facilities and equipment necessary for implementation of erosion and sediment controls in working and/or properly maintained?	☐	☐	☐
Is construction impacting adjacent properties?	☐	☐	☐
Is dust adequately controlled?	☐	☐	☐
Comments:			

Runoff Control Practices

Temporary Stream Crossings	Yes	No	N/A
Are the maximum necessary diameter pipes installed to span stream without dredging?	☐	☐	☐
Is non-woven geotextile fabric installed beneath the approaches?	☐	☐	☐
Is fill composed of aggregate (no earthen or soil material)?	☐	☐	☐
Is the rock on approaches clean enough to remove mud/sediment from vehicles and prevent sediment from entering the stream during high flows?	☐	☐	☐
Comments:			

Excavation Dewatering	Yes	No	N/A
Are upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per the Construction Drawings?	☐	☐	☐
Is clean water from the upstream pool being pumped to the downstream pool?	☐	☐	☐
Is sediment laden water from the work area being discharged to a sediment trapping device?	☐	☐	☐
Is the water discharging from the sediment trapping device clear and free of sediment?	☐	☐	☐
Does the constructed upstream berm have a minimum of one-foot freeboard?	☐	☐	☐
Comments:			

Flow Spreader(s)	Yes	No	N/A
Is the flow spreader installed per the Construction Drawings?	☐	☐	☐
Was the flow spreader constructed on undisturbed soil, not on fill?	☐	☐	☐
Does the flow spreader receive only clear, non-sediment laden flows?	☐	☐	☐
Does the discharge from the flow spreader sheet flow out of the spreader without erosion downstream?	☐	☐	☐
Comments:			

Interceptor Dikes and Swales	Yes	No	N/A
Is the dike/swale installed per the Construction Drawings?	☐	☐	☐
Has the dike/swale been stabilized by geotextile fabric, seed, and/or mulch?	☐	☐	☐
Was erosion observed within the dike/swale?	☐	☐	☐
Is sediment-laden runoff directed to a sediment trapping device?	☐	☐	☐
Comments:			

Stone Check Dam(s)	Yes	No	N/A
Are the check dams in good condition (rocks in place and no ponding behind the dams)?	☐	☐	☐
Has geotextile fabric been placed beneath the rock fill?	☐	☐	☐
Was sediment accumulation greater than 50% of the design capacity?	☐	☐	☐
Was erosion observed within the channel?	☐	☐	☐
Comments:			

Rock Outlet Protection	Yes	No	N/A
Is the rock outlet protection installed per approved plans?	☐	☐	☐
Was the outlet protection installed concurrently with pipe installation?	☐	☐	☐
Have the rocks been displaced?	☐	☐	☐
Is the sediment accumulation 0% of the design capacity?	☐	☐	☐
Comments:			

Soil Stabilization

Topsoil and Spoil Stockpiles	Yes	No	N/A
Are stockpiles properly stabilized and contained?	☐	☐	☐
Are sediment control installed at the toe of the slope?	☐	☐	☐
Are idle soil stockpiles are stabilized with vegetation and/or mulch?	☐	☐	☐
Comments:			

Revegetation	Yes	No	N/A
Has temporary seed and mulch been applied to idle areas?	☐	☐	☐
Has a minimum of 4 inches of topsoil been applied under permanent seeding areas?	☐	☐	☐
Comments:			

Sediment Control Practices

Stabilized Construction Entrance(s)	Yes	No	N/A
Is the entrance installed per the Construction Drawings?	☐	☐	☐
Is the stone clean enough to effectively remove mud/sediment from vehicle tires?	☐	☐	☐
Does all traffic enter and exit the site at the stabilized construction entrance(s)?	☐	☐	☐
Is adequate drainage provided to prevent ponding at the entrance(s)?	☐	☐	☐
Comments:			

Linear Sediment Control Barriers	Yes	No	N/A
Are the sediment controls installed along the contour, 10 feet from toe of slope and not within conveyance channels?	☐	☐	☐
Are silt fence joints constructed by wrapping the two ends together for continuous support?	☐	☐	☐
Is the silt fence fabric is buried a minimum of 6 inches?	☐	☐	☐
Are the posts stable and the fabric is tight and without rips/frayed areas?	☐	☐	☐
Does the compost filter sock have good contact with the soil?	☐	☐	☐
Is the sediment accumulation 0% of the design capacity?	☐	☐	☐
Comments:			

Storm Drain Inlet Protection	Yes	No	N/A
Is the inlet protection installed in accordance with the Construction Drawings?	☐	☐	☐
Is the inlet protection structurally sound?	☐	☐	☐
Are the posts stable and the fabric is tight and without rips/frayed areas?	☐	☐	☐
Is the sediment accumulation greater than 50% of the design capacity?	☐	☐	☐
Comments:			

Temporary Sediment Basin	Yes	No	N/A
Is the basin and outlet structure constructed per the Construction Drawings?	☐	☐	☐
Are the basin side slopes stabilized?	☐	☐	☐
Was the drainage structure flushed and basin surface restored upon removal of the sediment basin facility?	☐	☐	☐
Is the sediment basin dewatering at an appropriate rate?	☐	☐	☐
Is the sediment accumulation greater than 50% of the design capacity?	☐	☐	☐
Comments:			

Temporary Sediment Trap	Yes	No	N/A
Is the outlet structure constructed per the Construction Drawings?	☐	☐	☐
Has geotextile fabric been placed beneath the rock fill?	☐	☐	☐
Are the sediment trap slopes and disturbed areas are stabilized?	☐	☐	☐
Is the sediment accumulation greater than 50% of the design capacity?	☐	☐	☐
Comments:			

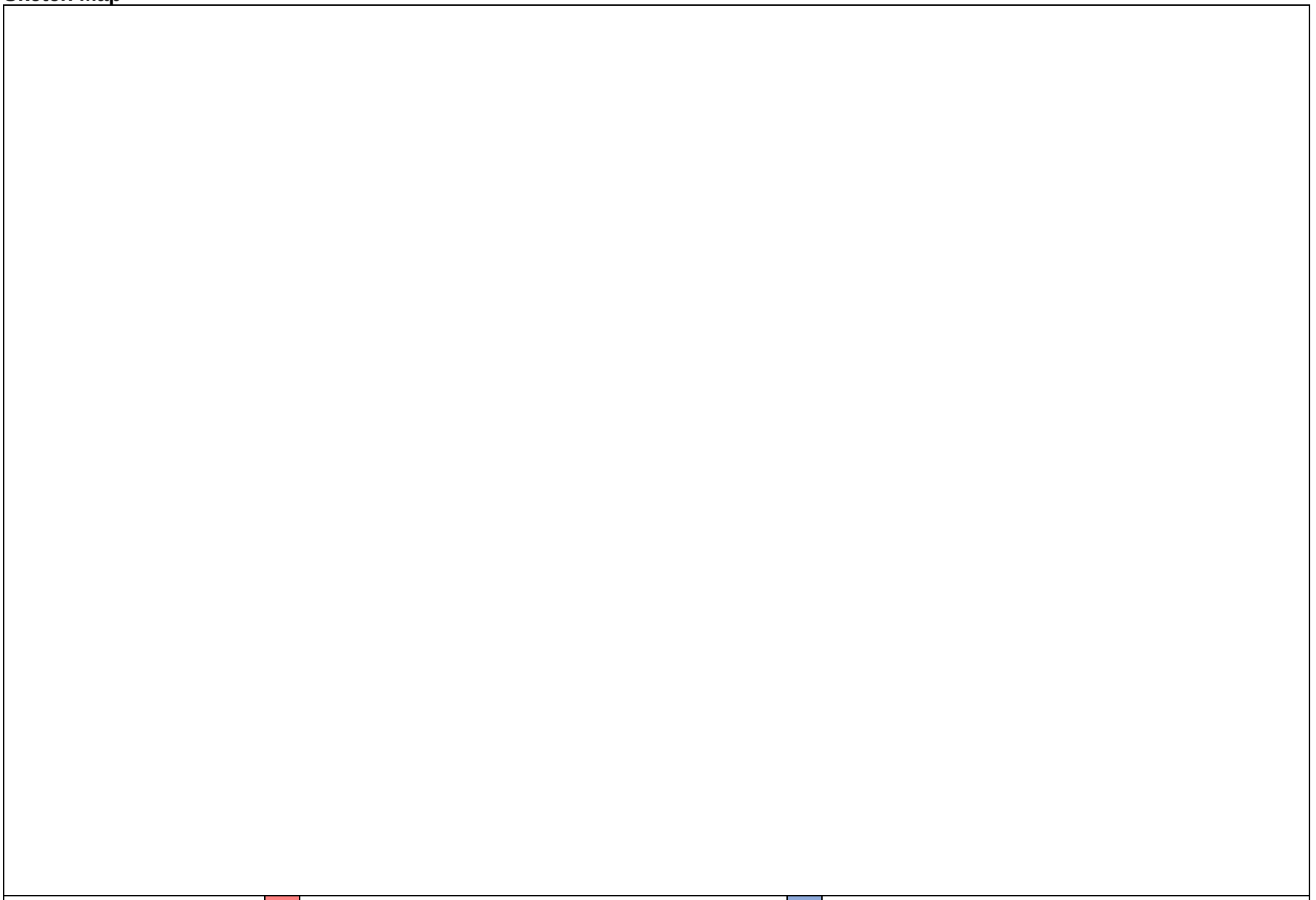
Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design. All practices shall be maintained in accordance with their respective standards.

Qualified Inspector _____ Qualified Inspector Signature _____

Qualified Professional _____ Qualified Professional Signature _____

The above signed acknowledges that, to the best of his/her knowledge, all information provided in this report is accurate and complete. If there are any questions, comments, or concerns regarding the contents of this report, feel free to contact Inspector's Name at XXX-XXX-XXXX or email address.

Sketch Map



Legend:		Area of Active Soil Disturbance		Area has Achieved Temporary Stabilization
		Area of Inactive Soil Disturbance		Area has Achieved Final Stabilization

Inspection Photographs

1		**2**	

3		**4**	

5		**6**	

7		**8**	

9	**10**

.	
11	**12**

Appendix N – Completed SWPPP Inspection Reports