



Hovey's Island PDD Application

Environmental Assessment Report

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Henderson NY

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Project Overview

This Environmental Assessment Report was prepared in accordance with Article 8 of the New York Environmental Conservation Law, the State Environmental Quality Review Act ("SEQRA"), and the implementing regulations of the New York State Department of Environmental Conservation (6NYCRR Part 617) on behalf of the Henderson Town Board, as the designated Lead Agency under to SEQRA.

This report addresses Sun Communities' proposal to establish Hovey's Island, as a Planned Development District (PDD). The Project covers 34 acres and is located in the Town of Henderson, Jefferson County, New York.

This report includes: a Full Environmental Assessment Form. Parts 1 and 2 are completed and included in Appendix A. This Environmental Assessment Report is intended to serve as Part 3 of the Environmental Assessment.

This Environmental Assessment Report (EAR) also includes the following:

- Geotechnical Report
- Stormwater Management Report
- Water/Wastewater Study
- Wetland Delineation & Endangered Species Report
- Archaeological Sensitivity Assessment & Survey
- Visual Impact Assessment
- Traffic Impact Study
- Lighting Photometric Plan
- Permitting Summary

Expanded Environmental Assessment (SEQR Part 3)

I PROJECT DESCRIPTION

A. Proposed Development

Hovey's Island development project includes associated on-site roadways, utility infrastructure, landscaping and stormwater management facilities to support the development of up to 117 cabins for seasonal occupancy. Sun Communities is proposing the following development:

- 117 Cabins (2 and 3 bedrooms)
- Community Building
- Dock containing a maximum of 10 slips
- Boat ramp
- Maintenance Building.
- Outdoor amenities for the residents, including various recreational facilities (potential amenities include tennis courts, swimming pools, pickleball courts, playground areas, walking trails, etc.)
- Wastewater collection system
- Water distribution system
- Stormwater management facilities
- Site lighting
- Parking area

Preliminary design plans for the site development have been submitted to the Town Consulting Engineer and are available separately.

B. Project Implementation

Implementation of the project involves several approvals including the following:

1. Coordinated SEQRA review by the Henderson Town Board (Lead Agency). The action has been designated to be a "Type I" action by the Town Board.
2. Approval of the PDD legislation by the Henderson Town Board.
3. NYSDEC and NYSDOH approvals for the extension of the private water and sewer mains, as well as additional flow to the existing water and wastewater treatment plants.

C. Involved/Interested Agencies

The following review agencies may be included in the necessary project review process:

1. Town of Henderson Town Board
 - a. SEQRA Review – Lead Agency
 - b. Approval of the Amended PDD Legislation
2. Town of Henderson Planning Board
 - a. SEQRA Review - Involved Agency
 - b. Site Plan Approval
3. Jefferson County Planning Board.
 - a. SEQRA review - Interested Agency
4. Jefferson County Health Department.
 - a. SEQRA review - Involved Agency
 - b. Approval of the proposed water and sewer mains and increased flow to the existing water and wastewater treatment plants.
5. New York State Department of Health
 - a. SEQRA review - Involved Agency
 - b. Approval of the proposed water and sewer mains and increased flow to the existing water and wastewater treatment plants (if deferred from Jefferson County Health Department).
6. New York State Department of Environmental Conservation
 - a. SEQRA Review - Involved Agency
 - b. General Permit for Stormwater Discharges (GP-0-20-001)
 - c. Section 401 Water Quality Certification
 - d. Article 15 Protection of Waters Permit
7. New York State Office of General Services
 - a. SEQRA Review - Involved Agency
 - b. Approval of Land Disturbances within Lake Ontario
8. New York State Office of Parks, Recreation and Historic Preservation
 - a. SEQRA Review - Involved Agency
 - b. Sign-off on Archaeological and Historic Impacts
9. U. S. Army Corps of Engineers
 - a. Federal Wetlands Jurisdictional Determination
 - b. Joint Permitting with NYSDEC as required

II IMPACT ANALYSIS AND MITIGATION MEASURES

A. Impact on Land

A.1 'The proposed action may involve construction on land where bedrock is exposed, or generally within 5 feet of existing ground surface.' (FEAF 1.c)

The project will require the excavation of existing land for the purpose of installing water mains, sanitary sewer piping, and stormwater management areas. As stated in the geotechnical report prepared by CME Associates, Inc., dated October 7, 2021 (see Appendix B), which was done for both Hovey's Island and Association Island, bedrock was observed in some locations of Hovey's Island ranging from 3.2 feet to 7 feet below existing ground surface. Rock coring was performed at the bedrock, and the bedrock is classified as limestone with shale fragments, which is considered a soft bedrock, and can be excavated using heavy equipment. The use of explosives will not be required. Rock excavation will take place during normal construction hours, 7 am to 4 pm, Monday through Friday. To our knowledge, the town does not have any noise ordinances regulating when construction can take place.

The action of exposing bedrock will be managed to ensure that there is no significant impact.

A.2 'The proposed action may involve construction that continues for more than one year or in multiple phases.' (FEAF 1.e)

The construction of the proposed infrastructure on Hovey's Island (roads, water mains, sanitary sewer pipes, electrical conduits, stormwater management, etc.) is expected to be completed within one year. The proposed cabins will be constructed off-site and will be delivered to Hovey's Island after the infrastructure has been completed. Foundations for each cabin sold will be constructed prior to the setting of the cabin. The number of cabins delivered each year will be dependent upon the amount of cabins sold that year. Construction will occur during normal construction hours (7 AM to 4 PM weekdays) and will create minimal disturbance since the cabins are constructed off-site and placed on concrete pads. Construction of the driveways will also have a minimal impact.

With the majority of construction being completed during the first year and the cabins being constructed off-site, the action of more than one year or in multiple phases will have a minimal impact on the community and environment.

A.3 'The proposed action may result in increased erosion, whether from physical disturbance or vegetative removal...' (FEAF 1.f)

The project construction site disturbed area at Hovey's Island is 29 acres and is expected to be disturbed for the purpose of site grading and construction of the infrastructure

components. The design plan set includes Erosion and Sediment Control (E&SC) plans for the site construction. All construction work will be in accordance with these E&SC plans, which are also part of the Stormwater Pollution Prevention Plan (SWPPP), which is included in Appendix C. The SWPPP utilizes erosion control practices that are described in the New York State Standards and Specifications for Erosion and Sediment Control, commonly known as the 'Blue Book'.

During construction, erosion control measures such as silt fence, diversion swales/berms and sediment traps/basins will be installed to mitigate the potential for erosion of soils and downstream siltation. The proposed stormwater basins will likely function as temporary sediment traps/basins during construction. Upon the completion of construction, those temporary facilities will be converted to permanent facilities. Special erosion control practices will be utilized so as not to allow any erosion or sediment into the surrounding waterbodies (Henderson Bay & Lake Ontario), and will take into account the potential for torrential rainfall, of which there have been recent events.

The action of increased erosion will be mitigated by implementing the erosion control measures and designed per NYSDEC standards and will not result in any significant impacts.

A.4 'The proposed action is, or may be, located within a Coastal Erosion Hazard Area.' (FEAF 1.g)

The project is located within the New York State Coastal Zone. As the project is anticipated to require a Federal action (i.e. Corps permit) the project will require a Coastal Zone Consistency Review in accordance with the Coastal Zone Management Act. During the permitting process, Colliers Engineering & Design (CED) will prepare the Joint Permit Application (JPA) and it will be sent to New York State Department of State (NYSDOS) to obtain an Individual Consistency Concurrence Determination. As part of this, the JPA will include information on how the Project will be consistent with coastal regulations.

Upon initial review, this project will be comply with federal and NYSDOS Coastal Zone Consistency.

Working with the NYSDOS, the proposed mitigation measures will not result in any impacts on coastal erosion.

B. Impact on Water

B.1 'The proposed action may create a new waterbody.' (FEAF 3.a)

As stated above, a SWPPP has been prepared for this project. The SWPPP includes a Stormwater Management Plan (SMP). The SMP includes the stormwater management design calculations and methods, which includes the use of bioretention ponds. The ponds will be constructed to treat the stormwater runoff after construction. The ponds or 'waterbodies' will be constructed in locations where the depth to bedrock is deep enough with proper separation to allow for this type of stormwater treatment method. Calculations of the efficiency of this treatment method is further described in the SMP. [The SMP will be in complete accordance with the NYSDEC Stormwater Design Manual and will continue to advance as the project design advances to 90% and ultimately to final design.](#)

The action of potentially creating a new waterbody is mitigated by the implementation of the SWPPP/SMP and will not result in any significant impacts.

B.2 'The proposed action may involve dredging more than 100 cubic yards of material from a wetland or water body.' (FEAF 3.c)

The project includes the construction of a boat launch from the shoreline of Hovey's Island going into Henderson Bay. The preliminary design of the concrete boat launch is that it will be 16 feet wide and extend into the bay approximately 25 feet. A dock will be placed adjacent to the boat launch and will be supported by posts that will be bored into the soil underwater. This work will result in a disturbance of soil under the water in the amount of approximately 60 cubic yards (less than 100 cubic yards).

A NYS Office of General Services State Owned Lands Under Water Permit will be obtained for this project, along with an Article 15 Protection of Waters Permit from the NYSDEC.

The work will result in less than 100 cubic yards of dredging and this action will be part of the permitting process with NYSOGS and NYSDEC and will not result in any significant impacts.

B.3 'The proposed action may involve construction within or adjoining a freshwater or tidal wetland, or in the bed of banks of any other water body.' (FEAF 3.d)

Colliers Engineering & Design performed a wetland and watercourse delineation of the project area. Refer to the report provided in Appendix D for more detailed information. Review of available NYSDEC Freshwater Wetlands mapping indicated that there are no freshwater wetlands within the limits of the proposed disturbed area.

According to the USFWS NWI digital data indicated that the project area is located within the Lake Ontario Watershed (HUC 04150200). The New York State Surface Water Classification

map shows that no streams are present on the site. The island is surrounded by Lake Ontario, a Class A/Standard A Lake. According to the FEMA Flood Insurance Rate Map the majority of the project is within Zone C – “above 500-year Floodplain, area of minimal flood hazard”, with a small portion in the northeast that is within Zone B – “between 100-year and 500-year Floodplain, area of moderate flood hazard”. No buildings are to be located in the 100-year floodplain.

During the field study, there was one palustrine emergent wetland (PEM) wetland delineated, which is located on the western edge of the island. The delineated wetland boundary is shown in the design plans.

The only construction within the banks of Henderson Bay will be for the construction of the boat launch and dock, as described previously in section B.2. Within Zone B floodplain, there will be construction of stormwater management facilities and some gravel trails. There will be no structures constructed within the Zone B or Zone A floodplains. The project will avoid disturbance of the PEM wetland.

The project design avoids impact to any wetlands under the jurisdiction of the ACOE or the NYSDEC and there will be no significant impact to wetlands.

B.4 ‘The proposed action may create turbidity in a waterbody, either from upland erosion, runoff or by disturbing bottom sediments.’ (FEAF 3.e). ‘The proposed action may cause soil erosion, or otherwise create a source of stormwater discharge that may lead to siltation or other degradation of receiving water bodies.’ (FEAF 3.h)

This project will be required to comply with the State Pollutant Discharge Elimination System (SPDES) Phase II General Permit for Stormwater Discharges from Construction Activities (GP-0-20-001). As part of these requirements a Stormwater Pollution Prevention Plan (SWPPP) will be prepared describing the required erosion and sedimentation control measures and will identify the required quality and quantity mitigation for the increase in stormwater runoff from the site. See Appendix C.

This project will incorporate Best Management Practices (BMP's) to ensure that water quality on site will be protected. BMP's to be employed will, at a minimum, include:

- 1) Silt fencing placed around construction areas prior to grading activities;
- 2) Placement of a turbidity curtain in the lake to contain sediments during construction of the boat ramp
- 3) Diversion Channels to prevent runoff from leaving the site
- 4) Land clearing activities shall be done only in areas where earthwork will be performed and shall progress as earthwork is needed;
- 5) Permanent seeding and planting of all unpaved areas using the hydro-mulching grass seeding technique;
- 6) Mulching exposed areas, where specified;

- 7) Temporary seeding and planting of all unpaved areas using the hydro-mulching grass seeding technique within 14 days of disturbance; and
- 8) Frequent watering to minimize wind erosion during construction.

All erosion and sediment control measures will be designed in accordance with the New York State Standards and Specifications for Erosion and Sediment Controls. The site contractor will be required to adhere to all erosion and sediment control measures as defined in the approved SWPPP. [The selection and design of the erosion and sediment control measures will take into account the proximity of the project to Lake Ontario and Hovey's Island coast for the prevention of any erosion, turbidity, and siltation.](#)

A construction phasing plan will be developed as part of the SWPPP. If it is planned to disturb more than five acres at a time, approval must be obtained from NYSDEC and at least two site inspections per week must be performed during construction by a qualified professional every seven days for as long as the disturbed area exceeds five acres to ensure that the erosion and sediment control facilities are functioning as designed and there are no impacts to the waters of the U.S. These inspections are to be performed as required by the NYSDEC General Permit GP-0-20-001.

Through these appropriate mitigation measures, there will not be a significant impact as a result of stormwater runoff from the project site.

B.5 'The proposed action may require the construction of new, or expansion of existing, wastewater treatment facilities.' (FEAF 3.k)

It is proposed to connect the sanitary sewer collection system on Hovey's Island to the existing wastewater treatment plant on Association Island. The existing wastewater treatment plant is permitted by NYSDEC for an average daily flow of 0.05 MGD (Million Gallons per Day). Information on the existing wastewater treatment plant at Association Island is described in a Water Treatment Plant Evaluation prepared by CED which is included in Appendix E.

As stated in the report, the average daily flow for Association Island is 8,900 gpd. For the proposed development of Hovey's Island, the report includes data from similar seasonal cabin developments. The total average daily flow of these similar developments is calculated to be 80 gpd per cabin. For the proposed 117 cabins on Hovey's Island, this comes to an average daily flow of 9,360 gpd. Combined with Association Island, this calculates to a combined flow of 18,260 gpd, which is under the SPDES permitted flow of 0.05 MGD (50,000 gpd).

Through permitting with the NYSDEC, the wastewater needs of the project will be compliant with all regulations.

C. Impact on Groundwater

C.1 'The proposed action may require new water supply wells, or create additional demand on supplies from existing water supply wells.' (FEAF 4.a)

Hovey's Island project will get its water from nearby Association Island. The water supply to the treatment system on Association Island draws water directly from Lake Ontario which is pumped through an offshore well. There are no groundwater supply wells on Association Island. The water is treated at the treatment plant using plate settling with polyaluminum chloride, followed by pressure filters and chlorine contact. Two (2) 14,000-gallon storage tanks are used which allow for additional chlorine contact time, and a 300-gpm supply pump conveys water to the distribution.

The projected average daily water use for the seasonal cabins is conservatively estimated to be 9,360 gpd as noted in Section B.5. This is based on actual usage data from similar seasonal cabin sites that Sun Communities operates throughout the country. There is no limit to the amount of water that can be drawn from the lake. The plant has a treatment capacity of 36,000 gpd. Therefore, the proposed combined usage of 18,260 gpd for Association Island and Hovey's Island will be less than the plant capacity. For more information, see the Water Treatment Plant Evaluation provided in Appendix E.

Through permitting with the NYSDEC, the water supply needs of the project will be compliant with all regulations. No wells will be required, as the project will rely on the existing permitted source.

D. Impact on Flooding

D.1 'The proposed action may result in development within a 100-year floodplain.' (FEAF 5.b).
'The proposed action may result in development within a 500-year floodplain.' (FEAF 5.c)

As stated above in Section B.3, the majority of Hovey's Island is located within Zone C, which is the above the 500- year floodplain, which is an area of minimal flooding. A small portion of the project on the east side of the island is within the 100-year floodplain (Zone A1, base flood elevation = 249 feet). See Appendix F for the FEMA floodplain map for the Project Area. The development within the 100-year floodplain will be limited to stormwater management, gravel walking trails, asphalt road, and the aforementioned boat launch and dock. There will be no structures located within the 100-year floodplain.

The development of the site will consider recent high lake levels. This will be addressed on the site grading plans and may include the construction of additional embankments along the access road.

The majority of the proposed project improvements are located outside the 100-year floodplain and will not have a significant impact on flooding.

E. Impact on Plants and Animals

E.1 'The proposed action requires the conversion of more than 10 acres of forest, grassland or any other regionally or locally important habitat.' (FEAF 7.f) 'The proposed action may substantially interfere with nesting/breeding, foraging, or over-wintering habitat for predominant species that occupy or use the project site.' (FEAF 7.g).

Approximately 11% (4.24 acres of 39-acre total project area) of the island will be preserved in it's natural forested condition to mitigate the conversion of existing forest on portions of the island.

The project area was reviewed using the NYSDEC Environmental Resource Mapper (ERM). The project is not located within the "Rare Plants and Animals", or "Significant Natural Communities" layers as mapped by the NYSDEC Environmental Resource Mapper, indicating that there are no records of listed species at the Project Site (see Appendix D). As such, no Natural Heritage screening is required.

Using the US Fish and Wildlife Services' (USFWS) online information, there are two (2) federal endangered species that may occur within the project area, the Indiana Bat and the Northern Long-eared Bat. To our knowledge, there are no other endangered species.

The effect determination for both species is that suitable summer habitat is presented in the project area, and that any tree cutting/clearing shall be conducted between November 1st and March 31st when the bats would be in their winter hibernaculum, which is not on Hovey's Island.

Impacts to species will be mitigated by having the clearing/cutting of trees take place when the bats are not in the area. The proposed project will not have a significant impact on plants and animals, with the large portion of the site that will remain in its natural condition.

F. Impact on Aesthetic Resources

F.1 'The situation or activity in which viewers are engaged while viewing the proposed action is: Recreational or tourism-based activities.' (FEAF 9.d.ii)

The existing wooded treeline on the perimeter of the island will remain and will provide natural screening of the development. A photo simulation of what the island is anticipated to look like after it has been developed, compared to what it looks like now, is included in Appendix G. To prepare the photo simulation, we used Autodesk 3ds Max to create the existing conditions model. We altered/added the proposed grading, landscape, and structures via the CAD drawings and using camera photo matching techniques in 3ds Max. Based on the recorded camera focal length and sensor size, we recreated the real camera view in a 3D scene. We then rendered the views and overlaid them in a composite Adobe Photoshop with the underlying base photo. Decisions on which trees

and foliage should be eliminated or remain comes from observing the photo, the site drawings in plan view, and using the Pictometry oblique imagery service.

There are no significant receptors nearby, such as public parks or historic places, other than the lake, that would have views of the island.

CED performed a Visibility Analysis for Hovey's Island. This predictability analysis takes into consideration what can be seen by an observer from a given location. Key terrain, observation posts, and other locations can be used to assess capabilities (what can be seen) and vulnerabilities (what cannot be seen). The Visibility Analysis tools use elevation data and observer information to produce linear line of sight (LLOS) and radial line of sight (RLOS) information. Given the definition, the figures, which are included in Appendix G, show how many cabins can be seen within those 25% increment areas, meaning within the 1-25% areas, an observer would see anywhere between 1% to 25% of the total number of cabins.

Other data used for the Visibility Analysis:

- Bare Earth Condition was generated using 1m DEM (Digital Elevation Model), source was USGS National Map. This is the highest resolution for this specific site in New York.
- Leaf-On Conditions were generated using available Lidar data for the project site. The LAS dataset were post-processed using a first return method (the first returned laser pulse is the most significant return and will be associated with the highest feature in the landscape like a treetop or the top of a building). Following post-processing a DSM (Digital Surface Model) was generated; containing the elevations of the terrain as well as above-ground features such as buildings, vegetation, and other infrastructure.

Visual impacts will be is mitigated by retaining the wooded island perimeter, and the proposed project will not have an impact on aesthetic resources.

G. Impact on Historic and Archeological Resources

G.1 'The proposed action may occur wholly or partially within, or substantially contiguous to, an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory.' (FEAF 10.b)

HAZEx, a subconsultant to Colliers Engineering & Design, conducted a Phase 1 archaeological assessment and survey for the proposed Hovey's Island development. This report is included in Appendix H. The Phase 1A assessment indicates that the project has a high sensitivity to contain pre-contact sites throughout the island. A Phase 1B survey was conducted covering the entire APE in sensitive areas, which consisted of 477 subsurface tests. No artifact concentrations were observed within the subsurface tests. No intact historic or pre-contact sites were identified during the survey. We are expecting a no-effect letter from SHPO and will provide it to the Town once it is received.

There are no historic or archaeological resources within the project area.

H. Impact on Transportation

H.1 'Proposed traffic increase may exceed capacity of existing road network.' (FEAF 13.a)

A Traffic Impact Study for the proposed development of Hovey's Island was conducted by CED and is included in Appendix I. Radar traffic data was collected along Snowshoe Road and at the access to Hovey's Island in August 2022 and again from September 1st through September 4th, 2023. This data includes traffic counts and classification studies.

Based on the data received for August 2022, the Average Daily Traffic (ADT) for Snowshoe Road during the count period was 452 vehicles per day and the percentage of large vehicles was 18%. The count data collected in September 2023 showed that the ADT was 901 vehicles per day and the percentage of large vehicles was 16%. The traffic volume was presumably higher than the previous count period because it was collected during a peak season holiday around Labor Day weekend, as well as in the southern section of Snowshoe Road before any access to residential or recreational destinations.

This data was compiled into two categories: "cars" and "larger vehicles". "Cars" refer to motorcycles and other vehicles that are less than 30' in length. "Larger vehicles" include vehicles greater than 30' in length such as trucks and RVs. Car travel peaked on Saturday (Aug. 27th and Sept. 2nd) which is also the day that total vehicle volumes were highest. [The peak hour during the August 2022 count period was 12:15 pm to 1:15 pm with 67 vehicles per hour. This is equivalent to approximately 1 vehicle per minute or 54 seconds between vehicles traveling on Snowshoe Road. During the September 2023 Labor Day count period, the Saturday peak hour was 11:30 am to 12:30 pm with 117 vehicles per hour which is about 2 vehicles per minute or 31 seconds between vehicles on Snowshoe Road.](#)

The volume of larger vehicles was higher on Thursday and Sunday in the typical summer weekend (Aug. 25th and 28th), and on Friday and Monday of the holiday Labor Day weekend (Sept. 1st and 4th).

Along with vehicle counts and classifications, vehicle speed data was also collected during the August 2022 study period. Based on the data received, the overall daily average speed on Snowshoe Road is 27.4 miles per hour while the average daily 85th percentile speed (i.e., the speed that 85% of the vehicles measured were travelling at or below) is 30.3 miles per hour. There are periods when traffic speeds are higher but there was a small number of vehicles that were above the speed limit. In addition, the average and 85th percentile speeds are close to or below the posted speed limit throughout most of the day.

To determine what proportion of the existing traffic on Snowshoe Road is traveling to and from the current 300 site campground on Association Island, traffic volume data was collected at the northern end of Snowshoe Road during the September 1st through September 4th, 2023 study period. The Average Daily Traffic (ADT) was 419 vehicles per day at the entrance to Hovey's Island and Association Island, which was 47% of the total ADT on Snowshoe Road (901

vehicles per day). Larger vehicles accounted for 26% of the ADT at this count location, and 73% of the larger vehicles on Snowshoe Road traveled to or from Hoveys Island and Association Island.

Based on the data collected from the study period, as well as information provided by Sun Communities, the existing average, existing peak, and future peak traffic volumes were approximated for Snowshoe Road. The 11th edition of the ITE Trip Generation Manual (latest edition – 2021) was used to determine the trip generation entering and exiting trips estimate for the proposed seasonal use cabins on Hoveys Island (ITE Land Use Code 260 – Recreational Homes). While the expected trips to be generated by the proposed cabins is highest on Sunday, the Saturday mid-day peak hour was analyzed because the existing volumes on Snowshoe Road are higher on Saturday than Sunday. Based on the trip generation rates, there is expected to be an average of 72 additional vehicles traveling on Snowshoe Road during the Saturday mid-day peak hour, which is a 62% increase from the existing peak hour volume of 117 vehicles during the peak holiday weekend.

Data received from Sun Communities Inc. for the study period during August 2022 showed that occupancy at the existing Association Island park was 48.37% (about 145 sites) with 24 sites being long term occupancy and about 121 being daily or weekly sites. This was assumed to be representative of a typical summer weekend based on average weekend occupancy between June and September. [Data received by Sun Communities Inc. during the September 2023 count period showed that the peak occupancy was 65.85% \(about 209 sites\). This is typical of the holiday weekend occupancy observed in recent years for Association Island, as well as throughout the campground and RV park industry. The ITE Trip Generation Manual 11th Edition has limited data for RV parks of a similar size and none in New York; however, the projected trips generated based on full occupancy of the existing Association Island RV park was evaluated and determined to be comparable to the actual counts in the Labor Day weekend. Therefore, the local data for the existing RV Park is considered more accurate.](#) The traffic count data collected around the Labor Day holiday weekend in September 2023 was assumed to represent peak season volumes on Snowshoe Road. The estimated trip generation that would result from the Hoveys Island cabins was added to the average and peak season traffic.

Based on the additional trips projected to be generated by the Hovey's Island cabins, there would be approximately 72 more vehicles traveling on Snowshoe Road during the Saturday peak hour, which is about 189 vehicles per hour on the peak weekends of the season such as Labor Day. [This is equivalent to approximately 3 vehicles per minute or about 19 seconds between vehicles traveling on Snowshoe Road.](#) When the expected trips generated are added to the average typical weekend volumes, there are expected to be about 139 vehicles per hour during the Saturday peak hour. There is not anticipated to be an increase to large vehicles on Snowshoe Road due to the addition of seasonal use cabins on Hovey's Island, as there are no RV spaces.

The increased traffic on Snowshoe Road generated by the Hoveys Island cabin development does not exceed the standard threshold for capacity. Based on guidelines in the Highway Capacity Manual (HCM) and NCHRP Report 825, Planning and Preliminary Engineering Applications Guide to the Highway Capacity Manual, the daily capacity for a two-lane roadway is approximately 24,900 vehicles per day and 7,100 vehicles per day for a Level of Service of C or better. The peak weekend average daily traffic on Snowshoe Road with the future traffic from the Hoveys Island cabins is approximately 1,380 vehicles per day in both directions, which is about 5.5% of the standard roadway capacity. These capacity thresholds assume ideal roadway conditions; however, Snowshoe Road is narrow with 18-20 feet pavement width and about 2-foot shoulders and no striping. If Snowshoe Road is conservatively assumed to have half the capacity of rural two-lane road with ideal conditions, the anticipated future peak volumes based on our data is still well under the capacity threshold.

Per the HCM 7th Edition, the hourly capacity of a two-lane highway segment is 1,700 vehicles per hour per lane, under base/ideal conditions including 12-foot lanes, level terrain, and a straight alignment. The Level of Service (LOS) for an uninterrupted two-lane highway facility (i.e., no signals or stop control within the segment) is not solely based on capacity and the HCM methodology does not produce a capacity adjusted for actual roadway conditions. However, based on engineering judgement and an iterative analysis in the Highway Capacity Software 7th Edition (HCS7) (i.e., increasing volume until the volume to capacity ratio equals 1.0), the adjusted capacity is assumed at about 1,490 vehicles per hour per lane. The projected peak hour volume on Snowshoe Road on a peak season Saturday with the addition of Hovey's Island cabins is 189 vehicles per hour total and 99 vehicles per hour in the peak direction. This is significantly less than the expected capacity of Snowshoe Road at about 6.6% of the adjusted capacity.

The vehicle trips per hour in the peak direction is only 6.6% of the capacity of Snowshoe Road.

Synchro software was used to conduct a preliminary intersection capacity analysis. Along Snowshoe Road, an intersection with a driveway was modeled to evaluate the impact of a resident turning left out of their driveway across both lanes of traffic. On the holiday peak season Saturday with the addition of Hovey's Island Cabins, the driveway LOS is expected to be A with a delay of 9.6 seconds per vehicle, compared to 9.2 seconds per vehicle without the development traffic. The unsignalized intersection of Snowshoe Road at Military Road was also analyzed, which shows an expected LOS of A for the intersection. The average delay per vehicle at the intersection is anticipated to increase from 4.2 seconds to 4.9 seconds per vehicle. The full Synchro reports are included in Appendix C.

While the existing Snowshoe Road (a two-way, two-lane roadway) is expected to have sufficient capacity for the existing and future traffic volumes, the pavement width does not meet NYSDOT standard criteria. Based on NYSDOT Highway Design Manual (HDM) Chapter 2, a local rural road with a design speed of 40 mph or less and average daily traffic (ADT) between 400 and 2,000 vehicles per day should have travel lane widths of 10 feet and shoulder widths of 4 feet. The existing pavement width varies from 20 feet to 18 feet with 2-foot gravel shoulders and does not meet this criteria. To meet NYSDOT design criteria, Snowshoe Road would need to be widened to a total width of 28 feet. [However, widening the roadway could have impacts on existing features such as driveways, trees, and parking, as well as the financial costs of road reconstruction and potential right-of-way acquisitions. In addition, according to the Highway Capacity Manual and Federal Highway Administration, wider lanes and shoulders can also lead to increased vehicle speeds.](#)

We would recommend the following improvements:

- There are two speed limit signs in each direction on the entirety of Snowshoe Road. Per the New York State Supplement to the Manual on Uniform Traffic Control Devices (MUTCD), the first intermediate speed limit sign should be placed a maximum of 1100 feet from the initial speed limit sign. The spacing between subsequent intermediate signs should not exceed the distance produced by multiplying the speed limit (in miles per hour) by 100, which would be 3000 feet in this case. The current spacing between the signs does not meet these standards.
- To address the issue of vehicle speed and pedestrians along Snowshoe Road, we recommend increasing the number of speed limit signs to be in accordance with the NYS Supplement to the MUTCD.
- Also, it is recommended that additional Pedestrian warning signs be added along Snowshoe Road to bring awareness to motorists of pedestrians along the road.

The proposed project will increase traffic during limited time periods, but will not cause the capacity of the existing road network to be exceeded. During most normal days, the peak hour increase is anticipated to be 39 trips. During busy days, such as holiday weekends, the peak hour trip generation is anticipated to be 72-88 trips. These trip volumes are below the national threshold of 100 trips per hour, as published by the Institute of Transportation Engineers. Therefore, these increases are not considered to be significant.

I. Impact on Energy

I.1 'The proposed action will require the creation or extension of an energy transmission or supply system to serve more than 50 single or two-family residences or to serve a commercial or industrial use.' (FEAF 14.b)

According to National Grid, there is sufficient electricity supplied to Association Island and Hovey's Island for this project. There will not be a need to create an extension of electrical transmission.

J. Impact on Noise, Odor, and Light

J.1 'The proposed action may produce sound above noise levels established by local regulation.' (FEAF 15.a)

Construction will occur on normal working days, Monday through Friday, approximately 7 am to 4 pm. Noise associated with typical construction will occur during those times and will be in accordance with typical noise standards. It is not expected that blasting will be required. Unusual odors are not anticipated to occur, other than what is common during construction operations.

For the proposed site lighting, the owner has selected 'dark sky compliant' lighting. Recently, lighting manufacturers do not list fixtures any longer as "Dark Sky Compliant" because the IES (Illuminating Engineering Society) standards have now shifted to B-U-G (backlight-uplight-glare) ratings. Previous "Dark Sky Compliance" required that fixtures be fully shielded and emit no light above the horizontal plane. Fixtures could not have sag or drop lenses, side light panels, up light panels, etc. Approved fixtures were required to employ warm-toned (3000K and lower) white light sources or may employ amber light sources or filtered LED light sources.

The IES Standard for B-U-G to meet the intended "Dark Sky Compliance" should have a U, or up light, value of 0, which provides no light above the horizontal plane. The light fixture planned for this project has a Kelvin temperature of 3000K to meet the requirements of "Dark Sky Compliance". These fixtures also have a B-U-G rating of B3-U0-G5, and the fixture provides no up light thus meeting the IES standard for "Dark Sky Compliance".

A photometric plan showing the proposed dark sky lighting levels for the proposed development of Hovey's Island is included in Appendix J.

K. Consistency with Community Plans

K.1 'The proposed action may cause a change in the density of development that is not supported by existing infrastructure or is distant from existing infrastructure.' (FEAF 17.e)

The Town of Henderson has a town comprehensive plan. Seasonal residences are included in the comprehensive plan. The development of Hovey's Island into seasonal use cabins is also consistent with the existing nearby development of Snowshoe Road, as well as on Association Island. New infrastructure will be constructed on Hovey's Island consisting of new roads, water mains, sanitary sewer system, electrical, and stormwater management. The water distribution system and sanitary sewer system will connect to the existing water and sewer

systems on Association Island. Existing electrical service will be extended and upgraded as required for Hovey's Island. The development of Hovey's Island will not affect any other nearby existing infrastructure.

The proposed project will be consistent with community plans and is supported by existing infrastructure.

L. Consistency with Community Character

L.1 'The proposed action may create a demand for additional community services (e.g. schools, police and fire).' (FEAF 18.b)

The development of Hovey's Island into 117 seasonal use cabins is not expected to create a demand for additional school services as the intended use is for vacation cabins used seasonally, not for permanent residency. Through conversations with local police and fire officials, we have not received any information indicating community services are inadequate in the Town of Henderson to support this project. The project will not have a significant impact on community services.



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Appendix A

SEQR Full EAF Parts 1 & 2

Full Environmental Assessment Form
Part 1 - Project and Setting

Instructions for Completing Part 1

Part 1 is to be completed by the applicant or project sponsor. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification.

Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information; indicate whether missing information does not exist, or is not reasonably available to the sponsor; and, when possible, generally describe work or studies which would be necessary to update or fully develop that information.

Applicants/sponsors must complete all items in Sections A & B. In Sections C, D & E, most items contain an initial question that must be answered either “Yes” or “No”. If the answer to the initial question is “Yes”, complete the sub-questions that follow. If the answer to the initial question is “No”, proceed to the next question. Section F allows the project sponsor to identify and attach any additional information. Section G requires the name and signature of the applicant or project sponsor to verify that the information contained in Part 1 is accurate and complete.

A. Project and Applicant/Sponsor Information.

Name of Action or Project:		
Project Location (describe, and attach a general location map):		
Brief Description of Proposed Action (include purpose or need):		
Name of Applicant/Sponsor:		Telephone:
		E-Mail:
Address:		
City/PO:	State:	Zip Code:
Project Contact (if not same as sponsor; give name and title/role):		Telephone:
		E-Mail:
Address:		
City/PO:	State:	Zip Code:
Property Owner (if not same as sponsor):		Telephone:
		E-Mail:
Address:		
City/PO:	State:	Zip Code:

B. Government Approvals

B. Government Approvals, Funding, or Sponsorship. (“Funding” includes grants, loans, tax relief, and any other forms of financial assistance.)

Government Entity	If Yes: Identify Agency and Approval(s) Required	Application Date (Actual or projected)
a. City Counsel, Town Board, or Village Board of Trustees <input type="checkbox"/> Yes <input type="checkbox"/> No		
b. City, Town or Village Planning Board or Commission <input type="checkbox"/> Yes <input type="checkbox"/> No		
c. City, Town or Village Zoning Board of Appeals <input type="checkbox"/> Yes <input type="checkbox"/> No		
d. Other local agencies <input type="checkbox"/> Yes <input type="checkbox"/> No		
e. County agencies <input type="checkbox"/> Yes <input type="checkbox"/> No		
f. Regional agencies <input type="checkbox"/> Yes <input type="checkbox"/> No		
g. State agencies <input type="checkbox"/> Yes <input type="checkbox"/> No		
h. Federal agencies <input type="checkbox"/> Yes <input type="checkbox"/> No		
i. Coastal Resources. <i>i.</i> Is the project site within a Coastal Area, or the waterfront area of a Designated Inland Waterway? <input type="checkbox"/> Yes <input type="checkbox"/> No <i>ii.</i> Is the project site located in a community with an approved Local Waterfront Revitalization Program? <input type="checkbox"/> Yes <input type="checkbox"/> No <i>iii.</i> Is the project site within a Coastal Erosion Hazard Area? <input type="checkbox"/> Yes <input type="checkbox"/> No		

C. Planning and Zoning

C.1. Planning and zoning actions.

Will administrative or legislative adoption, or amendment of a plan, local law, ordinance, rule or regulation be the only approval(s) which must be granted to enable the proposed action to proceed? ☐ Yes ☐ No

- **If Yes**, complete sections C, F and G.
- **If No**, proceed to question C.2 and complete all remaining sections and questions in Part 1

C.2. Adopted land use plans.

a. Do any municipally- adopted (city, town, village or county) comprehensive land use plan(s) include the site where the proposed action would be located? ☐ Yes ☐ No

If Yes, does the comprehensive plan include specific recommendations for the site where the proposed action would be located? ☐ Yes ☐ No

b. Is the site of the proposed action within any local or regional special planning district (for example: Greenway; Brownfield Opportunity Area (BOA); designated State or Federal heritage area; watershed management plan; or other?) ☐ Yes ☐ No

If Yes, identify the plan(s):

c. Is the proposed action located wholly or partially within an area listed in an adopted municipal open space plan, or an adopted municipal farmland protection plan? ☐ Yes ☐ No

If Yes, identify the plan(s):

C.3. Zoning

a. Is the site of the proposed action located in a municipality with an adopted zoning law or ordinance. ☐ Yes ☐ No
If Yes, what is the zoning classification(s) including any applicable overlay district?

b. Is the use permitted or allowed by a special or conditional use permit? ☐ Yes ☐ No

c. Is a zoning change requested as part of the proposed action? ☐ Yes ☐ No

If Yes,

i. What is the proposed new zoning for the site? _____

C.4. Existing community services.

a. In what school district is the project site located? _____

b. What police or other public protection forces serve the project site?

c. Which fire protection and emergency medical services serve the project site?

d. What parks serve the project site?

D. Project Details

D.1. Proposed and Potential Development

a. What is the general nature of the proposed action (e.g., residential, industrial, commercial, recreational; if mixed, include all components)?

b. a. Total acreage of the site of the proposed action? _____ acres

b. Total acreage to be physically disturbed? _____ acres

c. Total acreage (project site and any contiguous properties) owned
or controlled by the applicant or project sponsor? _____ acres

c. Is the proposed action an expansion of an existing project or use? ☐ Yes ☐ No

i. If Yes, what is the approximate percentage of the proposed expansion and identify the units (e.g., acres, miles, housing units, square feet)? % _____ Units: _____

d. Is the proposed action a subdivision, or does it include a subdivision? ☐ Yes ☐ No

If Yes,

i. Purpose or type of subdivision? (e.g., residential, industrial, commercial; if mixed, specify types)

ii. Is a cluster/conservation layout proposed? ☐ Yes ☐ No

iii. Number of lots proposed? _____

iv. Minimum and maximum proposed lot sizes? Minimum _____ Maximum _____

e. Will the proposed action be constructed in multiple phases? ☐ Yes ☐ No

i. If No, anticipated period of construction: _____ months

ii. If Yes:

- Total number of phases anticipated _____
- Anticipated commencement date of phase 1 (including demolition) _____ month _____ year
- Anticipated completion date of final phase _____ month _____ year

• Generally describe connections or relationships among phases, including any contingencies where progress of one phase may determine timing or duration of future phases: _____

f. Does the project include new residential uses? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, show numbers of units proposed.				
	<u>One Family</u>	<u>Two Family</u>	<u>Three Family</u>	<u>Multiple Family (four or more)</u>
Initial Phase	_____	_____	_____	_____
At completion	_____	_____	_____	_____
of all phases	_____	_____	_____	_____

g. Does the proposed action include new non-residential construction (including expansions)? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes,	
i. Total number of structures _____ ii. Dimensions (in feet) of largest proposed structure: _____ height; _____ width; and _____ length iii. Approximate extent of building space to be heated or cooled: _____ square feet	

h. Does the proposed action include construction or other activities that will result in the impoundment of any liquids, such as creation of a water supply, reservoir, pond, lake, waste lagoon or other storage? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes,	
i. Purpose of the impoundment: _____ ii. If a water impoundment, the principal source of the water: <input type="checkbox"/> Ground water <input type="checkbox"/> Surface water streams <input type="checkbox"/> Other specify: _____ iii. If other than water, identify the type of impounded/contained liquids and their source. _____ iv. Approximate size of the proposed impoundment. Volume: _____ million gallons; surface area: _____ acres v. Dimensions of the proposed dam or impounding structure: _____ height; _____ length vi. Construction method/materials for the proposed dam or impounding structure (e.g., earth fill, rock, wood, concrete): _____	

D.2. Project Operations

a. Does the proposed action include any excavation, mining, or dredging, during construction, operations, or both? <input type="checkbox"/> Yes <input type="checkbox"/> No (Not including general site preparation, grading or installation of utilities or foundations where all excavated materials will remain onsite) If Yes:	
i. What is the purpose of the excavation or dredging? _____ ii. How much material (including rock, earth, sediments, etc.) is proposed to be removed from the site? • Volume (specify tons or cubic yards): _____ • Over what duration of time? _____ iii. Describe nature and characteristics of materials to be excavated or dredged, and plans to use, manage or dispose of them. _____ _____ iv. Will there be onsite dewatering or processing of excavated materials? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe. _____ _____ v. What is the total area to be dredged or excavated? _____ acres vi. What is the maximum area to be worked at any one time? _____ acres vii. What would be the maximum depth of excavation or dredging? _____ feet viii. Will the excavation require blasting? <input type="checkbox"/> Yes <input type="checkbox"/> No ix. Summarize site reclamation goals and plan: _____ _____ _____	

b. Would the proposed action cause or result in alteration of, increase or decrease in size of, or encroachment into any existing wetland, waterbody, shoreline, beach or adjacent area? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes:	
i. Identify the wetland or waterbody which would be affected (by name, water index number, wetland map number or geographic description): _____ _____	

ii. Describe how the proposed action would affect that waterbody or wetland, e.g. excavation, fill, placement of structures, or alteration of channels, banks and shorelines. Indicate extent of activities, alterations and additions in square feet or acres:

iii. Will the proposed action cause or result in disturbance to bottom sediments? Yes ☐ No ☐
If Yes, describe: _____

iv. Will the proposed action cause or result in the destruction or removal of aquatic vegetation? ☐ Yes ☐ No ☐
If Yes:

- acres of aquatic vegetation proposed to be removed: _____
- expected acreage of aquatic vegetation remaining after project completion: _____
- purpose of proposed removal (e.g. beach clearing, invasive species control, boat access): _____
- proposed method of plant removal: _____
- if chemical/herbicide treatment will be used, specify product(s): _____

v. Describe any proposed reclamation/mitigation following disturbance: _____

c. Will the proposed action use, or create a new demand for water? ☐ Yes ☐ No ☐
If Yes:

i. Total anticipated water usage/demand per day: _____ gallons/day

ii. Will the proposed action obtain water from an existing public water supply? ☐ Yes ☐ No ☐
If Yes:

- Name of district or service area: _____
- Does the existing public water supply have capacity to serve the proposal? ☐ Yes ☐ No ☐
- Is the project site in the existing district? ☐ Yes ☐ No ☐
- Is expansion of the district needed? ☐ Yes ☐ No ☐
- Do existing lines serve the project site? ☐ Yes ☐ No ☐

iii. Will line extension within an existing district be necessary to supply the project? ☐ Yes ☐ No ☐
If Yes:

- Describe extensions or capacity expansions proposed to serve this project: _____
- Source(s) of supply for the district: _____

iv. Is a new water supply district or service area proposed to be formed to serve the project site? ☐ Yes ☐ No ☐
If, Yes:

- Applicant/sponsor for new district: _____
- Date application submitted or anticipated: _____
- Proposed source(s) of supply for new district: _____

v. If a public water supply will not be used, describe plans to provide water supply for the project: _____

vi. If water supply will be from wells (public or private), what is the maximum pumping capacity: _____ gallons/minute.

d. Will the proposed action generate liquid wastes? ☐ Yes ☐ No ☐
If Yes:

i. Total anticipated liquid waste generation per day: _____ gallons/day

ii. Nature of liquid wastes to be generated (e.g., sanitary wastewater, industrial; if combination, describe all components and approximate volumes or proportions of each): _____

iii. Will the proposed action use any existing public wastewater treatment facilities? ☐ Yes ☐ No ☐
If Yes:

- Name of wastewater treatment plant to be used: _____
- Name of district: _____
- Does the existing wastewater treatment plant have capacity to serve the project? ☐ Yes ☐ No ☐
- Is the project site in the existing district? ☐ Yes ☐ No ☐
- Is expansion of the district needed? ☐ Yes ☐ No ☐

<ul style="list-style-type: none"> • Do existing sewer lines serve the project site? _____ • Will a line extension within an existing district be necessary to serve the project? _____ <p>If Yes:</p> <ul style="list-style-type: none"> • Describe extensions or capacity expansions proposed to serve this project: _____ _____ _____ 	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>iv. Will a new wastewater (sewage) treatment district be formed to serve the project site? _____</p> <p>If Yes:</p> <ul style="list-style-type: none"> • Applicant/sponsor for new district: _____ • Date application submitted or anticipated: _____ • What is the receiving water for the wastewater discharge? _____ 	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>v. If public facilities will not be used, describe plans to provide wastewater treatment for the project, including specifying proposed receiving water (name and classification if surface discharge or describe subsurface disposal plans): _____ _____ _____</p>		
<p>vi. Describe any plans or designs to capture, recycle or reuse liquid waste: _____ _____ _____</p>		
<p>e. Will the proposed action disturb more than one acre and create stormwater runoff, either from new point sources (i.e. ditches, pipes, swales, curbs, gutters or other concentrated flows of stormwater) or non-point source (i.e. sheet flow) during construction or post construction? _____</p> <p>If Yes:</p> <p>i. How much impervious surface will the project create in relation to total size of project parcel?</p> <p style="padding-left: 40px;">_____ Square feet or _____ acres (impervious surface)</p> <p style="padding-left: 40px;">_____ Square feet or _____ acres (parcel size)</p> <p>ii. Describe types of new point sources. _____ _____</p> <p>iii. Where will the stormwater runoff be directed (i.e. on-site stormwater management facility/structures, adjacent properties, groundwater, on-site surface water or off-site surface waters)? _____ _____</p> <ul style="list-style-type: none"> • If to surface waters, identify receiving water bodies or wetlands: _____ _____ • Will stormwater runoff flow to adjacent properties? _____ 	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>iv. Does the proposed plan minimize impervious surfaces, use pervious materials or collect and re-use stormwater? _____</p>		
<p>f. Does the proposed action include, or will it use on-site, one or more sources of air emissions, including fuel combustion, waste incineration, or other processes or operations? _____</p> <p>If Yes, identify:</p> <p>i. Mobile sources during project operations (e.g., heavy equipment, fleet or delivery vehicles) _____</p> <p>ii. Stationary sources during construction (e.g., power generation, structural heating, batch plant, crushers) _____</p> <p>iii. Stationary sources during operations (e.g., process emissions, large boilers, electric generation) _____</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No	
<p>g. Will any air emission sources named in D.2.f (above), require a NY State Air Registration, Air Facility Permit, or Federal Clean Air Act Title IV or Title V Permit? _____</p> <p>If Yes:</p> <p>i. Is the project site located in an Air quality non-attainment area? (Area routinely or periodically fails to meet ambient air quality standards for all or some parts of the year) _____</p> <p>ii. In addition to emissions as calculated in the application, the project will generate:</p> <ul style="list-style-type: none"> • _____ Tons/year (short tons) of Carbon Dioxide (CO₂) • _____ Tons/year (short tons) of Nitrous Oxide (N₂O) • _____ Tons/year (short tons) of Perfluorocarbons (PFCs) • _____ Tons/year (short tons) of Sulfur Hexafluoride (SF₆) • _____ Tons/year (short tons) of Carbon Dioxide equivalent of Hydrofluorocarbons (HFCs) • _____ Tons/year (short tons) of Hazardous Air Pollutants (HAPs) 		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No

<p>h. Will the proposed action generate or emit methane (including, but not limited to, sewage treatment plants, landfills, composting facilities)? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes:</p> <p>i. Estimate methane generation in tons/year (metric): _____</p> <p>ii. Describe any methane capture, control or elimination measures included in project design (e.g., combustion to generate heat or electricity, flaring): _____</p>			
<p>i. Will the proposed action result in the release of air pollutants from open-air operations or processes, such as quarry or landfill operations? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes: Describe operations and nature of emissions (e.g., diesel exhaust, rock particulates/dust): _____</p>			
<p>j. Will the proposed action result in a substantial increase in traffic above present levels or generate substantial new demand for transportation facilities or services? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes:</p> <p>i. When is the peak traffic expected (Check all that apply): <input type="checkbox"/> Morning <input type="checkbox"/> Evening <input type="checkbox"/> Weekend <input type="checkbox"/> Randomly between hours of _____ to _____.</p> <p>ii. For commercial activities only, projected number of truck trips/day and type (e.g., semi trailers and dump trucks): _____</p> <p>iii. Parking spaces: Existing _____ Proposed _____ Net increase/decrease _____</p> <p>iv. Does the proposed action include any shared use parking? Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>v. If the proposed action includes any modification of existing roads, creation of new roads or change in existing access, describe: _____</p> <p>vi. Are public/private transportation service(s) or facilities available within ½ mile of the proposed site? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>vii. Will the proposed action include access to public transportation or accommodations for use of hybrid, electric or other alternative fueled vehicles? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>viii. Will the proposed action include plans for pedestrian or bicycle accommodations for connections to existing pedestrian or bicycle routes? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>			
<p>k. Will the proposed action (for commercial or industrial projects only) generate new or additional demand for energy? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes:</p> <p>i. Estimate annual electricity demand during operation of the proposed action: _____</p> <p>ii. Anticipated sources/suppliers of electricity for the project (e.g., on-site combustion, on-site renewable, via grid/local utility, or other): _____</p> <p>iii. Will the proposed action require a new, or an upgrade, to an existing substation? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>			
<p>l. Hours of operation. Answer all items which apply.</p> <table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>i. During Construction:</p> <ul style="list-style-type: none"> • Monday - Friday: _____ • Saturday: _____ • Sunday: _____ • Holidays: _____ </td> <td style="width: 50%; vertical-align: top;"> <p>ii. During Operations:</p> <ul style="list-style-type: none"> • Monday - Friday: _____ • Saturday: _____ • Sunday: _____ • Holidays: _____ </td> </tr> </table>		<p>i. During Construction:</p> <ul style="list-style-type: none"> • Monday - Friday: _____ • Saturday: _____ • Sunday: _____ • Holidays: _____ 	<p>ii. During Operations:</p> <ul style="list-style-type: none"> • Monday - Friday: _____ • Saturday: _____ • Sunday: _____ • Holidays: _____
<p>i. During Construction:</p> <ul style="list-style-type: none"> • Monday - Friday: _____ • Saturday: _____ • Sunday: _____ • Holidays: _____ 	<p>ii. During Operations:</p> <ul style="list-style-type: none"> • Monday - Friday: _____ • Saturday: _____ • Sunday: _____ • Holidays: _____ 		

<p>m. Will the proposed action produce noise that will exceed existing ambient noise levels during construction, operation, or both? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes:</p> <p>i. Provide details including sources, time of day and duration:</p> <p>_____</p> <p>_____</p>	
<p>ii. Will the proposed action remove existing natural barriers that could act as a noise barrier or screen? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Describe: _____</p> <p>_____</p>	
<p>n. Will the proposed action have outdoor lighting? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes:</p> <p>i. Describe source(s), location(s), height of fixture(s), direction/aim, and proximity to nearest occupied structures:</p> <p>_____</p> <p>_____</p>	
<p>ii. Will proposed action remove existing natural barriers that could act as a light barrier or screen? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Describe: _____</p> <p>_____</p>	
<p>o. Does the proposed action have the potential to produce odors for more than one hour per day? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes, describe possible sources, potential frequency and duration of odor emissions, and proximity to nearest occupied structures: _____</p> <p>_____</p> <p>_____</p>	
<p>p. Will the proposed action include any bulk storage of petroleum (combined capacity of over 1,100 gallons) or chemical products 185 gallons in above ground storage or any amount in underground storage? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes:</p> <p>i. Product(s) to be stored _____</p> <p>ii. Volume(s) _____ per unit time _____ (e.g., month, year)</p> <p>iii. Generally, describe the proposed storage facilities: _____</p> <p>_____</p>	
<p>q. Will the proposed action (commercial, industrial and recreational projects only) use pesticides (i.e., herbicides, insecticides) during construction or operation? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes:</p> <p>i. Describe proposed treatment(s):</p> <p>_____</p> <p>_____</p> <p>_____</p>	
<p>ii. Will the proposed action use Integrated Pest Management Practices? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	
<p>r. Will the proposed action (commercial or industrial projects only) involve or require the management or disposal of solid waste (excluding hazardous materials)? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes:</p> <p>i. Describe any solid waste(s) to be generated during construction or operation of the facility:</p> <ul style="list-style-type: none"> • Construction: _____ tons per _____ (unit of time) • Operation : _____ tons per _____ (unit of time) <p>ii. Describe any proposals for on-site minimization, recycling or reuse of materials to avoid disposal as solid waste:</p> <ul style="list-style-type: none"> • Construction: _____ _____ • Operation: _____ _____ <p>iii. Proposed disposal methods/facilities for solid waste generated on-site:</p> <ul style="list-style-type: none"> • Construction: _____ _____ • Operation: _____ _____ 	

s. Does the proposed action include construction or modification of a solid waste management facility? ☐ Yes ☐ No
 If Yes:
 i. Type of management or handling of waste proposed for the site (e.g., recycling or transfer station, composting, landfill, or other disposal activities): _____
 ii. Anticipated rate of disposal/processing:
 • _____ Tons/month, if transfer or other non-combustion/thermal treatment, or
 • _____ Tons/hour, if combustion or thermal treatment
 iii. If landfill, anticipated site life: _____ years

t. Will the proposed action at the site involve the commercial generation, treatment, storage, or disposal of hazardous waste? ☐ Yes ☐ No
 If Yes:
 i. Name(s) of all hazardous wastes or constituents to be generated, handled or managed at facility: _____

 ii. Generally describe processes or activities involving hazardous wastes or constituents: _____

 iii. Specify amount to be handled or generated _____ tons/month
 iv. Describe any proposals for on-site minimization, recycling or reuse of hazardous constituents: _____

 v. Will any hazardous wastes be disposed at an existing offsite hazardous waste facility? ☐ Yes ☐ No
 If Yes: provide name and location of facility: _____

 If No: describe proposed management of any hazardous wastes which will not be sent to a hazardous waste facility:

E. Site and Setting of Proposed Action

E.1. Land uses on and surrounding the project site			
a. Existing land uses. i. Check all uses that occur on, adjoining and near the project site. <input type="checkbox"/> Urban <input type="checkbox"/> Industrial <input type="checkbox"/> Commercial <input type="checkbox"/> Residential (suburban) <input type="checkbox"/> Rural (non-farm) <input type="checkbox"/> Forest <input type="checkbox"/> Agriculture <input type="checkbox"/> Aquatic <input type="checkbox"/> Other (specify): _____ ii. If mix of uses, generally describe: _____ _____			
b. Land uses and coverytypes on the project site.			
Land use or Coverytype	Current Acreage	Acreage After Project Completion	Change (Acres +/-)
• Roads, buildings, and other paved or impervious surfaces			
• Forested			
• Meadows, grasslands or brushlands (non-agricultural, including abandoned agricultural)			
• Agricultural (includes active orchards, field, greenhouse etc.)			
• Surface water features (lakes, ponds, streams, rivers, etc.)			
• Wetlands (freshwater or tidal)			
• Non-vegetated (bare rock, earth or fill)			
• Other Describe: _____ _____			

<p>c. Is the project site presently used by members of the community for public recreation? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><i>i. If Yes: explain:</i> _____</p>	
<p>d. Are there any facilities serving children, the elderly, people with disabilities (e.g., schools, hospitals, licensed day care centers, or group homes) within 1500 feet of the project site? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes,</p> <p><i>i. Identify Facilities:</i></p> <p>_____</p> <p>_____</p>	
<p>e. Does the project site contain an existing dam? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes:</p> <p><i>i. Dimensions of the dam and impoundment:</i></p> <ul style="list-style-type: none"> • Dam height: _____ feet • Dam length: _____ feet • Surface area: _____ acres • Volume impounded: _____ gallons OR acre-feet <p><i>ii. Dam's existing hazard classification:</i> _____</p> <p><i>iii. Provide date and summarize results of last inspection:</i></p> <p>_____</p> <p>_____</p>	
<p>f. Has the project site ever been used as a municipal, commercial or industrial solid waste management facility, or does the project site adjoin property which is now, or was at one time, used as a solid waste management facility? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes:</p> <p><i>i. Has the facility been formally closed?</i> <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <ul style="list-style-type: none"> • If yes, cite sources/documentation: _____ <p><i>ii. Describe the location of the project site relative to the boundaries of the solid waste management facility:</i></p> <p>_____</p> <p>_____</p> <p><i>iii. Describe any development constraints due to the prior solid waste activities:</i> _____</p> <p>_____</p>	
<p>g. Have hazardous wastes been generated, treated and/or disposed of at the site, or does the project site adjoin property which is now or was at one time used to commercially treat, store and/or dispose of hazardous waste? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes:</p> <p><i>i. Describe waste(s) handled and waste management activities, including approximate time when activities occurred:</i></p> <p>_____</p> <p>_____</p>	
<p>h. Potential contamination history. Has there been a reported spill at the proposed project site, or have any remedial actions been conducted at or adjacent to the proposed site? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes:</p> <p><i>i. Is any portion of the site listed on the NYSDEC Spills Incidents database or Environmental Site Remediation database? Check all that apply:</i> <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><input type="checkbox"/> Yes – Spills Incidents database</p> <p><input type="checkbox"/> Yes – Environmental Site Remediation database</p> <p><input type="checkbox"/> Neither database</p> </div> <div style="width: 50%;"> <p>Provide DEC ID number(s): _____</p> <p>Provide DEC ID number(s): _____</p> </div> </div> <p><i>ii. If site has been subject of RCRA corrective activities, describe control measures:</i> _____</p> <p>_____</p> <p><i>iii. Is the project within 2000 feet of any site in the NYSDEC Environmental Site Remediation database?</i> <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes, provide DEC ID number(s): _____</p> <p><i>iv. If yes to (i), (ii) or (iii) above, describe current status of site(s):</i></p> <p>_____</p> <p>_____</p>	

v. Is the project site subject to an institutional control limiting property uses? <input type="checkbox"/> Yes <input type="checkbox"/> No <ul style="list-style-type: none"> • If yes, DEC site ID number: _____ • Describe the type of institutional control (e.g., deed restriction or easement): _____ • Describe any use limitations: _____ • Describe any engineering controls: _____ • Will the project affect the institutional or engineering controls in place? <input type="checkbox"/> Yes <input type="checkbox"/> No • Explain: _____ _____ 	
E.2. Natural Resources On or Near Project Site	
a. What is the average depth to bedrock on the project site? _____ feet	
b. Are there bedrock outcroppings on the project site? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, what proportion of the site is comprised of bedrock outcroppings? _____ %	
c. Predominant soil type(s) present on project site: _____ % _____ % _____ %	
d. What is the average depth to the water table on the project site? Average: _____ feet	
e. Drainage status of project site soils: <input type="checkbox"/> Well Drained: _____ % of site <input type="checkbox"/> Moderately Well Drained: _____ % of site <input type="checkbox"/> Poorly Drained _____ % of site	
f. Approximate proportion of proposed action site with slopes: <input type="checkbox"/> 0-10%: _____ % of site <input type="checkbox"/> 10-15%: _____ % of site <input type="checkbox"/> 15% or greater: _____ % of site	
g. Are there any unique geologic features on the project site? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, describe: _____ _____	
h. Surface water features. i. Does any portion of the project site contain wetlands or other waterbodies (including streams, rivers, ponds or lakes)? <input type="checkbox"/> Yes <input type="checkbox"/> No ii. Do any wetlands or other waterbodies adjoin the project site? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes to either <i>i</i> or <i>ii</i> , continue. If No, skip to E.2.i. iii. Are any of the wetlands or waterbodies within or adjoining the project site regulated by any federal, state or local agency? <input type="checkbox"/> Yes <input type="checkbox"/> No iv. For each identified regulated wetland and waterbody on the project site, provide the following information: <ul style="list-style-type: none"> • Streams: Name _____ Classification _____ • Lakes or Ponds: Name _____ Classification _____ • Wetlands: Name <u>Federal waters, NYS wetland, Federal waters.</u> _____ Approximate Size _____ • Wetland No. (if regulated by DEC) _____ 	
v. Are any of the above water bodies listed in the most recent compilation of NYS water quality-impaired waterbodies? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, name of impaired water body/bodies and basis for listing as impaired: _____ _____	
i. Is the project site in a designated Floodway? <input type="checkbox"/> Yes <input type="checkbox"/> No	
j. Is the project site in the 100-year Floodplain? <input type="checkbox"/> Yes <input type="checkbox"/> No	
k. Is the project site in the 500-year Floodplain? <input type="checkbox"/> Yes <input type="checkbox"/> No	
l. Is the project site located over, or immediately adjoining, a primary, principal or sole source aquifer? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes: <ul style="list-style-type: none"> i. Name of aquifer: _____ 	

<p>m. Identify the predominant wildlife species that occupy or use the project site: _____</p> <p>_____</p> <p>_____</p>	
<p>n. Does the project site contain a designated significant natural community? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes:</p> <p style="margin-left: 20px;">i. Describe the habitat/community (composition, function, and basis for designation): _____</p> <p style="margin-left: 20px;">ii. Source(s) of description or evaluation: _____</p> <p style="margin-left: 20px;">iii. Extent of community/habitat:</p> <ul style="list-style-type: none"> • Currently: _____ acres • Following completion of project as proposed: _____ acres • Gain or loss (indicate + or -): _____ acres 	
<p>o. Does project site contain any species of plant or animal that is listed by the federal government or NYS as endangered or threatened, or does it contain any areas identified as habitat for an endangered or threatened species? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes:</p> <p style="margin-left: 20px;">i. Species and listing (endangered or threatened): <u>Northern long-eared Bat (Myotis septentrionalis)</u></p> <p>_____</p> <p>_____</p>	
<p>p. Does the project site contain any species of plant or animal that is listed by NYS as rare, or as a species of special concern? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes:</p> <p style="margin-left: 20px;">i. Species and listing: _____</p> <p>_____</p>	
<p>q. Is the project site or adjoining area currently used for hunting, trapping, fishing or shell fishing? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If yes, give a brief description of how the proposed action may affect that use: _____</p> <p>_____</p>	
<p>E.3. Designated Public Resources On or Near Project Site</p>	
<p>a. Is the project site, or any portion of it, located in a designated agricultural district certified pursuant to Agriculture and Markets Law, Article 25-AA, Section 303 and 304? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes, provide county plus district name/number: _____</p>	
<p>b. Are agricultural lands consisting of highly productive soils present? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p style="margin-left: 20px;">i. If Yes: acreage(s) on project site? _____</p> <p style="margin-left: 20px;">ii. Source(s) of soil rating(s): _____</p>	
<p>c. Does the project site contain all or part of, or is it substantially contiguous to, a registered National Natural Landmark? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes:</p> <p style="margin-left: 20px;">i. Nature of the natural landmark: <input type="checkbox"/> Biological Community <input type="checkbox"/> Geological Feature</p> <p style="margin-left: 20px;">ii. Provide brief description of landmark, including values behind designation and approximate size/extent: _____</p> <p>_____</p> <p>_____</p>	
<p>d. Is the project site located in or does it adjoin a state listed Critical Environmental Area? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If Yes:</p> <p style="margin-left: 20px;">i. CEA name: _____</p> <p style="margin-left: 20px;">ii. Basis for designation: _____</p> <p style="margin-left: 20px;">iii. Designating agency and date: _____</p>	

e. Does the project site contain, or is it substantially contiguous to, a building, archaeological site, or district which is listed on the National or State Register of Historic Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes: i. Nature of historic/archaeological resource: <input type="checkbox"/> Archaeological Site <input type="checkbox"/> Historic Building or District ii. Name: _____ iii. Brief description of attributes on which listing is based: _____
f. Is the project site, or any portion of it, located in or adjacent to an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory? <input type="checkbox"/> Yes <input type="checkbox"/> No
g. Have additional archaeological or historic site(s) or resources been identified on the project site? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes: i. Describe possible resource(s): _____ ii. Basis for identification: _____
h. Is the project site within five miles of any officially designated and publicly accessible federal, state, or local scenic or aesthetic resource? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes: i. Identify resource: _____ ii. Nature of, or basis for, designation (e.g., established highway overlook, state or local park, state historic trail or scenic byway, etc.): _____ iii. Distance between project and resource: _____ miles.
i. Is the project site located within a designated river corridor under the Wild, Scenic and Recreational Rivers Program 6 NYCRR 666? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes: i. Identify the name of the river and its designation: _____ ii. Is the activity consistent with development restrictions contained in 6NYCRR Part 666? <input type="checkbox"/> Yes <input type="checkbox"/> No

F. Additional Information

Attach any additional information which may be needed to clarify your project.

If you have identified any adverse impacts which could be associated with your proposal, please describe those impacts plus any measures which you propose to avoid or minimize them.

G. Verification

I certify that the information provided is true to the best of my knowledge.

Applicant/Sponsor Name _____ Date _____

Signature _____ Title _____

Full Environmental Assessment Form
Part 2 - Identification of Potential Project Impacts

Project :

Date :

Part 2 is to be completed by the lead agency. Part 2 is designed to help the lead agency inventory all potential resources that could be affected by a proposed project or action. We recognize that the lead agency's reviewer(s) will not necessarily be environmental professionals. So, the questions are designed to walk a reviewer through the assessment process by providing a series of questions that can be answered using the information found in Part 1. To further assist the lead agency in completing Part 2, the form identifies the most relevant questions in Part 1 that will provide the information needed to answer the Part 2 question. When Part 2 is completed, the lead agency will have identified the relevant environmental areas that may be impacted by the proposed activity.

If the lead agency is a state agency **and** the action is in any Coastal Area, complete the Coastal Assessment Form before proceeding with this assessment.

Tips for completing Part 2:

- Review all of the information provided in Part 1.
- Review any application, maps, supporting materials and the Full EAF Workbook.
- Answer each of the 18 questions in Part 2.
- If you answer “**Yes**” to a numbered question, please complete all the questions that follow in that section.
- If you answer “**No**” to a numbered question, move on to the next numbered question.
- Check appropriate column to indicate the anticipated size of the impact.
- Proposed projects that would exceed a numeric threshold contained in a question should result in the reviewing agency checking the box “Moderate to large impact may occur.”
- The reviewer is not expected to be an expert in environmental analysis.
- If you are not sure or undecided about the size of an impact, it may help to review the sub-questions for the general question and consult the workbook.
- When answering a question consider all components of the proposed activity, that is, the “whole action”.
- Consider the possibility for long-term and cumulative impacts as well as direct impacts.
- Answer the question in a reasonable manner considering the scale and context of the project.

1. Impact on Land Proposed action may involve construction on, or physical alteration of, the land surface of the proposed site. (See Part 1. D.1) <i>If “Yes”, answer questions a - j. If “No”, move on to Section 2.</i>				<input type="checkbox"/> NO	<input type="checkbox"/> YES
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur		
a. The proposed action may involve construction on land where depth to water table is less than 3 feet.	E2d	<input type="checkbox"/>	<input type="checkbox"/>		
b. The proposed action may involve construction on slopes of 15% or greater.	E2f	<input type="checkbox"/>	<input type="checkbox"/>		
c. The proposed action may involve construction on land where bedrock is exposed, or generally within 5 feet of existing ground surface.	E2a	<input type="checkbox"/>	<input type="checkbox"/>		
d. The proposed action may involve the excavation and removal of more than 1,000 tons of natural material.	D2a	<input type="checkbox"/>	<input type="checkbox"/>		
e. The proposed action may involve construction that continues for more than one year or in multiple phases.	D1e	<input type="checkbox"/>	<input type="checkbox"/>		
f. The proposed action may result in increased erosion, whether from physical disturbance or vegetation removal (including from treatment by herbicides).	D2e, D2q	<input type="checkbox"/>	<input type="checkbox"/>		
g. The proposed action is, or may be, located within a Coastal Erosion hazard area.	B1i	<input type="checkbox"/>	<input type="checkbox"/>		
h. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>		

2. Impact on Geological Features The proposed action may result in the modification or destruction of, or inhibit access to, any unique or unusual land forms on the site (e.g., cliffs, dunes, minerals, fossils, caves). (See Part 1. E.2.g) <input type="checkbox"/> NO <input type="checkbox"/> YES <i>If "Yes", answer questions a - c. If "No", move on to Section 3.</i>			
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. Identify the specific land form(s) attached: _____	E2g	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may affect or is adjacent to a geological feature listed as a registered National Natural Landmark. Specific feature: _____	E3c	<input type="checkbox"/>	<input type="checkbox"/>
c. Other impacts: _____		<input type="checkbox"/>	<input type="checkbox"/>

3. Impacts on Surface Water The proposed action may affect one or more wetlands or other surface water bodies (e.g., streams, rivers, ponds or lakes). (See Part 1. D.2, E.2.h) <input type="checkbox"/> NO <input type="checkbox"/> YES <i>If "Yes", answer questions a - l. If "No", move on to Section 4.</i>			
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may create a new water body.	D2b, D1h	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may result in an increase or decrease of over 10% or more than a 10 acre increase or decrease in the surface area of any body of water.	D2b	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may involve dredging more than 100 cubic yards of material from a wetland or water body.	D2a	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may involve construction within or adjoining a freshwater or tidal wetland, or in the bed or banks of any other water body.	E2h	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may create turbidity in a waterbody, either from upland erosion, runoff or by disturbing bottom sediments.	D2a, D2h	<input type="checkbox"/>	<input type="checkbox"/>
f. The proposed action may include construction of one or more intake(s) for withdrawal of water from surface water.	D2c	<input type="checkbox"/>	<input type="checkbox"/>
g. The proposed action may include construction of one or more outfall(s) for discharge of wastewater to surface water(s).	D2d	<input type="checkbox"/>	<input type="checkbox"/>
h. The proposed action may cause soil erosion, or otherwise create a source of stormwater discharge that may lead to siltation or other degradation of receiving water bodies.	D2e	<input type="checkbox"/>	<input type="checkbox"/>
i. The proposed action may affect the water quality of any water bodies within or downstream of the site of the proposed action.	E2h	<input type="checkbox"/>	<input type="checkbox"/>
j. The proposed action may involve the application of pesticides or herbicides in or around any water body.	D2q, E2h	<input type="checkbox"/>	<input type="checkbox"/>
k. The proposed action may require the construction of new, or expansion of existing, wastewater treatment facilities.	D1a, D2d	<input type="checkbox"/>	<input type="checkbox"/>

I. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>
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4. Impact on groundwater The proposed action may result in new or additional use of ground water, or may have the potential to introduce contaminants to ground water or an aquifer. (See Part 1. D.2.a, D.2.c, D.2.d, D.2.p, D.2.q, D.2.t) <i>If “Yes”, answer questions a - h. If “No”, move on to Section 5.</i>			
	<input type="checkbox"/> NO	<input type="checkbox"/> YES	
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may require new water supply wells, or create additional demand on supplies from existing water supply wells.	D2c	<input type="checkbox"/>	<input type="checkbox"/>
b. Water supply demand from the proposed action may exceed safe and sustainable withdrawal capacity rate of the local supply or aquifer. Cite Source: _____	D2c	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may allow or result in residential uses in areas without water and sewer services.	D1a, D2c	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may include or require wastewater discharged to groundwater.	D2d, E2l	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may result in the construction of water supply wells in locations where groundwater is, or is suspected to be, contaminated.	D2c, E1f, E1g, E1h	<input type="checkbox"/>	<input type="checkbox"/>
f. The proposed action may require the bulk storage of petroleum or chemical products over ground water or an aquifer.	D2p, E2l	<input type="checkbox"/>	<input type="checkbox"/>
g. The proposed action may involve the commercial application of pesticides within 100 feet of potable drinking water or irrigation sources.	E2h, D2q, E2l, D2c	<input type="checkbox"/>	<input type="checkbox"/>
h. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>

5. Impact on Flooding The proposed action may result in development on lands subject to flooding. (See Part 1. E.2) <i>If “Yes”, answer questions a - g. If “No”, move on to Section 6.</i>			
	<input type="checkbox"/> NO	<input type="checkbox"/> YES	
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may result in development in a designated floodway.	E2i	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may result in development within a 100 year floodplain.	E2j	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may result in development within a 500 year floodplain.	E2k	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may result in, or require, modification of existing drainage patterns.	D2b, D2e	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may change flood water flows that contribute to flooding.	D2b, E2i, E2j, E2k	<input type="checkbox"/>	<input type="checkbox"/>
f. If there is a dam located on the site of the proposed action, is the dam in need of repair, or upgrade?	E1e	<input type="checkbox"/>	<input type="checkbox"/>

g. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>
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6. Impacts on Air The proposed action may include a state regulated air emission source. <input type="checkbox"/> NO <input type="checkbox"/> YES (See Part 1. D.2.f., D.2.h, D.2.g) <i>If “Yes”, answer questions a - f. If “No”, move on to Section 7.</i>			
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. If the proposed action requires federal or state air emission permits, the action may also emit one or more greenhouse gases at or above the following levels: i. More than 1000 tons/year of carbon dioxide (CO ₂) ii. More than 3.5 tons/year of nitrous oxide (N ₂ O) iii. More than 1000 tons/year of carbon equivalent of perfluorocarbons (PFCs) iv. More than .045 tons/year of sulfur hexafluoride (SF ₆) v. More than 1000 tons/year of carbon dioxide equivalent of hydrochloroflouorocarbons (HFCs) emissions vi. 43 tons/year or more of methane	D2g D2g D2g D2g D2g D2h	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
b. The proposed action may generate 10 tons/year or more of any one designated hazardous air pollutant, or 25 tons/year or more of any combination of such hazardous air pollutants.	D2g	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may require a state air registration, or may produce an emissions rate of total contaminants that may exceed 5 lbs. per hour, or may include a heat source capable of producing more than 10 million BTU's per hour.	D2f, D2g	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may reach 50% of any of the thresholds in “a” through “c”, above.	D2g	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may result in the combustion or thermal treatment of more than 1 ton of refuse per hour.	D2s	<input type="checkbox"/>	<input type="checkbox"/>
f. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>

7. Impact on Plants and Animals The proposed action may result in a loss of flora or fauna. (See Part 1. E.2. m.-q.) <input type="checkbox"/> NO <input type="checkbox"/> YES <i>If “Yes”, answer questions a - j. If “No”, move on to Section 8.</i>			
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may cause reduction in population or loss of individuals of any threatened or endangered species, as listed by New York State or the Federal government, that use the site, or are found on, over, or near the site.	E2o	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may result in a reduction or degradation of any habitat used by any rare, threatened or endangered species, as listed by New York State or the federal government.	E2o	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may cause reduction in population, or loss of individuals, of any species of special concern or conservation need, as listed by New York State or the Federal government, that use the site, or are found on, over, or near the site.	E2p	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may result in a reduction or degradation of any habitat used by any species of special concern and conservation need, as listed by New York State or the Federal government.	E2p	<input type="checkbox"/>	<input type="checkbox"/>

e. The proposed action may diminish the capacity of a registered National Natural Landmark to support the biological community it was established to protect.	E3c	<input type="checkbox"/>	<input type="checkbox"/>
f. The proposed action may result in the removal of, or ground disturbance in, any portion of a designated significant natural community. Source: _____	E2n	<input type="checkbox"/>	<input type="checkbox"/>
g. The proposed action may substantially interfere with nesting/breeding, foraging, or over-wintering habitat for the predominant species that occupy or use the project site.	E2m	<input type="checkbox"/>	<input type="checkbox"/>
h. The proposed action requires the conversion of more than 10 acres of forest, grassland or any other regionally or locally important habitat. Habitat type & information source: _____	E1b	<input type="checkbox"/>	<input type="checkbox"/>
i. Proposed action (commercial, industrial or recreational projects, only) involves use of herbicides or pesticides.	D2q	<input type="checkbox"/>	<input type="checkbox"/>
j. Other impacts: _____		<input type="checkbox"/>	<input type="checkbox"/>

8. Impact on Agricultural Resources The proposed action may impact agricultural resources. (See Part 1. E.3.a. and b.) <input type="checkbox"/> NO <input type="checkbox"/> YES <i>If "Yes", answer questions a - h. If "No", move on to Section 9.</i>			
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may impact soil classified within soil group 1 through 4 of the NYS Land Classification System.	E2c, E3b	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may sever, cross or otherwise limit access to agricultural land (includes cropland, hayfields, pasture, vineyard, orchard, etc).	E1a, E1b	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may result in the excavation or compaction of the soil profile of active agricultural land.	E3b	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may irreversibly convert agricultural land to non-agricultural uses, either more than 2.5 acres if located in an Agricultural District, or more than 10 acres if not within an Agricultural District.	E1b, E3a	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may disrupt or prevent installation of an agricultural land management system.	E1 a, E1b	<input type="checkbox"/>	<input type="checkbox"/>
f. The proposed action may result, directly or indirectly, in increased development potential or pressure on farmland.	C2c, C3, D2c, D2d	<input type="checkbox"/>	<input type="checkbox"/>
g. The proposed project is not consistent with the adopted municipal Farmland Protection Plan.	C2c	<input type="checkbox"/>	<input type="checkbox"/>
h. Other impacts: _____		<input type="checkbox"/>	<input type="checkbox"/>

9. Impact on Aesthetic Resources The land use of the proposed action are obviously different from, or are in sharp contrast to, current land use patterns between the proposed project and a scenic or aesthetic resource. (Part 1. E.1.a, E.1.b, E.3.h.) <i>If "Yes", answer questions a - g. If "No", go to Section 10.</i>			
		<input type="checkbox"/> NO	<input type="checkbox"/> YES
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. Proposed action may be visible from any officially designated federal, state, or local scenic or aesthetic resource.	E3h	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may result in the obstruction, elimination or significant screening of one or more officially designated scenic views.	E3h, C2b	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may be visible from publicly accessible vantage points: i. Seasonally (e.g., screened by summer foliage, but visible during other seasons) ii. Year round	E3h	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
d. The situation or activity in which viewers are engaged while viewing the proposed action is: i. Routine travel by residents, including travel to and from work ii. Recreational or tourism based activities	E3h E2q, E1c	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
e. The proposed action may cause a diminishment of the public enjoyment and appreciation of the designated aesthetic resource.	E3h	<input type="checkbox"/>	<input type="checkbox"/>
f. There are similar projects visible within the following distance of the proposed project: 0-1/2 mile 1/2 -3 mile 3-5 mile 5+ mile	D1a, E1a, D1f, D1g	<input type="checkbox"/>	<input type="checkbox"/>
g. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>

10. Impact on Historic and Archeological Resources The proposed action may occur in or adjacent to a historic or archaeological resource. (Part 1. E.3.e, f. and g.) <i>If "Yes", answer questions a - e. If "No", go to Section 11.</i>			
		<input type="checkbox"/> NO	<input type="checkbox"/> YES
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may occur wholly or partially within, or substantially contiguous to, any buildings, archaeological site or district which is listed on the National or State Register of Historical Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places.	E3e	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may occur wholly or partially within, or substantially contiguous to, an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory.	E3f	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may occur wholly or partially within, or substantially contiguous to, an archaeological site not included on the NY SHPO inventory. Source: _____	E3g	<input type="checkbox"/>	<input type="checkbox"/>

d. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>
<p>If any of the above (a-d) are answered “Moderate to large impact may occur”, continue with the following questions to help support conclusions in Part 3:</p> <p>e.</p> <p>i. The proposed action may result in the destruction or alteration of all or part of the site or property.</p> <p>ii. The proposed action may result in the alteration of the property’s setting or integrity.</p> <p>iii. The proposed action may result in the introduction of visual elements which are out of character with the site or property, or may alter its setting.</p>	<p>E3e, E3g, E3f</p> <p>E3e, E3f, E3g, E1a, E1b</p> <p>E3e, E3f, E3g, E3h, C2, C3</p>	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>

11. Impact on Open Space and Recreation The proposed action may result in a loss of recreational opportunities or a reduction of an open space resource as designated in any adopted municipal open space plan. (See Part 1. C.2.c, E.1.c., E.2.q.) <i>If “Yes”, answer questions a - e. If “No”, go to Section 12.</i>				<input type="checkbox"/> NO	<input type="checkbox"/> YES
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur		
a. The proposed action may result in an impairment of natural functions, or “ecosystem services”, provided by an undeveloped area, including but not limited to stormwater storage, nutrient cycling, wildlife habitat.	D2e, E1b E2h, E2m, E2o, E2n, E2p	<input type="checkbox"/>	<input type="checkbox"/>		
b. The proposed action may result in the loss of a current or future recreational resource.	C2a, E1c, C2c, E2q	<input type="checkbox"/>	<input type="checkbox"/>		
c. The proposed action may eliminate open space or recreational resource in an area with few such resources.	C2a, C2c E1c, E2q	<input type="checkbox"/>	<input type="checkbox"/>		
d. The proposed action may result in loss of an area now used informally by the community as an open space resource.	C2c, E1c	<input type="checkbox"/>	<input type="checkbox"/>		
e. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>		

12. Impact on Critical Environmental Areas The proposed action may be located within or adjacent to a critical environmental area (CEA). (See Part 1. E.3.d) <i>If “Yes”, answer questions a - c. If “No”, go to Section 13.</i>				<input type="checkbox"/> NO	<input type="checkbox"/> YES
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur		
a. The proposed action may result in a reduction in the quantity of the resource or characteristic which was the basis for designation of the CEA.	E3d	<input type="checkbox"/>	<input type="checkbox"/>		
b. The proposed action may result in a reduction in the quality of the resource or characteristic which was the basis for designation of the CEA.	E3d	<input type="checkbox"/>	<input type="checkbox"/>		
c. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>		

13. Impact on Transportation

The proposed action may result in a change to existing transportation systems.

☐ NO

☐ YES

(See Part 1. D.2.j)

If “Yes”, answer questions a - f. If “No”, go to Section 14.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. Projected traffic increase may exceed capacity of existing road network.	D2j	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may result in the construction of paved parking area for 500 or more vehicles.	D2j	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action will degrade existing transit access.	D2j	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action will degrade existing pedestrian or bicycle accommodations.	D2j	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may alter the present pattern of movement of people or goods.	D2j	<input type="checkbox"/>	<input type="checkbox"/>
f. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>

14. Impact on Energy

The proposed action may cause an increase in the use of any form of energy.

☐ NO

☐ YES

(See Part 1. D.2.k)

If “Yes”, answer questions a - e. If “No”, go to Section 15.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action will require a new, or an upgrade to an existing, substation.	D2k	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action will require the creation or extension of an energy transmission or supply system to serve more than 50 single or two-family residences or to serve a commercial or industrial use.	D1f, D1q, D2k	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may utilize more than 2,500 MWhrs per year of electricity.	D2k	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may involve heating and/or cooling of more than 100,000 square feet of building area when completed.	D1g	<input type="checkbox"/>	<input type="checkbox"/>
e. Other Impacts: _____ _____			

15. Impact on Noise, Odor, and Light

The proposed action may result in an increase in noise, odors, or outdoor lighting.

☐ NO

☐ YES

(See Part 1. D.2.m., n., and o.)

If “Yes”, answer questions a - f. If “No”, go to Section 16.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may produce sound above noise levels established by local regulation.	D2m	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may result in blasting within 1,500 feet of any residence, hospital, school, licensed day care center, or nursing home.	D2m, E1d	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may result in routine odors for more than one hour per day.	D2o	<input type="checkbox"/>	<input type="checkbox"/>

d. The proposed action may result in light shining onto adjoining properties.	D2n	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may result in lighting creating sky-glow brighter than existing area conditions.	D2n, E1a	<input type="checkbox"/>	<input type="checkbox"/>
f. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>

16. Impact on Human Health

The proposed action may have an impact on human health from exposure to new or existing sources of contaminants. (See Part 1.D.2.q., E.1. d. f. g. and h.)

☐ NO

☐ YES

If "Yes", answer questions a - m. If "No", go to Section 17.

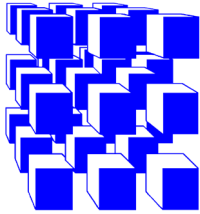
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action is located within 1500 feet of a school, hospital, licensed day care center, group home, nursing home or retirement community.	E1d	<input type="checkbox"/>	<input type="checkbox"/>
b. The site of the proposed action is currently undergoing remediation.	E1g, E1h	<input type="checkbox"/>	<input type="checkbox"/>
c. There is a completed emergency spill remediation, or a completed environmental site remediation on, or adjacent to, the site of the proposed action.	E1g, E1h	<input type="checkbox"/>	<input type="checkbox"/>
d. The site of the action is subject to an institutional control limiting the use of the property (e.g., easement or deed restriction).	E1g, E1h	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may affect institutional control measures that were put in place to ensure that the site remains protective of the environment and human health.	E1g, E1h	<input type="checkbox"/>	<input type="checkbox"/>
f. The proposed action has adequate control measures in place to ensure that future generation, treatment and/or disposal of hazardous wastes will be protective of the environment and human health.	D2t	<input type="checkbox"/>	<input type="checkbox"/>
g. The proposed action involves construction or modification of a solid waste management facility.	D2q, E1f	<input type="checkbox"/>	<input type="checkbox"/>
h. The proposed action may result in the unearthing of solid or hazardous waste.	D2q, E1f	<input type="checkbox"/>	<input type="checkbox"/>
i. The proposed action may result in an increase in the rate of disposal, or processing, of solid waste.	D2r, D2s	<input type="checkbox"/>	<input type="checkbox"/>
j. The proposed action may result in excavation or other disturbance within 2000 feet of a site used for the disposal of solid or hazardous waste.	E1f, E1g E1h	<input type="checkbox"/>	<input type="checkbox"/>
k. The proposed action may result in the migration of explosive gases from a landfill site to adjacent off site structures.	E1f, E1g	<input type="checkbox"/>	<input type="checkbox"/>
l. The proposed action may result in the release of contaminated leachate from the project site.	D2s, E1f, D2r	<input type="checkbox"/>	<input type="checkbox"/>
m. Other impacts: _____ _____			

17. Consistency with Community Plans The proposed action is not consistent with adopted land use plans. (See Part 1. C.1, C.2. and C.3.) <i>If “Yes”, answer questions a - h. If “No”, go to Section 18.</i>			
		<input type="checkbox"/> NO	<input type="checkbox"/> YES
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action’s land use components may be different from, or in sharp contrast to, current surrounding land use pattern(s).	C2, C3, D1a E1a, E1b	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action will cause the permanent population of the city, town or village in which the project is located to grow by more than 5%.	C2	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action is inconsistent with local land use plans or zoning regulations.	C2, C2, C3	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action is inconsistent with any County plans, or other regional land use plans.	C2, C2	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action may cause a change in the density of development that is not supported by existing infrastructure or is distant from existing infrastructure.	C3, D1c, D1d, D1f, D1d, E1b	<input type="checkbox"/>	<input type="checkbox"/>
f. The proposed action is located in an area characterized by low density development that will require new or expanded public infrastructure.	C4, D2c, D2d D2j	<input type="checkbox"/>	<input type="checkbox"/>
g. The proposed action may induce secondary development impacts (e.g., residential or commercial development not included in the proposed action)	C2a	<input type="checkbox"/>	<input type="checkbox"/>
h. Other: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>

18. Consistency with Community Character The proposed project is inconsistent with the existing community character. (See Part 1. C.2, C.3, D.2, E.3) <i>If “Yes”, answer questions a - g. If “No”, proceed to Part 3.</i>			
		<input type="checkbox"/> NO	<input type="checkbox"/> YES
	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may replace or eliminate existing facilities, structures, or areas of historic importance to the community.	E3e, E3f, E3g	<input type="checkbox"/>	<input type="checkbox"/>
b. The proposed action may create a demand for additional community services (e.g. schools, police and fire)	C4	<input type="checkbox"/>	<input type="checkbox"/>
c. The proposed action may displace affordable or low-income housing in an area where there is a shortage of such housing.	C2, C3, D1f D1g, E1a	<input type="checkbox"/>	<input type="checkbox"/>
d. The proposed action may interfere with the use or enjoyment of officially recognized or designated public resources.	C2, E3	<input type="checkbox"/>	<input type="checkbox"/>
e. The proposed action is inconsistent with the predominant architectural scale and character.	C2, C3	<input type="checkbox"/>	<input type="checkbox"/>
f. Proposed action is inconsistent with the character of the existing natural landscape.	C2, C3 E1a, E1b E2g, E2h	<input type="checkbox"/>	<input type="checkbox"/>
g. Other impacts: _____ _____		<input type="checkbox"/>	<input type="checkbox"/>

Appendix B

Geotechnical Report



CME
Associates, Inc.

6035 Corporate Drive
East Syracuse, New York 13057
(315) 701-0522
(315) 701-0526 (Fax)
www.cmeassociates.com

Transmittal

October 7, 2021

Sun Association Island RV, LLC (Client)
c/o Sun Communities, Inc.
c/o ATWELL, LLC
1250 East Diehl Road, Suite 300
Naperville, IL 60563

Attn: Mr. Brian A. Styck, P.E., Project Manager

**Re: Association Island Expansion Project
Henderson, New York
CME Project No.: 27803-05**

Gentlepeople:

Enclosed you will find....

<u>Number of Copies</u>	<u>Report Number</u>	<u>Description</u>
1	27803B-01-1021	Geotechnical Data Report

This report was emailed to Mr. Brian A. Styck at bstyck@atwell-group.com on 10/07/21.

Respectfully submitted,
CME Associates, Inc.

Chen Liu, Ph.D., EIT
Geotechnical Engineer

CL.cw

A New York State Certified Woman-Owned Business Enterprise (WBE)



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October 7, 2021

Sun Association Island RV, LLC (Client)
c/o Sun Communities, Inc.
c/o ATWELL, LLC
1250 East Diehl Road, Suite 300
Naperville, IL 60563
Phone: 630.557.0800
Cell: 602.499.0428

Attn: Mr. Brian A. Styck, P.E., Project Manager
bstyck@atwell-group.com

Re: Geotechnical Data Report
Association Island Expansion Project
Henderson, New York
CME Report No.: 27803B-01-1021
Page 1 of 3

1.0 INTRODUCTION

CME Associates, Inc. (CME) was retained by Sun Association Island RV, LLC (Client) to provide subsurface exploration and geotechnical services for the subject project. CME conducted a subsurface exploration for the subject project in September 2021. The Scope of Basic Services and this report have been provided pursuant to the Consultant Contract between CME and Client, executed on 06/01/2021 and 09/14/2021, through Purchases Order Nos. 1314 and 1387, respectively, which reference CME Proposal/Agreement No.: 05.6378, dated 04/13/2021 and CME Proposal/Agreement No.: 05.6492, dated 08/09/2021.

This report provides a summary of exploration activities conducted at the subject project site. This exploration consisted of advancing 27 Test Borings and performing 3 Infiltration Tests. Geotechnical recommendations for the proposed structure required in the agreement will be provided under a separate cover after CME receives the following information from Client.

- Site Plan
- Grading Plan with finish floor elevation of the proposed Buildings
- Loading information (maximum unfactored wall/column loads at foundation level)
- Progress Plans, including Foundation Plan, Cross-Sections, etc. (if available)

2.0 EXPLORATION METHODOLOGY

2.1 Exploration Layout and Utility Clearance

Test Boring locations were staked in the field by CME based on the attached *Soil Boring Location Plan 1*, Drawing No.CN-A, dated 11/25/2020 and *Soil Boring Location Plan 2*, Drawing No.CN-A, dated 08/25/2021 for two islands at the subject project. Following the field mark out, CME contacted Dig Safely New York (DSNY) to clear public utilities at the Test Boring locations. Test Boring locations were slightly shifted to avoid utility conflicts and access issues. *CME Exploration Location Plans*, labeled ELP-1 and ELP-2, depict the as-drilled Test Boring locations. GPS coordinates and elevation at grade for all exploration locations were obtained using a hand-held GPS survey equipment (Spectra Precision Ranger 3). Please refer to the attached *GPS Coordinates and Elevations Tables* for a description of equipment and datum used, as well as for GPS coordinates and elevations at the exploration locations.

2.2 Test Borings

Test Borings were advanced using a Central Mine Equipment Model 550X, ATV mounted, rotary exploration drill rig, equipped with 3-1/4" I.D. hollow stem augers. Soil sampling was conducted using a 140-pound hammer dropping through a distance of 30 inches to drive a 2" O.D. split barrel sampler in general conformance with ASTM Standard Practice D1586. Rock coring was performed in general conformance with ASTM Standard Practice D2113. The boreholes were backfilled with grout to closely match existing grade. The *Subsurface Exploration – Test Boring Logs*, labeled B-1 to B-11, IT-1 to IT-3, and SB-1 to SB-13, are attached. *Bedrock Core Photographs* are also attached to this report.

Samples were logged and visually classified in the field by a CME Driller, and a portion of each soil sample was placed and sealed in a glass jar. Bedrock cores were placed and secured in a wooden box. The soil and rock classifications were later reviewed by a CME Senior Geologist and spot checked by the undersigned Engineer in CME's AASHTO re:source¹ accredited East Syracuse Laboratory. The visual soil classifications were made using a modified Burmister Classification System, as practiced by CME and as generally described in the attached document, entitled "*General Information & Key to the Test Boring Logs*".

2.3 Infiltration Testing

Three Infiltration Tests (labeled IT-3, IT-01 and IT-02) were conducted by a CME Professional Geologist on 09/28/21 in general conformance with the New York State Stormwater Management Design Manual, Appendix D: Infiltration Testing Requirements. The test locations and depths were selected by Mr. Brian A. Styck, P.E., Project Manager of ATWELL, LLC. Please note, Infiltration Tests IT-1 and IT-2 were deleted due to the shallow depths of bedrock encountered while drilling Borings IT-1 and IT-2. The test details and results of Infiltration Tests IT-3, IT-01 and IT-02 are given in the attached, *Infiltration Test Reports*.

2.4 Laboratory Testing

Laboratory index testing on selected soil samples, consisting of Atterberg Limit Testing and Particle Size Analysis, was conducted in CME's East Syracuse Laboratory. Please refer to the attached, *Laboratory Test Summary Report*, for test methods and results.

¹AASHTO re:source – American Association of State Highway & Transportation Officials (AASHTO) Materials Reference Laboratory, a Federal Agency having jurisdiction to assess laboratory competency according to the Standards of the United States of America. CME East Syracuse accreditation includes testing of Portland Cement Concrete, Aggregate and Soil Materials. www.AASHTOresource.org.

3.0 STANDARD OF CARE

CME endeavored to conduct services identified herein in a manner consistent with that level of care and skill ordinarily exercised by members of the industry currently practicing in the same locality and under similar conditions as this project. No warranty, either expressed or implied, is made or intended by CME's proposal, contract, and written and oral reports, all of which warranties are hereby expressly disclaimed. CME shall not be responsible for the acts or omissions of Client, its contractors, agents and consultants. CME may rely upon information supplied by Client, its contractors, agents and consultants or information available from generally accepted reputable sources, without independent verification, and CME assumes no responsibility for the accuracy thereof.

4.0 CLOSING

CME's services have been provided according to the requirements of the referenced CME Proposal/Agreement. No other representations, expressed or implied, are intended or made with respect to the information provided herein, and including but not limited to, its suitability for use by others.

Respectfully Submitted,
CME Associates, Inc.

A handwritten signature in blue ink, appearing to read "Chen Liu".

Chen Liu, Ph.D., EIT
Geotechnical Engineer

CME Associates, Inc.

A handwritten signature in blue ink, appearing to read "Roonak Ghaderi".

Roonak Ghaderi, Ph.D., EIT
Geotechnical Engineer

CL.cw

Attachment Listing:

- Soil Boring Location Plan 1, Drawing No.CN-A, dated 11/25/2020 (1 of 1)
- Soil Boring Location Plan 2, Drawing No.CN-A, dated 08/25/2021 (1 of 1)
- CME Exploration Location Plans, ELP-1 and ELP-2 (2 of 2)
- GPS Coordinates and Elevations Tables (2 of 2)
- CME Subsurface Exploration – Test Boring Logs, B-1 to B-11, IT-1 to IT-3, SB-1 to SB-13 (27 of 27)
- Bedrock Core Photographs (4 of 4)
- Infiltration Test Reports (3 of 3)
- Laboratory Test Summary Report (2 of 2)
- General Information & Key to Test Boring Logs (4 of 4)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

A

B

C

D

E

F

G

H

I

J

K

LEGEND

— — — — — BOUNDARY LINE

- - - - - PROPOSED ROADWAY CENTERLINE

- - - - - BUILDING SETBACK LINE

SITE DATA

EXISTING ZONING DISTRICT I — ISLAND DISTRICT

SITE AREA EXISTING DEVELOPMENT 66.39 ACRES
PROPOSED EXPANSION 32 ACRES
TOTAL 98.39 ACRES

PROPOSED SITES
RV PULL-THRU 32 (17%)
RV BACK-IN (PERPENDICULAR) 155 (83%)
TOTAL 187

BUILDING SETBACKS
FROM ADJACENT ROADWAY 150'
FROM WATERFRONT 75'


RECREATION SPACE
REQUIRED 20% OF SITE AREA EXCLUDING REQUIRED SETBACKS
AREA OF SITE EXCLUDING SETBACKS: 22.73 ACRES
= 22.73 ACRES X 20% = 4.55 ACRES

PROVIDED 4.58 ACRES

Attachment to CME Report No. 27803B-01-1021

Soil Boring Location Plan 1






Know what's below.
Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

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ATWELL
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NAPERVILLE, IL 60563
DESIGN FIRM #784-005876

CLIENT
SUN COMMUNITIES, INC.
1000 ISLANDS KOA
15530 SNOWSHOE ROAD
HENDERSON, NY

CONCEPT PLAN A

DATE
NOVEMBER 25, 2020

REVISIONS


SCALE	0	50	100
1" = 100 FEET			
DR.	REK	GH.	JPC
P.M. J. CRABLE			
BOOK			
JOB 20004042			
SHEET NO.			
CN-A			

CAD FILE: 20004042N-01 CONCEPT PLAN A 2020-11-23.DWG



Attachment to CME Report No. 27803B-01-1021

Soil Boring Location Plan 2




**Know what's below.
Call before you dig.**

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

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NAPEEVILLE, IL 60563
DESIGN FIRM #784-005876

CLIENT	SUN COMMUNITIES, INC.
	ASSOCIATION ISLAND
	15530 SNOWSHOE ROAD HENDERSON, NY
DATE	AUGUST 25, 2021
REVISIONS	
SCALE 0 50 100 1" = 100 FEET	
DR. MSB/BAS	CH. BAS
P.M. B. STYCK	
BOOK --	
JOB 20004042.01	
SHEET NO.	
CN-A	

CAD FILE: 2000404201-03 CONCEPT PLAN REV. #2 2021-08-27.DWG

CME EXPLORATION LOCATION PLAN - ELP 1
CME Report No. 27803B-01-1021
Association Island Expansion Project
Henderson, New York

Legend

- ◆ Approximate Test Boring / Infiltration Test Location
- Approximate Test Boring Location



CME EXPLORATION LOCATION PLAN - ELP 2
CME Report No. 27803B-01-1021
Association Island Expansion Project - Phase 2
Henderson, New York

Legend

- ◆ Approximate Test Boring / Infiltration Test Location
- Approximate Test Boring Location



GPS Coordinates and Elevations Table
Association Island Expansion Project, Henderson, New York

TABLE 1			
Boring ID	Latitude	Longitude	Elevation (FT.)
B-1	43.88748575	-76.22779451	249.9
B-2	43.88846477	-76.22466122	253.1
B-3	43.88947558	-76.22192386	250.8
B-4	43.88614213	-76.22447680	253.6
B-5	43.88742022	-76.22391955	257.9
B-6	43.88670641	-76.22236234	252.2
B-7	43.88801681	-76.22151943	250.9
B-8	43.88739069	-76.22667996	251.4
B-9	43.88649670	-76.22560852	254.0
B-10	43.88879172	-76.22269688	252.0
B-11	43.88803182	-76.22183109	252.2
IT-1	43.88765092	-76.22570346	251.9
IT-2	43.88914492	-76.22213157	250.6
IT-3	43.88657610	-76.22270822	254.7
Water's Edge	43.88769836	-76.22652037	245.6

Notes:

AMSL: Above Mean Sea Level

1. GPS coordinates were obtained utilizing a Spectra Precision Ranger 3 GPS survey equipment.
2. NYSDOT CORS positions are based on NAD 83 (2011).
3. Elevations are based on the North American Vertical Datum of 1988 (NAVD 1988).

GPS Coordinates and Elevations Table


Association Island Expansion Project - Phase 2, Henderson, New York

TABLE 1			
Boring ID	Latitude	Longitude	Elevation (FT.)
SB-1 / IT-01	43.89299646	-76.21547071	249.5
SB-2	43.89340136	-76.21507360	248.7
SB-3	43.89380858	-76.21575874	250.7
SB-4	43.89343330	-76.21601793	251.6
SB-5	43.89382530	-76.21681601	251.8
SB-6 / IT-02	43.89326301	-76.21698177	251.4
SB-7	43.89286693	-76.21742512	250.3
SB-8	43.89366819	-76.21873402	251.1
SB-9	43.89478279	-76.21795114	250.2
SB-10	43.89578142	-76.21707567	249.9
SB-11	43.89736223	-76.21294161	248.3
SB-12	43.89659563	-76.21074525	249.5
SB-13	43.89517654	-76.21176607	249.4
Water's Edge	43.89307469	-76.21518559	245.5

Notes:


AMSL: Above Mean Sea Level

1. GPS coordinates were obtained utilizing a Spectra Precision Ranger 3 GPS survey equipment.
2. NYSDOT CORS positions are based on NAD 83 (2011).
3. Elevations are based on the North American Vertical Datum of 1988 (NAVD 1988).

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. B-1 Page No. 1 of 1 Report No. 27803B-01-1021 </div>					
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/14/21			
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/14/21			
Location:		See CME Exploration Location Plan, ELP-1		Surface Elev.		249.9'			
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS					
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.			
Driller:		Ryan Casatelli		Casing Hammer:					
Inspector:				Other:					
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel			
Type:		ATV Mounted		Hammer Wt:		140 lbs.			
Rod Size:		AWJ		Hammer Fall:		30 in.			
				Date		Time			
				09/14/21		While Drilling			
				09/14/21		Before Casing Removed			
				09/14/21		After Casing Removed			
				09/14/21		After Casing Removed			
						Depth (Ft.)			
						Casing At (Ft.)			
						None Noted			
						5.0'			
						None Noted			
						out			
						caved @ 1.5'			
						out			
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL					
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine	and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1	0.0	2.0	SS/17	23-29-22-16		FILL; Grey/Brown silt, cmf gravel, cmf sand, silt (moist)		51
1									
2	2	2.0	4.0	SS/15	17-17-12-18		Similar as above (moist)		29
3									
4	3	4.0	6.0	SS/15	14-12-13-12		Similar as above (moist)		25
5									
6	4	6.0	8.0	SS/14	7-9-4-5		Similar as above (moist)		13
7									
8	5	8.0	10.0	SS/10	6-3-2-2		Grey/Brown CLAY, little SILT, trace cmf GRAVEL, trace cmf SAND (wet, medium stiff)		5
9									
10							Bottom of Boring @ 10.0'		
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		Boring No.	B-2				
				Page No.	1 of 1				
				Report No.	27803B-01-1021				
Project Name:		Association Island Expansion, Henderson, New York		Date Started	09/15/21				
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished	09/15/21				
Location:		See CME Exploration Location Plan, ELP-1		Surface Elev.	253.1'				
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS					
Driller: Beau Fletcher		Casing: 3¼" ID H.S.A.		Date	Time				
Driller: Ryan Casatelli		Casing Hammer:		09/15/21	While Drilling				
Inspector:		Other:		09/15/21	Before Casing Removed				
Drill Rig: CME 550X		Soil Sampler: 2" OD Split Barrel		09/15/21	After Casing Removed				
Type: ATV Mounted		Hammer Wt: 140 lbs.		09/15/21	After Casing Removed				
Rod Size: AWJ		Hammer Fall: 30 in.		09/15/21	After Casing Removed				
				caved @ 2.5'	out				
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL					
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine	and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1	0.0	2.0	SS/14	9-10-12-9		FILL; Brown silt, cmf gravel, cmf sand, asphalt pieces, roots (moist)	22	
1									
2	2	2.0	4.0	SS/18	7-8-9-12		Brown SILT, little CLAY (moist, very stiff)	17	
3									
4	3	4.0	6.0	SS/16	8-9-11-19		Brown SILT, little CLAY, trace ROOTS (moist, very stiff)	20	
5									
6	4	6.0	6.1	SS/1	100@1"		Brown mf GRAVEL, little SILT, little cmf SAND (moist, hard) <i>Auger refusal @ 6.2' on possible top of bedrock.</i>	100+	
7							Bottom of Boring @ 6.2'		
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. B-3 Page No. 1 of 1 Report No. 27803B-01-1021 </div>				
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/16/21		
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/16/21		
Location:		See CME Exploration Location Plan, ELP-1		Surface Elev.		250.8'		
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS				
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		
Driller:		Ryan Casatelli		Casing Hammer:				
Inspector:				Other:				
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		
Type:		ATV Mounted		Hammer Wt:		140 lbs.		
Rod Size:		AWJ		Hammer Fall:		30 in.		
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL				
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1	0.0	2.0	SS/10	10-15-14-9		FILL; Brown cmf gravel, cmf sand, silt, roots (moist)	29
1								
2	2	2.0	3.7	SS/14	10-13-13-100@2"		Brown SILT, trace cmf GRAVEL, trace cmf SAND, trace ROOTS (moist, very stiff) Spoon refusal @ 3.7'. Auger refusal @ 3.9' on possible top of bedrock.	26
3								
4							Bottom of Boring @ 3.9'	
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. B-4 Page No. 1 of 1 Report No. 27803B-01-1021 </div>				
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/14/21		
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/14/21		
Location:		See CME Exploration Location Plan, ELP-1		Surface Elev.		253.6'		
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS				
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		
Driller:		Ryan Casatelli		Casing Hammer:				
Inspector:				Other:				
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		
Type:		ATV Mounted		Hammer Wt:		140 lbs.		
Rod Size:		AWJ		Hammer Fall:		30 in.		
				Date	Time	Depth (Ft.)	Casing At (Ft.)	
				09/14/21	While Drilling	None Noted	2.0'	
				09/14/21	Before Casing Removed	None Noted	3.3'	
				09/14/21	After Casing Removed	None Noted	out	
				09/14/21	After Casing Removed	caved @ 3.0'	out	
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL				
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.) From To		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1A	0.0	0.5	SS/16	2-3-4-6	0.5	Topsoil and Organic Material (moist)	7
1	1B	0.5	2.0				Brown SILT and CLAY, little highly weathered ROCK FRAGMENTS, trace ROOTS (moist, medium stiff)	
2	2	2.0	3.0	SS/11	8-24-100@0"		Brown CLAY, little SILT, trace ROCK FRAGMENTS (Limestone) (moist, hard) <i>Spoon refusal @ 3.0'.</i>	100+
3							<i>Auger refusal @ 3.3' on possible top of bedrock.</i>	
4							Bottom of Boring @ 3.3'	
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. B-5 Page No. 1 of 1 Report No. 27803B-01-1021 </div>				
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/14/21		
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/14/21		
Location:		See CME Exploration Location Plan, ELP-1		Surface Elev.		257.9'		
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS				
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		
Driller:		Ryan Casatelli		Casing Hammer:				
Inspector:				Other:				
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		
Type:		ATV Mounted		Hammer Wt:		140 lbs.		
Rod Size:		AWJ		Hammer Fall:		30 in.		
Date		09/14/21		Time		While Drilling		
Depth (Ft.)		None Noted		Casing At (Ft.)		4.0'		
09/14/21		Before Casing Removed		None Noted		5.8'		
09/14/21		After Casing Removed		None Noted		out		
09/14/21		After Casing Removed		caved @ 2.8'		out		
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL				
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1A	0.0	0.5	SS/15	2-3-5-5	0.5	Topsoil and Organic Material (moist)	7
1	1B	0.5	2.0				Brown/Grey CLAY, some SILT, trace ROOTS (moist, stiff)	
2	2	2.0	4.0	SS/17	5-9-20-41		Light Grey/Brown SILT, little CLAY, little cmf GRAVEL, trace ROOTS (moist, very stiff)	29
3								
4	3	4.0	4.5	SS/6	40-100@0"		Brown/Grey SILT, some weathered ROCK FRAGMENTS (Limestone) (moist, hard)	100+
5							Spoon refusal @ 4.5'.	
6							Auger refusal @ 5.8' on possible top of bedrock.	
7							Bottom of Boring @ 5.8'	
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

		6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522		SUBSURFACE EXPLORATION TEST BORING LOG		Boring No. B-6 Page No. 1 of 1 Report No. 27803B-01-1021			
Project Name:		Association Island Expansion, Henderson, New York				Date Started		09/14/21	
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.				Date Finished		09/14/21	
Location:		See CME Exploration Location Plan, ELP-1				Surface Elev.		252.2'	
METHODS OF INVESTIGATION						GROUNDWATER OBSERVATIONS			
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.			
Driller:		Ryan Casatelli		Casing Hammer:					
Inspector:				Other:					
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel			
Type:		ATV Mounted		Hammer Wt:		140 lbs.			
Rod Size:		AWJ		Hammer Fall:		30 in.			
						Date	Time	Depth (Ft.)	
						09/14/21	While Drilling	None Noted	
						09/14/21	Before Casing Removed	None Noted	
						09/14/21	After Casing Removed	None Noted	
						09/14/21	After Casing Removed	caved @ 1.0'	
LOG OF BORING SAMPLES						VISUAL CLASSIFICATION OF MATERIAL			
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.) From To		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine	and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1A	0.0	0.5	SS/15	1-4-4-6	0.5	Topsoil and Organic Material (moist)		8
1	1B	0.5	2.0				Brown/Grey CLAY, little SILT, trace ROOTS (moist, stiff)		
2	2	2.0	4.0	SS/16	6-10-11-14		Brown/Grey SILT, little CLAY, trace fine GRAVEL, trace cmf SAND (moist, very stiff)		21
3									
4	3	4.0	4.8	SS/8	18-100@3"		Brown CLAY, little SILT, trace ROCK FRAGMENTS (Limestone) (moist, hard) <i>Spoon refusal @ 4.8'.</i>		100+
5							<i>Auger refusal @ 5.0' on possible top of bedrock.</i>		
6							Bottom of Boring @ 5.0'		
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. B-7 Page No. 1 of 1 Report No. 27803B-01-1021 </div>				
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/15/21		
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/15/21		
Location:		See CME Exploration Location Plan, ELP-1		Surface Elev.		250.9'		
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS				
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		
Driller:		Ryan Casatelli		Casing Hammer:				
Inspector:				Other:				
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		
Type:		ATV Mounted		Hammer Wt:		140 lbs.		
Rod Size:		AWJ		Hammer Fall:		30 in.		
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL				
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1	0.0	2.0	SS/16	3-6-6-9		Brown SILT, trace CLAY, trace ROOTS (moist, stiff)	12
1								
2	2	2.0	2.9	SS/9	10-100@5"		Brown SILT, little ROCK FRAGMENTS (Limestone), trace mf GRAVEL, trace cmf SAND (moist, hard) <i>Spoon refusal @ 2.9'. Auger refusal @ 3.2' on possible top of bedrock.</i>	100+
3								
4							Bottom of Boring @ 3.2'	
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. B-8 Page No. 1 of 1 Report No. 27803B-01-1021 </div>				
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/14/21		
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/14/21		
Location:		See CME Exploration Location Plan, ELP-1		Surface Elev.		251.4'		
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS				
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		
Driller:		Ryan Casatelli		Casing Hammer:				
Inspector:				Other:		NQ-Core		
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		
Type:		ATV Mounted		Hammer Wt:		140 lbs.		
Rod Size:		AWJ		Hammer Fall:		30 in.		
Date:		09/14/21		Time:		While Drilling		
Depth (Ft.):		None Noted		Casing At (Ft.):		6.0'		
Before Casing Removed:		2.0' *		After Casing Removed:		2.3'		
After Casing Removed:		caved @ 5.6'		After Casing Removed:		out		
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL				
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1	0.0	2.0	SS/18	12-29-42-63		FILL; Grey/Brown cmf gravel, cmf sand, silt (moist)	71
1								
2	2	2.0	4.0	SS/14	24-40-17-9		FILL; Grey cmf gravel, silt, cmf sand, clay, roots (moist)	57
3								
4	3	4.0	6.0	SS/10	7-8-11-17		Grey cmf GRAVEL, trace cmf SAND, trace SILT, trace CLAY (moist, medium compact)	19
5								
6	4	6.0	7.0	SS/12	18-13-100@0"		Brown mf GRAVEL, some cmf SAND, little SILT, trace CLAY (moist, very compact)	100+
7							Spoon and auger refusal @ 7.0' on possible top of bedrock.	
8	R-1	7.0	12.0	C/54	NQ-Core	7.0	Grey LIMESTONE with interbedded SHALE layers (½"-1" thick) throughout core, moderately to highly weathered, thinly to medium bedded, hard. Broken zone @ 7.0'-8.3'. Horizontal fracture @ 9.2'. Recovery: 54"/60" = 90% RQD: 26"/60" = 43% 10 Pieces, 19" Chips and Fragments 7'-8' @ 6 min/ft, 8'-9' @ 8.5 min/ft, 9'-12' @ 2 min/ft, no water loss Coring conducted in 5th gear, 2400 rpm, 700 psi	43%
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks: * Water added to borehole during coring process.

 <div>6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522</div>		SUBSURFACE EXPLORATION TEST BORING LOG				Boring No.		B-9							
						Page No.		1 of 1							
						Report No.		27803B-01-1021							
Project Name:		Association Island Expansion, Henderson, New York				Date Started		09/15/21							
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.				Date Finished		09/15/21							
Location:		See CME Exploration Location Plan, ELP-1				Surface Elev.		254.0'							
METHODS OF INVESTIGATION						GROUNDWATER OBSERVATIONS									
Driller:		Beau Fletcher		Casing:		3¾" ID H.S.A.		Date		Time		Depth (Ft.)		Casing At (Ft.)	
Driller:		Ryan Casatelli		Casing Hammer:				09/15/21		While Drilling		None Noted		2.0'	
Inspector:				Other:		NQ-Core		09/15/21		Before Casing Removed		None Noted		4.7'	
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		09/15/21		After Casing Removed		None Noted		out	
Type:		ATV Mounted		Hammer Wt:		140 lbs.		09/15/21		After Casing Removed		caved @ 1.8'		out	
Rod Size:		AWJ		Hammer Fall:		30 in.									
LOG OF BORING SAMPLES						VISUAL CLASSIFICATION OF MATERIAL									
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse		and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%				SPT "N" or RQD %		
		m - medium	f - fine												
0	1A	0.0	1.5	SS/17	2-8-15-49		Brown SILT, little CLAY, trace Roots (moist, very stiff)						23		
1	2B	1.5	2.0				-----		Grey cmf GRAVEL, little cmf SAND, trace SILT (moist)						
2	2	2.0	2.2	SS/2	100@2"		Grey mf GRAVEL, little cmf SAND, trace SILT (moist, very compact)		-----				100+		
3															
4	3	4.0	4.5	SS/5	100@5"		Brown highly weathered ROCK FRAGMENTS (Shale), little SILT (moist) <i>Spoon refusal @ 4.5'.</i>						100+		
5						4.7	<i>Auger refusal @ 4.7' on top of bedrock.</i>								
6	R-1	4.7	8.3	C/42	NQ-Core		Grey LIMESTONE with interbedded SHALE layers (⅛"-1¼" thick) throughout core, moderately to highly weathered, thinly to medium bedded, hard. Broken zones @ 4.7'-6.4' and 7.3'- 8.1'. Recovery: 42"/42" = 100% RQD: 6"/42" = 14% 12 Pieces, 24" Chips and Fragments 3.25 min/ft, no water loss Coring conducted in 5th gear, 2400 rpm, 650 psi						14%		
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div>6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522</div>		SUBSURFACE EXPLORATION TEST BORING LOG				Boring No.		B-10							
						Page No.		1 of 1							
						Report No.		27803B-01-1021							
Project Name:		Association Island Expansion, Henderson, New York				Date Started		09/15/21							
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.				Date Finished		09/15/21							
Location:		See CME Exploration Location Plan, ELP-1				Surface Elev.		252.0'							
METHODS OF INVESTIGATION						GROUNDWATER OBSERVATIONS									
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		Date		Time		Depth (Ft.)		Casing At (Ft.)	
Driller:		Ryan Casatelli		Casing Hammer:				09/15/21		While Drilling		None Noted		4.0'	
Inspector:				Other:		NQ-Core		09/15/21		Before Casing Removed		1.2' *		4.0'	
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		09/15/21		After Casing Removed		1.2'		out	
Type:		ATV Mounted		Hammer Wt:		140 lbs.		09/15/21		After Casing Removed		caved @ 3.3'		out	
Rod Size:		AWJ		Hammer Fall:		30 in.									
LOG OF BORING SAMPLES						VISUAL CLASSIFICATION OF MATERIAL									
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse		and - 35 to 50% / some - 20 to 35%				SPT "N" or RQD %		
							m - medium		little - 10 to 20% / trace - 0 to 10%						
0	1	0.0	1.7	SS/15	1-3-12-100@2"		Brown CLAY, little SILT, trace mf GRAVEL, trace cmf SAND, trace ROOTS (moist, stiff)						15		
1															
2	2	2.0	3.1	SS/10	14-83-100@1"		Brown SILT, little ROCK FRAGMENTS (Limestone), little CLAY (moist, hard) <i>Spoon refusal @ 3.1'.</i>						100+		
3							<i>Auger refusal @ 4.0' on top of bedrock.</i>								
4	R-1	4.0	9.0	C/60	NQ-Core	4.0	Grey LIMESTONE with interbedded SHALE layers (½"-1" thick) throughout core, moderately to highly weathered, thinly to medium bedded, hard. Broken zone @ 4.0'-5.0' and 5.4'-5.8'. Recovery: 60"/60" = 100% RQD: 40"/60" = 67% 8 Pieces, 13" Chips and Fragments 3.75 min/ft, no water loss Coring conducted in 5th gear, 2500 rpm, 600 psi						67%		
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks: * Water added to borehole during coring process.

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. B-11 Page No. 1 of 1 Report No. 27803B-01-1021 </div>				
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/15/21		
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/15/21		
Location:		See CME Exploration Location Plan, ELP-1		Surface Elev.		252.2'		
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS				
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		
Driller:		Ryan Casatelli		Casing Hammer:				
Inspector:				Other:				
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		
Type:		ATV Mounted		Hammer Wt:		140 lbs.		
Rod Size:		AWJ		Hammer Fall:		30 in.		
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL				
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1	0.0	2.0	SS/17	2-4-6-8		Brown SILT, trace CLAY, trace ROOTS (moist, stiff)	10
1								
2	2A	2.0	3.0	SS/18	71-11-46-64		Brown SILT, little CLAY (moist, hard)	57
3	2B	3.0	4.0				Brown/Grey cmf GRAVEL and SILT, trace cmf SAND (moist, very compact)	
4	3	4.0	4.7	SS/8	32-100@2"		Grey/Brown highly weathered ROCK FRAGMENTS (Shale), some SILT, trace mf GRAVEL, trace cmf SAND (moist) <i>Spoon refusal @ 4.7'. Auger refusal @ 5.2' on possible top of bedrock.</i>	100+
5							Bottom of Boring @ 5.2'	
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. Page No. Report No. </div> <div> IT-1 1 of 1 27803B-01-1021 </div>				
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/20/21		
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/20/21		
Location:		See CME Exploration Location Plan, ELP-1		Surface Elev.		251.9'		
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS				
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		
Driller:		Ryan Casatelli		Casing Hammer:				
Inspector:				Other:				
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		
Type:		ATV Mounted		Hammer Wt:		140 lbs.		
Rod Size:		AWJ		Hammer Fall:		30 in.		
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL				
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1	0.0	2.0	SS/19	2-4-4-4		Brown/Grey CLAY, little SILT, trace cmf SAND, trace ROOTS (moist, stiff)	8
1								
2	2	2.0	3.0	SS/12	12-100@6"		Brown/Grey SILT, little CLAY, little cmf SAND, trace mf GRAVEL (moist, hard)	100+
3							Spoon and auger refusal @ 3.0' on possible top of bedrock.	
4							See remark 1.	
5							Bottom of Boring @ 3.0'	
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks: 1. Per Client instruction, no IT pipe was installed due to shallow bedrock.

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. Page No. Report No. </div> <div> IT-2 1 of 1 27803B-01-1021 </div>																					
Project Name: Association Island Expansion, Henderson, New York				Date Started: 09/20/21																					
Client: Sun Association Island RV, LLC c/o Sun Communities, Inc.				Date Finished: 09/20/21																					
Location: See CME Exploration Location Plan, ELP-1				Surface Elev.: 250.6'																					
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS																					
Driller: Beau Fletcher Driller: Ryan Casatelli Inspector: Drill Rig: CME 550X Type: ATV Mounted Rod Size: AWJ		Casing: 3¼" ID H.S.A. Casing Hammer: Other: Soil Sampler: 2" OD Split Barrel Hammer Wt: 140 lbs. Hammer Fall: 30 in.		<table border="1"> <tr> <th>Date</th> <th>Time</th> <th>Depth (Ft.)</th> <th>Casing At (Ft.)</th> </tr> <tr> <td>09/20/21</td> <td>While Drilling</td> <td>None Noted</td> <td>2.0'</td> </tr> <tr> <td>09/20/21</td> <td>Before Casing Removed</td> <td>None Noted</td> <td>2.4'</td> </tr> <tr> <td>09/20/21</td> <td>After Casing Removed</td> <td>None Noted</td> <td>out</td> </tr> <tr> <td>09/20/21</td> <td>After Casing Removed</td> <td>caved @ 1.0'</td> <td>out</td> </tr> </table>		Date	Time	Depth (Ft.)	Casing At (Ft.)	09/20/21	While Drilling	None Noted	2.0'	09/20/21	Before Casing Removed	None Noted	2.4'	09/20/21	After Casing Removed	None Noted	out	09/20/21	After Casing Removed	caved @ 1.0'	out
Date	Time	Depth (Ft.)	Casing At (Ft.)																						
09/20/21	While Drilling	None Noted	2.0'																						
09/20/21	Before Casing Removed	None Noted	2.4'																						
09/20/21	After Casing Removed	None Noted	out																						
09/20/21	After Casing Removed	caved @ 1.0'	out																						
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL																					
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	Visual Classification		SPT "N" or RQD %																
		From	To				c - coarse m - medium f - fine	and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%																	
0	1	0.0	1.9	SS/19	3-6-9-100@5"		Brown/Grey SILT, trace fine GRAVEL, trace cmf SAND (moist, very stiff)		15																
1		Spoon refusal @ 1.9' on possible cobble or top of weathered bedrock.																							
2		Auger refusal @ 2.4' on possible top of bedrock. See remark 1.																							
3		Bottom of Boring @ 2.4'																							
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
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14																									
15																									
16																									
17																									
18																									
19																									
20																									


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks: 1. Per Client instruction, no IT pipe was installed due to shallow bedrock.

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. Page No. Report No. </div> <div> IT-3 1 of 1 27803B-01-1021 </div>					
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/20/21			
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/20/21			
Location:		See CME Exploration Location Plan, ELP-1		Surface Elev.		254.7'			
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS					
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.			
Driller:		Ryan Casatelli		Casing Hammer:					
Inspector:				Other:					
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel			
Type:		ATV Mounted		Hammer Wt:		140 lbs.			
Rod Size:		AWJ		Hammer Fall:		30 in.			
				Date		Time			
				09/20/21		While Drilling			
				09/20/21		Before Casing Removed			
				09/20/21		After Casing Removed			
				09/20/21		After Casing Removed			
						Depth (Ft.)			
						Casing At (Ft.)			
						None Noted			
						6.0'			
						None Noted			
						7.3'			
						None Noted			
						out			
						caved @ 3.0'			
						out			
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL					
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine	and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1	0.0	2.0	SS/20	2-3-3-4		Brown CLAY, little SILT, trace ROOTS (moist, medium stiff)		6
1									
2	2	2.0	4.0	SS/16	5-8-15-17		Grey/Brown SILT, some CLAY, little cmf SAND, trace mf GRAVEL (moist, very stiff)		23
3									
4	3	4.0	6.0	SS/15	13-17-33-38		Grey/Brown SILT, some CLAY, little cmf SAND, trace cmf GRAVEL (moist, hard)		50
5									
6	4	6.0	7.2	SS/12	71-32-100@3"		Grey/Brown CLAY, some SILT, little ROCK FRAGMENTS (Limestone), little cmf SAND, trace mf GRAVEL (moist, hard) Spoon refusal @ 7.2'. Auger refusal @ 7.3' on possible top of bedrock.		100+
7									
8							Bottom of Boring @ 7.3'		
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

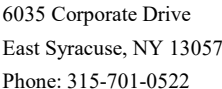
SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div>6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522</div>		SUBSURFACE EXPLORATION TEST BORING LOG				Boring No.		SB-1/IT-01							
						Page No.		1 of 1							
						Report No.		27803B-01-1021							
Project Name:		Association Island Expansion, Henderson, New York						Date Started		09/20/21					
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.						Date Finished		09/20/21					
Location:		See CME Exploration Location Plan, ELP-2						Surface Elev.		249.5'					
METHODS OF INVESTIGATION						GROUNDWATER OBSERVATIONS									
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		Date		Time		Depth (Ft.)		Casing At (Ft.)	
Driller:		Ryan Casatelli		Casing Hammer:				09/20/21		While Drilling		None Noted		4.0'	
Inspector:				Other:		NQ-Core		09/20/21		Before Casing Removed		None Noted		4.5'	
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		09/20/21		After Casing Removed		None Noted		out	
Type:		ATV Mounted		Hammer Wt:		140 lbs.		09/20/21		After Casing Removed		caved @ 4.3'		out	
Rod Size:		AWJ		Hammer Fall:		30 in.									
LOG OF BORING SAMPLES						VISUAL CLASSIFICATION OF MATERIAL									
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine		and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%			SPT "N" or RQD %			
0	1A	0.0	0.2	SS/19	5-8-6-6	0.2	Topsoil and Organic Material (moist)					14			
1	1B	0.2	2.0				Brown SILT, trace fine SAND, trace ROOTS (moist, stiff)								
2	2	2.0	4.0	SS/18	5-6-9-26		Brown/Grey SILT, little CLAY, trace mf GRAVEL, trace ROOTS (moist, stiff)					15			
3															
4	3	4.0	4.5	SS/6	100@6"	4.5	Brown/Grey ROCK FRAGMENTS (Limesonte), little SILT (moist) <i>Spoon and auger refusal @ 4.5' on top of bedrock.</i>					100+			
5	R-1	4.5	9.5	C/58	NQ-Core		Grey LIMESTONE with interbedded SHALE layers throughout (⅛"-¾" thick), thinly to medium bedded, moderately weathered, hard. Broken zones @ 4.9'-5.2', 5.8'-6.2' and 6.8'-7.0'. Vertical fracture with heavy weathering and sediment infilling @ 4.5'-4.9'. Horizontal fractures @ 6.4' and 7.2'. Recovery: 58"/60" = 97% RQD: 33"/60" = 55% 7 Pieces, 14" Chips and Fragments <i>1.5 min/ft, no water loss</i> <i>Coring conducted in 5th gear, 2200 rpm, 500 psi</i>					55%			
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															

SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:



Boring No.	SB-2
Page No.	1 of 1
Report No.	27803B-01-1021

Date Started	09/20/21
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Date Finished	09/20/21
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Surface Elev.	248.7'
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GROUNDWATER OBSERVATIONS


Date	Time	Depth (Ft.)	Casing At (Ft.)
09/20/21	While Drilling	None Noted	4.0'
09/20/21	Before Casing Removed	None Noted	5.9'
09/20/21	After Casing Removed	None Noted	out
09/20/21	After Casing Removed	caved @ 2.7'	out

VISUAL CLASSIFICATION OF MATERIAL

[illegible]


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. SB-3 Page No. 1 of 1 Report No. 27803B-01-1021 </div>				
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/20/21		
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/20/21		
Location:		See CME Exploration Location Plan, ELP-2		Surface Elev.		250.7'		
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS				
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		
Driller:		Ryan Casatelli		Casing Hammer:				
Inspector:				Other:				
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		
Type:		ATV Mounted		Hammer Wt:		140 lbs.		
Rod Size:		AWJ		Hammer Fall:		30 in.		
				Date		Time		
				09/20/21		While Drilling		
				09/20/21		Before Casing Removed		
				09/20/21		After Casing Removed		
				09/20/21		After Casing Removed		
						Depth (Ft.)		
						Casing At (Ft.)		
						None Noted		
						6.0'		
						None Noted		
						6.3'		
						None Noted		
						out		
						caved @ 1.5'		
						out		
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL				
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1A	0.0	0.2	SS/14	4-5-8-8	0.2	Topsoil and Organic Material (moist)	13
1	1B	0.2	2.0				Brown SILT, little cmf GRAVEL, trace cmf SAND, trace ROOTS (moist, stiff)	
2	2	2.0	4.0	SS/20	6-4-4-5		Brown/Grey CLAY, some SILT (moist, stiff)	8
3								
4	3	4.0	6.0	SS/12	7-23-13-7		Brown SILT and cmf GRAVEL, trace CLAY, trace cmf SAND, trace ROOTS (moist, hard)	36
5								
6	4	6.0	6.2	SS/3	100@3"		Brown/Grey CLAY, little ROCK FRAGMENTS (Limestone), little SILT (moist, hard) Spoon refusal @ 6.2'. Auger refusal @ 6.3' on possible top of bedrock.	100+
7							Bottom of Boring @ 6.3'	
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

		6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522		SUBSURFACE EXPLORATION TEST BORING LOG			Boring No. SB-4		Page No. 1 of 1		Report No. 27803B-01-1021				
Project Name:		Association Island Expansion, Henderson, New York						Date Started		09/20/21					
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.						Date Finished		09/20/21					
Location:		See CME Exploration Location Plan, ELP-2						Surface Elev.		251.6'					
METHODS OF INVESTIGATION						GROUNDWATER OBSERVATIONS									
Driller:		Beau Fletcher		Casing:		3 3/4" ID H.S.A.		Date		Time		Depth (Ft.)		Casing At (Ft.)	
Driller:		Ryan Casatelli		Casing Hammer:				09/20/21		While Drilling		None Noted		4.0'	
Inspector:				Other:				09/20/21		Before Casing Removed		None Noted		5.0'	
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		09/20/21		After Casing Removed		None Noted		out	
Type:		ATV Mounted		Hammer Wt:		140 lbs.		09/20/21		After Casing Removed		caved @ 2.0'		out	
Rod Size:		AWJ		Hammer Fall:		30 in.									
LOG OF BORING SAMPLES						VISUAL CLASSIFICATION OF MATERIAL									
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine		and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%		SPT "N" or RQD %				
0	1	0.0	2.0	SS/12	5-14-10-7		Brown SILT, little cmf GRAVEL, trace cmf SAND, trace ROOTS (moist, very stiff)				24				
1															
2	2	2.0	4.0	SS/18	7-5-6-7		Brown/Grey SILT, little CLAY, trace ROOTS (moist, stiff)				11				
3															
4	3	4.0	5.0	SS/12	7-8-100@0"		Brown/Grey SILT and CLAY, trace ROCK FRAGMENTS (Limestone) (moist, hard)				100+				
5							Spoon and auger refusal @ 5.0' on possible top of bedrock.								
6							Bottom of Boring @ 5.0'								
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		SUBSURFACE EXPLORATION TEST BORING LOG		Boring No. SB-5 Page No. 1 of 1 Report No. 27803B-01-1021					
Project Name: Association Island Expansion, Henderson, New York		Date Started: 09/20/21							
Client: Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished: 09/20/21							
Location: See CME Exploration Location Plan, ELP-2		Surface Elev. 251.8'							
METHODS OF INVESTIGATION			GROUNDWATER OBSERVATIONS						
Driller: Beau Fletcher	Casing: 3¼" ID H.S.A.	Date	Time	Depth (Ft.)	Casing At (Ft.)				
Driller: Ryan Casatelli	Casing Hammer:	09/20/21	While Drilling	1.3'	Spoon Hole				
Inspector:	Other:	09/20/21	Before Casing Removed	3.6'	6.5'				
Drill Rig: CME 550X	Soil Sampler: 2" OD Split Barrel	09/20/21	After Casing Removed	3.8'	out				
Type: ATV Mounted	Hammer Wt: 140 lbs.	09/20/21	After Casing Removed	caved @ 4.3'	out				
Rod Size: AWJ	Hammer Fall: 30 in.								
LOG OF BORING SAMPLES			VISUAL CLASSIFICATION OF MATERIAL						
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine	and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
		From	To						
0	1	0.0	2.0	SS/16	1-2-3-6		FILL; Brown clay, silt, roots, wood (moist)		5
1									
2	2	2.0	4.0	SS/7	3-2-1-2		Miscellaneous FILL; Brown/Grey wood, silt, ceramic pieces, clay (wet)		3
3									
4	3	4.0	6.0	SS/15	1-2-4-32		Grey mf GRAVEL and cmf SAND, little SILT, little CLAY (moist, loose)		6
5									
6	4	6.0	6.5	SS/6	32-100@0"		Grey weathered ROCK FRAGMENTS (Limestone) (wet) little SILT, trace cmf SAND (wet) <i>Spoon and auger refusal @ 6.5' on possible top of bedrock.</i>		100+
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. SB-6/IT-02 Page No. 1 of 1 Report No. 27803B-01-1021 </div>				
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/20/21		
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/20/21		
Location:		See CME Exploration Location Plan, ELP-2		Surface Elev.		251.4'		
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS				
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		
Driller:		Ryan Casatelli		Casing Hammer:				
Inspector:				Other:				
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		
Type:		ATV Mounted		Hammer Wt:		140 lbs.		
Rod Size:		AWJ		Hammer Fall:		30 in.		
Date:		09/20/21		Time:		While Drilling		
Depth (Ft.):		None Noted		Casing At (Ft.):		4.0'		
Before Casing Removed:		None Noted		After Casing Removed:		None Noted		
After Casing Removed:		None Noted		After Casing Removed:		caved @ 2.9'		
After Casing Removed:		out		After Casing Removed:		out		
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL				
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1A	0.0	0.2	SS/15	2-5-8-7	0.2	Topsoil and Organic Material (moist)	13
1	1B	0.2	2.0				Brown CLAY, little cmf GRAVEL, little SILT, trace cmf SAND, trace ROOTS (moist, stiff)	
2	2	2.0	4.0	SS/20	4-5-8-9		Brown/Grey SILT, some CLAY, trace ROOTS (moist, stiff)	13
3								
4	3	4.0	6.0	SS/18	9-10-11-20		Brown/Grey CLAY, some cmf GRAVEL, little SILT, trace cmf SAND (moist, very stiff)	21
5								
6	4	6.0	6.1	SS/1	100@1"		Grey ROCK FRAGMENTS (Limestone) and ROCK FLOUR (moist)	100+
7							Spoon and auger refusal @ 6.1' on possible top of bedrock.	
8							Bottom of Boring @ 6.1'	
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. SB-7 Page No. 1 of 1 Report No. 27803B-01-1021 </div>				
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/20/21		
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/20/21		
Location:		See CME Exploration Location Plan, ELP-2		Surface Elev.		250.3'		
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS				
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		
Driller:		Ryan Casatelli		Casing Hammer:				
Inspector:				Other:				
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		
Type:		ATV Mounted		Hammer Wt:		140 lbs.		
Rod Size:		AWJ		Hammer Fall:		30 in.		
Date:		09/20/21		Time:		While Drilling		
Depth (Ft.):		None Noted		Casing At (Ft.):		4.0'		
Before Casing Removed:		None Noted		After Casing Removed:		None Noted		
After Casing Removed:		None Noted		After Casing Removed:		caved @ 2.1'		
After Casing Removed:		out		After Casing Removed:		out		
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL				
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1A	0.0	0.2	SS/11	8-21-11-18	0.2	Topsoil and Organic Material (moist)	32
1	1B	0.2	2.0				FILL; Brown/Grey mf gravel, cmf sand, silt, roots (moist)	
2	2	2.0	4.0	SS/12	12-11-10-9		Miscellaneous FILL; Brown/Grey cmf gravel, cmf sand, silt, ash (moist)	21
3								
4	3	4.0	5.8	SS/11	9-7-9-100@4"		Grey weathered ROCK FRAGMENTS (Limestone), little SILT (wet)	16
5							Spoon and auger refusal @ 5.8' on possible top of bedrock.	
6							Bottom of Boring @ 5.8'	
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. SB-8 Page No. 1 of 1 Report No. 27803B-01-1021 </div>				
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/16/21		
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/16/21		
Location:		See CME Exploration Location Plan, ELP-2		Surface Elev.		251.1'		
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS				
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		
Driller:		Ryan Casatelli		Casing Hammer:				
Inspector:				Other:				
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		
Type:		ATV Mounted		Hammer Wt:		140 lbs.		
Rod Size:		AWJ		Hammer Fall:		30 in.		
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL				
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1A	0.0	0.2	SS/14	10-11-7-3	0.2	Topsoil and Organic Material (moist)	18
1	1B	0.2	2.0				FILL; Brown cmf gravel, cmf sand, silt (moist)	
2	2	2.0	4.0	SS/16	4-6-12-16		Brown SILT, trace fine SAND, trace ROOTS (moist, very stiff)	18
3								
4	3	4.0	6.0	SS/20	12-31-30-24		Grey/Brown SILT, some cmf SAND, little mf GRAVEL (moist, hard)	61
5								
6	4	6.0	6.3	SS/4	100@4"		Brown SILT, little cmf SAND, trace mf GRAVEL (moist, hard)	100+
7							Spoon refusal @ 6.3'.	
8							Auger refusal @ 6.5' on possible top of bedrock.	
9							Bottom of Boring @ 6.5'	
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. Page No. Report No. </div> <div> SB-9 1 of 1 27803B-01-1021 </div>					
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/16/21			
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/16/21			
Location:		See CME Exploration Location Plan, ELP-2		Surface Elev.		250.2'			
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS					
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.			
Driller:		Ryan Casatelli		Casing Hammer:					
Inspector:				Other:					
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel			
Type:		ATV Mounted		Hammer Wt:		140 lbs.			
Rod Size:		AWJ		Hammer Fall:		30 in.			
				Date		Time			
				09/16/21		While Drilling			
				09/16/21		Before Casing Removed			
				09/16/21		After Casing Removed			
				09/16/21		After Casing Removed			
						Depth (Ft.)			
						Casing At (Ft.)			
						None Noted			
						8.0'			
						out			
						caved @ 1.5'			
						out			
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL					
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine	and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1A	0.0	0.2	SS/12	4-4-4-8	0.2	Topsoil and Organic Material (moist)		8
1	1B	0.2	2.0				Brown/Grey CLAY, little SILT, trace cmf GRAVEL, trace cmf SAND, trace ROOTS (moist, stiff)		
2	2	2.0	4.0	SS/15	4-3-4-6		Grey/Brown CLAY, little SILT (moist, stiff)		7
3									
4	3	4.0	6.0	SS/19	4-4-8-12		Grey CLAY, some SILT, trace cmf SAND (moist, stiff)		9
5									
6	4	6.0	7.9	SS/22	13-19-20-100@5"		Brown/Grey CLAY, some cmf GRAVEL, little SILT, trace cmf SAND (moist, hard)		39
7									
8							Spoon refusal @ 7.9'.		
9							Auger refusal @ 8.0' on possible top of bedrock.		
10							Bottom of Boring @ 8.0'		
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. SB-10 Page No. 1 of 1 Report No. 27803B-01-1021 </div>				
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/16/21		
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/16/21		
Location:		See CME Exploration Location Plan, ELP-2		Surface Elev.		249.9'		
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS				
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		
Driller:		Ryan Casatelli		Casing Hammer:				
Inspector:				Other:				
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		
Type:		ATV Mounted		Hammer Wt:		140 lbs.		
Rod Size:		AWJ		Hammer Fall:		30 in.		
				Date		Time		
				09/16/21		While Drilling		
				09/16/21		Before Casing Removed		
				09/16/21		After Casing Removed		
				09/16/21		After Casing Removed		
						Depth (Ft.)		
						Casing At (Ft.)		
						None Noted		
						6.0'		
						None Noted		
						6.7'		
						None Noted		
						out		
						caved @ 2.0'		
						out		
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL				
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1	0.0	2.0	SS/14	3-5-5-6		Brown CLAY, some SILT, trace mf GRAVEL, trace cmf SAND, trace ROOTS (moist, stiff)	10
1								
2	2	2.0	4.0	SS/8	5-8-5-5		Brown SILT, little CLAY, little mf GRAVEL, trace cmf SAND (moist, stiff)	13
3								
4	3	4.0	6.0	SS/10	4-5-8-12		Brown CLAY, some cmf GRAVEL, little SILT, trace cmf SAND (moist, stiff)	13
5								
6	4	6.0	6.5	SS/6	13-100@0"		Grey/Brown CLAY, some cmf GRAVEL, little SILT, trace fine SAND (moist, hard) <i>Spoon refusal @ 6.5'</i>	100+
7							<i>Auger refusal @ 6.7' on possible top of bedrock.</i>	
8							Bottom of Boring @ 6.7'	
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. SB-11 Page No. 1 of 1 Report No. 27803B-01-1021 </div>				
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/16/21		
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/16/21		
Location:		See CME Exploration Location Plan, ELP-2		Surface Elev.		248.3'		
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS				
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		
Driller:		Ryan Casatelli		Casing Hammer:				
Inspector:				Other:				
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		
Type:		ATV Mounted		Hammer Wt:		140 lbs.		
Rod Size:		AWJ		Hammer Fall:		30 in.		
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL				
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.) From To		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1	0.0	2.0	SS/8	8-6-4-3		Brown SILT, some CLAY, trace mf GRAVEL, trace cmf SAND, trace ROOTS (moist, stiff)	10
1								
2	2	2.0	3.2	SS/10	2-2-100@2"		Brown/Grey mottled CLAY, little SILT, trace ROCK FRAGMENTS (Limestone), trace mf GRAVEL, trace cmf SAND, trace ROOTS (moist, hard) <i>Auger refusal @ 3.2' on possible top of bedrock.</i>	100+
3								
4							Bottom of Boring @ 3.2'	
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								


SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. SB-12 Page No. 1 of 1 Report No. 27803B-01-1021 </div>					
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/16/21			
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/16/21			
Location:		See CME Exploration Location Plan, ELP-2		Surface Elev.		249.5'			
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS					
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.			
Driller:		Ryan Casatelli		Casing Hammer:					
Inspector:				Other:					
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel			
Type:		ATV Mounted		Hammer Wt:		140 lbs.			
Rod Size:		AWJ		Hammer Fall:		30 in.			
				Date		Time			
				09/16/21		While Drilling			
				09/16/21		Before Casing Removed			
				09/16/21		After Casing Removed			
				09/16/21		After Casing Removed			
						Depth (Ft.)			
						Casing At (Ft.)			
						None Noted			
						5.0'			
						None Noted			
						out			
						caved @ 3.5'			
						out			
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL					
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine	and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1	0.0	2.0	SS/15	4-7-5-8		FILL; Brown cmf gravel, silt, cmf sand, roots (moist)		12
1									
2	2A	2.0	3.0	SS/14	4-7-17-17		Brown CLAY, little mf GRAVEL, little SILT, trace cmf SAND (moist, very stiff)		24
3	2B	3.0	4.0				Grey cmf GRAVEL, little cmf SAND, trace SILT (moist)		
4	3	4.0	4.1	SS/1	100@1"		Grey ROCK FRAGMENTS (Limestone), little ROCK FLOUR, trace SILT (moist) Spoon refusal @ 4.1'		100+
5							Auger refusal @ 5.0' on possible top of bedrock.		
6							Bottom of Boring @ 5.0'		
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

 <div> 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522 </div>		<div> SUBSURFACE EXPLORATION TEST BORING LOG </div>		<div> Boring No. SB-13 Page No. 1 of 1 Report No. 27803B-01-1021 </div>				
Project Name:		Association Island Expansion, Henderson, New York		Date Started		09/16/21		
Client:		Sun Association Island RV, LLC c/o Sun Communities, Inc.		Date Finished		09/16/21		
Location:		See CME Exploration Location Plan, ELP-2		Surface Elev.		249.4'		
METHODS OF INVESTIGATION				GROUNDWATER OBSERVATIONS				
Driller:		Beau Fletcher		Casing:		3¼" ID H.S.A.		
Driller:		Ryan Casatelli		Casing Hammer:				
Inspector:				Other:				
Drill Rig:		CME 550X		Soil Sampler:		2" OD Split Barrel		
Type:		ATV Mounted		Hammer Wt:		140 lbs.		
Rod Size:		AWJ		Hammer Fall:		30 in.		
LOG OF BORING SAMPLES				VISUAL CLASSIFICATION OF MATERIAL				
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.)		Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
0	1	0.0	2.0	SS/14	6-14-12-8		FILL; Brown cmf gravel, clay, silt, cmf sand, roots (moist)	26
1								
2	2	2.0	4.0	SS/7	12-9-8-12		Brown CLAY and cmf GRAVEL, little SILT, trace cmf SAND (moist, very stiff)	17
3								
4	3	4.0	6.0	SS/10	7-4-7-11		Dark Grey/Brown CLAY, some cmf GRAVEL, little SILT, trace cmf SAND (moist, stiff)	11
5								
6	4	6.0	7.6	SS/15	11-8-10-100@1"		Dark Grey/Brown CLAY, little SILT, trace mf GRAVEL, trace cmf SAND, trace ORGANIC MATERIAL (moist, very stiff)	18
7							Spoon refusal @ 7.6'.	
8							Auger refusal @ 7.7' on possible top of bedrock	
9							Bottom of Boring @ 7.7'	
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

Bedrock Core Photographs

Attachment to CME Report No: 27803B-01-1021



Photograph 1 Boring: SB-1 Run 1 Depth 4.5' - 9.5' See Photographs Nos. 2 and 3 for detailed views.



Photograph 2 SB-1 Run 1 Top Depth 4.5' -7.0'



Photograph 3 SB-1 Run 1 Bottom Depth 7.0' - 9.5'

Bedrock Core Photographs

Attachment to CME Report No: 27803B-01-1021



Photograph 4 Boring: B-8 Run 1 Depth 7.0' - 12.0' See Photographs Nos. 5 and 6 for detailed views.



Photograph 5 B-8 Run 1 Top Depth 7.0' - 9.5'



Photograph 6 B-8 Run 1 Bottom Depth 9.5' - 12.0'

Bedrock Core Photographs

Attachment to CME Report No: 27803B-01-1021



Photograph 7 Boring: B-9 Run 1 Depth 4.7' - 8.3' See Photographs Nos. 8 and 9 for detailed views.



Photograph 8 B-9 Run 1 Top Depth 4.7' - 6.7'



Photograph 9 B-9 Run 1 Bottom Depth 6.7' - 8.3'

Bedrock Core Photographs

Attachment to CME Report No: 27803B-01-1021



Photograph 10 Boring: B-10 Run 1 Depth 4.0' - 9.0' See Photographs Nos. 11 and 12 for detailed views.



Photograph 11 B-10 Run 4 Top Depth 4.0' - 6.5'



Photograph 12 B-10 Run 1 Bottom Depth 6.5' - 9.0'

INFILTRATION TEST REPORT



Test ID: IT-3

Project:	Association Island Exansion Henderson, New York	CME Report No.:	27803B-01-1021
		Test Date:	09/28/21
Client:	Sun Association Island RV, LLC c/o Sun Communities, Inc.	Test Location:	See Exploration Location Plan, ELP-1
		Technician:	Bryan Reles, P.G.

Test Preparation and Dimensions

Casing Installed in: ☐ Test Pit ☒ Borehole
 Casing Diameter and Type: 4 inch I.D. PVC

A Existing Grade Elevation (ft): 254.7 ±
 B Casing Stickup Length Above Grade (ft): 1.50
 C Top of Casing Elevation (ft): (A+B)= 256.2 ±
 D Depth to Bottom of Test Hole, Below Top of Casing (ft): 6.00
 E Bottom of Test Hole Elevation: (C-D)= 250.2 ±

Burmister Classification of Soil at Bottom of Hole: Grey/Brown SILT, some CLAY, little cmf SAND, trace cmf GRAVEL

Thickness/Type of Scour/Sediment Protection Layer Installed: 3" of Pea Gravel

Date and Time Pre-Soaked: 09/27/21 8:48

Depth to Water Level, Below Top of Casing

Just After Pre-Soak Filling (ft): 5.30

Just Prior to First Test Filling (ft): 5.60 Date: 9/28/21 Time: 12:50

Test Observations

Run 1			Run 2			Run 3			Run 4		
Real Time (hh:mm)	Elapsed Time (h:mm)	Depth to Water Level, Below Top of Casing (feet)	Real Time (hh:mm)	Elapsed Time (h:mm)	Depth to Water Level, Below Top of Casing (feet)	Real Time (hh:mm)	Elapsed Time (h:mm)	Depth to Water Level, Below Top of Casing (feet)	Real Time (hh:mm)	Elapsed Time (h:mm)	Depth to Water Level, Below Top of Casing (feet)
12:55	0:00	4.00	14:00	0:00	4.00		0:00			0:00	
12:56	0:01	4.00	14:01	0:01	4.00		0:01			0:01	
12:57	0:02	4.00	14:02	0:02	4.00		0:02			0:02	
12:58	0:03	4.00	14:03	0:03	4.00		0:03			0:03	
13:00	0:05	4.00	14:05	0:05	4.00		0:05			0:05	
13:05	0:10	4.00	14:10	0:10	4.00		0:10			0:10	
13:10	0:15	4.00	14:15	0:15	4.00		0:15			0:15	
13:25	0:30	4.00	14:30	0:30	4.00		0:30			0:30	
13:40	0:45	4.00	14:45	0:45	4.00		0:45			0:45	
13:55	1:00	4.00	15:00	1:00	4.00		1:00			1:00	

Test Results

Run:	Run 1	Run 2	Run 3	Run 4
Infiltration Rate (feet/hour):	0.00	0.00		
Infiltration Rate (inches/hour):	0.00	0.00		

Final Infiltration Rate (inches/hour): 0.00 ☐ Based on average of all four runs
☒ Based on result of last run

Note(s)

- Test performed in general conformance with NYS Stormwater Management Design Manual, Appendix D: Infiltration Testing Requirements.
- IT casing installed adjacent to soil boring IT-3.
- Test pipe bailed dry and recharged prior to the start of second test.

INFILTRATION TEST REPORT



Test ID: IT-01

Project:	Association Island Exansion, Phase 2 Henderson, New York	CME Report No.:	27803B-01-1021
		Test Date:	09/28/21
Client:	Sun Association Island RV, LLC c/o Sun Communities, Inc.	Test Location:	See Exploration Location Plan, ELP-2
		Technician:	Bryan Reles, P.G.

Test Preparation and Dimensions

Casing Installed in: ☐ Test Pit ☒ Borehole
Casing Diameter and Type: 4 inch I.D. PVC

A Existing Grade Elevation (ft): 249.5 ±
B Casing Stickup Length Above Grade (ft): 1.50
C Top of Casing Elevation (ft): (A+B)= 251.0 ±
D Depth to Bottom of Test Hole, Below Top of Casing (ft): 3.00
E Bottom of Test Hole Elevation: (C-D)= 248.0 ±

Burmister Classification of Soil at Bottom of Hole: Brown SILT, trace fine SAND, trace ROOTS
Thickness/Type of Scour/Sediment Protection Layer Installed: 3" of Pea Gravel
Date and Time Pre-Soaked: 09/27/21 9:06
Depth to Water Level, Below Top of Casing
Just After Pre-Soak Filling (ft): 2.15
Just Prior to First Test Filling (ft): 2.65 Date: 9/28/21 Time: 9:31

Test Observations

Run 1			Run 2			Run 3			Run 4		
Real Time (hh:mm)	Elapsed Time (h:mm)	Depth to Water Level, Below Top of Casing (feet)	Real Time (hh:mm)	Elapsed Time (h:mm)	Depth to Water Level, Below Top of Casing (feet)	Real Time (hh:mm)	Elapsed Time (h:mm)	Depth to Water Level, Below Top of Casing (feet)	Real Time (hh:mm)	Elapsed Time (h:mm)	Depth to Water Level, Below Top of Casing (feet)
9:33	0:00	1.00	10:34	0:00	0.95	11:35	0:00	1.00		0:00	
9:34	0:01	1.10	10:35	0:01	0.95	11:36	0:01	1.00		0:01	
9:35	0:02	1.15	10:36	0:02	0.95	11:37	0:02	1.00		0:02	
9:36	0:03	1.15	10:37	0:03	0.95	11:38	0:03	1.00		0:03	
9:38	0:05	1.20	10:39	0:05	0.95	11:40	0:05	1.00		0:05	
9:43	0:10	1.30	10:44	0:10	0.95	11:45	0:10	1.00		0:10	
9:48	0:15	1.30	10:49	0:15	0.95	11:50	0:15	1.00		0:15	
10:03	0:30	1.30	11:04	0:30	0.95	12:05	0:30	1.00		0:30	
10:18	0:45	1.30	11:19	0:45	0.95	12:20	0:45	1.00		0:45	
10:33	1:00	1.30	11:34	1:00	0.95	12:35	1:00	1.00		1:00	

Test Results

Run:	Run 1	Run 2	Run 3	Run 4
Infiltration Rate (feet/hour):	0.00	0.00	0.00	
Infiltration Rate (inches/hour):	0.00	0.00	0.00	

Final Infiltration Rate (inches/hour): 0.00 ☐ Based on average of all four runs
☒ Based on result of last run

Note(s)

- Test performed in general conformance with NYS Stormwater Management Design Manual, Appendix D: Infiltration Testing Requirements.
- IT casing installed adjacent to soil boring SB-1.
- Test pipe bailed dry and recharged prior to the start of third test.

INFILTRATION TEST REPORT



Test ID: IT-02

Project:	Association Island Exansion, Phase 2 Henderson, New York	CME Report No.:	27803B-01-1021
		Test Date:	09/28/21
Client:	Sun Association Island RV, LLC c/o Sun Communities, Inc.	Test Location:	See Exploration Location Plan, ELP-2
		Technician:	Bryan Reles, P.G. / Skye Schumacher

Test Preparation and Dimensions

Casing Installed in: ☐ Test Pit ☒ Borehole
Casing Diameter and Type: 4 inch I.D. PVC

A Existing Grade Elevation (ft): 251.4 ±
B Casing Stickup Length Above Grade (ft): 3.00
C Top of Casing Elevation (ft): (A+B)= 254.4 ±
D Depth to Bottom of Test Hole, Below Top of Casing (ft): 5.90
E Bottom of Test Hole Elevation: (C-D)= 248.5 ±

Burmister Classification of Soil at Bottom of Hole: Grey/Brown SILT, some CLAY, trace ROOTS
Thickness/Type of Scour/Sediment Protection Layer Installed: 3" of Pea Gravel
Date and Time Pre-Soaked: 09/27/21 8:58
Depth to Water Level, Below Top of Casing
Just After Pre-Soak Filling (ft): 5.20
Just Prior to First Test Filling (ft): 5.20 Date: 9/28/21 Time: 9:18

Test Observations

Run 1			Run 2			Run 3			Run 4		
Real Time (hh:mm)	Elapsed Time (h:mm)	Depth to Water Level, Below Top of Casing (feet)	Real Time (hh:mm)	Elapsed Time (h:mm)	Depth to Water Level, Below Top of Casing (feet)	Real Time (hh:mm)	Elapsed Time (h:mm)	Depth to Water Level, Below Top of Casing (feet)	Real Time (hh:mm)	Elapsed Time (h:mm)	Depth to Water Level, Below Top of Casing (feet)
9:23	0:00	3.95	10:30	0:00	3.90		0:00			0:00	
9:24	0:01	3.95	10:31	0:01	3.90		0:01			0:01	
9:25	0:02	3.95	10:32	0:02	3.90		0:02			0:02	
9:26	0:03	3.95	10:33	0:03	3.90		0:03			0:03	
9:28	0:05	3.95	10:35	0:05	3.90		0:05			0:05	
9:33	0:10	3.95	10:40	0:10	3.90		0:10			0:10	
9:38	0:15	3.95	10:45	0:15	3.90		0:15			0:15	
9:53	0:30	3.95	11:00	0:30	3.90		0:30			0:30	
10:08	0:45	3.95	11:15	0:45	3.90		0:45			0:45	
10:23	1:00	3.95	11:30	1:00	3.90		1:00			1:00	

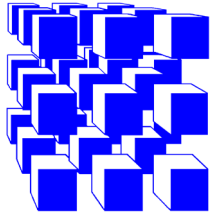
Test Results

Run:	Run 1	Run 2	Run 3	Run 4
Infiltration Rate (feet/hour):	0.00	0.00		
Infiltration Rate (inches/hour):	0.00	0.00		

Final Infiltration Rate (inches/hour): 0.00 ☐ Based on average of all four runs
☒ Based on result of last run

Note(s)

- Test performed in general conformance with NYS Stormwater Management Design Manual, Appendix D: Infiltration Testing Requirements.
- IT casing installed adjacent to soil boring SB-6.
- Water did not move from pre-charge level. Test pipe bailed dry and recharged prior to the start of both tests.



LABORATORY TEST SUMMARY
Association Island, Henderson, New York
CME Report No.: 27803L-01-1021
October 6, 2021
Page 1 of 2

CME Representatives obtained soil samples from Test Borings advanced as part of the Subsurface Exploration Program conducted for the subject project. Selected samples were delivered to CME's East Syracuse facility, an AASHTO re:source¹ accredited laboratory for various laboratory testing. The results are presented below:

Sample ID Notations: SB or B - Test Boring, S - Sample

I. Atterberg Limits Testing (ASTM D4318)

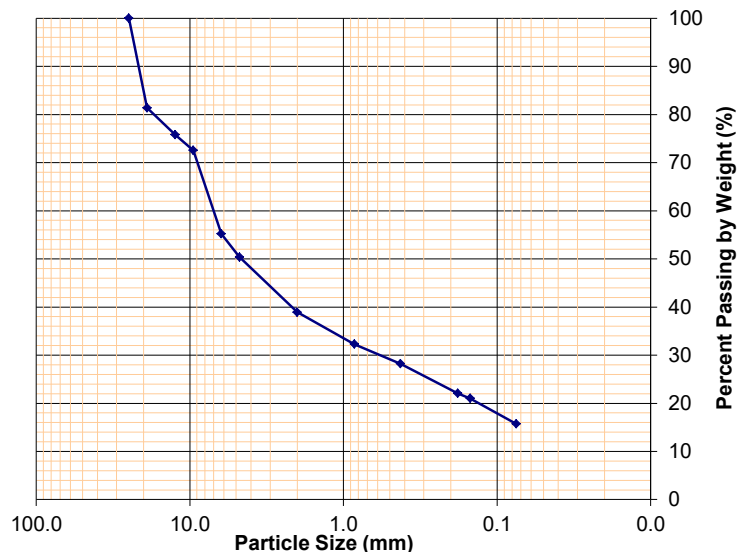
Sample ID	Liquid Limit	Plastic Limit	Plasticity Index	Natural Moisture (%)
SB-3; S-2	63	27	36	29.5
SB-9; S-2	89	30	59	40.9

II. Particle Size Analysis (ASTM D422)

Sample #
B-8; S-4

Classification
Brown mf GRAVEL, some cmf SAND, little SILT, trace CLAY
Grain Size Distribution Curve

Sieve Designation	Sieve Size (mm)	% Passing by Dry Weight
1"	25.0	100
3/4"	19.0	81
1/2"	12.5	76
3/8"	9.5	73
1/4"	6.25	55
No.4	4.75	50
No.10	2.00	39
No.20	0.850	32
No.40	0.425	28
No.80	0.180	22
No.100	0.150	21
No.200	0.075	16



Sample #

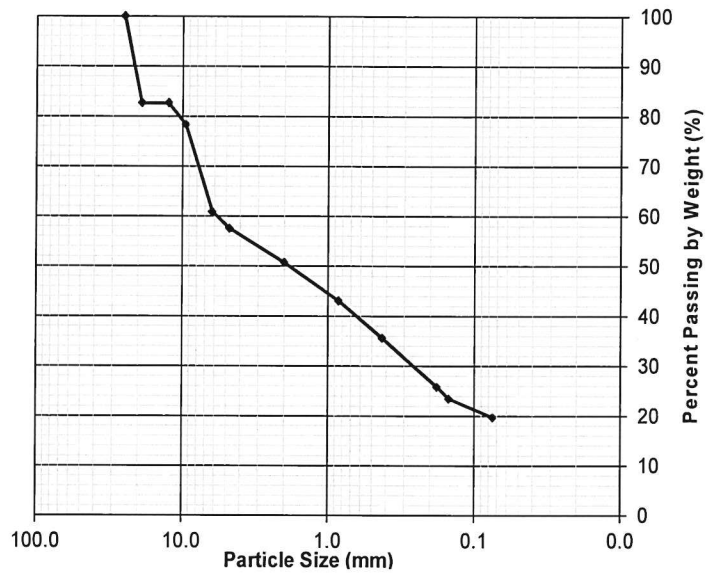
Classification

¹AASHTO re:source – American Association of State Highway & Transportation Officials (AASHTO) Materials Reference Laboratory, a Federal Agency having jurisdiction to assess laboratory competency according to the Standards of the United States of America. CME East Syracuse accreditation includes testing of Portland Cement Concrete, Aggregate and Soil Materials. www.AASHTOresource.org.

Sample #
SB-5; S-3

Classification
Grey mf GRAVEL and cmf SAND, little SILT, little CLAY
Grain Size Distribution Curve

<u>Sieve Designation</u>	<u>Sieve Size (mm)</u>	<u>% Passing by Dry Weight</u>
1"	25.0	100
3/4"	19.0	83
1/2"	12.5	83
3/8"	9.5	78
1/4"	6.25	61
No.4	4.75	58
No.10	2.00	51
No.20	0.850	43
No.40	0.425	36
No.80	0.180	26
No.100	0.150	23
No.200	0.075	20



If you have any questions regarding this report please contact our office.

Hannah Kloiber
Hannah Kloiber
Laboratory Supervisor

GENERAL INFORMATION & KEY TO TEST BORING LOGS

The **Subsurface Exploration – Test Boring Logs** produced by **CME Associates, Inc.** (CME) present observations and mechanical data collected by the CME Drill Crew while at the site, supplemented, at times, by classification of the materials removed from the borings determined through visual identification by technicians in the laboratory. It is cautioned that the materials removed from the borings represent only a fraction of the total volume of the deposits at the site and may not necessarily be representative of the subsurface conditions between adjacent borings or between the sampled intervals. The data presented on the Exploration Logs together with the recovered samples will provide a basis for evaluating the character of the subsurface conditions relative to the proposed construction. The evaluation must consider all the recorded details and their significance relative to each other. Often, analyses of standard boring data indicate the need for additional testing and sampling procedures to more accurately evaluate the subsurface conditions. Any evaluations of the contents of CME's report and the recovered samples must be performed by Licensed Professionals having experience in Soil Mechanics, Geological Sciences and Geotechnical Engineering. The information presented in this Key defines some of the methods, procedures and terms used on the CME Exploration Logs to describe the conditions encountered. Refer to the Log on page 4 for key number.

Key No.

Description

1. The figures in the **DEPTH SCALE** column define the vertical scale of the Boring Log.
2. The **SAMPLE NO.** is used for identification on the sample containers and in the Laboratory Test Report or Summary.
3. The **SAMPLE DEPTH** column gives the depth range from which a sample was recovered.
4. The **TYPE / SAMPLE RECOVERY** column is used to signify the various types of samples. "SS is Split Spoon, "U" is Undisturbed Tube, and "C" is Rock Core. For soil and rock samples, the recovered length of the sample is recorded in inches.
5. **BLOWS ON SAMPLER** – This column shows the results of the "Standard Penetration Test (SPT) ASTM D1586", recording the number of blows required to drive a 2-inch outside diameter (O.D.) split spoon sampler into the ground beneath the casing. The number of blows required for each six inches of penetration is recorded. The total number of blows required for the 6-inch to 18-inch interval is summarized in the **SPT "N"** column and represents the "Standard Penetration Number". The outside diameter of the sampler, the hammer weight and the length of drop are noted in the **Methods of Investigation** portion of the log. A "WH" or "WR" in this column indicates that the sample spoon advanced a 6-inch interval under the Weight of **Hammer + Rod** or **Weight of Rod**, respectively. If a rock core sample is taken, the core bit size designation is given here.
6. The **DEPTH OF CHANGE** column designates the depth (in feet) that the driller noted a compactness or stratum change. In soft materials or soil strata exhibiting a consistent relative density, it is difficult for the driller to determine the exact change from one stratum to the next. In addition, a grading or gradual change may exist. In such cases the depth noted is approximate or estimated only and may be represented by a dashed line. When continuous split spoon sampling is not employed, or an interval of several feet exists between samplings, the Depth of Change may not be indicated at all.
7. **VISUAL CLASSIFICATION OF MATERIAL** – Soil materials sampled and recovered are described by the Driller or Geotechnical Representative on the original field log. Notes of the Drillers observations are also placed in this column. Recovered samples may also be visually classified by a Geologist, Engineer, or Soil Technician. Visual soil classifications are made using a modified Burmister System as practiced by CME and as generally described in this Key and abbreviated on the Test Boring Log. This modified Burmister System is a type of visual-manual textural classification estimated by the Driller, Geologist, Engineer, or Technician on the basis of weight-fraction of the recovered material and estimated plasticity, among other characteristics. See Table 1 "**Classification of Materials**". The description of the relative compactness or consistency is based upon the standard penetration number as defined in Table 2. The description of the recovered sample moisture condition is described as dry, moist, wet, or saturated. Water used to advance the boring may affect the moisture content of the recovered sample. Special terms may be used to describe recovered materials in greater detail, such terms are listed in ASTM D653. When sampling gravelly soils with a standard two-inch O.D. Split Spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter. The presence of boulders, cobbles, and large gravel is sometimes, but not necessarily, detected by observation of the casing advancement and sampler blows and/or through the "action" of the drill rig, sampler and/or casing as reported by the Driller.

The description of **Rock** is based upon the recovered rock core. Terms frequently used in the description are included in Tables 3, 4 and 5. The length of core run is defined as length of penetration between retrievals of the core barrel from the bore hole, expressed in inches. The core recovery expresses the length of core recovered from the core barrel per core run, in percent. The size core barrel used is noted in Column 5. An "N" size core, being larger in diameter than "A" size core, often produces better recovery, and is frequently utilized where accurate information regarding the geologic conditions and engineering properties is needed. An estimate of in-situ rock quality is provided by a modified core recovery ratio known as the "**Rock Quality Designation**" (**RQD**). This ratio is determined by considering only pieces of core that are at least 4 inches long and are hard and sound. Breaks obviously caused by drilling are ignored. The percentage ratio between the total length of such core recovered and the length of core drilled on a given run is the RQD. Table 4 indicates in-situ rock quality as related to the **RQD**.

8. The SPT “N” or RQD is given in this column as applicable to the specific sample taken. In Very Compact coarse-grained soils and in Hard fine-grained soils the N-value may be indicated as 50+ or 100+. This typically means that the blow count was achieved prior to driving the sampler the entire 6-inch interval or the sampler refused further penetration. For an “N” size rock core, the RQD is reported here, expressed in percent (%).
9. **GROUNDWATER OBSERVATIONS** and timing noted by the Drill Crew are shown in this section. It is important to realize that the reliability of the water level observations depend upon the soil type (e.g. water does not readily stabilize in a hole through fine grained soils), and that drill water used to advance the boring may have influenced the observations. Groundwater levels typically fluctuate seasonally so those noted on the log are only representative of that exhibited during the period of time noted on the log. One or more perched or trapped water levels may exist in the ground seasonally. All the available resources and data should be evaluated. If definite conclusions cannot be made, it is often prudent to examine the conditions more thoroughly through test pit excavations or through groundwater observation well installations.
10. **METHODS of INVESTIGATION** provides pertinent information regarding the identity of the Drill Crew members, inspector (if any), drill rig make and model, drill rig mount vehicle, casing and type of advancement, soil and rock sampling tools and appurtenances used in the installation of the Test Boring.

TABLE 1 - CLASSIFICATION OF MATERIALS	
GROUP	COARSE GRAINED SOILS TEXTURAL SIZES
BOULDERS	larger than 12" diameter
COBBLES	12" diameter to 3" sieve
GRAVEL	3" - coarse - 1" - medium - 1/2" - fine - #4 sieve
SAND	#4 - coarse - #10 - medium - #40 - fine - #200 sieve
GROUP	FINE GRAINED SOILS SIZE (PLASTICITY*)
SILT	#200 sieve (0.074mm) to 0.005mm size (see below *)
CLAY	0.005mm size to 0.001 mm size (see below *)
GROUP	ORGANIC SOILS, PEAT, MUCK, MARL
ORGANIC	Based on smell, visual-manual and laboratory testing

ABBREVIATIONS	TERM	ESTIMATED PERCENT OF TOTAL SAMPLE BY WEIGHT
f - fine	and	35 to 50%
m - medium	some	20 to 35%
c - coarse	little	10 to 20%
	trace	0 to 10%

*PLASTICITY DESCRIPTIONS and INDICATOR FIELD TESTS			
TERM	PLASTICITY INDEX	DRY STRENGTH TEST	
		INDICATION	FIELD TEST RESULT
non-plastic	0 - 3	Very low	falls apart easily
slightly plastic	4 - 15	Slight	easily crushed by fingers
plastic	15 - 30	Medium	difficult to crush
highly plastic	31 or more	High	impossible to crush with fingers
Other Field Tests include: Dilatancy, Thread and Shine Testing			

TABLE 2 - DESCRIPTION OF SOIL COMPACTNESS OR CONSISTENCY based on SPT "N"*

Primary Soil Type	Descriptive Term of Compactness	Range of Standard Penetration Resistance (N)
COARSE GRAINED SOILS	Very Loose	less than 4 blows per foot
(More than half of Material is larger than No. 200 sieve size)	Loose	4 to 10
	Medium Compact	10 to 30
	Compact	30 to 50
	Very Compact	Greater than 50
FINE GRAINED SOILS	Descriptive Term of Consistency	Range of Standard Penetration Resistance (N)
(More than half of material is smaller than No. 200 sieve size)	Very Soft	less than 2 blows per foot
	Soft	2 to 4
	Medium Stiff	4 to 8
	Stiff	8 to 15
	Very Stiff	15 to 30
	Hard	Greater than 30
*The number of blows of 140-pound weight falling 30 inches to drive a 2-inch O.D., 1-3/8 inch I.D. sampler 12 inches is defined as the Standard Penetration Resistance, designated "N".		

TABLE 3 - ROCK CLASSIFICATION TERMS


Rock Classification Terms		Field Test or Meaning of Term
Hardness	Soft	Scratched by fingernail. Crumbles under firm blows with a geologic pick.
	Medium Soft	Shallow indentations (1 to 3 mm) can be made by firm blows of a geologic pick. Can be peeled with a pocketknife with difficulty.
	Medium Hard	Scratched distinctly by penknife or steel nail. Can't be peeled or scraped with knife.
	Hard	Scratched with difficulty by penknife or steel nail. Requires more than one blow with a geologic hammer to break it
	Very Hard	Cannot be scratched by penknife or steel nail. Breaks only by repeated heavy blows with a geologic hammer.
Bedding (Divisional planes and/or surfaces separating it from layers above and below)	Thinly Laminated Laminated Thinly Bedded Medium Bedded Thickly Bedded Massive	less than 1/8 th inch 1/8 th to 1 inch 1 inch to 4 inches 4 inches to 12 inches 12 inches to 48 inches greater than 48 inches

TABLE 4
Relation of Rock Quality Designation (RQD) and in-situ Rock Quality

RQD %	Rock Quality Term Used
90 to 100	Excellent
75 to 90	Good
50 to 75	Fair
25 to 50	Poor
0 to 25	Very Poor

TABLE 5 – BEDROCK WEATHERING CLASSIFICATION

Classification	Diagnostic Features
Fresh	No visible sign of decomposition or discoloration. Rings under hammer impact.
Slightly Weathered	Slight discoloration inwards from open fractures, otherwise similar to Fresh.
Moderately Weathered	Discoloration throughout. Strength somewhat less than fresh rock but cores cannot be broken by hand or scraped with knife. Texture observed.
Highly Weathered	Most minerals somewhat decomposed. Specimens can be broken by hand with effort or shaved with knife. Core stones present in rock mass. Texture becoming indistinct but fabric preserved.
Completely Weathered	Minerals decomposed to soil, but fabric and structure preserved (e.g. Saprolite). Specimens easily crumbled or penetrated.
Residual Soil	Advanced state of decomposition resulting in plastic soils. Rock fabric and structure completely destroyed. Large volume change.

 6035 Corporate Drive East Syracuse, NY 13057 Phone: 315-701-0522		SUBSURFACE EXPLORATION TEST BORING LOG		Boring No. B-2				
				Page No. 1 of 1				
				Report No. 				
Project Name:				Date Started				
Client:				Date Finished				
Location:				Surface Elev.				
METHODS OF INVESTIGATION			GROUNDWATER OBSERVATIONS					
Driller: 10 Driller: Inspector: Drill Rig: Type: Rod Size:	Casing: 10 Casing Hammer: Other: Soil Sampler: Hammer Wt: Hammer Fall:	Date Time While Drilling Before Casing Removed After Casing Removed After Casing Removed	Depth (Ft.) 9 	Casing At (Ft.) 9 				
LOG OF BORING SAMPLES			VISUAL CLASSIFICATION OF MATERIAL					
Depth Scale (Feet)	Sample No.	Sample Depth (Ft.) From To	Type / Sample Rec. (in.)	Blows on Sampler Per 6 Inches	Depth of Change (Ft.)	c - coarse m - medium f - fine	and - 35 to 50% / some - 20 to 35% little - 10 to 20% / trace - 0 to 10%	SPT "N" or RQD %
1	2	3 3	4	5	6	7		8

SS - Split Spoon, U - Undisturbed Tube, C - Core, WH - Weight of Hammer + Rod, WR - Weight of Rod

Remarks:

Appendix C

Stormwater Management Report &
SWPPP



Engineering
& Design

PROJECT SITE

Sun Communities Inc. - Hovey's Island Draft Stormwater Pollution Prevention Plan

October 20, 2023

Prepared for:

Sun Communities Inc.
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Southfield, MI 48034

Prepared by:

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Appendix Q. Pre-Construction Meeting Attendance Record
Appendix R. Stormwater Management Report
Appendix S. Post Construction Stormwater BMP Operations and Maintenance Plan.
Appendix T. Historical Mapping and Supporting Documentation

Section I. Scope

A. Purpose

Development and proper implementation of the New York State Department of Environmental Conservation (NYSDEC), State Pollutant Discharge Elimination System (SPDES) Construction General Permit governing stormwater discharges during construction and the National Pollutant Discharge Elimination System (NPDES) Construction General Permit governing storm water discharges during construction, and in accordance with Erosion and Sediment Control practices is critical. The Contractor's participation in this program is mandatory and its non-compliance is subject to various remedies, including without limitation, monetary set-offs, withholding payments; reimbursement for costs, expenses (including reasonable attorney's fees), fines and civil penalties incurred by the Operator. This section provides a descriptive explanation of the Storm Water Pollution Prevention Program and required Contractor participation.

B. SPDES Construction General Permit for Storm Water Discharge from Construction Activities

Regulations promulgated by the NYSDEC to regulate the discharge of storm water from Construction Activity on sites where one (1) or more acre of soil is disturbed. One of the ways to comply with these regulations for affected sites is to request coverage under the SPDES General Permit for Stormwater Discharges from Construction Activities (GP-0-20-001). In order to use the Construction General Permit, a Notice of Intent (NOI) form must be completed and mailed to the NYSDEC. Authorization to discharge stormwater under the General Permit will be effective when the owner or operator has satisfied all of the criteria listed in Part II, B of the SPDES General Permit for Construction Activity (GP-0-20-001).

C. Notice of Intent

The Operator will petition the NYSDEC for stormwater discharges during construction at this site to be covered by the SPDES General Permit for Stormwater Discharges from Construction Activity, GP-0-20-001, following completion of this SWPPP. An NOI form will be filed by the Operator. Authorization to discharge stormwater from Construction Activities is effective five (5) or (60) calendar days after the NYSDEC receives the complete NOI.

D. Responsibilities of the Contractor Regarding the Construction General Permit

The Contractor shall manage the discharge of stormwater from the site in accordance with the NYSDEC General Permit for Stormwater Discharges from Construction Activities and the following provisions:

1. The Contractor shall be responsible for conducting the Storm Water Management practices in accordance with the permit.
2. The Contractor shall be responsible for any enforcement action taken or imposed by federal, state, or local agencies, including the cost of fines, construction delays, and remedial actions resulting from the Contractor's failure to comply with the permit provisions

E. Pre-Construction Meeting

A Pre-Construction SWPPP Meeting (although not required by the General Permit) may occur before any land disturbing activities are started. If a pre-construction SWPPP meeting is held it should include a review and explanation of the following topics:

1. Erosion and sediment control for water quality protection
2. Implementation of Erosion and Sediment Control Plans
3. The importance to proper installation of erosion and sediment control measures
4. Regular inspection by Qualified Inspector of erosion and sediment control measures
5. Diligent maintenance to erosion and sediment control measures
6. Contemporaneous preparation of accurate and complete records regarding inspection and maintenance of erosion and sediment control measures
7. Record-keeping for inspections and maintenance activities

F. SWPPP Certification Requirements for the Contractor and Sub-Contractor

The SWPPP shall provide forms for both the Contractor and Subcontractor(s) identifying the Company Name, Business Address and Telephone Number along with the Responsible Person for the Contractor and all subcontractors' who will implement the measures identified in the SWPPP.

The Contractor shall sign, the Contractor's Certification Statement (Appendix H) and all Subcontractors shall sign the Subcontractor's Certification Statement (Appendix I) verifying they have been instructed on how to comply with and fully understand the requirements of the NYSDEC and SWPPP. These certifications must be signed, by a responsible corporate officer or other party meeting the "Signatory Requirements" in Part VII Section H & Part III.A.5. of the NYS DEC SPDES General Permit for Stormwater Runoff from construction Activity (GP-0-20-001), on behalf of each entity, prior to the beginning of any Construction Activities and shall be filed in the Project's SWPPP.

G. SWPPP Location Requirements

The SWPPP Ledger is meant to be a working document that shall be maintained at the site of the Construction Activities at all times throughout the Project, shall be readily available upon request by the Operator's personnel or NYSDEC or any other agency with regulatory authority over storm water issues, and shall be kept on-site until the site complies with the Final Stabilization section of this document. A copy of the General Permit (GP-0-20-001), NOI, NOI Acknowledgment Letter, SWPPP Binder, and inspection reports shall be maintained at the construction site until all disturbed areas have achieved final stabilization and the Notice of Termination has been submitted to the Department. The documents must be maintained in a secure location, such as a job trailer, on-site construction office, or mailbox with lock; that is accessible during normal working hours to an individual performing a compliance inspection.

H. SWPPP Ledger

A minimum of two (2) copies of the SWPPP, in three (3) ring binders shall be provided by the Operator's Engineer. One (1) copy shall be provided for use by the General Contractor and one (1) copy shall be provided as an original.

I. Inspections and Record Keeping

Inspections are required as described in Part IV, C of the General Permit GP-0-20-001 by a qualified inspector:

1. INSPECTOR QUALIFICATIONS

- Inspections must be conducted by a "Qualified" Inspector. "Qualified" is defined as a person knowledgeable in the principles and practices of erosion and sediment controls who possesses the skills to assess conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the Construction Activity such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), licensed Landscape Architect.
- It also means someone working under the direct supervision of a licensed Professional Engineer, or Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control.
 - I. Training in the principles and practices of erosion and sediment control means that an individual performing the site inspection has received four (4) hours of training, endorsed by the Department, from a Soil and Water Conservation District, CPESC, Inc. or other department endorsed entity in proper erosion and sediment control principles no later than two (2) years from the date of the current general permit issued.
 - II. After receiving the initial training, an individual working under the direct supervision of a licensed Professional Engineer or licensed Landscape Architect shall receive four (4) hours of training every three (3) years.
- Inspections of post construction stormwater management practices that include structural components, such as a dam for impoundment, shall be performed by a licensed Professional Engineer.

2. RAINFALL MONITORING

- A rain gage should be maintained on the site and a record of the rainfall amounts (in tenths of an inch) and dates shall be recorded every 24 hours on the Rain Log (Appendix P).

3. INSPECTOR RESPONSIBILITIES:

- The Qualified Inspector shall be trained in all the inspection and maintenance practices necessary for keeping the Erosion and Sediment Controls that are used onsite in good working order. They will also be trained in the completion of, initiation of actions required by, and the filing of the inspection forms. Documentation of Qualified Inspector training will be kept on site with the SWPPP.

4. INSPECTION PROCEDURES

- Inspections must include all areas of the site disturbed by Construction Activities and areas used for storage of materials that are exposed to precipitation.
- Qualified Inspectors must look for evidence of, or the potential for, pollutants entering the storm water conveyance system. Erosion and Sediment Control measures identified in the SWPPP must be observed to ensure proper operation.
- Discharge locations must be inspected to ascertain whether Erosion and Sediment Control measures are effective in preventing significant impacts to Waters of the United States, where accessible.
- Where discharge locations are inaccessible, nearby downstream locations must be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the site must be inspected for evidence of off-site tracking.
- The following inspection and maintenance practices will be used to maintain Erosion and Sediment Controls and stabilization measures:
 - I. All control measures will be inspected at least at the frequency identified in this Section. The minimum inspection frequency shall be twice every seven (7) calendar days. The two inspections shall be separated by a minimum of two full calendar days.
 - II. All measures will be maintained in good working order; if repairs or other measures are found to be necessary, they will be initiated within 24 hours of report, and completed within 48 hours of report and documented with photos.
 - III. Check dams will be inspected for sediment build-up. Built up sediment will be removed from silt fence when it has reached 25% of the height of the check dam. Check dam stone will be removed and replaced as necessary to ensure it is free of sediment.
 - IV. Built up sediment will be removed from silt fence when it has reached 25% of the height of the fence.
 - V. Silt fences will be inspected for depth of sediment, tears, etc., to see if the fabric is securely attached to the fence posts, and to see that the fence posts are securely in the ground.

- VI. Temporary and permanent seeding and all other stabilization measures will be inspected for bare spots, washouts, and healthy growth.
- VII. An Inspection Report (Appendix J) will be completed after each inspection. Copies of the report forms to be completed by the Qualified Inspector(s) are included in this SWPPP.
- VIII. Disturbed Areas and materials storage areas will be inspected for evidence of or potential for pollutants entering stormwater systems.
- IX. Report to U.S. Environmental Protection Agency, or NYSDEC within 24 hours any noncompliance with the SWPPP that will endanger public health or the environment. Follow up with a written report within 5 days of the noncompliance event. The following events require 24 hour reporting:
 - 1. Any unanticipated bypass which exceeds any effluent limitation in the permit,
 - 2. Any upset which exceeds any effluent limitation in the permit, and
 - 3. A violation of a maximum daily discharge limitation for any of the pollutants listed by the EPA in the permit to be reported within 24 hours. The written submission must contain a description of the non-compliance and its cause; the period of non-compliance, including exact dates and times, and if the non-compliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the non-compliance.
- X. Spills or Releases of Hazardous Substances or Oil in excess of reportable quantities (as established under 40 CFR Part 110, 40 CFR Part 117 or 40 CFR Part 302) must be reported.

5. MONITORING

- There are no monitoring requirements required under this SWPPP and NOI coverage.

6. THIRD PARTY INSPECTIONS

- Where required or requested by the Operator, third party inspections by the design engineer shall be in addition to and shall not replace inspections by the Contractor (Qualified Inspector). The third party inspector shall complete and sign any inspection report and include a copy of the report in the SWPPP following each inspection.

7. RECORDKEEPING

- It is imperative that documentation of the inspection and maintenance of all erosion and sediment control measures as soon as possible after the inspection and/or maintenance is completed. The inspection reports identify any incidents of non-compliance with the permit conditions. Where a report does not identify any

incidents of non-compliance, the report must contain a certification that the Project is in compliance with the SWPPP and the Construction General Permit or other applicable State Permit. The report must be signed in accordance Part VII.H of the General Permit (GP-0-20-001). These records are used to prove that the required inspection and maintenance were performed and shall be placed in the SWPPP Ledger. In addition to inspection and maintenance reports, records should be kept of the Construction Activities that occur on the site. The Contractor shall retain copies of the SWPPP, all reports and data for a minimum of five (5) years after the project is complete in paper and CD format.

- The forms found in this SWPPP shall be used by the Qualified Inspector(s) to inventory and report the condition of each measure to assist in maintaining the erosion and sediment control measures in good working order. The following list identifies the required Inspection and Maintenance documentation and record keeping that must be maintained by the Contractor under this SWPPP:
 - I. Appendix J Inspection Report
 - II. Appendix K Stabilization Schedule
 - III. Appendix L Implementation Schedule
 - IV. Appendix M Modification Report
 - V. Appendix N Final Stabilization/Notice of Termination Checklist
 - VI. Appendix O Reportable Quantity Release Form
 - VII. Appendix P Project Rainfall Log
- These report forms shall become an integral part of the SWPPP and shall be made readily accessible to governmental inspection officials, the Operator's Engineer, and the Operator for review upon request during visits to the Project site. In addition, copies of the reports shall be provided to any of these persons, upon request, via mail or facsimile transmission. Inspection and maintenance report forms are to be maintained by the permittee for five years following the final stabilization of the site.

8. OTHER RECORD KEEPING REQUIREMENTS

- The Contractor shall keep the following records related to Construction Activities at the site:
 - I. Dates when major grading activities occur and the areas which were graded
 - II. Dates and details concerning the installation of structural controls
 - III. Dates when Construction Activities cease in an area
 - IV. Dates when stabilization measures are initiated
 - V. Dates when an area is stabilized, either temporarily or permanently
 - VI. Dates of rainfall and the amount of rainfall
 - VII. Dates and descriptions of the character and amount of any spills of Hazardous Substances or Oil
 - VIII. Records of reports filed with regulatory agencies if reportable quantities of Hazardous Substances or Oil spilled

J. SWPPP Modifications

The inspection report should also identify if any revisions to the SWPPP are warranted due to unexpected conditions. The SWPPP is meant to be a dynamic working guide that is to be kept current and amended whenever:

1. There is a change in design, construction, operation, or maintenance at the construction site that has or could have a significant effect on the discharge of pollutants to the Waters of the United States that has not been previously addressed in the SWPPP. In addition to modifying the SWPPP, the site map may also require an amendment.
2. Inspections or investigations by site staff, or by local, state or federal officials, determine that the discharges the SWPPP is ineffective in eliminating or significantly minimizing pollutants in storm water discharges from the construction site. Modifications that are the result of an inspection must be initiated within 24 hours and completed within 48 hours.
3. Based on the results of an inspection, it must be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP must be completed within seven (7) calendar days following the inspection.
4. There is a release containing a Hazardous Substance or Oil in an amount equal or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117 or 40 CFR Part 302 occurs during a 24-hour period. Revisions to the SWPPP must be completed within seven (7) calendar days of knowledge of the release.
5. Any such changes to the SWPPP must be made in writing on the Modification Report (Appendix M) within 7 days of the date such modification or amendment is made. Changes must also be drawn on the Progress Drawing.

K. Final Stabilization and Termination of Permit Coverage

A site can be considered finally stabilized when all soil disturbing activities have been completed and:

1. A uniform perennial vegetative cover with a density of 80% for the unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures have been established.
2. The facility no longer discharges storm water associated with Construction Activities.
3. A Notice of Termination (NOT) form filed by the Operator(s) with the NYSDEC. The NOT must be submitted within 30 days of final stabilization.

Section II. Project Name and Location

Sun Communities – Hovey's Island
Snowshoe Rd
Town of Henderson, NY 13650
Jefferson County
-76.223830E, 43.887403 N

A general location map with enough detail to identify the location of the construction site, the receiving waters within one (1) mile of the site is included in Appendix A.

Section III. Operator's Name and Address

Sun Communities Inc.
27777 Franklin Road #200
Southfield, MI 48034

Section IV. Project Description

This SWPPP is for the proposed Sun Communities Hovey's Island Campgrounds at Snowshoe Road (Parcel #97.00-1-11, 96.936 Acres) in the Town of Henderson, Jefferson County, New York. (Refer to Appendix A – Location Map). Hovey's Island and the contiguous Association Island are owned by Sun Communities, which has a total acreage of 98.33 ± acres. The project will include 117 new campsites, each with an associated single-family cabin, driveways and access roadways, utilities, and landscaping.

The total project disturbance area is approximately 27.62 acres. General soil disturbing activities will include:

1. Construction of temporary construction exit points
2. Clearing and grubbing
3. Installation of storm sewer structures
4. Installation of water, sanitary, electric, gas, and communication services
5. Construction of curb, drives, and walkways
6. Construction of foundations
7. Final grading

Section V. Existing Site Conditions

Existing Conditions:

The project site tributary area is approximately 26.15 acres.

The topography of the project property ranges from elevations 246 to 258 feet. The property has slopes ranging from 1% to 33%. Runoff is conveyed via overland shallow sheet flow, shallow concentrated, and stream/channel flow prior to discharging off site.

Groundwater & bedrock elevations on the project site range in elevations from 3 feet to 8 feet below existing grade.

There is a non-regulated wetland located on the western edge of the project site that is not proposed to be disturbed in any way.

Section VI. Description of Soils

Soil Types within the Subject Area

Symbol	Soil Name	Hydrologic Soil Group
Be	Beaches (0 to 3% slopes)	A
CIA	Chaumont silty clay (3 to 8% slopes)	D
CIB	Chaumont silty clay (0 to 3% slopes)	D
KgA	Kingsbury silty clay (0 to 3% slopes)	D
Ub	Udorthents, smoothed (0 to 8% slopes)	A

More information pertaining to the existing soils can be found in the NRCS Soils Report and Geotechnical Engineering Report included in the Stormwater Management report (Appendix R).

Section VII. Name of Receiving Waters

The site discharges directly to an unnamed stream which ultimately discharges into Henderson Bay, which is a part of Lake Ontario.

Section VIII. Erosion and Sediment Controls

A. List of Erosion and Sediment Controls

The project will utilize temporary and permanent erosion and sediment control practices to prevent sediment from leaving the project area. A list of the practices anticipated are as follows:

Temporary Structural					
	BMP	Notes		BMP	Notes
<input checked="" type="checkbox"/>	Inlet Protection		<input type="checkbox"/>	Brush Barrier	
<input type="checkbox"/>	Outlet Protection		<input type="checkbox"/>	Temporary Stream Crossing	
<input checked="" type="checkbox"/>	Perimeter Protection		<input type="checkbox"/>	Pipe Slope Drain	
<input checked="" type="checkbox"/>	Stabilized Construction Entrance/Exit		<input type="checkbox"/>	Wind Fence	
<input type="checkbox"/>	Stone Staging Area		<input type="checkbox"/>	Temporary Diversion Channels	
<input type="checkbox"/>	Temporary Sediment Basin		<input type="checkbox"/>	Temporary Diversion Berms	
<input type="checkbox"/>	Temporary Gravel and Riprap Sediment Trap		<input type="checkbox"/>	Other	
<input type="checkbox"/>	Temporary Stone Outlet Sediment Trap		<input type="checkbox"/>	Other	
<input type="checkbox"/>	Check Dam		<input type="checkbox"/>	Other	
<input checked="" type="checkbox"/>	Silt Fence		<input type="checkbox"/>		
<input checked="" type="checkbox"/>	Temporary Seeding		<input type="checkbox"/>	Chemical Stabilization	
<input checked="" type="checkbox"/>	Temporary Mulching		<input type="checkbox"/>	Other	
<input type="checkbox"/>	Rolled Erosion Control Product (RECP)	1 on 3 slope or greater	<input type="checkbox"/>	Other	
<input checked="" type="checkbox"/>	Slope Tracking (Soil Roughening)		<input type="checkbox"/>	Other	

Temporary Structural					
	BMP	Notes		BMP	Notes
<input checked="" type="checkbox"/>	Watering to Minimize Wind Erosion		<input type="checkbox"/>	Other	
Permanent Stabilization					
	BMP	Notes		BMP	Notes
<input type="checkbox"/>	RECP (all slopes exceeding 3:3 (3 horizontal to 1 vertical))		<input type="checkbox"/>	Vegetation Protection	
<input checked="" type="checkbox"/>	Permanent Seeding		<input type="checkbox"/>	Sod	
<input checked="" type="checkbox"/>	Permanent Planting (vegetative landscaping)		<input type="checkbox"/>	Other	
<input checked="" type="checkbox"/>	Mulching		<input type="checkbox"/>	Other	
Permanent Structural					
	BMP	Notes		BMP	Notes
<input checked="" type="checkbox"/>	Outlet Protection		<input type="checkbox"/>	Stormwater Channel	
<input checked="" type="checkbox"/>	Storm Drainage System		<input type="checkbox"/>	Retaining Wall	
<input checked="" type="checkbox"/>	Curb		<input type="checkbox"/>	Gradient Terrace	
<input type="checkbox"/>	Stormwater Pond		<input type="checkbox"/>	Stormwater Retention Pond	
<input type="checkbox"/>	Stormwater Infiltration		<input type="checkbox"/>	Stormwater Filtration	
<input type="checkbox"/>	Bio Swale		<input checked="" type="checkbox"/>	Bio Retention Basin	
<input checked="" type="checkbox"/>	Wet Swale		<input type="checkbox"/>	Other	
<input type="checkbox"/>	Other		<input type="checkbox"/>	Other	

B. Sequence of Major Construction Activities

The Contractor will be responsible for implementing the following Erosion and Sediment Control and Storm Water Management control measures. The Contractor may designate these tasks to certain subcontractors as he sees fit, but the ultimate responsibility for implementing these controls and ensuring their proper functioning remains with the Contractor. The order of activities will be as follows (refer to the Grading and Erosion & Sediment Control Plans C140 contained in this SWPPP for details):

Construction Sequence

1. If necessary, hold a pre-construction meeting, attended by the project manager, contractor, sub-contractors, NYSDEC representative and the operator's engineer prior to land disturbing activities.
2. Construct temporary construction entrances/exits at locations shown on the plans.
3. Install perimeter silt fences in the locations shown on the plans.
4. Have a qualified professional conduct an assessment of the site prior to the commencement of construction and certify in an inspection report that the appropriate erosion and sediment controls described in the SWPPP as required by part iv of the GP-0-20-001 have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.
5. Begin clearing and grubbing operations. Clearing and grubbing shall be done only in areas where earthwork will be performed and only in areas where building is planned to commence within 14 days after clearing and grubbing.
6. Install diversion swales at locations shown on the plans.
7. Commence site grading. The work shall be progressed to allow a reasonable transfer of cut and fill earth for rough grading and earth moving. The contractor will be given some latitude to vary from the following schedule in order to meet the field conditions encountered. Contractor shall review variations to SWPPP with design engineer and qualified professional prior to implementation. All changes to SWPPP drawings must be documented within onsite SWPPP.
8. Stockpile topsoil in a location acceptable to construction manager. When stockpile is complete, install perimeter silt fence, seed surface with 100% perennial ryegrass mixture at a rate of 2-4 lbs. Per 1000 sf. Apply 90-100 lbs per 1000 sf of mulch.
9. Install erosion control blankets on all slopes greater than 3:1. Disturbed areas of the site where construction activity has ceased for more than 7 days shall be temporarily seeded and watered.
10. Following rough grading, utility installation should begin, trench excavation/backfill areas should be stabilized progressively at the end of each workday with seed and straw mulch at a rate of 100% perennial rye grass at 2-4 lbs/1000 sf mulched at 90-100 lbs/1000 sf.
11. Construct all curb, gutter inlets, area inlets, and storm sewer manholes, as shown on the plans. Inlet protection may be removed temporarily for this construction. Place required rip rap at locations shown on the plans.
12. As roadway, building pads and access drives are brought to grade, they will be stabilized with crushed stone subbase at a depth specified on plans to prevent erosion as soon as practicable. Inlet protection may be removed temporarily for this construction.
13. Clean sub-base where required and install base material as required for pavement. Proceed with building and paving. Remove inlet protection around inlets and manholes no more than 48 hours prior to paving operations.
14. Carry out final grading and seeding and planting.
15. Remove temporary construction exits only prior to final paving operations (these areas are to be paved last).

16. A qualified professional shall perform a site assessment to confirm that all permanent stormwater devices have been installed per plans and 80% uniform germination/stabilization has been achieved prior to the removal of all remaining temporary erosion and sediment controls.

C. Stormwater Management

Sun Communities will own and is responsible for all maintenance of the stormwater management facilities associated with the project, A draft stormwater maintenance agreement is required by the Town of Henderson and Sun Communities will initiate it prior to applying for a building permit.

The proposed project consists of the development of approximately 28± acres of an existing 39.1 ± acre island, known as Hovey's Island. Hovey's Island and the contiguous Association Island are owned by Sun Communities, which has a total acreage of 98.33 ± acres. The project will include 117 new campsites, each with an associated single-family cabin, driveways and access roadways, utilities, and landscaping. Proposed site disturbance will total approximately 27.62 acres of land.

Three aboveground wet swales and two bioretention areas are proposed to mitigate stormwater quality objectives for the development. The wet swales and bioretention areas will provide the required water quality volume (WQv) and Runoff Reduction Volume (RRv) for the site, based on the New York State Department of Environmental Conservation (NYSDEC) requirements. The stormwater management report is provided in Appendix R.

1. Water Quality Volume (WQv)

The New York State Department of Environmental Conservation, Stormwater Management Design Manual was used to determine the water quality criteria. Specifically, the unified storm water sizing criteria was followed for water quality to meet the State of New York pollutant goals. The water quantity volume is intended to improve water quality by capturing and treating 90% of the average annual storm water runoff volume. The following equation is given within the design manual for calculating the water quality storage volume and was used to size subject practices.

$$WQ_v = \frac{(P)(R_v)(A)}{12}$$

where:

WQ_v = water quality volume (acre-ft)

P = 90% Rainfall Event Number (1.0" was used per NYSDEC guidelines)

R_v = 0.05 + 0.009 (I) , where I is percent of impervious cover

Due to poor draining soils and high bedrock (Refer to Appendix R) across the project site limiting practice depth, Bioretention Areas (F-5) and Wet Swales (O-2) were chosen to provide the necessary Water Quality Volume (WQv). This project is not located within a section 303(d) watershed requiring enhanced phosphorus treatment, therefore additional WQv requirements are not necessary for this project.

The required WQv for the full site development is 39,563 CF. Drainage areas P-1 & P-2 will each have a separate Bioretention Area (F-5) to accommodate the required WQv for the drainage area. Drainage areas P-3, P-4 & P-5 will each have a separate Wet Swale (O-2) to accommodate the required WQv for the drainage area. WQv calculations for each drainage area are provided in Appendix R and are summarized in the Table below.

Water Quality Volume Summary			
Drainage Area	Water Quality Volume Required (CF)	Water Quality Volume Provided (CF)	Practice
P-1	7,293	7,293	Bioretention Area
P-2	5,879	5,879	Bioretention Area
P-3	7,063	7,063	Wet Swale
P-4	7,411	7,411	Wet Swale
P-5	11,917	11,917	Wet Swale

2. Runoff Reduction Volume (RRv)

The Runoff Reduction Volume (RRv) for the site shall be equal to a percentage of the water quality volume per section 4.3 of the Stormwater Management Design Manual and NYSDEC GI worksheets. The required Runoff Reduction Volume (RRv) of 7,351 CF has been achieved via the Bioretention Areas (F-5) utilizing soil media for filtration and underdrains. Drainage areas P-1 & P-2 will each have a separate Bioretention Area (F-5) to accommodate the required RRv for the project site.

RRv calculations are provided in Appendix R and are summarized in the Table below.

Runoff Reduction Volume Summary			
Drainage Area	Runoff Reduction Volume Required (CF)	Runoff Reduction Volume Provided (CF)	Practice
P-1	5,351	6,840	Bioretention Area
P-2	2,000	2,448	Bioretention Area

3. Channel Protection Volume (Cpv), Overbank Flood Volume (Qp) and Extreme Storm Volume (Qu) 1, 10 & 100-Year Storm Event

Channel Protection Volume, Overbank Flood and Extreme Storm control is not required as the site discharges directly into a fifth order stream, Henderson Bay, which is a part of Lake Ontario.

D. Post Construction Stormwater BMP Operation and Maintenance Plan

In addition to the stormwater facilities, the following post-construction storm water management measures will be applied during the construction process to control pollutants in storm water discharges after construction operations have been completed.

1. Parking and roads shall be cleaned or swept on an as needed basis.
2. Wet swales and Bioretention areas shall be inspected periodically, and debris should be removed.
3. Lawn areas shall be maintained and or reseeded to protect against erosion. Fertilizers shall be applied in order to maintain a healthy lawn and to promote longevity. All fertilizers shall be applied according to the soil test report recommendations and will contain no phosphorous.
4. Any lawn area disturbed after construction is completed shall be seeded or mulched (in landscaped) areas immediately and water shall be applied on a daily basis (either naturally by rain water or manually by tap water) until adequate seed germination has occurred.

An Operations and Maintenance Plan is included to address the inspection, operation and maintenance of all post construction BMPs identified in this plan. The Contractor is responsible for proper installation, maintenance and functioning of all best management practices shown on the drawings until final stabilization is achieved. A copy of the Post Construction Stormwater BMP Operations and Maintenance Plan is included in Appendix S of this document.

Section IX. Other Controls

A. Off-Site Vehicle Tracking

A stabilized construction entrance/exit will be provided at each entrance used for construction access to help reduce vehicle tracking of sediments. The paved streets adjacent to the site entrance will be inspected daily and swept as necessary to remove any excess mud, dirt, or rock tracked from the site. Dump trucks hauling material from the construction site will be covered with a tarpaulin. The job Contractor's Superintendent will be responsible for seeing that these procedures are followed.

B. Excavation Spoil Materials

Excavation spoil materials may be generated during excavations including, but not limited to footings and utilities installation. These materials must be properly managed to prevent them from contributing to storm water discharges. The materials generated from the development of this Project will be managed by the following method: Stockpiled on-site, the general site contractor to specify location and provide erosion control for excavated spoil materials.

C. Dust Control

Minimizing wind erosion and controlling dust will be accomplished by one or more of the following methods

1. Covering 30% or more of the soil surface with a non-erodible material.
2. Roughening the soil to produce ridges perpendicular to the prevailing wind. Ridges should be about six (6) inches in height.
3. Frequent watering of excavation and fill areas.
4. Providing gravel or paving at entrance/exit drives, parking areas and transit paths.

D. Equipment Service Area

The Contractor shall identify an area on the Erosion and Sediment Control Plan for equipment cleaning, maintenance and repair. This area shall be protected by a temporary perimeter berm preventing all surface runoff from leaving the area, or equivalent measure, and shall be located no closer than 100' from any Waters of the United States or state, and shall be located no closer than 50' from any storm inlet. External washing of trucks and other construction vehicles must be confined to this area. No engine degreasing or asphalt equipment or tool washing is permitted.

E. Material Stockpiles

Stormwater runoff to and from material stockpiles shall be controlled to prevent materials from creating a diversion of surface water to disturbed soils or from entering the surface water. Topsoil stockpiles shall be surrounded with perimeter sediment control measures such as silt fence and be covered with non-erosive material as soon as practicable but no longer than 14 days after completion of the pile. Non-erosive material may include temporary seeding with straw mulch and tackifier, Mulch, or other material providing suitable cover.

F. Masonry Mixing Area

Non-stormwater discharges into storm drainage systems or waterways containing slurries from concrete or mortar mixing operations shall not be permitted. Masonry mixing areas shall be located a minimum distance of 100 linear feet from drainage ways, inlets and surface waters and all storm water runoff from these areas shall be contained by a berm or other measures. Run-on water to these areas will be diverted to prevent mixing of clean water and water contaminated with concrete slurry.

Section X. Compliance with Other Federal, State and Local Regulations

At a minimum, the Contractor will obtain copies of any and all local and state regulations which are applicable to Storm Water Management, Erosion and Sediment Control, and pollution minimization at this Project and will comply fully with such regulations. The Contractor will submit written evidence of such compliance if requested by the Operator or any agent of a regulatory body. The

Contractor will comply with all conditions of the NYSDEC General Permit for Stormwater Discharges from Construction Activities including the conditions related to maintaining the SWPPP and evidence of compliance with the SWPPP at the Project and allowing regulatory personnel access to the Project and to records in order to determine compliance. The Contractor shall also comply with any additional or more stringent requirements imposed by the permit issued by an approved state storm water program, or with permits issued, or requirements imposed by the Town to which the Project discharges storm water. Requirements with which the Contractor must comply include installation of post-construction measures required by the State, County, or Town.

Section XI. Materials Management Plan

A. Progress Drawing

A Progress Drawing consisting of a print of the Erosion and Sediment Control Plans shall be posted inside the job trailer wall. The Progress Drawing will be used to record the locations of the Job Trailer, Sanitary Waste Facilities, Solid Waste Facilities, Fuel Storage Area, Equipment Service Area, and Concrete Washout Pit. Any time any of these facilities are relocated on the site, a new location will be noted on the Progress Drawing and a Modification Report (Appendix M) will be prepared.

B. Materials Covered

The following materials or substances are expected to be present onsite during construction:

1. Concrete/Additives/Waste
2. Cleaning solvents
3. Detergents
4. Petroleum based products
5. Paints/Solvents
6. Acids
7. Fertilizers
8. Solid and construction wastes
9. Sanitary wastes
10. Soil stabilization additives

C. Material Management Practices

The following are the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to stormwater runoff. The Contractor's Superintendent will be responsible for ensuring that these procedures are followed:

1. Good Housekeeping
The following good housekeeping practices will be followed onsite during construction:
 - I. An effort will be made to store only enough products required to do the job.

- II. All materials stored onsite will be stored in a neat, orderly manner and, if possible, under a roof or in a containment area. At a minimum, all containers will be stored with their lids on when not in use. Drip pans shall be provided under all dispensers.
- III. Products will be kept in their original containers with the original manufacturer's label in legible condition.
- IV. Substances will not be mixed with one another unless recommended by the manufacturer.
- V. Whenever possible, all of a product will be used up before disposing of the container.
- VI. Manufacturer's recommendations for proper use and disposal will be followed.
- VII. The Contractor's Superintendent will be responsible for daily inspections to ensure proper use and disposal of materials.

2. Hazardous Substances

These practices will be used to reduce the risks associated with Hazardous Substances. Material Safety Data Sheets (MSDS's) for each product with hazardous properties that is used at the Project will be obtained and used for the proper management of potential wastes that may result from these products. An MSDS will be posted in the immediate area where such product is stored and/or used and another copy of each MSDS will be maintained in the job trailer at the Project. Each employee who must handle a Hazardous Substance will be instructed on the use of MSDS sheets and the specific information in the applicable MSDS for the product he/she is using, particularly regarding spill control techniques.

- I. An effort will be made to store only enough products required to do the job.
- II. Original labels and MSDS's will be procured and used for each product.
- III. If surplus product must be disposed manufacturer's and local/state/federal required methods for proper disposal must be followed.

3. Hazardous Waste

It is imperative that all Hazardous Waste be properly identified and handled in accordance with all applicable Hazardous Waste Standards, including the storage, transport and disposal of the Hazardous Wastes. There are significant penalties for the improper handling of Hazardous Wastes. It is important that the Site Superintendent seeks appropriate assistance in making the determination of whether a substance or material is a Hazardous Waste. For example, Hazardous Waste may include certain Hazardous Substances, as well as pesticides, paints, paint solvents, cleaning solvents, pesticides, contaminated soils, and other materials, substances or chemicals that have been discarded (or are to be discarded) as being out-of-date, contaminated, or otherwise unusable, and can include the containers for those substances; other materials and substances can also be or become Hazardous Wastes, however. The Contractor's Superintendent is also responsible for ensuring that all site personnel are instructed as to these Hazardous Waste requirements and also that the requirements are being followed.

4. Product Specific Practices

The following product specific practices will be followed on the job site:

I. Petroleum Products

All onsite vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Petroleum storage tanks shall be located at minimum 100 linear feet from drainage ways, inlets and surface waters. Maximum total aggregate above ground storage capacity (for the total permit area) shall not exceed 1,320 gallons (which includes both bulk and equipment operational storage volumes in fuel tanks 55 gallons and greater). Total aggregate petroleum storage exceeding 1,320 gallons shall require preparation, certification (using a Professional Engineer or providing a Self-Certified SPCC Plan if applicable) and implementation of a Spill Prevention Control and Countermeasures (SPCC) Plan. The SPCC Plan must be prepared and fully implemented prior to the commencement of work. The SPCC Plan, if needed, will be furnished by the Contractor. Any petroleum storage tanks stored onsite will be located within a containment area that is designed with an impervious surface between the tank and the ground. The secondary containment must be designed to provide a containment volume that is equal to 110% of the volume of the largest tank. Any mobile petroleum tank shall be parked in a vehicular service area surrounded by a berm that provides a containment volume that is equal to 110% of the volume of the largest tank. Containment must provide sufficient volume to contain expected precipitation and 110% volume of the largest tank. Accumulated rainwater or spills from containment areas are to be promptly pumped into a containment device and disposed of properly by a licensed Hazardous Waste transporter. Drip pans shall be provided for all dispensers. Any asphalt substances used onsite will be applied according to the manufacturer's recommendations. The location of any fuel tanks and/or equipment storage areas must be identified on the PROGRESS DRAWING by the Contractor once the locations have been determined.

II. Fertilizers

Fertilizers will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked in the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills. Fertilizers shall not contain any phosphorous material.

III. Paints, Paint Solvents, and Cleaning Solvents

All containers will be tightly sealed and stored when not in use. Excess paint and solvents will not be discharged to the storm sewer system but will be properly disposed of according to manufacturer's instructions or state and federal regulations.

IV. Concrete Wastes

Concrete trucks will be allowed to wash out or discharge surplus concrete or drum wash water on the site, but only in specifically designated diked and impervious washouts which have been prepared to prevent contact between the concrete wash and storm water. A standard detail on the construction of the concrete wash out is included on C505. Waste generated from concrete wash water shall not be allowed to flow into drainage ways, inlets, receiving waters or highway right of ways, or any location other than the designated concrete washout. Waste concrete may be poured into forms to make riprap or other useful concrete products. Proper signage designating the "Concrete Washout" shall be placed near the facility. Concrete Washouts shall be located at minimum 100 linear feet from drainage ways, inlets and surface waters.

The hardened residue from the concrete wash out areas will be disposed of in the same manner as other non-hazardous construction waste materials or may be broken up and used on site as deemed appropriate by the Contractor. Maintenance of the washout is to include removal of hardened concrete. The Facility shall have sufficient volume to contain all the concrete waste resulting from washout and a minimum freeboard of 12 inches. Facility shall not be filled beyond 95% capacity and shall be cleaned out once 75% full unless a new facility is constructed. The Contractor's Superintendent will be responsible for seeing that these procedures are followed.

Saw-cut Portland Cement Concrete (PCC) slurry shall not be allowed to enter storm drains or Watercourses. Saw-cut residue should not be left on the surface of pavement or be allowed to flow over and off pavement. Residue from saw-cutting and grinding shall be collected by vacuum and disposed of in the concrete washout facility.

The Project may require the use of multiple concrete wash out areas. These concrete wash out areas are to be made available to all trades and subcontractors working on the Project. The Contractor may designate certain wash out areas for particular trades or subcontractors, but the Contractor is responsible for the management of all concrete washout areas on the Project. All concrete wash out areas will be located in an area where the likelihood of the area contributing to storm water discharges is negligible. If required, additional BMPs must be implemented to prevent concrete wastes from contributing to storm water discharges. The location of concrete wash out area(s) must be identified on the PROGRESS DRAWING by the Contractor once the locations have been determined. In addition, a standard detail on the construction of the concrete wash out is included on C505.

V. Solid and Construction Wastes

All waste materials will be collected and stored in an appropriately covered container and/or securely contained metal dumpster rented from a local waste management company which must be a licensed solid waste management company. The dumpster will comply with all local and state solid waste management regulations.

All trash and construction debris from the site will be deposited in the dumpster. The dumpster will be emptied a minimum of once per week or more often if necessary. Once building construction has commenced, the dumpster will be emptied a minimum of once per week or when 95% full, or more often if necessary, to prevent over-flow and the trash will be hauled to a landfill. No construction waste materials will be buried on site. All personnel will be instructed regarding the correct procedures for waste disposal.

All waste dumpsters and roll-off containers will be located in an area where the likelihood of the containers contributing to storm water discharges is negligible. Solid waste containers shall be located no less than 50 feet from any storm inlet, drainage way, or surface water. If required, additional BMPs must be implemented, such as gravel bags, wattles, dikes, berms, and fences around the base to prevent wastes from contributing to storm water discharges. The location of waste dumpsters and roll-off containers must be identified on the PROGRESS DRAWING by the Contractor once the locations have been determined.

VI. Sanitary Wastes

A minimum of one portable sanitary unit will be provided for every ten (10) workers on the site. All sanitary waste will be collected from the portable units a minimum of one time per week by a licensed portable facility provider in complete compliance with local and state regulations.

All sanitary waste units will be located in an area where the likelihood of the unit contributing to storm water discharges is negligible. Additional containment BMPs must be implemented, such as gravel bags or specially designed plastic skid containers around the base, to prevent wastes from contributing to storm water discharges. The location of sanitary waste units must be identified on the PROGRESS DRAWING by the contractor once the locations have been determined

VII. Contaminated Soils

Any contaminated soils (resulting from spills of Hazardous Substances or Oil or discovered during the course of construction) which may result from Construction Activities will be contained and cleaned up in accordance with applicable state and federal regulations. Contaminated soils not resulting from Construction Activities, or which pre-existed Construction Activities, but which are discovered by virtue of Construction Activities, should be reported in the same manner as spills, but with

sufficient information to indicate that the discovery of an existing condition is being reported. If there is a release that occurs by virtue of the discovery of existing contamination, this should be reported as a spill, if it otherwise meets the requirements for a reportable spill.

D. Spill Prevention and Response Procedures

The Contractor will train all personnel in the proper handling and cleanup of spilled Hazardous Substances or Oil. No spilled Hazardous Substances or Oil will be allowed to come in contact with storm water discharges. If such contact occurs, the storm water discharge will be contained on site until appropriate measures in compliance with state and federal regulations are taken to dispose of such contaminated storm water. It shall be the responsibility of the Contractor's Superintendent to be properly trained, and to train all personnel in spill prevention and clean up procedures.

1. In order to prevent or minimize the potential for a spill of Hazardous Substances or Oil to come into contact with storm water, the following steps will be implemented:
 - I. All Hazardous Substances or Oil (such as pesticides, petroleum products, fertilizers, detergents, construction chemicals, acids, paints, paint solvents, cleaning solvents, additives for soil stabilization, concrete curing compounds and additives, etc.) will be stored in a secure location, with their lids on, preferably under cover, when not in use.
 - II. The minimum practical quantity of all such materials will be kept at the Project.
 - III. A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided at the storage site.
 - IV. Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.
 - V. It is the Contractor's responsibility to ensure that all Hazardous Waste discovered or generated at the Project site is disposed of properly by a licensed hazardous material disposal company. The Contractor is responsible for not exceeding Hazardous Waste storage requirements mandated by the EPA or state and local authority.
2. In the event of a spill of Hazardous Substances or Oil, the following procedures must be followed:
 - I. All measures must be taken to contain and abate the spill and to prevent the discharge of the Hazardous Substance or Oil to storm water or off-site. (The spill area must be kept

well ventilated and personnel must wear appropriate protective clothing to prevent injury from contact with the Hazardous Substances.)

- II. If the release is equal to or in excess of a reportable quantity, the SWPPP must be modified within seven (7) calendar days of knowledge of the discharge to provide a description of the release, the circumstances leading to the release, and the date of the release. The SWPPP must identify measures to prevent the recurrence of such releases and to respond to such releases. The form in Appendix O must be completed in accordance with this requirement.

Section XII. Control of Non-Storm Water Discharges

Certain types of discharges are allowable under the NYSDEC General Permit for Stormwater Discharges from Construction Activities, and it is the intent of this SWPPP to allow such discharges. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to or after its discharge. The control measures which have been outlined previously in this SWPPP will be strictly followed to ensure that no contamination of these non-storm water discharges takes place. The following non-storm water discharges are allowed by the NYSDEC and may occur at the Project:

1. Discharges from fire-fighting activities;
2. Fire hydrant flushing;
3. Waters used to wash vehicles where detergents are not used;
4. Water used to control dust;
5. Potable water including uncontaminated water line flushing;
6. Routine external building wash down that does not use detergents;
7. Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used;
8. Uncontaminated air conditioning or compressor condensate;
9. Uncontaminated ground water or spring water;
10. Foundation or footing drains where flows are not contaminated with process materials such as solvents;
11. Uncontaminated excavation dewatering;
12. Landscape irrigation

Section XIII. Historical Properties

Coordination with NYS SHPO has been ongoing regarding the Project. Per NYS SHPOS request a Phase I Archaeological Sensitivity Assessment and Survey of Hovey Island was conducted by H.A.Z.Ex. an effects determination from NYS SHPO is still pending following this submittal.

Section XIV. Industrial Activities

There are no discharges planned from industrial activities as part of this project.

Section XV. Enhanced Phosphorus Removal Standards

This development does not discharge to a waterbody listed as a Class C Impaired Water of the Section 303(d) Impaired Water List of the Clean Water Act, therefore is not required to provide enhanced phosphorus removal practices.

Section XVI. Environmental Review

Based on a review of the NYSDEC Environmental resource mapper, the site does not contain any "Significant Natural Communities" or "Rare Plants and Animals." Based on a review of the US's Fish and Wildlife (USFW) online Information, there were no USFW designated critical habitats located within the project area.

A review of the project site area using the USFW's Planning and Consultation System (IPaC) provided an Official Species List (Project Code 2023-0129411). The Official Species List identified two (2) federal endangered and one (1) federal candidate species that may occur within the project area, including:

1. Indiana Bat (*Myotis sodalis*); federal endangered
2. Northern Long-eared Bat (*Myotis septentrionalis*); federal endangered
3. Monarch butterfly (*Danaus plexippus*); federal candidate.

There was one (1) palustrine emergent wetland (PEM) wetland delineated within the project site. Determination of jurisdiction of the wetland site from USACE and/or NYS Agencies is still pending following this submittal. There are no wetland disturbances planned as part of this project.

Appendices

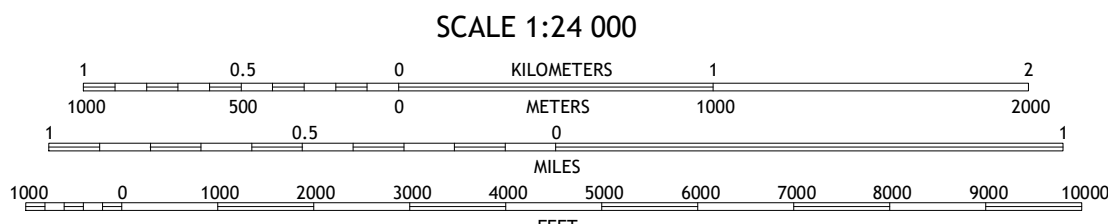
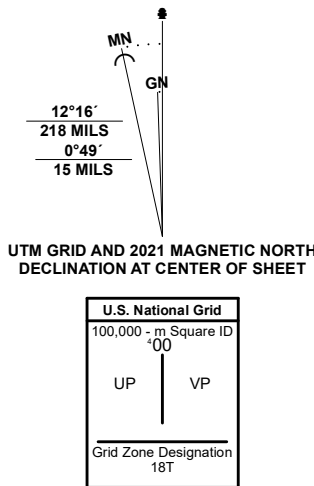
Appendix A. | Location Map



Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid: Universal Transverse Mercator, Zone 18T
Data is provided by The National Map (TNM), is the best available at the time of map
generation, and includes data content from supporting themes of Elevation,
Hydrography, Geographic Names, Boundaries, Transportation, Structures, Land Cover
and Orthoimagery. Refer to associated Federal Geographic Data Committee (FGDC)
Metadata for additional source data information.

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands. Temporal changes may have occurred since these data were collected and some data may no longer represent actual surface conditions.

Learn About The National Map: <https://nationalmap.gov>







CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
CONTOUR SMOOTHNESS = Medium






Cape Vincent South	Chaumont	Dexter
Point Peninsula	Henderson Bay	Sackets Harbor
Stony Point	Henderson	Adams

ADJOINING QUADRANGLES

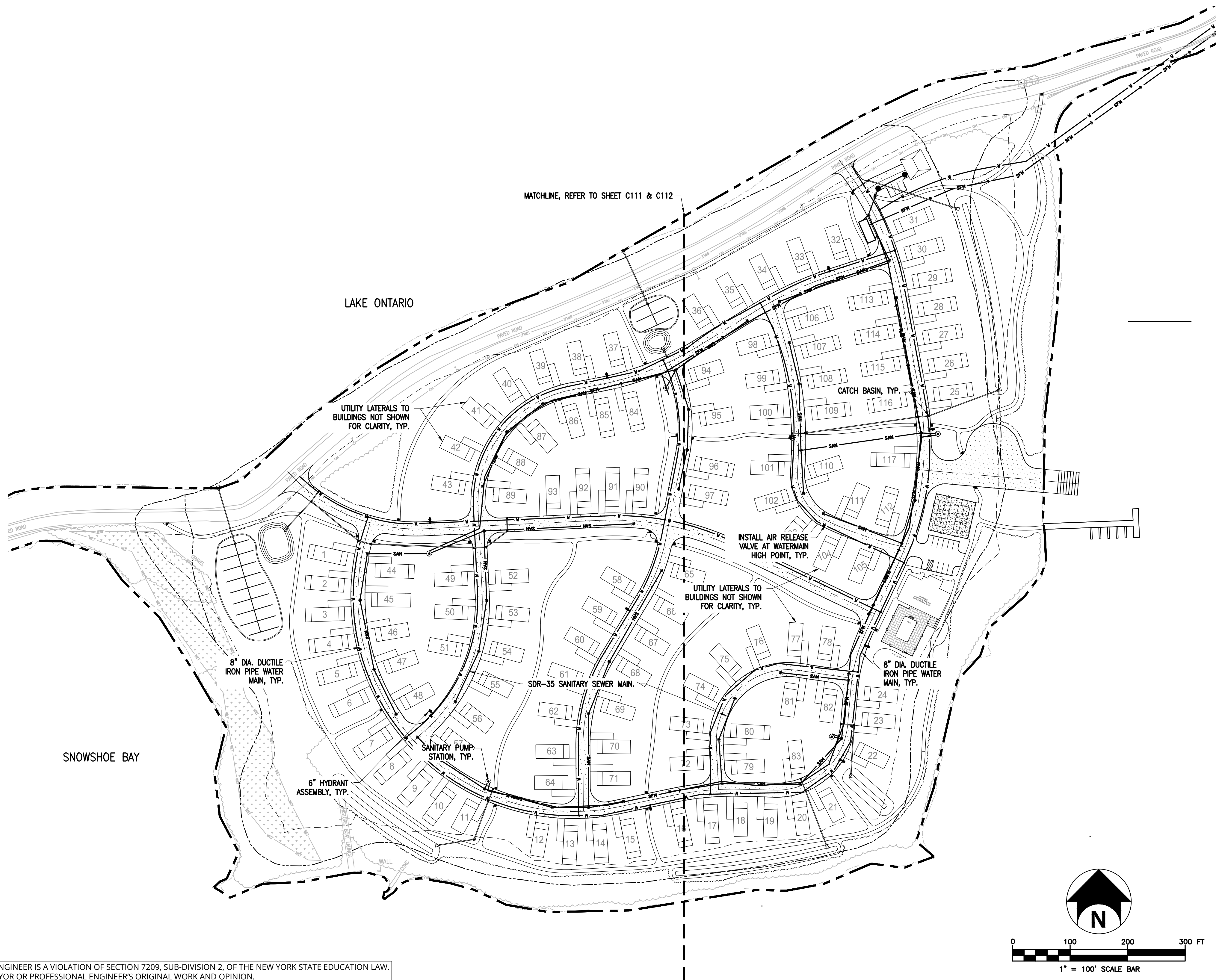
ROAD CLASSIFICATION

Expressway  Local Connector 
 Secondary Hwy Local Road
 Ramp  4WD 

 Interstate Route  US Route  State Route

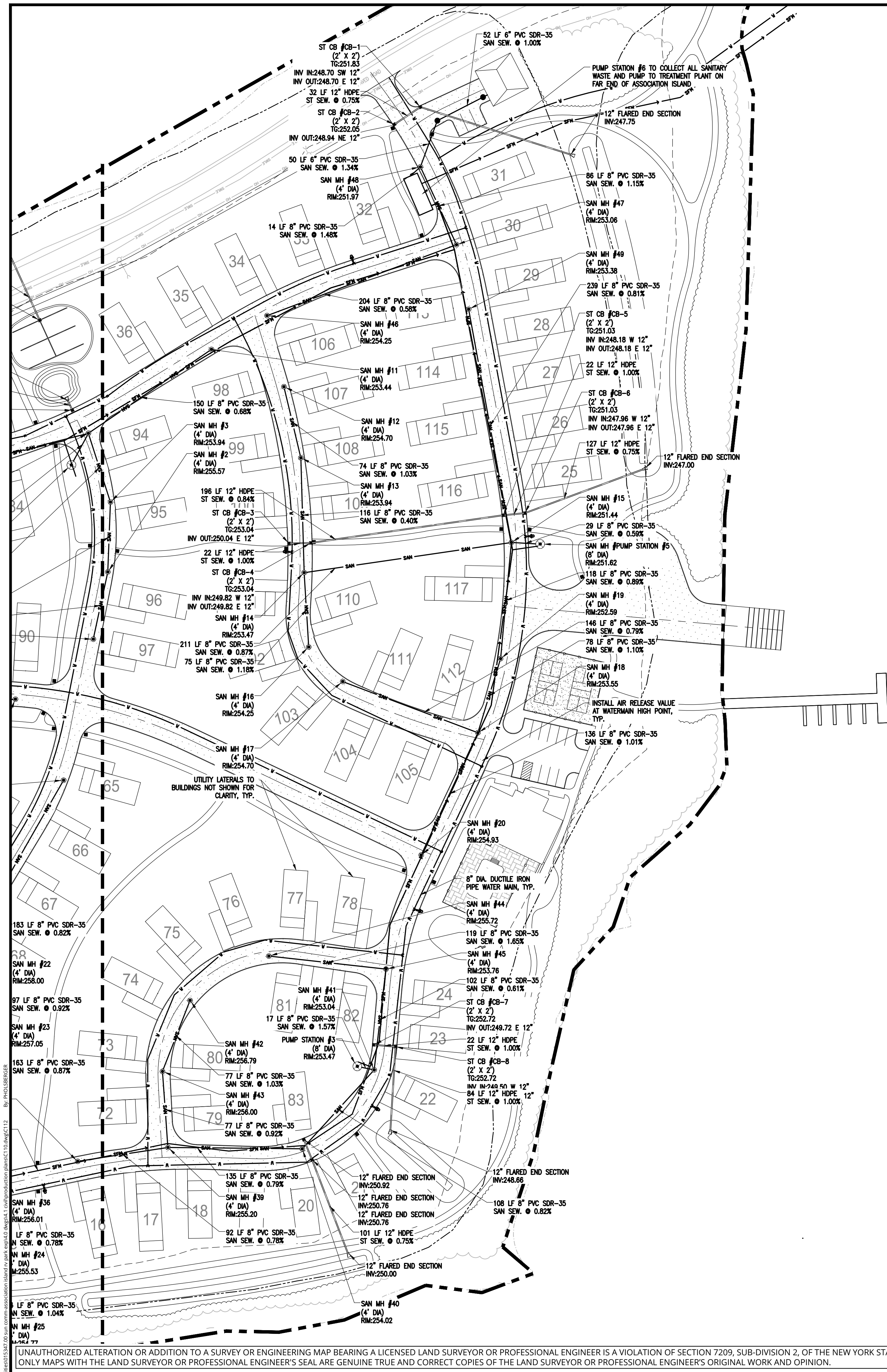
HENDERSON BAY, NY
2023

Appendix B. | Plans and Details



UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY OR ENGINEERING MAP BEARING A LICENSED LAND SURVEYOR OR PROFESSIONAL ENGINEER IS A VIOLATION OF SECTION 7209, SUB-DIVISION 2, OF THE NEW YORK STATE EDUCATION LAW.
ONLY MAPS WITH THE LAND SURVEYOR OR PROFESSIONAL ENGINEER'S SEAL ARE GENUINE TRUE AND CORRECT COPIES OF THE LAND SURVEYOR OR PROFESSIONAL ENGINEER'S ORIGINAL WORK AND OPINION.

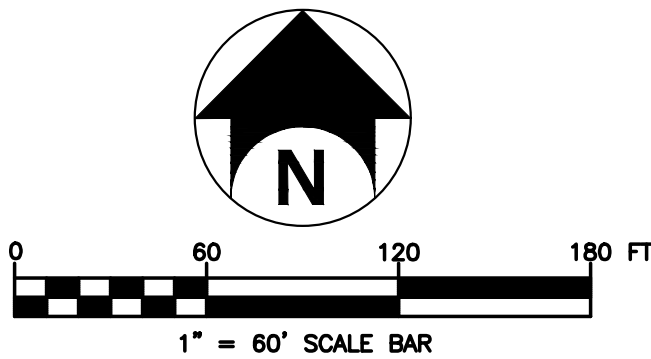
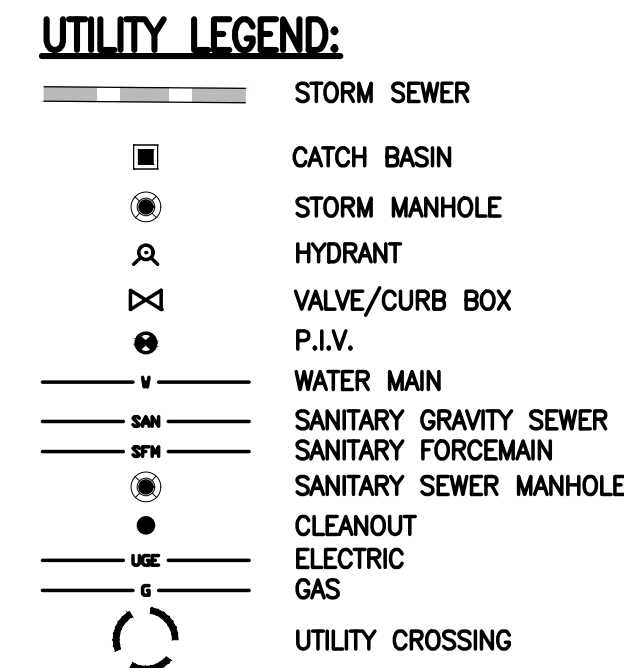
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION



SANITARY STRUCTURE TABLE				
STRUCTURE NAME:	DETAILS:	PIPES IN:	PIPES OUT	
1	RM = 257.21	4" PVC INV IN =252.64 E	8" PVC INV OUT =252.54 W	
2	RM = 255.57	8" PVC INV IN =250.90 S	8" PVC INV OUT =250.80 N	
3	RM = 253.94	8" PVC INV IN =249.28 S	8" PVC INV OUT =249.18 N	
5	RM = 258.13	4" PVC INV IN =253.56 W	8" PVC INV OUT =253.47 W	
6	RM = 255.58	8" PVC INV IN =250.92 E 8" PVC INV IN =250.92 E	8" PVC INV OUT =250.82 W	
7	RM = 255.52	4" PVC INV IN =250.95 W 4" PVC INV IN =250.95 SE	8" PVC INV OUT =250.85 NE	
8	RM = 255.10	8" PVC INV IN =250.43 SW	8" PVC INV OUT =250.33 NS	
9	RM = 254.25	8" PVC INV IN =248.59 SW	8" PVC INV OUT =248.49 E	
10	RM = 252.41	8" PVC INV IN =247.75 W 8" PVC INV IN =247.75 NE 8" PVC INV IN =247.75 S	8" PVC INV OUT =247.65 SW	
11	RM = 253.44	4" PVC INV IN =289.87 NW	8" PVC INV OUT =248.77 SW	
12	RM = 254.70	4" PVC INV IN =250.13 N 4" PVC INV IN =250.13 W	8" PVC INV OUT =250.03 S	
13	RM = 253.94	8" PVC INV IN =249.27 N	8" PVC INV OUT =249.17 S	
14	RM = 253.47	8" PVC INV IN =248.70 N 8" PVC INV IN =248.70 S	8" PVC INV OUT =248.60 E	
15	RM = 251.44	8" PVC INV IN =246.77 W 8" PVC INV IN =246.77 S 8" PVC INV IN =246.77 N	8" PVC INV OUT =246.67 E	
16	RM = 254.25	4" PVC INV IN =248.69 W	8" PVC INV OUT =248.59 N	
17	RM = 254.70	4" PVC INV IN =250.13 N	8" PVC INV OUT =250.03 E	
18	RM = 253.55	8" PVC INV IN =248.68 W 8" PVC INV IN =248.68 SW	8" PVC INV OUT =248.78 N	
19	RM = 252.59	8" PVC INV IN =247.92 S	8" PVC INV OUT =247.82 E	
20	RM = 254.93		8" PVC INV OUT =250.26 NE	
21	RM = 259.49	4" PVC INV IN =254.93 E	8" PVC INV OUT =254.83 SW	
22	RM = 258.00	8" PVC INV IN =253.33 NE	8" PVC INV OUT =253.28 S	
23	RM = 257.05	8" PVC INV IN =252.39 N	8" PVC INV OUT =252.29 S	
24	RM = 255.05	8" PVC INV IN =250.86 E 8" PVC INV IN =250.86 N	8" PVC INV OUT =250.76 W	
25	RM = 254.77	8" PVC INV IN =250.10 E	8" PVC INV OUT =250.00 W	
26	RM = 253.96	8" PVC INV IN =249.28 E 8" PVC INV IN =249.28 NW	8" PVC INV OUT =249.18 NE	

SANITARY STRUCTURE TABLE				
STRUCTURE NAME:	DETAILS:	PIPES IN:	PIPES OUT	
27	RIM = 257.95	4" PVC INV IN = 253.38 SE	8" PVC INV OUT = 253.29 NE	
28	RIM = 257.19	8" PVC INV IN = 252.52 SW	8" PVC INV OUT = 252.42 N	
29	RIM = 256.45	8" PVC INV IN = 251.78 S	8" PVC INV OUT = 251.68 E	
30	RIM = 256.59	4" PVC INV IN = 252.02 S	8" PVC INV OUT = 251.92 NW	
31	RIM = 255.81	8" PVC INV IN = 251.14 SE	8" PVC INV OUT = 251.04 N	
32	RIM = 254.76	8" PVC INV IN = 250.10 S	8" PVC INV OUT = 250.00 N	
33	RIM = 253.98	8" PVC INV IN = 249.31 S	8" PVC INV OUT = 249.21 E	
34	RIM = 252.28	4" PVC INV IN = 252.69 SW	8" PVC INV OUT = 252.59 SE	
35	RIM = 255.73	8" PVC INV IN = 251.06 NW	8" PVC INV OUT = 250.96 SE	
36	RIM = 256.01	4" PVC INV IN = 251.44 S	8" PVC INV OUT = 251.34 W	
38	RIM = 255.92	4" PVC INV IN = 251.15 SE	8" PVC INV OUT = 251.25 E	
39	RIM = 255.20	8" PVC INV IN = 250.53 W	8" PVC INV OUT = 250.43 E	
40	RIM = 254.02	8" PVC INV IN = 249.35 S	8" PVC INV OUT = 249.25 NE	
41	RIM = 253.04	8" PVC INV IN = 248.37 SW 8" PVC INV IN = 248.37 N	8" PVC INV OUT = 248.27 W	
42	RIM = 256.79	4" PVC INV IN = 252.22 N 4" PVC INV IN = 252.22 W	8" PVC INV OUT = 252.12 S	
43	RIM = 256.00	8" PVC INV IN = 251.34 N	8" PVC INV OUT = 251.24 S	
44	RIM = 255.72	4" PVC INV IN = 251.16 NW	8" PVC INV OUT = 251.06 E	
45	RIM = 253.76	8" PVC INV IN = 249.10 W	8" PVC INV OUT = 249.00 S	
46	RIM = 254.25	8" PVC INV IN = 249.68 NW	8" PVC INV OUT = 249.58 E	
47	RIM = 253.06	8" PVC INV IN = 248.39 W	8" PVC INV OUT = 248.29 NW	
48	RIM = 251.97	8" PVC INV IN = 247.30 SE 6" PVC INV IN = 247.30 N	8" PVC INV OUT = 247.20 SW	
49	RIM = 253.38	4" PVC INV IN = 248.81 W 4" PVC INV IN = 248.81 NE	8" PVC INV OUT = 248.71 S	

Sanitary Pump Station Design									
Pump Station	Structure Description	Rim Elev.	Inlet Elev.	Force Main Outlet Elev.	Alarm On Elev.	Pump On Elev.	Pump Off Elev.	Bottom of Structure Elev.	Structure Height
#1	8' DIA Precast Concrete Manhole	255.30	249.00	248.75	245.36	244.36	244.00	243.50	11.80
#2	8' DIA Precast Concrete Manhole	254.45	249.25	249.00	246.30	245.80	245.50	245.00	9.45
#3	8' DIA Precast Concrete Manhole	253.63	248.25	248.00	245.30	244.80	244.50	244.00	9.63
#4	8' DIA Precast Concrete Manhole	253.71	247.25	247.00	244.29	243.79	243.50	243.00	10.71
#5	8' DIA Precast Concrete Manhole	251.77	246.63	246.38	242.86	242.36	242.00	241.50	10.27
#6	11' x 26" Concrete Pump Station	253.33	247.35	247.10	243.08	242.58	242.27	241.77	11.56

[illegible]

—75— PROPOSED MAJOR CONTOUR
 —76— PROPOSED MINOR CONTOUR
 TC=78.01 PROPOSED TOP OF CURB / BOTTOM OF CURB ELEVATION
 BC=77.51
 *TW/BW=152.50 PROPOSED TOP OF WALL / BOTTOM OF WALL
 *77.73 PROPOSED SPOT ELEVATION
 *EG=77.73 EXISTING ELEVATION
 *HP=77.73 PROPOSED HIGH POINT ELEVATION
 *TG=77.73 PROPOSED TOP OF GRATE ELEVATION
 *RIM=77.73 PROPOSED RIM ELEVATION
2.5% PROPOSED SLOPE
 —72— EXISTING CONTOUR



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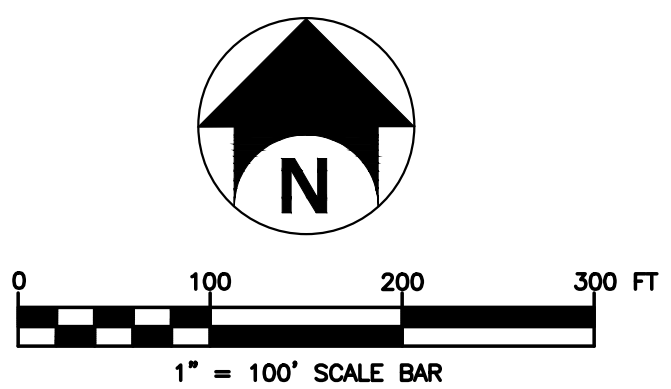
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FINAL MAJOR
SITE PLAN

FOR
SUN
COMMUNITIES INC.

HOVEYS ISLAND
TOWN OF HENDERSON
JEFFERSON COUNTY
NEW YORK



ALBANY
8 Corporate Woods Blvd.
Suite 400
Albany, NY 12211
Phone: 518.862.0325
LIERS ENGINEERING & DESIGN CT, P.C.

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	10/20/23	PH	RD
PROJECT NUMBER:	DRAWING NAME:		REVIEWED BY:
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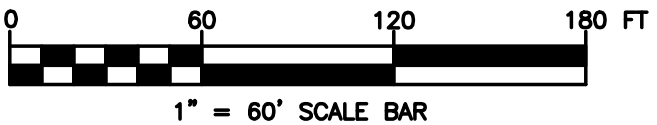
TITLE: OVERALL GRADING PLAN

SHEET NUMBER:
11 of 32

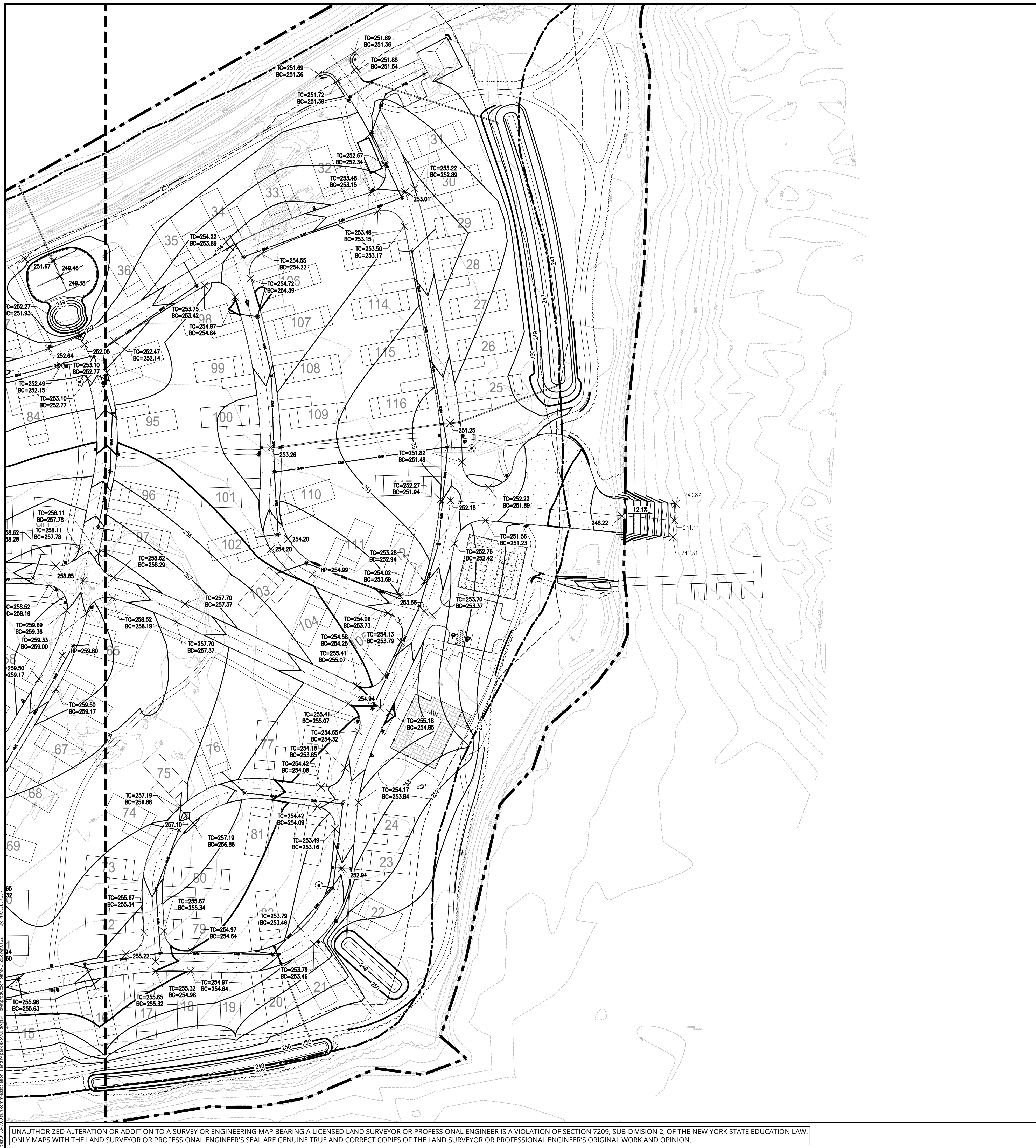
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION

unities\015347.00 sun comm-association island rv park exp\4.0 dwgs\4.1 civil\production plans\C120.dwg\C120 By: PHOLLSBERGER

<u>75</u>	PROPOSED MAJOR CONTOUR
<u>76</u>	PROPOSED MINOR CONTOUR
×TC=78.01	PROPOSED TOP OF CURB / BOTTOM OF CURB ELEVATION
×BC=77.51	
×TW/BW=152.50	PROPOSED TOP OF WALL / BOTTOM OF WALL
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×RIM=77.73	PROPOSED RIM ELEVATION
<u>2.5%</u>	PROPOSED SLOPE
<u>72</u>	EXISTING CONTOUR

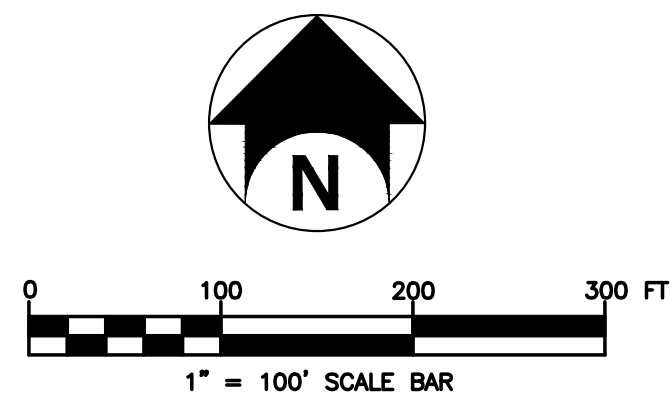
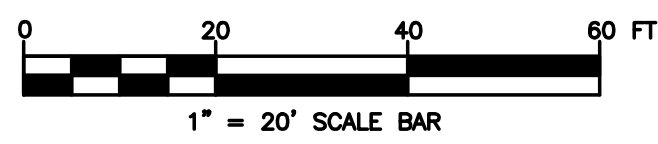
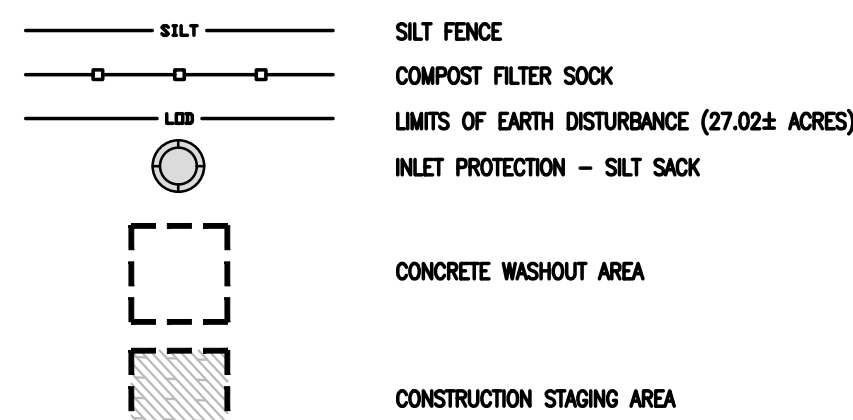
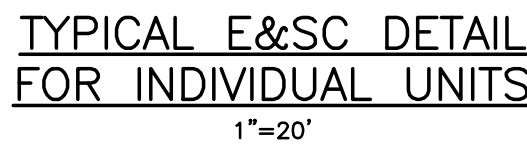


SCALE DRAWINGS FOR CONSTRUCTION



<u>75</u>	PROPOSED MAJOR CONTOUR
<u>76</u>	PROPOSED MINOR CONTOUR
TC=78.01	PROPOSED TOP OF CURB / BOTTOM OF CURB ELEVATION
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*RIM=77.73	PROPOSED RIM ELEVATION
<u>2.5%</u>	PROPOSED SLOPE
<u>72</u>	EXISTING CONTOUR

1. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES MUST BE IMPLEMENTED, INSPECTED, MONITORED, AND MAINTAINED AS SPECIFIED IN THE NYSDOT SPECIFICATIONS.
2. THE LOCATIONS OF EROSION AND SEDIMENT CONTROL MEASURES, AS INDICATED IN THE CONTRACT DOCUMENTS MAY REQUIRE FIELD ADJUSTMENTS DEPENDING ON THE SEQUENCE OF CONSTRUCTION ACTIVITIES, CONSTRUCTION METHODS AND/OR ACTUAL FIELD CONDITIONS.
3. THE ENGINEER IN CHARGE SHALL BE NOTIFIED OF ANY SIGNIFICANT CHANGES TO THE EROSION AND SEDIMENT CONTROL MEASURES INDICATED IN THE CONTRACT DOCUMENTS.
4. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL TO THE ENGINEER IN CHARGE THEIR WRITTEN SCHEDULE AND PROPOSED MEASURES FOR TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL WORK AND SCHEDULE OF OPERATIONS AS REQUIRED BY SECTION 209 OF THE NYSDOT STANDARD SPECIFICATIONS.
5. ALL DREDGED AND EXCAVATED MATERIAL THAT IS DISPOSED OF ON AN UPLAND SITE MUST BE COVERED WITHIN 72 HOURS OF DEPOSIT WITH AN ACCORDANCE WITH SECTION 209 OF THE NYSDOT STANDARD SPECIFICATIONS SO THAT IT CANNOT REASONABLY RE-ENTER ANY WATER BODY OR WETLAND AREA.
6. INSPECTION, PERIODIC CLEANING AND MAINTENANCE OF TEMPORARY SOIL EROSION AND POLLUTION DEVICES SHALL BE PERFORMED ON A SCHEDULED BASIS IN ACCORDANCE WITH SECTION 209 OF THE NYSDOT STANDARD SPECIFICATIONS. THE COST OF INSTALLING, CLEANING AND REMOVING TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL DEVICES SHALL BE PAID FOR UNDER THE ITEMS SHOWN.
7. ALL CONTROL MEASURES SHALL BE PLACED PRIOR TO STARTING EARTH WORK OPERATIONS AND SHALL REMAIN IN PLACE UNTIL THE NEW SLOPES ARE STABILIZED WITH SEEDING, MULCH OR OTHER DEVICES, IN ACCORDANCE WITH SECTION 209 OF THE NYSDOT STANDARD SPECIFICATIONS.
8. WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO ADJACENT ROADWAYS, WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO PREVENT CONTAMINATION OF ANY STREAM OR WATERWAY BY SOIL, SEDIMENT, OILS, SOLVENTS, LUBRICANTS, EPOXY COATINGS, CONCRETE LEACHATE OR ANY OTHER POLLUTANT ASSOCIATED WITH CONSTRUCTION AND CONSTRUCTION PROCEDURES.
10. DURING CONSTRUCTION, NO WET OR FRESH CONCRETE OR LEACHATE SHALL BE ALLOWED TO ESCAPE INTO ANY WATERBOD, NOR SHALL WASHINGS FROM CONCRETE TRUCKS, MIXERS OR OTHER DEVICES BE ALLOWED TO ENTER ANY WETLAND OR UPLAND.
11. DUMP TRUCKS HAULING MATERIAL FROM THE CONSTRUCTION SITE WHICH ARE PRONE TO BLOWING FROM THE WIND WILL BE COVERED BY A TARPULAIN.
12. IF CONSTRUCTION ACTIVITIES ARE DISCONTINUED IN AREAS OF SOIL DISTURBANCE BEFORE FINAL GRADING IS COMPLETE, THEN TEMPORARY GRADING SHALL INCLUDE TEMPORARY SEEDINGS AND MULCH THAT WILL BE STABILIZED WITHIN SEVEN (7) DAYS OF EXPOSURE. MULCH SHALL BE MAINTAINED UNTIL SUITABLE VEGETATIVE COVER IS ESTABLISHED.
13. CONTAIN ANY TEMPORARY STOCKPILES OF TOPSOIL OR FILL WITH SILT FENCES AS SHOWN IN THE SITES FIELD EXPOSURE IN THE STANDARD SPECIFICATIONS AND STANDARD SPECIFICATIONS. PILES DEPENDED TO BE LONGER THAN TWO (2) WEEKS SHALL BE STABILIZED WITH SEEDING AND MULCH AND SOILS PROTECTED IN ACCORDANCE WITH SECTION 209 OF THE NYSDOT STANDARD SPECIFICATIONS.
14. ALL METHODS AND EQUIPMENT PROPOSED BY THE CONTRACTOR TO ACCOMPLISH THE WORK SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER IN CHARGE.
15. AT THE COMPLETION OF CONSTRUCTION AND PERMANENT SOIL STABILIZATION, SEDIMENT SHALL BE REMOVED FROM KENNS, PILES, DRAINAGE STRUCTURES, AND CHECK DAMS. THE COST FOR THE REMOVAL SHALL BE INCLUDED IN THE COST BID FOR THE EROSION CONTROL ITEMS.
16. THE LOCATION OF EROSION AND SEDIMENT CONTROL MEASURES AS INDICATED IN THE CONTRACT DOCUMENTS, MAY REQUIRE FIELD ADJUSTMENTS DEPENDING ON THE SEQUENCE OF CONSTRUCTION ACTIVITIES, CONSTRUCTION METHODS AND/OR ACTUAL FIELD CONDITIONS. NO MODIFICATIONS WILL BE MADE WITHOUT THE APPROVAL OF THE ENGINEER.
17. THE TOWN HIGHWAY MUST BE KEPT CLEAN OF MUD, DIRT, AND OTHER DEBRIS AT ALL TIMES.
18. ANY DEBRIS OR EXCESS MATERIALS FROM CONSTRUCTION OF THIS PROJECT SHALL BE IMMEDIATELY AND COMPLETELY REMOVED FROM THE BED AND BANKS OF ALL WATER AREAS TO AN APPROPRIATE UPLAND AREA FOR DISPOSAL.
19. ANY GRADED AREAS NOT SUBJECT TO FURTHER DISTURBANCE OR CONSTRUCTION TRAFFIC SHALL BE ESTABLISHED WITH PERMANENT VEGETATIVE COVER, AS PER CONTRACT SPECIFICATIONS, WITHIN 14 DAYS OF FINAL GRADING.
20. THE SITE SHALL AT ALL TIMES BE GRADED AND MAINTAINED SUCH THAT ALL STORM WATER RUNOFF IS DIVERTED TO SOIL EROSION AND SEDIMENT CONTROL STRUCTURES.
21. UNLESS OTHERWISE INDICATED TEMPORARY SEDIMENT FILTER BASS SHALL BE INSTALLED AT THE EXISTING AND PROPOSED DRAINAGE STRUCTURES, WITHIN THE LIMITS OF EXCAVATION.

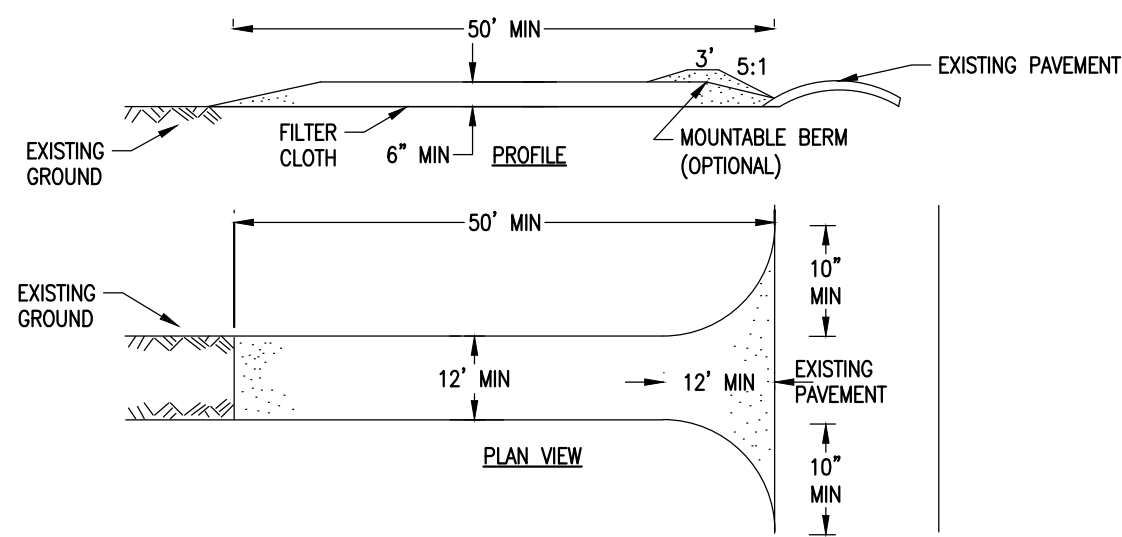
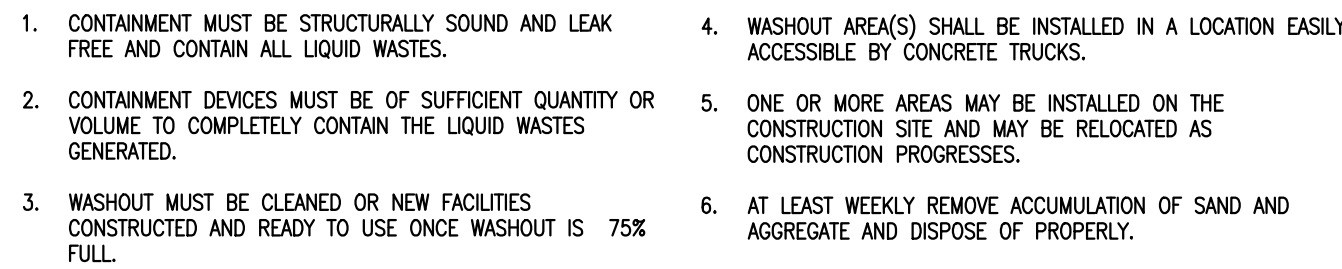


1. THE CONTRACTOR SHALL CLEAR AND GRUB ALL AREAS INDICATED IN THE CONTRACT DOCUMENTS AND A.O.B.E. WORK SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:
1.1. ALL VEGETATION SPECIFIED FOR CLEARING AND GRUBBING REMOVAL AS INDICATED ON THE PLANS.
2. CLEARING AND GRUBBING SHALL NOT INCLUDE THE FOLLOWING:
2.1. TREES AND SHRUBS AND ANY OTHER BROKEN OR INJURED DURING CONSTRUCTION. THIS CORRECTIVE WORK SHALL BE DONE IN ACCORDANCE WITH ACCEPTED NURSERY PRACTICE. WORK SHALL BE DONE AT NO ADDITIONAL COST TO THE OWNER.
3. CLEARING AND GRUBBING SHALL BE LIMITED TO NO MORE THAN IS NECESSARY BEYOND THE REQUIRED GRADING LIMITS, UNLESS DIRECTED OTHERWISE.
4. THE CONTRACTOR MAY ENCOUNTER NESTING BIRDS DURING THE ADMINISTRATION OF THIS CONTRACT. UNDER THE MIGRATORY BIRD TREATY ACT, IT IS UNLAWFUL TO TAKE, CAPTURE, OR KILL ANY MIGRATORY BIRDS, INCLUDING BUT NOT LIMITED TO, ANY BIRDS THAT ARE NESTING. THE CONTRACTOR SHOULD SCHEDULE WORK TO MINIMIZE THE POTENTIAL FOR CONFLICT BETWEEN THIS FEDERAL LAW AND WORK OPERATIONS. REFERENCE TO SPECIAL ZONE FOR MIGRATORY BIRD PROTECTION AND AVOIDANCE ELSEWHERE IN THE CONTRACT DOCUMENTS FOR FURTHER GUIDANCE AND REQUIREMENTS. ADDITIONAL, THE RESTRICTIONS FOR OTHER WORK ARE CONTAINED ELSEWHERE IN THE CONTRACT DOCUMENTS.
5. ALL HEALTHY PLANT MATERIALS CLIPPED ON THE JOB SITE MAY BE CHIPPED AND/OR SHREDED ON-SITE FOR SUBSEQUENT REUSE. CHIPPED AND SHREDED MATERIAL SHALL BE ACCEPTABLE TO AND LOCATIONS SHALL BE APPROVED BY THE EPC. THE EPC SHALL BE NOTIFIED OF ANY CHIPPED AND/OR SHREDED MATERIALS TO BE COLLECTED AND DISPOSED OF OFF-SITE TO A LOCATION ACCEPTABLE TO THE ENGINEER.

1. CONSTRUCT INTERCONTR/DIVERSION SWALES/BERMS & TEMPORARY SEDIMENT BASIN(S) TO INTERCEPT SURFACE WATER AND DIRECT IT AWAY FROM WORK AREA AS INDICATED ON PLAN. SEDIMENT SHALL BE REMOVED FROM BASINS BEFORE THEY REACH THEIR CAPACITY.
2. REMOVE AND STOCKPILE TOPSOIL AS DIRECTED BY THE CONSTRUCTION MANAGER. REPLACE TOPSOIL TO A MINIMUM 4" DEPTHS. ALL DISTURBED AREAS TO BE REVERSESEED AS DIRECTED BY THE CONSTRUCTION MANAGER TO PROMOTE VEGETATION AS SOON AS PRACTICABLE.
3. INSTALL INLET PROTECTION, AND RIP RAP APRONS PROGRESSIVELY AS STORM SEWER, AND DISCHARGE POINTS ARE INSTALLED.
4. IF THE SEASONS PROHIBITS TEMPORARY SEEDING, THE DISTURBED AREAS WILL BE MULCHED WITH STRAW HAY OR EQUIVALENT AND ANCHORED IN ACCORDANCE WITH THE "STANDARDS", NETTING OR LIQUID MULCH BINDER.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORATION OF TOPSOIL TO ALL DISTURBED AREAS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN EROSION CONTROL MEASURES AT ALL TIMES.
6. ALL DISTURBED AREAS SHALL BE FINISH GRADED TO PROMOTE VEGETATION ON ALL EXPOSED AREAS AS SOON AS PRACTICABLE. STABILIZATION PRACTICES (TEMPORARY SEEDING, MULCHING, GEOTEXTILES, ETC.) SHALL BE IMPLEMENTED WITHIN SEVEN (7) DAYS WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, AND NOT EXPECTED TO RESUME WITHIN FOURTEEN (14) DAYS.
7. PAVED ROADWAYS MUST BE KEPT CLEAN AT ALL TIMES. ALL CONSTRUCTION DEBRIS AND SEDIMENT SPILLS, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAYS MUST BE REMOVED IMMEDIATELY.
8. ADJACENT PROPERTY SHALL BE PROTECTED FROM EXCAVATION AND FILLING OPERATIONS ON THE PROPOSED SITE.
9. DIVERSION SWALES/BERMS, AND SEDIMENT TRAPS SHOULD BE RELOCATED INWARD AS PERMITTER SLOPE CONSTRUCTION PROGRESSES AND RECONSTRUCTED TO THE NYS STANDARDS & SPECIFICATIONS AT THE END OF EACH DAY TO DIVERT RUNOFF FROM SLOPED AREAS AND DIRECT TO APPROPRIATE BASINS.
10. PERMITTER AREAS SHALL BE TEMPORARILY STABILIZED WITH SEED AND MULCH AT LEAST ONCE A WEEK, AT A MINIMUM, WITH 100% PERENNIAL RYEGRASS MIX AT A RATE OF 2-4 LBS PER 1000 SF AND MULCH 90-100 LB/1000 SF OF WEE FREE STRAW.
11. SLOPE TRACKING SHALL BE IMPLEMENTED ON ALL SLOPE 1 ON 3 OR GREATER AT THE END OF EACH WORK DAY AND PRIOR TO FINAL SLOPE GRADING AND STABILIZATION.

1. HOLD A PRE-CONSTRUCTION MEETING, ATTENDED BY THE PROJECT MANAGER, CONTRACTOR, SUB-CONTRACTORS, MONITOR REPRESENTATIVE AND THE OPERATOR'S ENGINEER PRIOR TO LAND DISTURBING ACTIVITIES.
2. CONSTRUCT TEMPORARY CONSTRUCTION ENTRANCES/EXITS AT LOCATIONS SHOWN ON THE PLANS.
3. INSTALL PERIMETER SILT FENCES AND TEMPORARY SEDIMENT BASINS IN THE LOCATIONS SHOWN ON THE PLANS.
4. HAVE A QUALIFIED PROFESSIONAL CONDUCT AN ASSESSMENT OF THE SITE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND CERTIFY IN AN INSPECTION REPORT THAT THE APPROPRIATE EROSION AND SEDIMENT CONTROLS DESCRIBED IN THE SWPPP AS REQUIRED BY PART IV OF THE GP-0-200-001 HAVE BEEN ADEQUATELY INSTALLED OR IMPLEMENTED TO ENSURE ADEQUATE PREPAREDNESS OF THE SITE FOR THE COMMENCEMENT OF CONSTRUCTION.
5. BEGIN CLEARING AND GRUBBING OPERATIONS. CLEARING AND GRUBBING SHALL BE DONE ONLY IN AREAS WHERE EARTHWORK WILL BE PERFORMED AND ONLY IN AREAS WHERE BUILDING IS PLANNED TO COMMENCE WITHIN 14 DAYS AFTER CLEARING AND GRUBBING.
6. INSTALL DIVERSION SNALES AT LOCATIONS SHOWN ON THE PLANS.
7. COMMENCE SITE GRADING. THE WORK SHALL BE PROGRESSSED TO ALLOW A REASONABLE TRANSFER OF CUT AND FILL EARTH FOR LOADING AND EARTH MOVING. THE CONTRACTOR WILL BE GIVEN SOME LATITUDE TO VARY FROM THE FOLLOWING SCHEDULE IN ORDER TO MEET THE FIELD CONDITIONS ENCOUNTERED. CONTRACTOR SHALL REVIEW VARIATIONS TO SWPPP WITH DESIGN ENGINEER AND QUALIFIED PROFESSIONAL PRIOR TO IMPLEMENTATION. ALL CHANGES TO SWPPP DRAWINGS MUST BE DOCUMENTED WITHIN ONSITE SWPPP
8. STOCKPILE TOPSOIL IN A LOCATION ACCEPTABLE TO CONSTRUCTION MANAGER. WHEN STOCKPILE IS COMPLETE, INSTALL PERIMETER SILT FENCE, SEED SURFACE WITH 100% PERENNIAL RYEGRASS MIXTURE AT A RATE OF 2-4 LBS. PER 1000 SF. APPLY 90-100 LBS PER 1000 SF OF MULCH.
9. INSTALL EROSION CONTROL BLANKETS ON ALL SLOPES GREATER THAN 3:1. DISTURBED AREAS OF THE SITE WHERE CONSTRUCTION ACTIVITY HAS CEASED FOR MORE THAN 7 DAYS SHALL BE TEMPORARILY SEEDED AND WATERED.
10. FOLLOWING ROUGH GRADING, UTILITY INSTALLATION SHOULD BEGIN. TRENCH EXCAVATION/BACKFILL ARE SHOULD BE STABILIZED PROGRESSIVELY AT THE END OF EACH WORKDAY WITH SEED AND STRAW MULCH AT A RATE OF 100% PERENNIAL RYE GRASS AT 2-4 LBS/1000 SF MULCHED AT 90-100 LBS/1000 SF
11. CONSTRUCT ALL CURBS, GUTTER INLETS, AREA INLETS, AND STORM SEWER MANHOLES, AS SHOWN ON THE PLANS. INLET PROTECTION MAY BE REMOVED TEMPORARILY FOR THIS CONSTRUCTION. PLACE REQUIRED RIP RAP AT LOCATIONS SHOWN ON THE PLANS.
12. AS ROADWAY, BUILDING PADS AND ACCESS DRIVES ARE BROUGHT TO GRADE, THEY WILL BE STABILIZED WITH CRUSHED STONE SUBBASE AT A DEPTH SPECIFIED ON PLANS TO PREVENT EROSION AS SOON AS PRACTICABLE. INLET PROTECTION MAY BE REMOVED TEMPORARILY FOR THIS CONSTRUCTION.
13. CLEAN SUB-BASE WHERE REQUIRED AND INSTALL BASE MATERIAL AS REQUIRED FOR PAVEMENT. PROCEED WITH BUILDING AND PAVING. REMOVE INLET PROTECTION AROUND INLETS AND MANHOLES NO MORE THAN 48 HOURS PRIOR TO PAVING OPERATIONS.
14. CARRY OUT FINAL GRADING AND SEEDING AND PLANTING.
15. REMOVE TEMPORARY CONSTRUCTION EXITS ONLY PRIOR TO FINAL PAVING OPERATIONS (THESE AREAS ARE TO BE PAVED LAST)
16. A QUALIFIED PROFESSIONAL SHALL PERFORM A SITE ASSESSMENT TO CONFIRM THAT ALL PERMANENT STORMWATER DEVICES HAVE BEEN INSTALLED PER PLANS AND BOX UNIFORM GERMINATION/STABILIZATION HAS BEEN ACHIEVED PRIOR TO THE REMOVAL OF ALL REMAINING TEMPORARY EROSION AND SEDIMENT CONTROLS.

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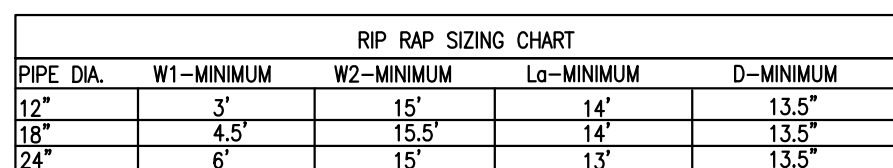
1. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. SURFACE CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. FLUID WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH

CONSTRUCTION SPECIFICATIONS

1. WOMEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOMEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOMEN WIRE, 12 1/2 GAUGE, #6 MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJACED EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILUNA 1140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.



GRASS SWALE DETAIL



- NOTES:
1. $d = 1.5$ TIMES THE MAXIMUM STONE DIAMETER BUT NO LESS THAN 6".
 2. INSTALL FILTER MIRAFI 500X OR APPROVED EQUAL FILTER FABRIC BETWEEN RIP-RAP AND SUBGRADE

FILTER SACK INLET PROTECTION
N.T.S.

NOTES

1. TUBULAR SEDIMENT CONTROL AND STORMWATER FILTRATION DEVICES SHALL BE FILTERTEX FILTERSOX, OR EQUIVALENT.
2. REPLACE AND DISPOSE OF PER MANUFACTURERS SPECIFICATIONS.
3. THIS PRACTICE INCLUDES SANDBAGS, COMPOST FILTER SOCKS, GEO-TUBES FILLED WITH BALLAST, AND MANUFACTURED SURFACE BARRIERS. PEA GRAVEL CAN ALSO BE USED IN CONJUNCTION WITH THESE PRACTICES TO IMPROVE PERFORMANCE. WHEN INLET IS NOT AT A LOW POINT, AND IS OFF-SET FROM THE PAVEMENT OR GUTTER LINE, PROTECTION SHOULD BE SELECTED AND INSTALLED SO THAT FLOWS ARE NOT DIVERTED AROUND INLET.
4. THE DRAINAGE AREA SHOULD BE LIMITED TO 1 ACRE AT THE DRAINAGE INLET. ALL PRACTICES WILL BE PLACED AT THE INLET PERIMETER OR BEYOND TO MAXIMIZE THE FLOW CAPACITY OF THE INLET. PRACTICES SHALL BE WEIGHTED, BAGED, TIED, OR OTHERWISE ANCHORED TO PREVENT MOVEMENT OR SHIFTING OF LOCATION ON PAVED SURFACES. TRAFFIC SAFETY SHALL BE INTEGRATED WITH THE USE OF THIS PRACTICE. ALL PRACTICES SHOULD BE MARKED WITH TRAFFIC SAFETY CONES AS APPROPRIATE. STRUCTURE HEIGHT SHALL NOT CAUSE FLOODING OR BY-PASS FLOW THAT WOULD CAUSE ADDITIONAL EROSION. THE STRUCTURE SHOULD BE INSPECTED AFTER EVERY STORM EVENT. ANY SEDIMENT SHOULD BE REMOVED AND DISPOSED OF ON THE SITE. ANY BROKEN OR DAMAGED COMPONENTS SHOULD BE REPLACED. CHECK ALL MATERIALS FOR PROPER ANCHORING AND SECURE AS NECESSARY.
5. IF USING THE COMPOST FILTER SOCK, THE COMPOST INLET SHALL BE WELL DECOMPOSED (MATURED AT LEAST 3 MONTHS), WEED-FREE, ORGANIC MATERIAL. IT SHALL BE AEROBICALLY COMPOSTED, POSSESS NO OBJECTIONABLE ODOORS, AND CONTAIN LESS THAN 1% BY DRY WEIGHT OF NON-ORGANIC MATERIAL. WHEN USING COMPOST FILTER SOCKS ADJACENT TO SURFACE WATER, THE COMPOST SHOULD HAVE LOW NUTRIENT VALUE.

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Colliers
Engineering
& Design

ALBANY
18 Corporate Woods Blvd.
Suite 400
Albany, NY 12211
Phone: 518.862.0325
COLLIERS ENGINEERING & DESIGN CT, P.C.

SCALE: AS SHOWN	DATE: 10/20/23	DRAWN BY: PH	CHECKED BY: RD
PROJECT NUMBER: 22007621A		DRAWING NAME: C500	REVIEWED BY: GU

SHEET NUMBER:
32 of 32

Appendix C. | Notice of Intent (NOI)

NOI for coverage under Stormwater General Permit for Construction Activity

Alternate Identifier Hoveys Island Submission HPY-GVJP-EW6T1 Revision 1 Form Version 1.37

Review

This step allows you to review the form to confirm the form is populated completely and accurately, prior to certification and submission.
Please note: Any work you perform filling out a form will not be accessible by NYSDEC staff or the public until you actually submit the form in the 'Certify & Submit' step.

OWNER/OPERATOR INFORMATION	
Owner/Operator Name (Company/Private Owner/Municipality/Agency/Institution, etc.) Sun Communities	
Owner/Operator Contact Person Last Name (NOT CONSULTANT) Borgeson	
Owner/Operator Contact Person First Name Scott	
Owner/Operator Mailing Address Two Towne Square Suite 700	
City Southfield	
State MI	
Zip 48076	
Phone 248-447-2000	
Email sborgeson@atwell-group.com	
Federal Tax ID None Specified	
<div><div></div><div>If the owner/operator is an organization, provide the Federal Tax ID number, or Employer Identification Number (EIN), in the format xx-xxxxxxx. If the owner/operator is an individual and not an organization, enter "Not Applicable" or "N/A" and do not provide the individual's social security number.</div></div>	

PROJECT LOCATION	
Project/Site Name Hoveys Island	
Street Address (Not P.O. Box) Snowshoe Road	
Side of Street South	
City/Town/Village (THAT ISSUES BUILDING PERMIT) Henderson	
State NY	
Zip 13650	
DEC Region 6	
<div><p>The DEC Region must be provided. Please use the NYSDEC Stormwater Interactive Map (https://gisservices.dec.ny.gov/gis/stormwater/) to confirm which DEC Region this site is located in. To view the DEC Regions, click on "Other Useful Reference Layers" on the left side of the map, then click on "DEC Administrative Boundary." Zoom out as needed to see the Region boundaries.</p><p>For projects that span multiple Regions, please select a primary Region and then provide the additional Regions as a note in Question 39.</p></div>	
County JEFFERSON	
Name of Nearest Cross Street Williams Drive	
Distance to Nearest Cross Street (Feet) 1000	
Project In Relation to Cross Street North	
Tax Map Numbers Section-Block-Parcel 97.00-1-11	
Tax Map Numbers None Specified	
<div><p>If the project does not have tax map numbers (e.g. linear projects), enter "Not Applicable" or "N/A".</p></div>	
1. Coordinates <hr/>	
<p>Provide the Geographic Coordinates for the project site. The two methods are:</p> <ul style="list-style-type: none">- Navigate to the project location on the map (below) and click to place a marker and obtain the XY coordinates.- The "Find Me" button will provide the lat/long for the person filling out this form. Then pan the map to the correct location and click the map to place a marker and obtain the XY coordinates.	


Navigate to your location and click on the map to get the X,Y coordinates

Latitude	Longitude
43.88730683156666	-76.22380966488616

PROJECT DETAILS

2. What is the nature of this project?

New Construction

 For the purposes of this eNOI, “New Construction” refers to any project that does not involve the disturbance of existing impervious area (i.e. 0 acres). If existing impervious area will be disturbed on the project site, it is considered redevelopment with either increase in impervious area or no increase in impervious area.

3. Select the predominant land use for both pre and post development conditions.

Pre-Development Existing Landuse

Pasture/Open Land

Post-Development Future Land Use

Single Family Subdivision (Please answer 3a)

3a. If Single Family Subdivision was selected in question 3, enter the number of subdivision lots.

117

4. In accordance with the larger common plan of development or sale, enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area.

*** ROUND TO THE NEAREST TENTH OF AN ACRE. ***

Total Site Area (acres)

96.9

Total Area to be Disturbed (acres)

27.6

Existing Impervious Area to be Disturbed (acres)

1.2

Future Impervious Area Within Disturbed Area (acres)

10.7

5. Do you plan to disturb more than 5 acres of soil at any one time?

Yes

6. Indicate the percentage (%) of each Hydrologic Soil Group(HSG) at the site.

A (%)



0

B (%)



0

C (%)

0

D (%) 100
7. Is this a phased project? Yes
8. Enter the planned start and end dates of the disturbance activities.
Start Date 5/1/2024
End Date 11/1/2024
9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge. Lake Ontario
<div> Drainage ditches and storm sewer systems are not considered surface waterbodies. Please identify the surface waterbody that they discharge to. If the nearest surface waterbody is unnamed, provide a description of the waterbody, such as, "Unnamed tributary to Niagara River."</div>
9a. Type of waterbody identified in question 9? Lake Off Site
Other Waterbody Type Off Site Description None Specified
9b. If "wetland" was selected in 9A, how was the wetland identified? None Specified
10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-20-001? No
11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-20-001? No
12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? No
<div> Please use the DEC Stormwater Interactive Map (https://gisservices.dec.ny.gov/gis/stormwater/) to confirm if this site is located in one of the watersheds of an AA or AA-S classified water. To view the watershed areas, click on "Permit Related Layers" on the left side of the map, then click on "Class AA AAS Watersheds."</div>
If No, skip question 13.
13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as D (provided the map unit name is inclusive of slopes greater than 25%), E or F on the USDA Soil Survey? No
If Yes, what is the acreage to be disturbed? None Specified
14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? No

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? No
16. What is the name of the municipality/entity that owns the separate storm sewer system? <i>None Specified</i>
17. Does any runoff from the site enter a sewer classified as a Combined Sewer? No
18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law? No
19. Is this property owned by a state authority, state agency, federal government or local government? No
20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) No
REQUIRED SWPPP COMPONENTS
21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)? Yes
22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? Yes
If you answered No in question 22, skip question 23 and the Post-construction Criteria and Post-construction SMP Identification sections.
23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual? Yes
24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by: Professional Engineer (P.E.)
SWPPP Preparer Colliers Engineering and Design
Contact Name (Last, First) Holsberger, Paul
Mailing Address 18 Corporate Woods Blvd, Suite 400
City Albany
State NY

Zip 12211
Phone 518-556-3647
Email Paul.Holsberger@collierseng.com
Download SWPPP Preparer Certification Form Please take the following steps to prepare and upload your preparer certification form: 1) Click on the link below to download a blank certification form 2) The certified SWPPP preparer should sign this form 3) Scan the signed form 4) Upload the scanned document Download SWPPP Preparer Certification Form 
Please upload the SWPPP Preparer Certification <div>No files uploaded</div> <div>Comment None Specified</div> <div> At least one file is required.</div>
EROSION & SEDIMENT CONTROL CRITERIA
25. Has a construction sequence schedule for the planned management practices been prepared? Yes
26. Select all of the erosion and sediment control practices that will be employed on the project site:
Temporary Structural <div>Construction Road Stabilization</div> <div>Dust Control</div> <div>Sediment Basin</div> <div>Silt Fence</div> <div>Stabilized Construction Entrance</div> <div>Storm Drain Inlet Protection</div>
Biotechnical None
Vegetative Measures <div>Mulching</div> <div>Seeding</div> <div>Protecting Vegetation</div> <div>Topsoiling</div>
Permanent Structural <div>Land Grading</div> <div>Rock Outlet Protection</div>
Other None Specified
POST-CONSTRUCTION CRITERIA
* IMPORTANT: Completion of Questions 27-39 is not required if response to Question 22 is No.

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

Reduction of Clearing and Grading

Preservation of Buffers

Preservation of Undisturbed Area

Roadway Reduction

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).

All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout). (Acre-feet)

0.908

29. Post-construction SMP Identification

Use the Post-construction SMP Identification section to identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRV Capacity that were used to reduce the Total WQv Required (#28).

Identify the SMPs to be used by providing the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use the Post-Construction SMP Identification section to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

30. Indicate the Total RRV provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRV capacity identified in question 29. (acre-feet)

0.213

31. Is the Total RRV provided (#30) greater than or equal to the total WQv required (#28)?

No

If Yes, go to question 36. If No, go to question 32.

32. Provide the Minimum RRV required based on HSG. [Minimum RRV Required = (P) (0.95) (Ai) / 12, Ai=(s) (Aic)] (acre-feet)

0.169

32a. Is the Total RRV provided (#30) greater than or equal to the Minimum RRV Required (#32)?

Yes

If Yes, go to question 33.

Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.



If No, sizing criteria has not been met; therefore, NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. SMPs Use the Post-construction SMP Identification section to identify the Standard SMPs and, if applicable, the Alternative SMPs to be used to treat the remaining total WQv (=Total WQv Required in #28 - Total RRv Provided in #30). Also, provide the total impervious area that contributes runoff to each practice selected. NOTE: Use the Post-construction SMP Identification section to identify the SMPs used on Redevelopment projects.
33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question #29. (acre-feet) 0.695
Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - provided by the practice. (See Table 3.5 in Design Manual)
34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a). 0.908
35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? Yes
If Yes, go to question 36. If No, sizing criteria has not been met; therefore, NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.
36. Provide the total Channel Protection Storage Volume (CPv required and provided or select waiver (#36a), if applicable.
CPv Required (acre-feet) <i>None Specified</i>
CPv Provided (acre-feet) <i>None Specified</i>
36a. The need to provide channel protection has been waived because: Site discharges directly to tidal waters or a fifth order or larger stream.
37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (#37a), if applicable.
Overbank Flood Control Criteria (Qp)
Pre-Development (CFS) <i>None Specified</i>
Post-Development (CFS) <i>None Specified</i>
Total Extreme Flood Control Criteria (Qf)
Pre-Development (CFS) <i>None Specified</i>
Post-Development (CFS) <i>None Specified</i>

<p>37a. The need to meet the Qp and Qf criteria has been waived because:</p> <p>Site discharges directly to tidal waters or a fifth order or larger stream.</p>
<p>38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed?</p> <p>Yes</p>
<p>If Yes, Identify the entity responsible for the long term Operation and Maintenance</p> <p>Sun Communities</p>
<p>39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). (See question #32a) This space can also be used for other pertinent project information.</p> <p>Groundwater & bedrock elevations on the project site range in elevations from 3 feet to 8 feet below existing grade. Due to poor draining soils and high bedrock across the project site limiting practice depth, Bioretention Areas (F-5) and Wet Swales (O-2) were chosen to provide the necessary Water Quality Volume (WQv).</p>
<p>POST-CONSTRUCTION SMP IDENTIFICATION</p>
<p>Runoff Reduction (RR) Techniques, Standard Stormwater Management Practices (SMPs) and Alternative SMPs</p> <p>Identify the Post-construction SMPs to be used by providing the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.</p>
<p>RR Techniques (Area Reduction)</p> <hr/>
<p>Round to the nearest tenth</p>
<p>Total Contributing Acres for Conservation of Natural Area (RR-1)</p> <p>0</p>
<p>Total Contributing Impervious Acres for Conservation of Natural Area (RR-1)</p> <p>0</p>
<p>Total Contributing Acres for Sheetflow to Riparian Buffers/Filter Strips (RR-2)</p> <p>0</p>
<p>Total Contributing Impervious Acres for Sheetflow to Riparian Buffers/Filter Strips (RR-2)</p> <p>0</p>
<p>Total Contributing Acres for Tree Planting/Tree Pit (RR-3)</p> <p>0</p>
<p>Total Contributing Impervious Acres for Tree Planting/Tree Pit (RR-3)</p> <p>0</p>
<p>Total Contributing Acres for Disconnection of Rooftop Runoff (RR-4)</p> <p>0</p>
<p>RR Techniques (Volume Reduction)</p> <hr/>
<p>Total Contributing Impervious Acres for Disconnection of Rooftop Runoff (RR-4)</p> <p>0</p>

Total Contributing Impervious Acres for Vegetated Swale (RR-5) 0
Total Contributing Impervious Acres for Rain Garden (RR-6) 0
Total Contributing Impervious Acres for Stormwater Planter (RR-7) 0
Total Contributing Impervious Acres for Rain Barrel/Cistern (RR-8) 0
Total Contributing Impervious Acres for Porous Pavement (RR-9) 0
Total Contributing Impervious Acres for Green Roof (RR-10) 0
Standard SMPs with RRV Capacity <hr/>
Total Contributing Impervious Acres for Infiltration Trench (I-1) 0
Total Contributing Impervious Acres for Infiltration Basin (I-2) 0
Total Contributing Impervious Acres for Dry Well (I-3) 0
Total Contributing Impervious Acres for Underground Infiltration System (I-4) 0
Total Contributing Impervious Acres for Bioretention (F-5) 3.51
Total Contributing Impervious Acres for Dry Swale (O-1) 0
Standard SMPs <hr/>
Total Contributing Impervious Acres for Micropool Extended Detention (P-1) 0
Total Contributing Impervious Acres for Wet Pond (P-2) 0
Total Contributing Impervious Acres for Wet Extended Detention (P-3) 0
Total Contributing Impervious Acres for Multiple Pond System (P-4) 0
Total Contributing Impervious Acres for Pocket Pond (P-5) 0
Total Contributing Impervious Acres for Surface Sand Filter (F-1) 0

Total Contributing Impervious Acres for Underground Sand Filter (F-2) 0
Total Contributing Impervious Acres for Perimeter Sand Filter (F-3) 0
Total Contributing Impervious Acres for Organic Filter (F-4) 0
Total Contributing Impervious Acres for Shallow Wetland (W-1) 0
Total Contributing Impervious Acres for Extended Detention Wetland (W-2) 0
Total Contributing Impervious Acres for Pond/Wetland System (W-3) 0
Total Contributing Impervious Acres for Pocket Wetland (W-4) 0
Total Contributing Impervious Acres for Wet Swale (O-2) 7.2
<u>Alternative SMPs (DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)</u>
Total Contributing Impervious Area for Hydrodynamic 0
Total Contributing Impervious Area for Wet Vault 0
Total Contributing Impervious Area for Media Filter 0
"Other" Alternative SMP? 0
Total Contributing Impervious Area for "Other" 0
Provide the name and manufacturer of the alternative SMPs (i.e. proprietary practice(s)) being used for WQv treatment.
Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs used, total WQv required and total WQv provided for the project.
Manufacturer of Alternative SMP <i>None Specified</i>
Name of Alternative SMP <i>None Specified</i>
OTHER PERMITS
40. Identify other DEC permits, existing and new, that are required for this project/facility. Individual SPDES

If SPDES Multi-Sector GP, then give permit ID <i>None Specified</i>	
If Other, then identify <i>None Specified</i>	
41. Does this project require a US Army Corps of Engineers Wetland Permit? No	
If "Yes," then indicate Size of Impact, in acres, to the nearest tenth <i>None Specified</i>	
42. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. <i>None Specified</i>	
MS4 SWPPP ACCEPTANCE	
43. Is this project subject to the requirements of a regulated, traditional land use control MS4? No	
If No, skip question 44	
44. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? <i>None Specified</i>	
MS4 SWPPP Acceptance Form Download Download form from the link below. Complete, sign, and upload. MS4 SWPPP Acceptance Form 	
MS4 Acceptance Form Upload <i>No files uploaded</i> Comment <i>None Specified</i>	
OWNER/OPERATOR CERTIFICATION	
The owner/operator must download, sign, and upload the certification form in order to complete this application. Owner/Operator Certification Form Download Download the certification form by clicking the link below. Complete, sign, scan, and upload the form. Owner/Operator Certification Form (PDF, 45KB) 	
Upload Owner/Operator Certification Form <i>No files uploaded</i> Comment <i>None Specified</i>	
<div> At least one file is required.</div>	

Appendix D. | Notice of Permit Coverage

Appendix E. | NYSDEC SPDES General Permit for Stormwater



Department of
Environmental
Conservation

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

From

CONSTRUCTION ACTIVITY

Permit No. GP- 0-20-001

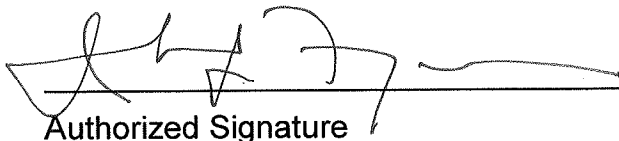
Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: January 29, 2020

Expiration Date: January 28, 2025

John J. Ferguson

Chief Permit Administrator



Authorized Signature

1-23-20
Date

Address: NYS DEC
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

PREFACE

Pursuant to Section 402 of the Clean Water Act (“CWA”), stormwater *discharges* from certain *construction activities* are unlawful unless they are authorized by a *National Pollutant Discharge Elimination System (“NPDES”)* permit or by a state permit program. New York administers the approved State Pollutant Discharge Elimination System (SPDES) program with permits issued in accordance with the New York State Environmental Conservation Law (ECL) Article 17, Titles 7, 8 and Article 70.

An *owner or operator* of a *construction activity* that is eligible for coverage under this permit must obtain coverage prior to the *commencement of construction activity*. Activities that fit the definition of “*construction activity*”, as defined under 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), constitute construction of a *point source* and therefore, pursuant to ECL section 17-0505 and 17-0701, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. The *owner or operator* cannot wait until there is an actual *discharge* from the *construction site* to obtain permit coverage.

***Note: The italicized words/phrases within this permit are defined in Appendix A.**

**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES FROM
CONSTRUCTION ACTIVITIES**

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Part 1. PERMIT COVERAGE AND LIMITATIONS

A. Permit Application

This permit authorizes stormwater *discharges* to *surface waters of the State* from the following *construction activities* identified within 40 CFR Parts 122.26(b)(14)(x), 122.26(b)(15)(i) and 122.26(b)(15)(ii), provided all of the eligibility provisions of this permit are met:

1. *Construction activities* involving soil disturbances of one (1) 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;
2. *Construction activities* involving soil disturbances of less than one (1) acre where the Department has determined that a *SPDES* permit is required for stormwater *discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of *pollutants* to *surface waters of the State*.
3. *Construction activities* located in the watershed(s) identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

B. Effluent Limitations Applicable to Discharges from Construction Activities

Discharges authorized by this permit must achieve, at a minimum, the effluent limitations in Part I.B.1. (a) – (f) of this permit. These limitations represent the degree of effluent reduction attainable by the application of best practicable technology currently available.

1. Erosion and Sediment Control Requirements - The *owner or operator* must select, design, install, implement and maintain control measures to *minimize* the *discharge of pollutants* and prevent a violation of the *water quality standards*. The selection, design, installation, implementation, and maintenance of these control measures must meet the non-numeric effluent limitations in Part I.B.1.(a) – (f) of this permit and be in accordance with the New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, using sound engineering judgment. Where control measures are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must include in the *Stormwater Pollution Prevention Plan* (“SWPPP”) the reason(s) for the

deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

- a. **Erosion and Sediment Controls.** Design, install and maintain effective erosion and sediment controls to *minimize* the *discharge of pollutants* and prevent a violation of the *water quality standards*. At a minimum, such controls must be designed, installed and maintained to:
- (i) *Minimize* soil erosion through application of runoff control and soil stabilization control measure to *minimize pollutant discharges*;
 - (ii) Control stormwater *discharges*, including both peak flowrates and total stormwater volume, to *minimize* channel and *streambank* erosion and scour in the immediate vicinity of the *discharge* points;
 - (iii) *Minimize* the amount of soil exposed during *construction activity*;
 - (iv) *Minimize* the disturbance of *steep slopes*;
 - (v) *Minimize* sediment *discharges* from the site;
 - (vi) Provide and maintain *natural buffers* around surface waters, direct stormwater to vegetated areas and maximize stormwater infiltration to reduce *pollutant discharges*, unless *infeasible*;
 - (vii) *Minimize* soil compaction. Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted;
 - (viii) Unless *infeasible*, preserve a sufficient amount of topsoil to complete soil restoration and establish a uniform, dense vegetative cover; and
 - (ix) *Minimize* dust. On areas of exposed soil, *minimize* dust through the appropriate application of water or other dust suppression techniques to control the generation of pollutants that could be discharged from the site.
- b. **Soil Stabilization.** In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within fourteen (14) days from the date the current soil disturbance activity ceased. For construction sites that *directly discharge* to one of the 303(d) segments

listed in Appendix E or is located in one of the watersheds listed in Appendix C, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. See Appendix A for definition of *Temporarily Ceased*.

- c. **Dewatering.** *Discharges* from *dewatering* activities, including *discharges* from *dewatering* of trenches and excavations, must be managed by appropriate control measures.
- d. **Pollution Prevention Measures.** Design, install, implement, and maintain effective pollution prevention measures to *minimize* the *discharge* of *pollutants* and prevent a violation of the *water quality standards*. At a minimum, such measures must be designed, installed, implemented and maintained to:
 - (i) *Minimize* the *discharge* of *pollutants* from equipment and vehicle washing, wheel wash water, and other wash waters. This applies to washing operations that use clean water only. Soaps, detergents and solvents cannot be used;
 - (ii) *Minimize* the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste, hazardous and toxic waste, and other materials present on the site to precipitation and to stormwater. Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a *discharge* of *pollutants*, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use) ; and
 - (iii) Prevent the *discharge* of *pollutants* from spills and leaks and implement chemical spill and leak prevention and response procedures.
- e. **Prohibited Discharges.** The following *discharges* are prohibited:
 - (i) Wastewater from washout of concrete;
 - (ii) Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;

- (iii) Fuels, oils, or other *pollutants* used in vehicle and equipment operation and maintenance;
 - (iv) Soaps or solvents used in vehicle and equipment washing; and
 - (v) Toxic or hazardous substances from a spill or other release.
- f. Surface Outlets. When discharging from basins and impoundments, the outlets shall be designed, constructed and maintained in such a manner that sediment does not leave the basin or impoundment and that erosion at or below the outlet does not occur.

C. Post-construction Stormwater Management Practice Requirements

1. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must select, design, install, and maintain the practices to meet the *performance criteria* in the New York State Stormwater Management Design Manual (“Design Manual”), dated January 2015, using sound engineering judgment. Where post-construction stormwater management practices (“SMPs”) are not designed in conformance with the *performance criteria* in the Design Manual, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.
2. The *owner or operator* of a *construction activity* that requires post-construction stormwater management practices pursuant to Part III.C. of this permit must design the practices to meet the applicable *sizing criteria* in Part I.C.2.a., b., c. or d. of this permit.

a. Sizing Criteria for New Development

- (i) Runoff Reduction Volume (“RRv”): Reduce the total Water Quality Volume (“WQv”) by application of RR techniques and standard SMPs with RRv capacity. The total WQv shall be calculated in accordance with the criteria in Section 4.2 of the Design Manual.
- (ii) Minimum RRv and Treatment of Remaining Total WQv: Construction activities that cannot meet the criteria in Part I.C.2.a.(i) of this permit due to site limitations shall direct runoff from all newly constructed impervious areas to a RR technique or standard SMP with RRv capacity unless infeasible. The specific site limitations that prevent the reduction of 100% of the WQv shall be documented in the SWPPP.

For each impervious area that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered infeasible.

In no case shall the runoff reduction achieved from the newly constructed impervious areas be less than the Minimum RRv as calculated using the criteria in Section 4.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

- (iii) Channel Protection Volume (“Cpv”): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:
 - (1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or
 - (2) The site discharges directly to tidal waters, or fifth order or larger streams.
- (iv) *Overbank* Flood Control Criteria (“Qp”): Requires storage to attenuate the post-development 10-year, 24-hour peak discharge rate (Qp) to predevelopment rates. The Qp requirement does not apply when:
 - (1) the site discharges directly to tidal waters or fifth order or larger streams, or
 - (2) A downstream analysis reveals that *overbank* control is not required.
- (v) Extreme Flood Control Criteria (“Qf”): Requires storage to attenuate the post-development 100-year, 24-hour peak discharge rate (Qf) to predevelopment rates. The Qf requirement does not apply when:
 - (1) the site discharges directly to tidal waters or fifth order or larger streams, or
 - (2) A downstream analysis reveals that *overbank* control is not required.

b. Sizing Criteria for New Development in Enhanced Phosphorus Removal Watershed

- (i) Runoff Reduction Volume (RRv): Reduce the total Water Quality Volume (WQv) by application of RR techniques and standard SMPs with RRv capacity. The total WQv is the runoff volume from the 1-year, 24 hour design storm over the post-developed watershed and shall be

calculated in accordance with the criteria in Section 10.3 of the Design Manual.

- (ii) Minimum RRv and Treatment of Remaining Total WQv: *Construction activities* that cannot meet the criteria in Part I.C.2.b.(i) of this permit due to *site limitations* shall direct runoff from all newly constructed *impervious areas* to a RR technique or standard SMP with RRv capacity unless *infeasible*. The specific *site limitations* that prevent the reduction of 100% of the WQv shall be documented in the SWPPP. For each *impervious area* that is not directed to a RR technique or standard SMP with RRv capacity, the SWPPP must include documentation which demonstrates that all options were considered and for each option explains why it is considered *infeasible*.

In no case shall the runoff reduction achieved from the newly constructed *impervious areas* be less than the Minimum RRv as calculated using the criteria in Section 10.3 of the Design Manual. The remaining portion of the total WQv that cannot be reduced shall be treated by application of standard SMPs.

- (iii) Channel Protection Volume (Cpv): Provide 24 hour extended detention of the post-developed 1-year, 24-hour storm event; remaining after runoff reduction. The Cpv requirement does not apply when:
 - (1) Reduction of the entire Cpv is achieved by application of runoff reduction techniques or infiltration systems, or
 - (2) The site *discharges* directly to tidal waters, or fifth order or larger streams.
- (iv) Overbank Flood Control Criteria (Qp): Requires storage to attenuate the post-development 10-year, 24-hour peak *discharge* rate (Qp) to predevelopment rates. The Qp requirement does not apply when:
 - (1) the site *discharges* directly to tidal waters or fifth order or larger streams, or
 - (2) A downstream analysis reveals that *overbank* control is not required.
- (v) Extreme Flood Control Criteria (Qf): Requires storage to attenuate the post-development 100-year, 24-hour peak *discharge* rate (Qf) to predevelopment rates. The Qf requirement does not apply when:
 - (1) the site *discharges* directly to tidal waters or fifth order or larger streams, or
 - (2) A downstream analysis reveals that *overbank* control is not required.

c. Sizing Criteria for Redevelopment Activity

- (i) Water Quality Volume (WQv): The WQv treatment objective for *redevelopment activity* shall be addressed by one of the following options. *Redevelopment activities* located in an Enhanced Phosphorus Removal Watershed (see Part III.B.3. and Appendix C of this permit) shall calculate the WQv in accordance with Section 10.3 of the Design Manual. All other *redevelopment activities* shall calculate the WQv in accordance with Section 4.2 of the Design Manual.
 - (1) Reduce the existing *impervious cover* by a minimum of 25% of the total disturbed, *impervious area*. The Soil Restoration criteria in Section 5.1.6 of the Design Manual must be applied to all newly created pervious areas, or
 - (2) Capture and treat a minimum of 25% of the WQv from the disturbed, *impervious area* by the application of standard SMPs; or reduce 25% of the WQv from the disturbed, *impervious area* by the application of RR techniques or standard SMPs with RRv capacity., or
 - (3) Capture and treat a minimum of 75% of the WQv from the disturbed, *impervious area* as well as any additional runoff from tributary areas by application of the alternative practices discussed in Sections 9.3 and 9.4 of the Design Manual., or
 - (4) Application of a combination of 1, 2 and 3 above that provide a weighted average of at least two of the above methods. Application of this method shall be in accordance with the criteria in Section 9.2.1(B) (IV) of the Design Manual.

If there is an existing post-construction stormwater management practice located on the site that captures and treats runoff from the *impervious area* that is being disturbed, the WQv treatment option selected must, at a minimum, provide treatment equal to the treatment that was being provided by the existing practice(s) if that treatment is greater than the treatment required by options 1 – 4 above.

- (ii) Channel Protection Volume (Cpv): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.
- (iii) Overbank Flood Control Criteria (Qp): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site.
- (iv) Extreme Flood Control Criteria (Qf): Not required if there are no changes to hydrology that increase the *discharge* rate from the project site

d. Sizing Criteria for Combination of Redevelopment Activity and New Development

Construction projects that include both New Development and Redevelopment Activity shall provide post-construction stormwater management controls that meet the sizing criteria calculated as an aggregate of the Sizing Criteria in Part I.C.2.a. or b. of this permit for the New Development portion of the project and Part I.C.2.c of this permit for Redevelopment Activity portion of the project.

D. Maintaining Water Quality

The Department expects that compliance with the conditions of this permit will control *discharges* necessary to meet applicable *water quality standards*. It shall be a violation of the *ECL* for any discharge to either cause or contribute to a violation of *water quality standards* as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, such as:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;
2. There shall be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and
3. There shall be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

If there is evidence indicating that the stormwater *discharges* authorized by this permit are causing, have the reasonable potential to cause, or are contributing to a violation of the *water quality standards*; the *owner or operator* must take appropriate corrective action in accordance with Part IV.C.5. of this general permit and document in accordance with Part IV.C.4. of this general permit. To address the *water quality standard* violation the *owner or operator* may need to provide additional information, include and implement appropriate controls in the SWPPP to correct the problem, or obtain an individual SPDES permit.

If there is evidence indicating that despite compliance with the terms and conditions of this general permit it is demonstrated that the stormwater *discharges* authorized by this permit are causing or contributing to a violation of *water quality standards*, or if the Department determines that a modification of the permit is necessary to prevent a violation of *water quality standards*, the authorized *discharges* will no longer be eligible for coverage under this permit. The Department may require the *owner or operator* to obtain an individual SPDES permit to continue discharging.

E. Eligibility Under This General Permit

1. This permit may authorize all *discharges* of stormwater from *construction activity* to *surface waters of the State* and *groundwaters* except for ineligible *discharges* identified under subparagraph F. of this Part.
2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater *discharges*; including stormwater runoff, snowmelt runoff, and surface runoff and drainage, from *construction activities*.
3. Notwithstanding paragraphs E.1 and E.2 above, the following non-stormwater discharges are authorized by this permit: those listed in 6 NYCRR 750-1.2(a)(29)(vi), with the following exception: “Discharges from firefighting activities are authorized only when the firefighting activities are emergencies/unplanned”; waters to which other components have not been added that are used to control dust in accordance with the SWPPP; and uncontaminated *discharges* from *construction site* de-watering operations. All non-stormwater discharges must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with *water quality standards* in Part I.D of this permit.
4. The *owner or operator* must maintain permit eligibility to *discharge* under this permit. Any *discharges* that are not compliant with the eligibility conditions of this permit are not authorized by the permit and the *owner or operator* must either apply for a separate permit to cover those ineligible *discharges* or take steps necessary to make the *discharge* eligible for coverage.

F. Activities Which Are Ineligible for Coverage Under This General Permit

All of the following are **not** authorized by this permit:

1. *Discharges* after *construction activities* have been completed and the site has undergone *final stabilization*;
2. *Discharges* that are mixed with sources of non-stormwater other than those expressly authorized under subsection E.3. of this Part and identified in the SWPPP required by this permit;
3. *Discharges* that are required to obtain an individual SPDES permit or another SPDES general permit pursuant to Part VII.K. of this permit;
4. *Construction activities* or *discharges* from *construction activities* that may adversely affect an *endangered or threatened species* unless the *owner or*

operator has obtained a permit issued pursuant to 6 NYCRR Part 182 for the project or the Department has issued a letter of non-jurisdiction for the project. All documentation necessary to demonstrate eligibility shall be maintained on site in accordance with Part II.D.2 of this permit;

5. *Discharges* which either cause or contribute to a violation of *water quality standards* adopted pursuant to the *ECL* and its accompanying regulations;
6. *Construction activities* for residential, commercial and institutional projects:
 - a. Where the *discharges* from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and
 - b. Which are undertaken on land with no existing *impervious cover*; and
 - c. Which disturb one (1) or more acres of land designated on the current United States Department of Agriculture ("USDA") Soil Survey as Soil Slope Phase "D", (provided the map unit name is inclusive of slopes greater than 25%), or Soil Slope Phase "E" or "F" (regardless of the map unit name), or a combination of the three designations.
7. *Construction activities* for linear transportation projects and linear utility projects:
 - a. Where the *discharges* from the *construction activities* are tributary to waters of the state classified as AA or AA-s; and
 - b. Which are undertaken on land with no existing *impervious cover*; and
 - c. Which disturb two (2) or more acres of land designated on the current USDA Soil Survey as Soil Slope Phase "D" (provided the map unit name is inclusive of slopes greater than 25%), or Soil Slope Phase "E" or "F" (regardless of the map unit name), or a combination of the three designations.

8. *Construction activities* that have the potential to affect an *historic property*, unless there is documentation that such impacts have been resolved. The following documentation necessary to demonstrate eligibility with this requirement shall be maintained on site in accordance with Part II.D.2 of this permit and made available to the Department in accordance with Part VII.F of this permit:
- a. Documentation that the *construction activity* is not within an archeologically sensitive area indicated on the sensitivity map, and that the *construction activity* is not located on or immediately adjacent to a property listed or determined to be eligible for listing on the National or State Registers of Historic Places, and that there is no new permanent building on the *construction site* within the following distances from a building, structure, or object that is more than 50 years old, or if there is such a new permanent building on the *construction site* within those parameters that NYS Office of Parks, Recreation and Historic Preservation (OPRHP), a Historic Preservation Commission of a Certified Local Government, or a qualified preservation professional has determined that the building, structure, or object more than 50 years old is not historically/archeologically significant.
 - 1-5 acres of disturbance - 20 feet
 - 5-20 acres of disturbance - 50 feet
 - 20+ acres of disturbance - 100 feet, or
 - b. DEC consultation form sent to OPRHP, and copied to the NYS DEC Agency Historic Preservation Officer (APO), and
 - (i) the State Environmental Quality Review (SEQR) Environmental Assessment Form (EAF) with a negative declaration or the Findings Statement, with documentation of OPRHP's agreement with the resolution; or
 - (ii) documentation from OPRHP that the *construction activity* will result in No Impact; or
 - (iii) documentation from OPRHP providing a determination of No Adverse Impact; or
 - (iv) a Letter of Resolution signed by the owner/operator, OPRHP and the DEC APO which allows for this *construction activity* to be eligible for coverage under the general permit in terms of the State Historic Preservation Act (SHPA); or
 - c. Documentation of satisfactory compliance with Section 106 of the National Historic Preservation Act for a coterminous project area:

- (i) No Affect
- (ii) No Adverse Affect
- (iii) Executed Memorandum of Agreement, or

d. Documentation that:

- (i) SHPA Section 14.09 has been completed by NYS DEC or another state agency.

9. *Discharges from construction activities* that are subject to an existing SPDES individual or general permit where a SPDES permit for *construction activity* has been terminated or denied; or where the *owner or operator* has failed to renew an expired individual permit.

Part II. PERMIT COVERAGE

A. How to Obtain Coverage

1. An *owner or operator* of a *construction activity* that is not subject to the requirements of a regulated, traditional land use control MS4 must first prepare a SWPPP in accordance with all applicable requirements of this permit and then submit a completed Notice of Intent (NOI) to the Department to be authorized to discharge under this permit.
2. An *owner or operator* of a *construction activity* that is subject to the requirements of a *regulated, traditional land use control MS4* must first prepare a SWPPP in accordance with all applicable requirements of this permit and then have the SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the "MS4 SWPPP Acceptance" form signed in accordance with Part VII.H., and then submit that form along with a completed NOI to the Department.
3. The requirement for an *owner or operator* to have its SWPPP reviewed and accepted by the *regulated, traditional land use control MS4* prior to submitting the NOI to the Department does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.F. (Change of Owner or Operator) or where the *owner or operator* of the *construction activity* is the *regulated, traditional land use control MS4*. This exemption does not apply to *construction activities* subject to the New York City Administrative Code.

B. Notice of Intent (NOI) Submittal

1. Prior to December 21, 2020, an owner or operator shall use either the electronic (eNOI) or paper version of the NOI that the Department prepared. Both versions of the NOI are located on the Department's website (<http://www.dec.ny.gov/>). The paper version of the NOI shall be signed in accordance with Part VII.H. of this permit and submitted to the following address:

**NOTICE OF INTENT
NYS DEC, Bureau of Water Permits
625 Broadway, 4th Floor
Albany, New York 12233-3505**

2. Beginning December 21, 2020 and in accordance with EPA's 2015 NPDES Electronic Reporting Rule (40 CFR Part 127), the *owner or operator* must submit the NOI electronically using the *Department's* online NOI.
3. The *owner or operator* shall have the SWPPP preparer sign the "SWPPP Preparer Certification" statement on the NOI prior to submitting the form to the Department.
4. As of the date the NOI is submitted to the Department, the *owner or operator* shall make the NOI and SWPPP available for review and copying in accordance with the requirements in Part VII.F. of this permit.

C. Permit Authorization

1. An *owner or operator* shall not *commence construction activity* until their authorization to *discharge* under this permit goes into effect.
2. Authorization to *discharge* under this permit will be effective when the *owner or operator* has satisfied all of the following criteria:
 - a. project review pursuant to the State Environmental Quality Review Act ("SEQRA") have been satisfied, when SEQRA is applicable. See the Department's website (<http://www.dec.ny.gov/>) for more information,
 - b. where required, all necessary Department permits subject to the *Uniform Procedures Act* ("UPA") (see 6 NYCRR Part 621), or the equivalent from another New York State agency, have been obtained, unless otherwise notified by the Department pursuant to 6 NYCRR 621.3(a)(4). *Owners or operators of construction activities* that are required to obtain UPA permits

must submit a preliminary SWPPP to the appropriate DEC Permit Administrator at the Regional Office listed in Appendix F at the time all other necessary *UPA* permit applications are submitted. The preliminary SWPPP must include sufficient information to demonstrate that the *construction activity* qualifies for authorization under this permit,

- c. the final SWPPP has been prepared, and
 - d. a complete NOI has been submitted to the Department in accordance with the requirements of this permit.
3. An *owner or operator* that has satisfied the requirements of Part II.C.2 above will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:
- a. For *construction activities* that are not subject to the requirements of a *regulated, traditional land use control MS4*:
 - (i) Five (5) business days from the date the Department receives a complete electronic version of the NOI (eNOI) for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.; or
 - (ii) Sixty (60) business days from the date the Department receives a complete NOI (electronic or paper version) for *construction activities* with a SWPPP that has not been prepared in conformance with the design criteria in technical standard referenced in Part III.B.1. or, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C., the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, or;
 - (iii) Ten (10) business days from the date the Department receives a complete paper version of the NOI for *construction activities* with a SWPPP that has been prepared in conformance with the design criteria in the technical standard referenced in Part III.B.1 and the *performance criteria* in the technical standard referenced in Parts III.B., 2 or 3, for *construction activities* that require post-construction stormwater management practices pursuant to Part III.C.

- b. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*:
 - (i) Five (5) business days from the date the Department receives both a complete electronic version of the NOI (eNOI) and signed “MS4 SWPPP Acceptance” form, or
 - (ii) Ten (10) business days from the date the Department receives both a complete paper version of the NOI and signed “MS4 SWPPP Acceptance” form.
4. Coverage under this permit authorizes stormwater *discharges* from only those areas of disturbance that are identified in the NOI. If an *owner or operator* wishes to have stormwater *discharges* from future or additional areas of disturbance authorized, they must submit a new NOI that addresses that phase of the development, unless otherwise notified by the Department. The *owner or operator* shall not *commence construction activity* on the future or additional areas until their authorization to *discharge* under this permit goes into effect in accordance with Part II.C. of this permit.

D. General Requirements For Owners or Operators With Permit Coverage

1. The *owner or operator* shall ensure that the provisions of the SWPPP are implemented from the *commencement of construction activity* until all areas of disturbance have achieved *final stabilization* and the Notice of Termination (“NOT”) has been submitted to the Department in accordance with Part V. of this permit. This includes any changes made to the SWPPP pursuant to Part III.A.4. of this permit.
2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-20-001), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form, inspection reports, responsible contractor’s or subcontractor’s certification statement (see Part III.A.6.), and all documentation necessary to demonstrate eligibility with this permit at the *construction site* until all disturbed areas have achieved *final stabilization* and the NOT has been submitted to the Department. The documents must be maintained in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection.
3. The *owner or operator* of a *construction activity* shall not disturb greater than five (5) acres of soil at any one time without prior written authorization from the Department or, in areas under the jurisdiction of a *regulated, traditional land*

- use control MS4, the regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*). At a minimum, the *owner or operator* must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:
- a. The *owner or operator* shall have a *qualified inspector* conduct **at least** two (2) site inspections in accordance with Part IV.C. of this permit every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.
 - b. In areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016.
 - c. The *owner or operator* shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.
 - d. The *owner or operator* shall install any additional site-specific practices needed to protect water quality.
 - e. The *owner or operator* shall include the requirements above in their SWPPP.
4. In accordance with statute, regulations, and the terms and conditions of this permit, the Department may suspend or revoke an *owner's or operator's* coverage under this permit at any time if the Department determines that the SWPPP does not meet the permit requirements or consistent with Part VII.K..
 5. Upon a finding of significant non-compliance with the practices described in the SWPPP or violation of this permit, the Department may order an immediate stop to all activity at the site until the non-compliance is remedied. The stop work order shall be in writing, describe the non-compliance in detail, and be sent to the *owner or operator*.
 6. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*, the *owner or operator* shall notify the

regulated, traditional land use control MS4 in writing of any planned amendments or modifications to the post-construction stormwater management practice component of the SWPPP required by Part III.A. 4. and 5. of this permit. Unless otherwise notified by the *regulated, traditional land use control MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *regulated, traditional land use control MS4* prior to commencing construction of the post-construction stormwater management practice.

E. Permit Coverage for Discharges Authorized Under GP-0-15-002

1. Upon renewal of SPDES General Permit for Stormwater Discharges from *Construction Activity* (Permit No. GP-0-15-002), an *owner or operator* of a *construction activity* with coverage under GP-0-15-002, as of the effective date of GP- 0-20-001, shall be authorized to *discharge* in accordance with GP- 0-20-001, unless otherwise notified by the Department.

An *owner or operator* may continue to implement the technical/design components of the post-construction stormwater management controls provided that such design was done in conformance with the technical standards in place at the time of initial project authorization. However, they must comply with the other, non-design provisions of GP-0-20-001.

F. Change of Owner or Operator

1. When property ownership changes or when there is a change in operational control over the construction plans and specifications, the original *owner or operator* must notify the new *owner or operator*, in writing, of the requirement to obtain permit coverage by submitting a NOI with the Department. For *construction activities* subject to the requirements of a *regulated, traditional land use control MS4*, the original *owner or operator* must also notify the MS4, in writing, of the change in ownership at least 30 calendar days prior to the change in ownership.
2. Once the new *owner or operator* obtains permit coverage, the original *owner or operator* shall then submit a completed NOT with the name and permit identification number of the new *owner or operator* to the Department at the address in Part II.B.1. of this permit. If the original *owner or operator* maintains ownership of a portion of the *construction activity* and will disturb soil, they must maintain their coverage under the permit.
3. Permit coverage for the new *owner or operator* will be effective as of the date the Department receives a complete NOI, provided the original *owner or*

operator was not subject to a sixty (60) business day authorization period that has not expired as of the date the Department receives the NOI from the new *owner or operator*.

Part III. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A. General SWPPP Requirements

1. A SWPPP shall be prepared and implemented by the *owner or operator* of each *construction activity* covered by this permit. The SWPPP must document the selection, design, installation, implementation and maintenance of the control measures and practices that will be used to meet the effluent limitations in Part I.B. of this permit and where applicable, the post-construction stormwater management practice requirements in Part I.C. of this permit. The SWPPP shall be prepared prior to the submittal of the NOI. The NOI shall be submitted to the Department prior to the *commencement of construction activity*. A copy of the completed, final NOI shall be included in the SWPPP.
2. The SWPPP shall describe the erosion and sediment control practices and where required, post-construction stormwater management practices that will be used and/or constructed to reduce the *pollutants* in stormwater *discharges* and to assure compliance with the terms and conditions of this permit. In addition, the SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater *discharges*.
3. All SWPPPs that require the post-construction stormwater management practice component shall be prepared by a *qualified professional* that is knowledgeable in the principles and practices of stormwater management and treatment.
4. The *owner or operator* must keep the SWPPP current so that it at all times accurately documents the erosion and sediment controls practices that are being used or will be used during construction, and all post-construction stormwater management practices that will be constructed on the site. At a minimum, the *owner or operator* shall amend the SWPPP, including construction drawings:
 - a. whenever the current provisions prove to be ineffective in minimizing *pollutants* in stormwater *discharges* from the site;

- b. whenever there is a change in design, construction, or operation at the *construction site* that has or could have an effect on the *discharge* of *pollutants*;
 - c. to address issues or deficiencies identified during an inspection by the *qualified inspector*, the Department or other regulatory authority; and
 - d. to document the final construction conditions.
5. The Department may notify the *owner or operator* at any time that the SWPPP does not meet one or more of the minimum requirements of this permit. The notification shall be in writing and identify the provisions of the SWPPP that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by the Department, the *owner or operator* shall make the required changes to the SWPPP and submit written notification to the Department that the changes have been made. If the *owner or operator* does not respond to the Department's comments in the specified time frame, the Department may suspend the *owner's or operator's* coverage under this permit or require the *owner or operator* to obtain coverage under an individual SPDES permit in accordance with Part II.D.4. of this permit.
6. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP; and the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP. The *owner or operator* shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the *trained contractor*. The *owner or operator* shall ensure that at least one *trained contractor* is on site on a daily basis when soil disturbance activities are being performed.

The *owner or operator* shall have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before they commence any *construction activity*:

"I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with

the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater *discharges* from *construction activities* and that it is unlawful for any person to cause or contribute to a violation of *water quality standards*. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

In addition to providing the certification statement above, the certification page must also identify the specific elements of the SWPPP that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the *trained contractor* responsible for SWPPP implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* shall attach the certification statement(s) to the copy of the SWPPP that is maintained at the *construction site*. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the certification statement and provide the information listed above.

7. For projects where the Department requests a copy of the SWPPP or inspection reports, the *owner or operator* shall submit the documents in both electronic (PDF only) and paper format within five (5) business days, unless otherwise notified by the Department.

B. Required SWPPP Contents

1. Erosion and sediment control component - All SWPPPs prepared pursuant to this permit shall include erosion and sediment control practices designed in conformance with the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. Where erosion and sediment control practices are not designed in conformance with the design criteria included in the technical standard, the *owner or operator* must demonstrate *equivalence* to the technical standard. At a minimum, the erosion and sediment control component of the SWPPP shall include the following:
 - a. Background information about the scope of the project, including the location, type and size of project

- b. A site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s); floodplain/floodway boundaries; wetlands and drainage patterns that could be affected by the *construction activity*; existing and final contours ; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the stormwater *discharge(s)*;
- c. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG);
- d. A construction phasing plan and sequence of operations describing the intended order of *construction activities*, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance;
- e. A description of the minimum erosion and sediment control practices to be installed or implemented for each *construction activity* that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented;
- f. A temporary and permanent soil stabilization plan that meets the requirements of this general permit and the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016, for each stage of the project, including initial land clearing and grubbing to project completion and achievement of *final stabilization*;
- g. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice;
- h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any temporary sediment basins and structural practices that will be used to divert flows from exposed soils;
- i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6. of this permit, to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection

schedule shall be in accordance with the requirements in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016;

- j. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a *pollutant* source in the stormwater *discharges*;
 - k. A description and location of any stormwater *discharges* associated with industrial activity other than construction at the site, including, but not limited to, stormwater *discharges* from asphalt plants and concrete plants located on the *construction site*; and
 - l. Identification of any elements of the design that are not in conformance with the design criteria in the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, dated November 2016. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.
2. Post-construction stormwater management practice component – The *owner or operator* of any construction project identified in Table 2 of Appendix B as needing post-construction stormwater management practices shall prepare a SWPPP that includes practices designed in conformance with the applicable *sizing criteria* in Part I.C.2.a., c. or d. of this permit and the *performance criteria* in the technical standard, New York State Stormwater Management Design Manual dated January 2015

Where post-construction stormwater management practices are not designed in conformance with the *performance criteria* in the technical standard, the *owner or operator* must include in the SWPPP the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the technical standard.

The post-construction stormwater management practice component of the SWPPP shall include the following:

- a. Identification of all post-construction stormwater management practices to be constructed as part of the project. Include the dimensions, material specifications and installation details for each post-construction stormwater management practice;

- b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;
- c. A Stormwater Modeling and Analysis Report that includes:
 - (i) Map(s) showing pre-development conditions, including watershed/subcatchments boundaries, flow paths/routing, and design points;
 - (ii) Map(s) showing post-development conditions, including watershed/subcatchments boundaries, flow paths/routing, design points and post-construction stormwater management practices;
 - (iii) Results of stormwater modeling (i.e. hydrology and hydraulic analysis) for the required storm events. Include supporting calculations (model runs), methodology, and a summary table that compares pre and post-development runoff rates and volumes for the different storm events;
 - (iv) Summary table, with supporting calculations, which demonstrates that each post-construction stormwater management practice has been designed in conformance with the *sizing criteria* included in the Design Manual;
 - (v) Identification of any *sizing criteria* that is not required based on the requirements included in Part I.C. of this permit; and
 - (vi) Identification of any elements of the design that are not in conformance with the *performance criteria* in the Design Manual. Include the reason(s) for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is *equivalent* to the Design Manual;
- d. Soil testing results and locations (test pits, borings);
- e. Infiltration test results, when required; and
- f. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each post-construction stormwater management practice. The plan shall identify the entity that will be responsible for the long term operation and maintenance of each practice.

3. Enhanced Phosphorus Removal Standards - All construction projects identified in Table 2 of Appendix B that are located in the watersheds identified in Appendix C shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the applicable *sizing criteria* in Part I.C.2. b., c. or d. of this permit and the *performance criteria*, Enhanced Phosphorus Removal Standards included in the Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items 2.a - 2.f. above.

C. Required SWPPP Components by Project Type

Unless otherwise notified by the Department, *owners or operators of construction activities* identified in Table 1 of Appendix B are required to prepare a SWPPP that only includes erosion and sediment control practices designed in conformance with Part III.B.1 of this permit. *Owners or operators of the construction activities* identified in Table 2 of Appendix B shall prepare a SWPPP that also includes post-construction stormwater management practices designed in conformance with Part III.B.2 or 3 of this permit.

Part IV. INSPECTION AND MAINTENANCE REQUIREMENTS

A. General Construction Site Inspection and Maintenance Requirements

1. The *owner or operator* must ensure that all erosion and sediment control practices (including pollution prevention measures) and all post-construction stormwater management practices identified in the SWPPP are inspected and maintained in accordance with Part IV.B. and C. of this permit.
2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the ECL, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York or protect the public health and safety and/or the environment.

B. Contractor Maintenance Inspection Requirements

1. The *owner or operator* of each *construction activity* identified in Tables 1 and 2 of Appendix B shall have a *trained contractor* inspect the erosion and sediment control practices and pollution prevention measures being implemented within the active work area daily to ensure that they are being maintained in effective operating condition at all times. If deficiencies are identified, the contractor shall

begin implementing corrective actions within one business day and shall complete the corrective actions in a reasonable time frame.

2. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *trained contractor* can stop conducting the maintenance inspections. The *trained contractor* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. of this permit as soon as soil disturbance activities resume.
3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *trained contractor* can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.

C. Qualified Inspector Inspection Requirements

The *owner or operator* shall have a *qualified inspector* conduct site inspections in conformance with the following requirements:

[Note: The *trained contractor* identified in Part III.A.6. and IV.B. of this permit **cannot** conduct the *qualified inspector* site inspections unless they meet the *qualified inspector* qualifications included in Appendix A. In order to perform these inspections, the *trained contractor* would have to be a:

- licensed Professional Engineer,
 - Certified Professional in Erosion and Sediment Control (CPESC),
 - New York State Erosion and Sediment Control Certificate Program holder
 - Registered Landscape Architect, or
 - someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity].
1. A *qualified inspector* shall conduct site inspections for all *construction activities* identified in Tables 1 and 2 of Appendix B, with the exception of:
 - a. the construction of a single family residential subdivision with 25% or less *impervious cover* at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located

in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;

- b. the construction of a single family home that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E;
 - c. construction on agricultural property that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres; and
 - d. *construction activities* located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.
2. Unless otherwise notified by the Department, the *qualified inspector* shall conduct site inspections in accordance with the following timetable:
- a. For construction sites where soil disturbance activities are on-going, the *qualified inspector* shall conduct a site inspection at least once every seven (7) calendar days.
 - b. For construction sites where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part II.D.3 to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.
 - c. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and *temporary stabilization* measures have been applied to all disturbed areas, the *qualified inspector* shall conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4*, the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to reducing the frequency of inspections.

- d. For construction sites where soil disturbance activities have been shut down with partial project completion, the *qualified inspector* can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The *owner or operator* shall notify the DOW Water (SPDES) Program contact at the Regional Office (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4*, the *regulated, traditional land use control MS4* (provided the *regulated, traditional land use control MS4* is not the *owner or operator* of the *construction activity*) in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* shall have the *qualified inspector* perform a final inspection and certify that all disturbed areas have achieved *final stabilization*, and all temporary, structural erosion and sediment control measures have been removed; and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the “*Final Stabilization*” and “*Post-Construction Stormwater Management Practice*” certification statements on the NOT. The *owner or operator* shall then submit the completed NOT form to the address in Part II.B.1 of this permit.
 - e. For construction sites that directly *discharge* to one of the 303(d) segments listed in Appendix E or is located in one of the watersheds listed in Appendix C, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.
3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices and pollution prevention measures to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved *final stabilization*, all points of *discharge* to natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the *construction site*, and all points of *discharge* from the *construction site*.
 4. The *qualified inspector* shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

- a. Date and time of inspection;
- b. Name and title of person(s) performing inspection;
- c. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;
- d. A description of the condition of the runoff at all points of *discharge* from the *construction site*. This shall include identification of any *discharges* of sediment from the *construction site*. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;
- e. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the *construction site* which receive runoff from disturbed areas. This shall include identification of any *discharges* of sediment to the surface waterbody;
- f. Identification of all erosion and sediment control practices and pollution prevention measures that need repair or maintenance;
- g. Identification of all erosion and sediment control practices and pollution prevention measures that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;
- h. Description and sketch of areas with active soil disturbance activity, areas that have been disturbed but are inactive at the time of the inspection, and areas that have been stabilized (temporary and/or final) since the last inspection;
- i. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;
- j. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices and pollution prevention measures; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s);
- k. Identification and status of all corrective actions that were required by previous inspection; and

- I. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.
5. Within one business day of the completion of an inspection, the *qualified inspector* shall notify the *owner or operator* and appropriate contractor or subcontractor identified in Part III.A.6. of this permit of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.
6. All inspection reports shall be signed by the *qualified inspector*. Pursuant to Part II.D.2. of this permit, the inspection reports shall be maintained on site with the SWPPP.

Part V. TERMINATION OF PERMIT COVERAGE

A. Termination of Permit Coverage

1. An *owner or operator* that is eligible to terminate coverage under this permit must submit a completed NOT form to the address in Part II.B.1 of this permit. The NOT form shall be one which is associated with this permit, signed in accordance with Part VII.H of this permit.
2. An *owner or operator* may terminate coverage when one or more the following conditions have been met:
 - a. Total project completion - All *construction activity* identified in the SWPPP has been completed; and all areas of disturbance have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are operational;

- b. Planned shutdown with partial project completion - All soil disturbance activities have ceased; and all areas disturbed as of the project shutdown date have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational;
 - c. A new *owner or operator* has obtained coverage under this permit in accordance with Part II.F. of this permit.
 - d. The *owner or operator* obtains coverage under an alternative SPDES general permit or an individual SPDES permit.
3. For *construction activities* meeting subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *qualified inspector* perform a final site inspection prior to submitting the NOT. The *qualified inspector* shall, by signing the “*Final Stabilization*” and “Post-Construction Stormwater Management Practice certification statements on the NOT, certify that all the requirements in Part V.A.2.a. or b. of this permit have been achieved.
4. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4* and meet subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *regulated, traditional land use control MS4* sign the “MS4 Acceptance” statement on the NOT in accordance with the requirements in Part VII.H. of this permit. The *regulated, traditional land use control MS4* official, by signing this statement, has determined that it is acceptable for the *owner or operator* to submit the NOT in accordance with the requirements of this Part. The *regulated, traditional land use control MS4* can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector’s* final site inspection certification(s) required in Part V.A.3. of this permit.
5. For *construction activities* that require post-construction stormwater management practices and meet subdivision 2a. of this Part, the *owner or operator* must, prior to submitting the NOT, ensure one of the following:
- a. the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,

- b. an executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s),
- c. for post-construction stormwater management practices that are privately owned, the *owner or operator* has a mechanism 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,
- d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university, hospital), government agency or authority, or public utility; the *owner or operator* has policy and procedures in place that ensures operation and maintenance of the practices in accordance with the operation and maintenance plan.

Part VI. REPORTING AND RETENTION RECORDS

A. Record Retention

The *owner or operator* shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the Department receives a complete NOT submitted in accordance with Part V. of this general permit.

B. Addresses

With the exception of the NOI, NOT, and MS4 SWPPP Acceptance form (which must be submitted to the address referenced in Part II.B.1 of this permit), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate DOW Water (SPDES) Program contact at the Regional Office listed in Appendix F.

Part VII. STANDARD PERMIT CONDITIONS

A. Duty to Comply

The *owner or operator* must comply with all conditions of this permit. All contractors and subcontractors associated with the project must comply with the terms of the SWPPP. Any non-compliance with this permit constitutes a violation of the Clean Water

Act (CWA) and the ECL and is grounds for an enforcement action against the *owner or operator* and/or the contractor/subcontractor; permit revocation, suspension or modification; or denial of a permit renewal application. Upon a finding of significant non-compliance with this permit or the applicable SWPPP, the Department may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied. The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the *owner or operator*.

If any human remains or archaeological remains are encountered during excavation, the *owner or operator* must immediately cease, or cause to cease, all *construction activity* in the area of the remains and notify the appropriate Regional Water Engineer (RWE). *Construction activity* shall not resume until written permission to do so has been received from the RWE.

B. Continuation of the Expired General Permit

This permit expires five (5) years from the effective date. If a new general permit is not issued prior to the expiration of this general permit, an *owner or operator* with coverage under this permit may continue to operate and *discharge* in accordance with the terms and conditions of this general permit, if it is extended pursuant to the State Administrative Procedure Act and 6 NYCRR Part 621, until a new general permit is issued.

C. Enforcement

Failure of the *owner or operator*, its contractors, subcontractors, agents and/or assigns to strictly adhere to any of the permit requirements contained herein shall constitute a violation of this permit. There are substantial criminal, civil, and administrative penalties associated with violating the provisions of this permit. Fines of up to \$37,500 per day for each violation and imprisonment for up to fifteen (15) years may be assessed depending upon the nature and degree of the offense.

D. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for an *owner or operator* in an enforcement action that it would have been necessary to halt or reduce the *construction activity* in order to maintain compliance with the conditions of this permit.

E. Duty to Mitigate

The *owner or operator* and its contractors and subcontractors shall take all reasonable steps to *minimize* or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

F. Duty to Provide Information

The *owner or operator* shall furnish to the Department, within a reasonable specified time period of a written request, all documentation necessary to demonstrate eligibility and any information to determine compliance with this permit or to determine whether cause exists for modifying or revoking this permit, or suspending or denying coverage under this permit, in accordance with the terms and conditions of this permit. The NOI, SWPPP and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five (5) business days of the *owner or operator* receiving a written request by any such person to review these documents. Copying of documents will be done at the requester's expense.

G. Other Information

When the *owner or operator* becomes aware that they failed to submit any relevant facts, or submitted incorrect information in the NOI or in any of the documents required by this permit, or have made substantive revisions to the SWPPP (e.g. the scope of the project changes significantly, the type of post-construction stormwater management practice(s) changes, there is a reduction in the sizing of the post-construction stormwater management practice, or there is an increase in the disturbance area or *impervious area*), which were not reflected in the original NOI submitted to the Department, they shall promptly submit such facts or information to the Department using the contact information in Part II.A. of this permit. Failure of the *owner or operator* to correct or supplement any relevant facts within five (5) business days of becoming aware of the deficiency shall constitute a violation of this permit.

H. Signatory Requirements

1. All NOIs and NOTs shall be signed as follows:
 - a. For a corporation these forms shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

- (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or
 - (ii) the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;
 - b. For a partnership or sole proprietorship these forms shall be signed by a general partner or the proprietor, respectively; or
 - c. For a municipality, State, Federal, or other public agency these forms shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:
 - (i) the chief executive officer of the agency, or
 - (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).
2. The SWPPP and other information requested by the Department shall be signed by a person described in Part VII.H.1. of this permit or by a duly authorized representative of that person. A person is a duly authorized representative only if:
- a. The authorization is made in writing by a person described in Part VII.H.1. of this permit;
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field,

superintendent, position of *equivalent* responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position) and,

- c. The written authorization shall include the name, title and signature of the authorized representative and be attached to the SWPPP.
3. All inspection reports shall be signed by the *qualified inspector* that performs the inspection.
4. The MS4 SWPPP Acceptance form shall be signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4*, or by a duly authorized representative of that person.

It shall constitute a permit violation if an incorrect and/or improper signatory authorizes any required forms, SWPPP and/or inspection reports.

I. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations. *Owners or operators* must obtain any applicable conveyances, easements, licenses and/or access to real property prior to *commencing construction activity*.

J. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

K. Requirement to Obtain Coverage Under an Alternative Permit

1. The Department may require any owner or operator authorized by this permit to apply for and/or obtain either an individual SPDES permit or another SPDES general permit. When the Department requires any discharger authorized by a general permit to apply for an individual SPDES permit, it shall notify the discharger in writing that a permit application is required. This notice shall

include a brief statement of the reasons for this decision, an application form, a statement setting a time frame for the owner or operator to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from owner or operator receipt of the notification letter, whereby the authorization to discharge under this general permit shall be terminated. Applications must be submitted to the appropriate Permit Administrator at the Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Department, that additional time to apply for an alternative authorization is necessary or where the Department has not provided a permit determination in accordance with Part 621 of this Title.

2. When an individual SPDES permit is issued to a discharger authorized to *discharge* under a general SPDES permit for the same *discharge(s)*, the general permit authorization for outfalls authorized under the individual SPDES permit is automatically terminated on the effective date of the individual permit unless termination is earlier in accordance with 6 NYCRR Part 750.

L. Proper Operation and Maintenance

The *owner or operator* shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the *owner or operator* to achieve compliance with the conditions of this permit and with the requirements of the SWPPP.

M. Inspection and Entry

The *owner or operator* shall allow an authorized representative of the Department, EPA, applicable county health department, or, in the case of a *construction site* which *discharges* through an *MS4*, an authorized representative of the *MS4* receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the owner's or operator's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;
2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment), practices or operations regulated or required by this permit.
4. Sample or monitor at reasonable times, for purposes of assuring permit compliance or as otherwise authorized by the Act or ECL, any substances or parameters at any location.

N. Permit Actions

This permit may, at any time, be modified, suspended, revoked, or renewed by the Department in accordance with 6 NYCRR Part 621. The filing of a request by the *owner or operator* for a permit modification, revocation and reissuance, termination, a notification of planned changes or anticipated noncompliance does not limit, diminish and/or stay compliance with any terms of this permit.

O. Definitions

Definitions of key terms are included in Appendix A of this permit.

P. Re-Opener Clause

1. If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with construction activity covered by this permit, the owner or operator of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part VII.K. of this permit or the permit may be modified to include different limitations and/or requirements.
2. Any Department initiated permit modification, suspension or revocation will be conducted in accordance with 6 NYCRR Part 621, 6 NYCRR 750-1.18, and 6 NYCRR 750-1.20.

Q. Penalties for Falsification of Forms and Reports

In accordance with 6NYCRR Part 750-2.4 and 750-2.5, any person who knowingly makes any false material statement, representation, or certification in any application, record, report or other document filed or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished in accordance with ECL §71-1933 and or Articles 175 and 210 of the New York State Penal Law.

R. Other Permits

Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

APPENDIX A – Acronyms and Definitions

Acronyms

APO – Agency Preservation Officer
BMP – Best Management Practice
CPESC – Certified Professional in Erosion and Sediment Control
Cpv – Channel Protection Volume
CWA – Clean Water Act (or the Federal Water Pollution Control Act, 33 U.S.C. §1251 et seq)
DOW – Division of Water
EAF – Environmental Assessment Form
ECL - Environmental Conservation Law
EPA – U. S. Environmental Protection Agency
HSG – Hydrologic Soil Group
MS4 – Municipal Separate Storm Sewer System
NOI – Notice of Intent
NOT – Notice of Termination
NPDES – National Pollutant Discharge Elimination System
OPRHP – Office of Parks, Recreation and Historic Places
Qf – Extreme Flood
Qp – Overbank Flood
RRv – Runoff Reduction Volume
RWE – Regional Water Engineer
SEQR – State Environmental Quality Review
SEQRA - State Environmental Quality Review Act
SHPA – State Historic Preservation Act
SPDES – State Pollutant Discharge Elimination System
SWPPP – Stormwater Pollution Prevention Plan
TMDL – Total Maximum Daily Load
UPA – Uniform Procedures Act
USDA – United States Department of Agriculture
WQv – Water Quality Volume

Definitions

All definitions in this section are solely for the purposes of this permit.

Agricultural Building – a structure designed and constructed to house farm implements, hay, grain, poultry, livestock or other horticultural products; excluding any structure designed, constructed or used, in whole or in part, for human habitation, as a place of employment where agricultural products are processed, treated or packaged, or as a place used by the public.

Agricultural Property – means the land for construction of a barn, *agricultural building*, silo, stockyard, pen or other structural practices identified in Table II in the “Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State” prepared by the Department in cooperation with agencies of New York Nonpoint Source Coordinating Committee (dated June 2007).

Alter Hydrology from Pre to Post-Development Conditions - means the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer - means a sewer that is designed to collect and convey both “sewage” and “stormwater”.

Commence (Commencement of) Construction Activities - means the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the SWPPP. See definition for “*Construction Activity(ies)*” also.

Construction Activity(ies) - means any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Construction Site – means the land area where *construction activity(ies)* will occur. See definition for “*Commence (Commencement of) Construction Activities*” and “*Larger Common Plan of Development or Sale*” also.

Dewatering – means the act of draining rainwater and/or groundwater from building foundations, vaults or excavations/trenches.

Direct Discharge (to a specific surface waterbody) - means that runoff flows from a *construction site* by overland flow and the first point of discharge is the specific surface waterbody, or runoff flows from a *construction site* to a separate storm sewer system

and the first point of discharge from the separate storm sewer system is the specific surface waterbody.

Discharge(s) - means any addition of any pollutant to waters of the State through an outlet or *point source*.

Embankment – means an earthen or rock slope that supports a road/highway.

Endangered or Threatened Species – see 6 NYCRR Part 182 of the Department's rules and regulations for definition of terms and requirements.

Environmental Conservation Law (ECL) - means chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law.

Equivalent (Equivalence) – means that the practice or measure meets all the performance, longevity, maintenance, and safety objectives of the technical standard and will provide an equal or greater degree of water quality protection.

Final Stabilization - means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

General SPDES permit - means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 and Section 70-0117 of the ECL authorizing a category of discharges.

Groundwater(s) - means waters in the saturated zone. The saturated zone is a subsurface zone in which all the interstices are filled with water under pressure greater than that of the atmosphere. Although the zone may contain gas-filled interstices or interstices filled with fluids other than water, it is still considered saturated.

Historic Property – means any building, structure, site, object or district that is listed on the State or National Registers of Historic Places or is determined to be eligible for listing on the State or National Registers of Historic Places.

Impervious Area (Cover) - means all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

Infeasible – means not technologically possible, or not economically practicable and achievable in light of best industry practices.

Larger Common Plan of Development or Sale - means a contiguous area where multiple separate and distinct *construction activities* are occurring, or will occur, under one plan. The term “plan” in “larger common plan of development or sale” is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQRA) environmental assessment form or other documents, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that *construction activities* may occur on a specific plot.

For discrete construction projects that are located within a larger common plan of development or sale that are at least 1/4 mile apart, each project can be treated as a separate plan of development or sale provided any interconnecting road, pipeline or utility project that is part of the same “common plan” is not concurrently being disturbed.

Minimize – means reduce and/or eliminate to the extent achievable using control measures (including best management practices) that are technologically available and economically practicable and achievable in light of best industry practices.

Municipal Separate Storm Sewer (MS4) - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

- (i) Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to surface waters of the State;
- (ii) Designed or used for collecting or conveying stormwater;
- (iii) Which is not a *combined sewer*; and
- (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES) - means the national system for the issuance of wastewater and stormwater permits under the Federal Water Pollution Control Act (Clean Water Act).

Natural Buffer – means an undisturbed area with natural cover running along a surface water (e.g. wetland, stream, river, lake, etc.).

New Development – means any land disturbance that does not meet the definition of Redevelopment Activity included in this appendix.

New York State Erosion and Sediment Control Certificate Program – a certificate program that establishes and maintains a process to identify and recognize individuals who are capable of developing, designing, inspecting and maintaining erosion and sediment control plans on projects that disturb soils in New York State. The certificate program is administered by the New York State Conservation District Employees Association.

NOI Acknowledgment Letter - means the letter that the Department sends to an owner or operator to acknowledge the Department's receipt and acceptance of a complete Notice of Intent. This letter documents the owner's or operator's authorization to discharge in accordance with the general permit for stormwater discharges from *construction activity*.

Nonpoint Source - means any source of water pollution or pollutants which is not a discrete conveyance or *point source* permitted pursuant to Title 7 or 8 of Article 17 of the Environmental Conservation Law (see ECL Section 17-1403).

Overbank –means flow events that exceed the capacity of the stream channel and spill out into the adjacent floodplain.

Owner or Operator - means the person, persons or legal entity which owns or leases the property on which the *construction activity* is occurring; an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications; and/or an entity that has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions.

Performance Criteria – means the design criteria listed under the “Required Elements” sections in Chapters 5, 6 and 10 of the technical standard, New York State Stormwater Management Design Manual, dated January 2015. It does not include the Sizing Criteria (i.e. WQv, RRv, Cpv, Qp and Qf) in Part I.C.2. of the permit.

Point Source - means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel or other floating craft, or landfill leachate collection system from which *pollutants* are or may be discharged.

Pollutant - means dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast discharged into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in 6 NYCRR Parts 700 et seq .

Qualified Inspector - means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, New York State Erosion and Sediment Control Certificate Program holder or other Department endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

Qualified Professional - means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other Department endorsed individual(s). Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics. All components of the SWPPP that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.

Redevelopment Activity(ies) – means the disturbance and reconstruction of existing impervious area, including impervious areas that were removed from a project site within five (5) years of preliminary project plan submission to the local government (i.e. site plan, subdivision, etc.).

Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is authorized to discharge under New York State DEC's

SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s) or the City of New York's Individual SPDES Permit for their Municipal Separate Storm Sewer Systems (NY-0287890).

Routine Maintenance Activity - means *construction activity* that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, including, but not limited to:

- Re-grading of gravel roads or parking lots,
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and hydraulic capacity of the ditch,
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch),
- Placement of aggregate shoulder backing that stabilizes the transition between the road shoulder and the ditch or *embankment*,
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material,
- Long-term use of equipment storage areas at or near highway maintenance facilities,
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or *embankment*,
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts.

Site limitations – means site conditions that prevent the use of an infiltration technique and or infiltration of the total WQv. Typical site limitations include: seasonal high groundwater, shallow depth to bedrock, and soils with an infiltration rate less than 0.5 inches/hour. The existence of site limitations shall be confirmed and documented using actual field testing (i.e. test pits, soil borings, and infiltration test) or using information from the most current United States Department of Agriculture (USDA) Soil Survey for the County where the project is located.

Sizing Criteria – means the criteria included in Part I.C.2 of the permit that are used to size post-construction stormwater management control practices. The criteria include; Water Quality Volume (WQv), Runoff Reduction Volume (RRv), Channel Protection Volume (Cpv), *Overbank Flood* (Qp), and *Extreme Flood* (Qf).

State Pollutant Discharge Elimination System (SPDES) - means the system established pursuant to Article 17 of the ECL and 6 NYCRR Part 750 for issuance of permits authorizing discharges to the waters of the state.

Steep Slope – means land area designated on the current United States Department of Agriculture (“USDA”) Soil Survey as Soil Slope Phase “D”, (provided the map unit name is inclusive of slopes greater than 25%) , or Soil Slope Phase E or F, (regardless of the map unit name), or a combination of the three designations.

Streambank – as used in this permit, means the terrain alongside the bed of a creek or stream. The bank consists of the sides of the channel, between which the flow is confined.

Stormwater Pollution Prevention Plan (SWPPP) – means a project specific report, including construction drawings, that among other things: describes the construction activity(ies), identifies the potential sources of pollution at the *construction site*; describes and shows the stormwater controls that will be used to control the pollutants (i.e. erosion and sediment controls; for many projects, includes post-construction stormwater management controls); and identifies procedures the *owner or operator* will implement to comply with the terms and conditions of the permit. See Part III of the permit for a complete description of the information that must be included in the SWPPP.

Surface Waters of the State - shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporarily Ceased – means that an existing disturbed area will not be disturbed again within 14 calendar days of the previous soil disturbance.

Temporary Stabilization - means that exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Total Maximum Daily Loads (TMDLs) - A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and *nonpoint sources*. It is a calculation of the maximum amount of a pollutant that a waterbody can receive on a daily basis and still meet *water quality standards*, and an allocation of that amount to the pollutant's sources. A TMDL stipulates wasteload allocations (WLAs) for *point source* discharges, load allocations (LAs) for *nonpoint sources*, and a margin of safety (MOS).

Trained Contractor - means an employee from the contracting (construction) company, identified in Part III.A.6., that has received four (4) hours of Department endorsed

training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.6., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, New York State Erosion and Sediment Control Certificate Program holder, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity).

The *trained contractor* is responsible for the day to day implementation of the SWPPP.

Uniform Procedures Act (UPA) Permit - means a permit required under 6 NYCRR Part 621 of the Environmental Conservation Law (ECL), Article 70.

Water Quality Standard - means such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

APPENDIX B – Required SWPPP Components by Project Type

Table 1
Construction Activities that Require the Preparation of a SWPPP That Only Includes Erosion and Sediment Controls

<p>The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres:</p> <ul style="list-style-type: none">• Single family home <u>not</u> located in one of the watersheds listed in Appendix C or <u>not directly discharging</u> to one of the 303(d) segments listed in Appendix E• Single family residential subdivisions with 25% or less impervious cover at total site build-out and <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E• Construction of a barn or other <i>agricultural building</i>, silo, stock yard or pen.
<p>The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land:</p> <p>All construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.</p>
<p>The following construction activities that involve soil disturbances of one (1) or more acres of land:</p> <ul style="list-style-type: none">• Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains• Environmental enhancement projects, such as wetland mitigation projects, stormwater retrofits and stream restoration projects• Pond construction• Linear bike paths running through areas with vegetative cover, including bike paths surfaced with an impervious cover• Cross-country ski trails and walking/hiking trails• Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are not part of residential, commercial or institutional development;• Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that include incidental shoulder or curb work along an existing highway to support construction of the sidewalk, bike path or walking path.• Slope stabilization projects• Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics

**Table 1 (Continued) CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP
THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS**

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Spoil areas that will be covered with vegetation
- Vegetated open space projects (i.e. recreational parks, lawns, meadows, fields, downhill ski trails) excluding projects that *alter hydrology from pre to post development* conditions,
- Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre to post development* conditions
- Demolition project where vegetation will be established, and no redevelopment is planned
- Overhead electric transmission line project that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover*
- Structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State", excluding projects that involve soil disturbances of greater than five acres and construction activities that include the construction or reconstruction of impervious area
- Temporary access roads, median crossovers, detour roads, lanes, or other temporary impervious areas that will be restored to pre-construction conditions once the construction activity is complete

Table 2
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES
POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Single family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family home that disturbs five (5) or more acres of land
- Single family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% impervious cover at total site build-out
- Single family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a larger common plan of development or sale that will ultimately disturb five or more acres of land
- Multi-family residential developments; includes duplexes, townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- Breweries, cideries, and wineries, including establishments constructed on agricultural land
- Campgrounds
- Cemeteries that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development conditions*
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other *agricultural building* (e.g. silo) and structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" that include the construction or reconstruction of *impervious area*, excluding projects that involve soil disturbances of less than five acres.
- Golf courses
- Institutional development; includes hospitals, prisons, schools and colleges
- Industrial facilities; includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's, water treatment plants, and water storage tanks
- Office complexes
- Playgrounds that include the construction or reconstruction of impervious area
- Sports complexes
- Racetracks; includes racetracks with earthen (dirt) surface
- Road construction or reconstruction, including roads constructed as part of the construction activities listed in Table 1

Table 2 (Continued)

CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Parking lot construction or reconstruction, including parking lots constructed as part of the construction activities listed in Table 1
- Athletic fields (natural grass) that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with *impervious cover*, and constructed as part of an over-head electric transmission line project, wind-power project, cell tower project, oil or gas well drilling project, sewer or water main project or other linear utility project
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are part of a residential, commercial or institutional development
- Sidewalk, bike path or walking path projects, surfaced with an impervious cover, that are part of a highway construction or reconstruction project
- All other construction activities that include the construction or reconstruction of *impervious area* or *alter the hydrology from pre to post development* conditions, and are not listed in Table 1

APPENDIX C – Watersheds Requiring Enhanced Phosphorus Removal

Watersheds where *owners or operators* of construction activities identified in Table 2 of Appendix B must prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the technical standard, New York State Stormwater Management Design Manual (“Design Manual”).

- Entire New York City Watershed located east of the Hudson River - Figure 1
- Onondaga Lake Watershed - Figure 2
- Greenwood Lake Watershed -Figure 3
- Oscawana Lake Watershed – Figure 4
- Kinderhook Lake Watershed – Figure 5

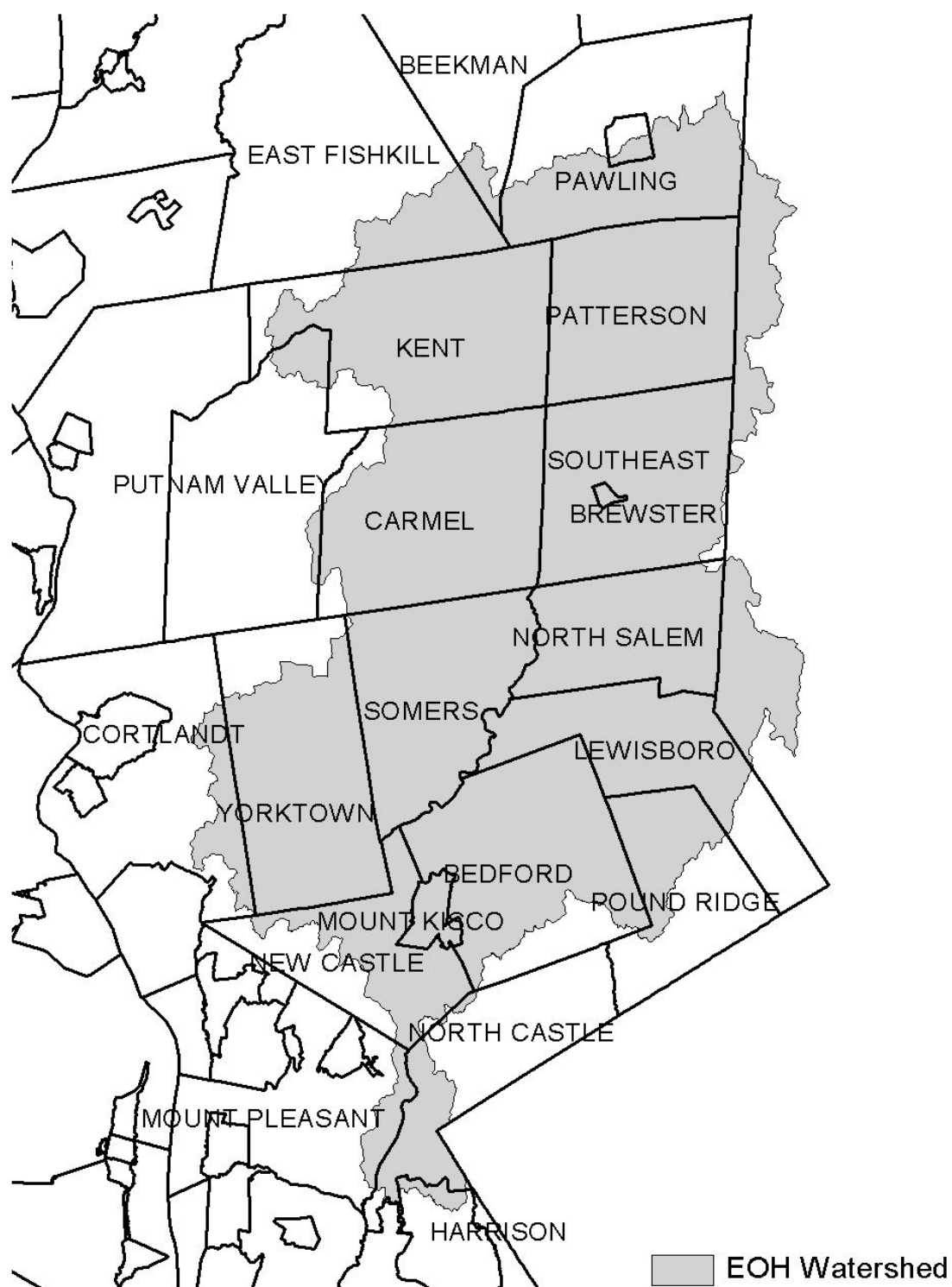
Figure 1 - New York City Watershed East of the Hudson

Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

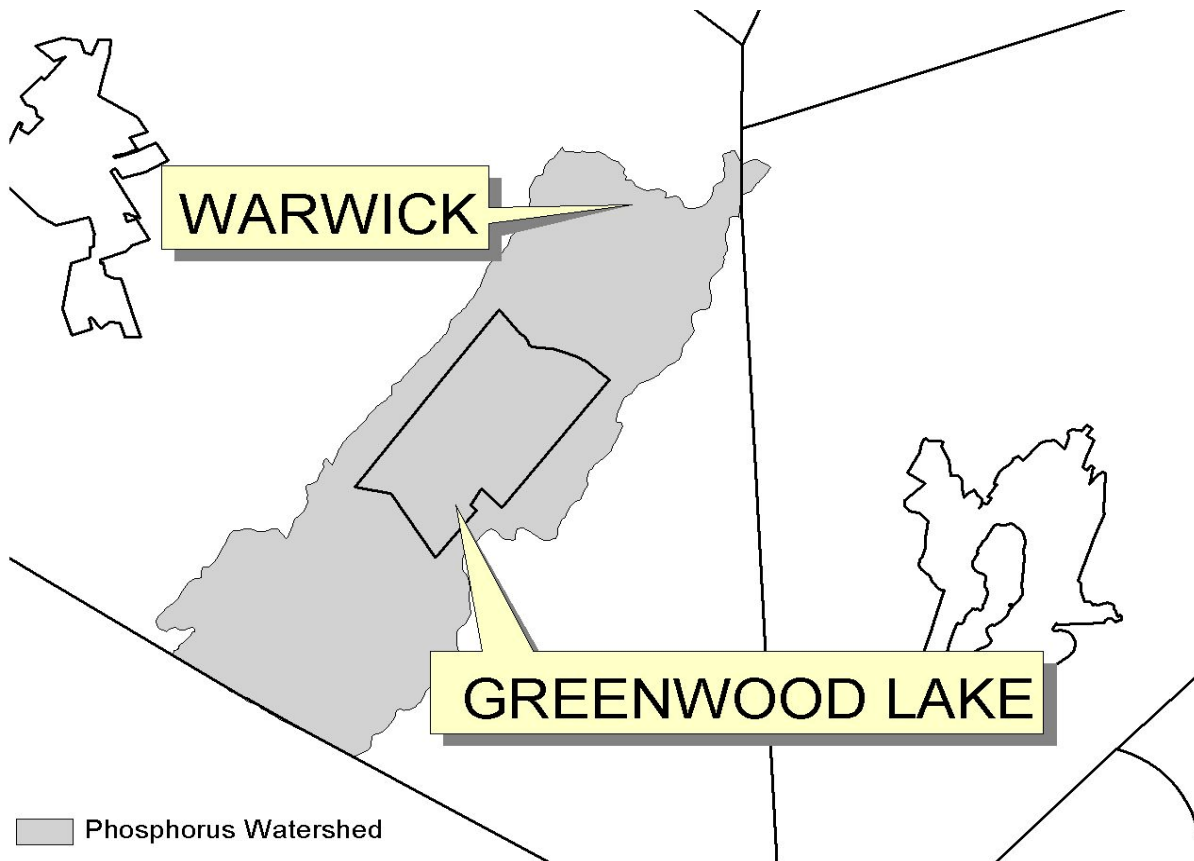


Figure 4 - Oscawana Lake Watershed

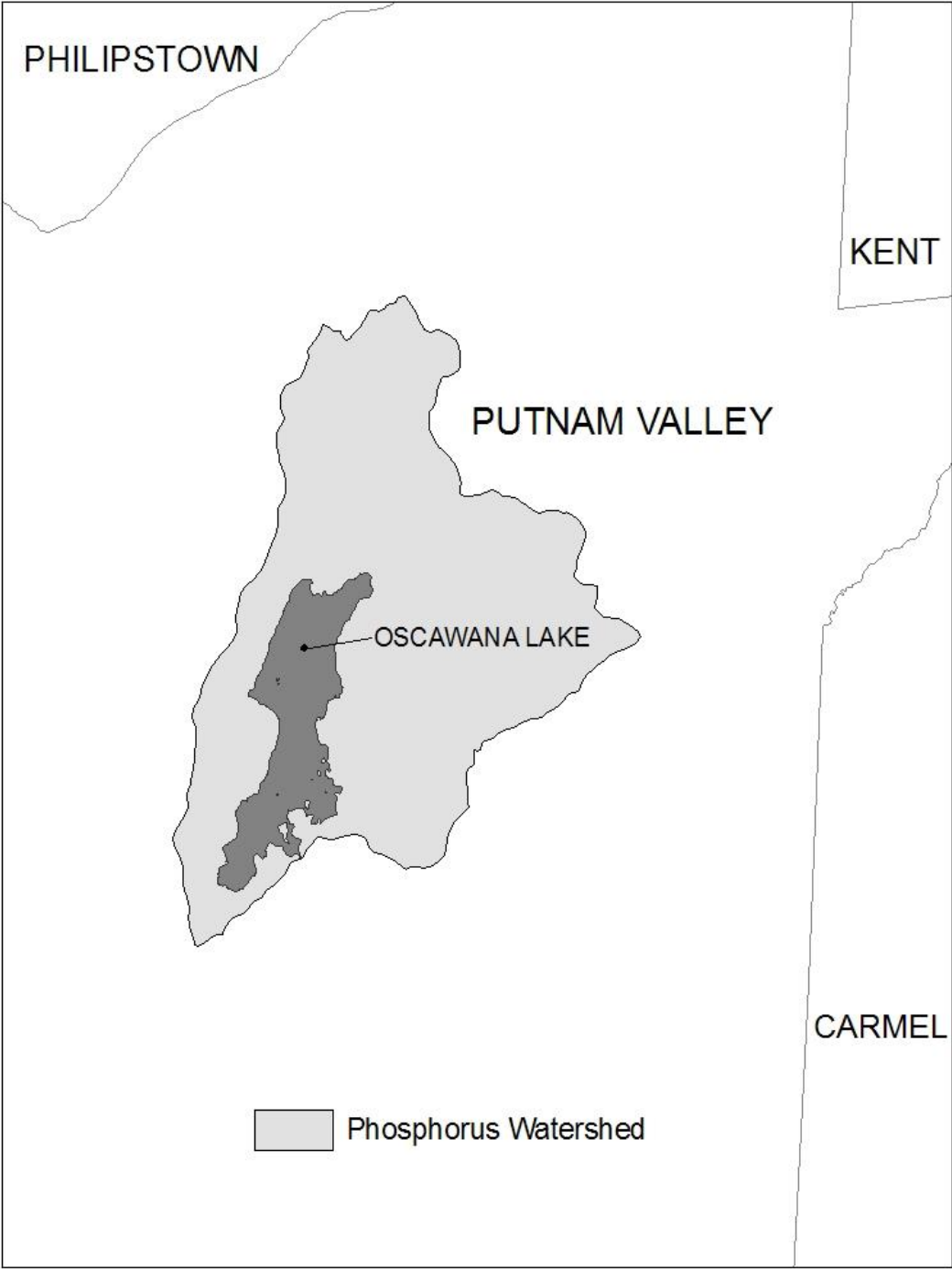
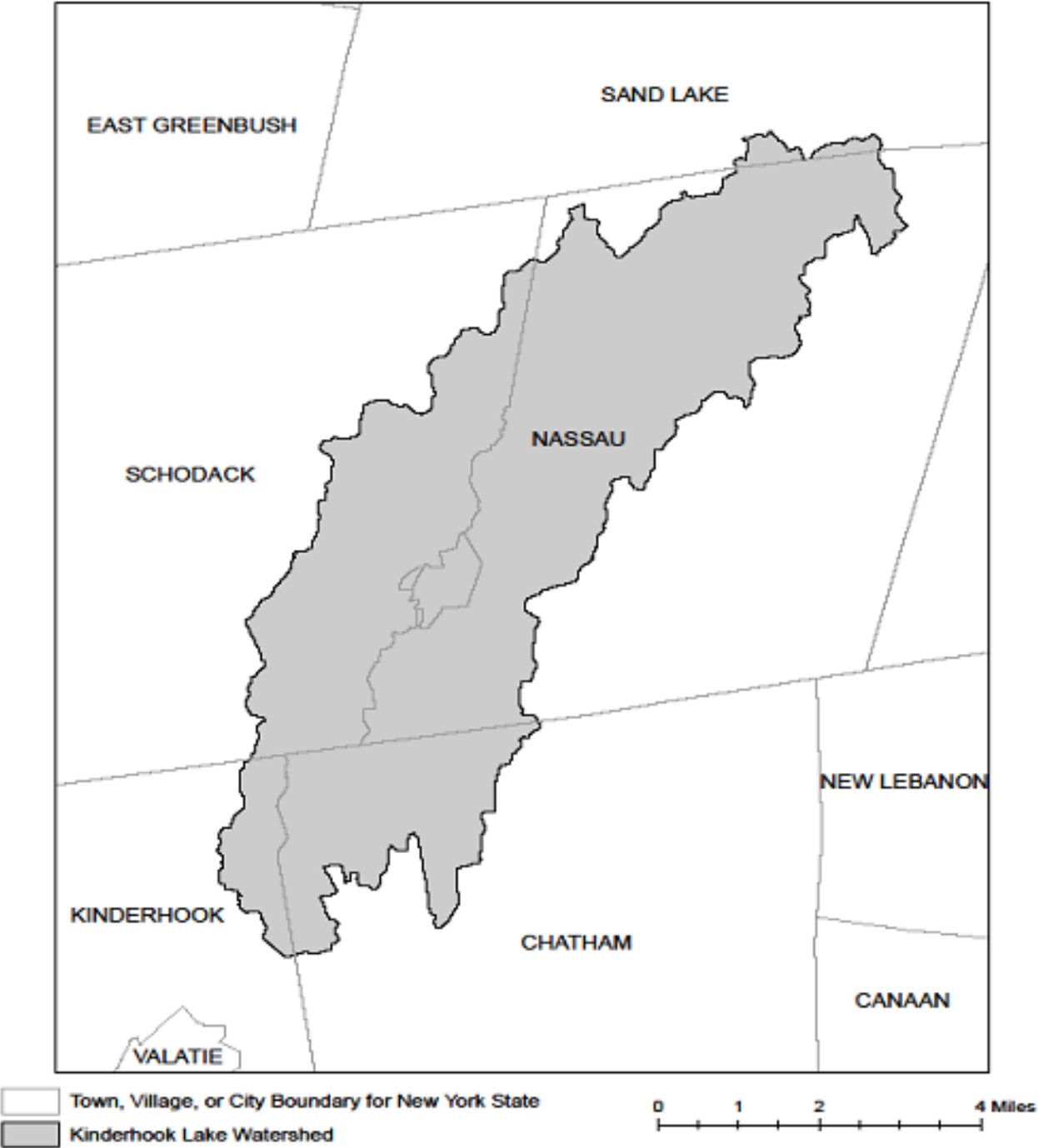


Figure 5 - Kinderhook Lake Watershed



APPENDIX D – Watersheds with Lower Disturbance Threshold

Watersheds where *owners or operators* of construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land must obtain coverage under this permit.

Entire New York City Watershed that is located east of the Hudson River - See Figure 1 in Appendix C
--

APPENDIX E – 303(d) Segments Impaired by Construction Related Pollutant(s)

List of 303(d) segments impaired by pollutants related to *construction activity* (e.g. silt, sediment or nutrients). The list was developed using "The Final New York State 2016 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy" dated November 2016. *Owners or operators* of single family home and single family residential subdivisions with 25% or less total impervious cover at total site build-out that involve soil disturbances of one or more acres of land, but less than 5 acres, and *directly discharge* to one of the listed segments below shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the New York State Stormwater Management Design Manual ("Design Manual"), dated January 2015.

COUNTY	WATERBODY	POLLUTANT
Albany	Ann Lee (Shakers) Pond, Stump Pond	Nutrients
Albany	Basic Creek Reservoir	Nutrients
Allegany	Amity Lake, Saunders Pond	Nutrients
Bronx	Long Island Sound, Bronx	Nutrients
Bronx	Van Cortlandt Lake	Nutrients
Broome	Fly Pond, Deer Lake, Sky Lake	Nutrients
Broome	Minor Tribs to Lower Susquehanna (north)	Nutrients
Broome	Whitney Point Lake/Reservoir	Nutrients
Cattaraugus	Allegheny River/Reservoir	Nutrients
Cattaraugus	Beaver (Alma) Lake	Nutrients
Cattaraugus	Case Lake	Nutrients
Cattaraugus	Linlyco/Club Pond	Nutrients
Cayuga	Duck Lake	Nutrients
Cayuga	Little Sodus Bay	Nutrients
Chautauqua	Bear Lake	Nutrients
Chautauqua	Chadakoin River and tribs	Nutrients
Chautauqua	Chautauqua Lake, North	Nutrients
Chautauqua	Chautauqua Lake, South	Nutrients
Chautauqua	Findley Lake	Nutrients
Chautauqua	Hulburt/Clymer Pond	Nutrients
Clinton	Great Chazy River, Lower, Main Stem	Silt/Sediment
Clinton	Lake Champlain, Main Lake, Middle	Nutrients
Clinton	Lake Champlain, Main Lake, North	Nutrients
Columbia	Kinderhook Lake	Nutrients
Columbia	Robinson Pond	Nutrients
Cortland	Dean Pond	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Dutchess	Fall Kill and tribs	Nutrients
Dutchess	Hillside Lake	Nutrients
Dutchess	Wappingers Lake	Nutrients
Dutchess	Wappingers Lake	Silt/Sediment
Erie	Beeman Creek and tribs	Nutrients
Erie	Ellicott Creek, Lower, and tribs	Silt/Sediment
Erie	Ellicott Creek, Lower, and tribs	Nutrients
Erie	Green Lake	Nutrients
Erie	Little Sister Creek, Lower, and tribs	Nutrients
Erie	Murder Creek, Lower, and tribs	Nutrients
Erie	Rush Creek and tribs	Nutrients
Erie	Scajaquada Creek, Lower, and tribs	Nutrients
Erie	Scajaquada Creek, Middle, and tribs	Nutrients
Erie	Scajaquada Creek, Upper, and tribs	Nutrients
Erie	South Branch Smoke Cr, Lower, and tribs	Silt/Sediment
Erie	South Branch Smoke Cr, Lower, and tribs	Nutrients
Essex	Lake Champlain, Main Lake, South	Nutrients
Essex	Lake Champlain, South Lake	Nutrients
Essex	Willsboro Bay	Nutrients
Genesee	Bigelow Creek and tribs	Nutrients
Genesee	Black Creek, Middle, and minor tribs	Nutrients
Genesee	Black Creek, Upper, and minor tribs	Nutrients
Genesee	Bowen Brook and tribs	Nutrients
Genesee	LeRoy Reservoir	Nutrients
Genesee	Oak Orchard Cr, Upper, and tribs	Nutrients
Genesee	Tonawanda Creek, Middle, Main Stem	Nutrients
Greene	Schoharie Reservoir	Silt/Sediment
Greene	Sleepy Hollow Lake	Silt/Sediment
Herkimer	Steele Creek tribs	Silt/Sediment
Herkimer	Steele Creek tribs	Nutrients
Jefferson	Moon Lake	Nutrients
Kings	Hendrix Creek	Nutrients
Kings	Prospect Park Lake	Nutrients
Lewis	Mill Creek/South Branch, and tribs	Nutrients
Livingston	Christie Creek and tribs	Nutrients
Livingston	Conesus Lake	Nutrients
Livingston	Mill Creek and minor tribs	Silt/Sediment
Monroe	Black Creek, Lower, and minor tribs	Nutrients
Monroe	Buck Pond	Nutrients
Monroe	Cranberry Pond	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Monroe	Lake Ontario Shoreline, Western	Nutrients
Monroe	Long Pond	Nutrients
Monroe	Mill Creek and tribs	Nutrients
Monroe	Mill Creek/Blue Pond Outlet and tribs	Nutrients
Monroe	Minor Tribs to Irondequoit Bay	Nutrients
Monroe	Rochester Embayment - East	Nutrients
Monroe	Rochester Embayment - West	Nutrients
Monroe	Shipbuilders Creek and tribs	Nutrients
Monroe	Thomas Creek/White Brook and tribs	Nutrients
Nassau	Beaver Lake	Nutrients
Nassau	Camaans Pond	Nutrients
Nassau	East Meadow Brook, Upper, and tribs	Silt/Sediment
Nassau	East Rockaway Channel	Nutrients
Nassau	Grant Park Pond	Nutrients
Nassau	Hempstead Bay	Nutrients
Nassau	Hempstead Lake	Nutrients
Nassau	Hewlett Bay	Nutrients
Nassau	Hog Island Channel	Nutrients
Nassau	Long Island Sound, Nassau County Waters	Nutrients
Nassau	Massapequa Creek and tribs	Nutrients
Nassau	Milburn/Parsonage Creeks, Upp, and tribs	Nutrients
Nassau	Reynolds Channel, west	Nutrients
Nassau	Tidal Tribs to Hempstead Bay	Nutrients
Nassau	Tribs (fresh) to East Bay	Nutrients
Nassau	Tribs (fresh) to East Bay	Silt/Sediment
Nassau	Tribs to Smith/Halls Ponds	Nutrients
Nassau	Woodmere Channel	Nutrients
New York	Harlem Meer	Nutrients
New York	The Lake in Central Park	Nutrients
Niagara	Bergholtz Creek and tribs	Nutrients
Niagara	Hyde Park Lake	Nutrients
Niagara	Lake Ontario Shoreline, Western	Nutrients
Niagara	Lake Ontario Shoreline, Western	Nutrients
Oneida	Ballou, Nail Creeks and tribs	Nutrients
Onondaga	Harbor Brook, Lower, and tribs	Nutrients
Onondaga	Ley Creek and tribs	Nutrients
Onondaga	Minor Tribs to Onondaga Lake	Nutrients
Onondaga	Ninemile Creek, Lower, and tribs	Nutrients
Onondaga	Onondaga Creek, Lower, and tribs	Nutrients
Onondaga	Onondaga Creek, Middle, and tribs	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Onondaga	Onondaga Lake, northern end	Nutrients
Onondaga	Onondaga Lake, southern end	Nutrients
Ontario	Great Brook and minor tribs	Silt/Sediment
Ontario	Great Brook and minor tribs	Nutrients
Ontario	Hemlock Lake Outlet and minor tribs	Nutrients
Ontario	Honeoye Lake	Nutrients
Orange	Greenwood Lake	Nutrients
Orange	Monhagen Brook and tribs	Nutrients
Orange	Orange Lake	Nutrients
Orleans	Lake Ontario Shoreline, Western	Nutrients
Orleans	Lake Ontario Shoreline, Western	Nutrients
Oswego	Lake Neatahwanta	Nutrients
Oswego	Pleasant Lake	Nutrients
Putnam	Bog Brook Reservoir	Nutrients
Putnam	Boyd Corners Reservoir	Nutrients
Putnam	Croton Falls Reservoir	Nutrients
Putnam	Diverting Reservoir	Nutrients
Putnam	East Branch Reservoir	Nutrients
Putnam	Lake Carmel	Nutrients
Putnam	Middle Branch Reservoir	Nutrients
Putnam	Oscawana Lake	Nutrients
Putnam	Palmer Lake	Nutrients
Putnam	West Branch Reservoir	Nutrients
Queens	Bergen Basin	Nutrients
Queens	Flushing Creek/Bay	Nutrients
Queens	Jamaica Bay, Eastern, and tribs (Queens)	Nutrients
Queens	Kissena Lake	Nutrients
Queens	Meadow Lake	Nutrients
Queens	Willow Lake	Nutrients
Rensselaer	Nassau Lake	Nutrients
Rensselaer	Snyders Lake	Nutrients
Richmond	Grasmere Lake/Bradys Pond	Nutrients
Rockland	Congers Lake, Swartout Lake	Nutrients
Rockland	Rockland Lake	Nutrients
Saratoga	Ballston Lake	Nutrients
Saratoga	Dwaas Kill and tribs	Silt/Sediment
Saratoga	Dwaas Kill and tribs	Nutrients
Saratoga	Lake Lonely	Nutrients
Saratoga	Round Lake	Nutrients
Saratoga	Tribs to Lake Lonely	Nutrients

303(d) Segments Impaired by Construction Related Pollutant(s)

Schenectady	Collins Lake	Nutrients
Schenectady	Duane Lake	Nutrients
Schenectady	Mariaville Lake	Nutrients
Schoharie	Engleville Pond	Nutrients
Schoharie	Summit Lake	Nutrients
Seneca	Reeder Creek and tribs	Nutrients
St.Lawrence	Black Lake Outlet/Black Lake	Nutrients
St.Lawrence	Fish Creek and minor tribs	Nutrients
Steuben	Smith Pond	Nutrients
Suffolk	Agawam Lake	Nutrients
Suffolk	Big/Little Fresh Ponds	Nutrients
Suffolk	Canaan Lake	Silt/Sediment
Suffolk	Canaan Lake	Nutrients
Suffolk	Flanders Bay, West/Lower Sawmill Creek	Nutrients
Suffolk	Fresh Pond	Nutrients
Suffolk	Great South Bay, East	Nutrients
Suffolk	Great South Bay, Middle	Nutrients
Suffolk	Great South Bay, West	Nutrients
Suffolk	Lake Ronkonkoma	Nutrients
Suffolk	Long Island Sound, Suffolk County, West	Nutrients
Suffolk	Mattituck (Marratooka) Pond	Nutrients
Suffolk	Meetinghouse/Terrys Creeks and tribs	Nutrients
Suffolk	Mill and Seven Ponds	Nutrients
Suffolk	Millers Pond	Nutrients
Suffolk	Moriches Bay, East	Nutrients
Suffolk	Moriches Bay, West	Nutrients
Suffolk	Peconic River, Lower, and tidal tribs	Nutrients
Suffolk	Quantuck Bay	Nutrients
Suffolk	Shinnecock Bay and Inlet	Nutrients
Suffolk	Tidal tribs to West Moriches Bay	Nutrients
Sullivan	Bodine, Montgomery Lakes	Nutrients
Sullivan	Davies Lake	Nutrients
Sullivan	Evens Lake	Nutrients
Sullivan	Pleasure Lake	Nutrients
Tompkins	Cayuga Lake, Southern End	Nutrients
Tompkins	Cayuga Lake, Southern End	Silt/Sediment
Tompkins	Owasco Inlet, Upper, and tribs	Nutrients
Ulster	Ashokan Reservoir	Silt/Sediment
Ulster	Esopus Creek, Upper, and minor tribs	Silt/Sediment
Warren	Hague Brook and tribs	Silt/Sediment

303(d) Segments Impaired by Construction Related Pollutant(s)

Warren	Huddle/Finkle Brooks and tribs	Silt/Sediment
Warren	Indian Brook and tribs	Silt/Sediment
Warren	Lake George	Silt/Sediment
Warren	Tribs to L.George, Village of L George	Silt/Sediment
Washington	Cossayuna Lake	Nutrients
Washington	Lake Champlain, South Bay	Nutrients
Washington	Tribs to L.George, East Shore	Silt/Sediment
Washington	Wood Cr/Champlain Canal and minor tribs	Nutrients
Wayne	Port Bay	Nutrients
Westchester	Amawalk Reservoir	Nutrients
Westchester	Blind Brook, Upper, and tribs	Silt/Sediment
Westchester	Cross River Reservoir	Nutrients
Westchester	Lake Katonah	Nutrients
Westchester	Lake Lincolndale	Nutrients
Westchester	Lake Meahagh	Nutrients
Westchester	Lake Mohegan	Nutrients
Westchester	Lake Shenorock	Nutrients
Westchester	Long Island Sound, Westchester (East)	Nutrients
Westchester	Mamaroneck River, Lower	Silt/Sediment
Westchester	Mamaroneck River, Upper, and minor tribs	Silt/Sediment
Westchester	Muscoot/Upper New Croton Reservoir	Nutrients
Westchester	New Croton Reservoir	Nutrients
Westchester	Peach Lake	Nutrients
Westchester	Reservoir No.1 (Lake Isle)	Nutrients
Westchester	Saw Mill River, Lower, and tribs	Nutrients
Westchester	Saw Mill River, Middle, and tribs	Nutrients
Westchester	Sheldrake River and tribs	Silt/Sediment
Westchester	Sheldrake River and tribs	Nutrients
Westchester	Silver Lake	Nutrients
Westchester	Teatown Lake	Nutrients
Westchester	Titicus Reservoir	Nutrients
Westchester	Truesdale Lake	Nutrients
Westchester	Wallace Pond	Nutrients
Wyoming	Java Lake	Nutrients
Wyoming	Silver Lake	Nutrients

APPENDIX F – List of NYS DEC Regional Offices

<u>Region</u>	<u>COVERING THE FOLLOWING COUNTIES:</u>	<u>DIVISION OF ENVIRONMENTAL PERMITS (DEP) PERMIT ADMINISTRATORS</u>	<u>DIVISION OF WATER (DOW) WATER (SPDES) PROGRAM</u>
1	NASSAU AND SUFFOLK	50 CIRCLE ROAD STONY BROOK, NY 11790 TEL. (631) 444-0365	50 CIRCLE ROAD STONY BROOK, NY 11790-3409 TEL. (631) 444-0405
2	BRONX, KINGS, NEW YORK, QUEENS AND RICHMOND	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4997	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4933
3	DUTCHESS, ORANGE, PUTNAM, ROCKLAND, SULLIVAN, ULSTER AND WESTCHESTER	21 SOUTH PUTT CORNERS ROAD NEW PALTZ, NY 12561-1696 TEL. (845) 256-3059	100 HILLSIDE AVENUE, SUITE 1W WHITE PLAINS, NY 10603 TEL. (914) 428 - 2505
4	ALBANY, COLUMBIA, DELAWARE, GREENE, MONTGOMERY, OTSEGO, RENSSELAER, SCHENECTADY AND SCHOHARIE	1150 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2069	1130 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2045
5	CLINTON, ESSEX, FRANKLIN, FULTON, HAMILTON, SARATOGA, WARREN AND WASHINGTON	1115 STATE ROUTE 86, Po Box 296 RAY BROOK, NY 12977-0296 TEL. (518) 897-1234	232 GOLF COURSE ROAD WARRENSBURG, NY 12885-1172 TEL. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7438	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROADAVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7165	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7070

Appendix F. | Blank Notice of Termination (NOT)

**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 G. | Signatory Authorization Designation

SIGNATORY AUTHORIZATION DESIGNATION

CONSTRUCTION SITE – SUN COMMUNITIES – HOVEYS ISLAND
TOWN OF HENDERSON
JEFFERSON COUNTY, NEW YORK

STORMWATER POLLUTION PREVENTION PLAN INCLUDING ALL SUBSEQUENT AMENDMENTS AS MAY
BE REQUIRED.

"In accordance with the NYS DEC SPDES General Permit for Storm Water Discharges from Construction Activities, Part VII, Section H (Signatory Requirements), the Project Manager is hereby duly authorized to sign on my behalf, all reports and certifications that are required under the Permit and as part of this Storm Water Pollution Prevention Plan.

Signed: _____

Printed Name: _____

Title: _____

Company Name: _____

Address: _____

Telephone Number: _____

Date: _____

Note: Multiple designation forms may be required
(i.e., one from the Operator and one from the Contractor).

Appendix H. | General Contractor's Certification

GENERAL CONTRACTOR'S CERTIFICATION

CONSTRUCTION SITE – SUN COMMUNITIES – HOVEYS ISLAND
TOWN OF HENDERSON
JEFFERSON COUNTY, NEW YORK

STORMWATER POLLUTION PREVENTION PLAN INCLUDING ALL SUBSEQUENT AMENDMENTS AS MAY
BE REQUIRED.

CONTRACTOR'S CERTIFICATION:

"I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

List of Contractor Responsibilities

- | | |
|-----------|-----------|
| 1. _____ | 11. _____ |
| 2. _____ | 12. _____ |
| 3. _____ | 13. _____ |
| 4. _____ | 14. _____ |
| 5. _____ | 15. _____ |
| 6. _____ | 16. _____ |
| 7. _____ | 17. _____ |
| 8. _____ | 18. _____ |
| 9. _____ | 19. _____ |
| 10. _____ | 20. _____ |

Name: _____

(Print)

Date: _____

Signature: _____

Received by: _____

Title: _____

Company Name: _____

Address: _____

Telephone Number: _____

Date: _____

Appendix I. | Subcontractor's Certification

SUBCONTRACTOR'S CERTIFICATION

CONSTRUCTION SITE – SUN COMMUNITIES – HOVEYS ISLAND
TOWN OF HENDERSON
JEFFERSON COUNTY, NEW YORK

STORMWATER POLLUTION PREVENTION PLAN INCLUDING ALL SUBSEQUENT AMENDMENTS AS MAY
BE REQUIRED.

SUBCONTRACTOR'S CERTIFICATION:

"I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

List of Sub-Contractor Responsibilities

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

Name: _____
(Print)

Signature: _____

Title: _____

Company Name: _____

Address: _____

Telephone Number: _____

Date: _____

Date: _____

Received by: _____
(Print)

Appendix J. | Inspection Report

INSPECTION REPORT

CONSTRUCTION SITE – SUN COMMUNITIES – HOVEYS ISLAND
TOWN OF HENDERSON
JEFFERSON COUNTY, NEW YORK

STORMWATER POLLUTION PREVENTION PLAN INCLUDING ALL SUBSEQUENT AMENDMENTS AS MAY
BE REQUIRED.

Inspections/reports must be completed a minimum of twice every seven calendar days. The two
inspections shall be separated by a minimum of two full calendar days.

Inspection Type: ☐ Routine (twice every 7 calendar days) ☐ Other _____

Date: _____

Week Ending: _____

Weather/Storm Event Information: _____

Storm Start Time: _____

Storm Duration: _____

Approximate Amount of Rainfall (inches): _____

Soil Condition: _____

Condition of site discharge points: _____

Condition of adjacent natural surface water bodies: _____

Based on the results of the inspection, necessary control modifications shall be initiated within 24-
hours and completed within a reasonable time frame. These reports shall be kept on file as part of
the Storm Water Pollution Prevention Plan for at least five (5) years from the date of completion and
submission of the Final Stabilization Certification/Termination Checklist and Notice of Termination.
A copy of the SWPPP shall be kept at the site at all times during construction.

Practices in need of repair inspection:

Item not corrected from

Name of Inspector: _____

Title of Inspector: _____

Inspector's Signature: _____

Contractor Compliance Certification

I certify that, based on no incidents of non-compliance identified during the inspection, the site is in compliance with the SWPPP and the Construction General Permit.

Name of Duly Authorized Representative (Printed): _____

Signature of Duly Authorized Representative: _____

Date: _____

*Note: Only to be signed when the site is in full compliance with the SWPPP and the Construction General Permit.

II. CONSTRUCTION DURATION INSPECTIONS

a. Directions:

Inspection Forms will be filled out during the entire construction phase of the project.

Required Elements:

(1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;

(2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;

(3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);

(5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and

(6) Immediately report to the Contractor and Operator any deficiencies that are identified with the implementation of the SWPPP.

SITE PLAN/SKETCH

Qualified Inspector (print name)

Qualified Inspector Signature

Date of inspection

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete

CONSTRUCTION DURATION INSPECTIONS – CONSTRUCTION PHASE _____

<u>Maintaining Water Quality</u>			
Issue Description	Yes	No	N/A
Is there an increase in turbidity causing a substantial visible contrast to natural conditions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is there residue from oil and floating substances, visible oil film, or globules or grease?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All disturbance is within the limits of the approved plans.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<u>Housekeeping</u>			
<u>General Site Conditions</u>			
Issue Description	Yes	No	N/A
Is construction site litter and debris appropriately managed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is construction impacting the adjacent property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is dust adequately controlled?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Temporary Stream Crossing</u>			
Maximum diameter pipes necessary to span creek without dredging are installed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Installed non-woven geotextile fabric beneath approaches.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is fill composed of aggregate (no earth or soil)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<u>Runoff Control Practices</u>			
<u>Excavation De-Watering</u>			
Issue Description	Yes	No	N/A
Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clean water from upstream pool is being pumped to the downstream pool.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sediment laden water from work area is being discharged to a silt-trapping device.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Constructed upstream berm with one-foot minimum freeboard.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Level Spreader</u>			
Installed per plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flow sheets out of level spreader without erosion on downstream edge.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Interceptor Dikes and Swales</u>			
Installed per plan with minimum side slopes 2H:1V or flatter.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stabilized by geotextile fabric, seed, or mulch with no erosion occurring..	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sediment-laden runoff directed to sediment trapping structure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Stone Check Dam</u>			
Is the channel stable? (flow is not eroding soil underneath or around the structure).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stone Check Dam is in good condition (rocks in place and no permanent pools behind the structure).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has accumulated sediment been removed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Rock Outlet Protection</u>			
Installed per plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Installed concurrently with pipe installation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<u>Soil Stabilization</u>			
<u>Topsoil and Spoil Stockpiles</u>			
Issue Description	Yes	No	N/A
Stockpiles are stabilized with vegetation and/or mulch.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sediment control is installed at the toe of the slope..	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Revegetation</u>			
Temporary seedings and mulch have been applied to idle areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 inches minimum of topsoil has been applied under permanent seedings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<u>Sediment Control</u>			
<u>Stabilized Construction Entrance</u>			
Issue Description	Yes	No	N/A
Stone is clean enough to effectively remove mud from vehicles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Installed per standards and specifications?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does all traffic use the stabilized entrance to enter and leave site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is adequate drainage provided to prevent ponding at entrance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Silt Fence</u>			
Installed on Contour, 10 feet from toe of slope (not across conveyance channels).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Joints constructed by wrapping the two ends together for continuous support.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fabric buried 6 inches minimum.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Posts are stable, fabric is tight and without rips or frayed areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sediment accumulation is XX % of design capacity.			
<u>Storm Drain Inlet Protection</u> (Use for Stone & Block; Filter Fabric; Curb; or Excavated practices)			
Installed concrete blocks lengthwise so open ends face outward, not upward.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Placed wire screen between No. 3 crushed stone and concrete blocks.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drainage area is 1-acre or less.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excavated area is 900 cubic feet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excavated side slopes should be 2:1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2" x 4" frame is constructed and structurally sound.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Posts 3-foot maximum spacing between posts.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Posts are stable, fabric is tight and without rips or frayed areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sediment accumulation is XX % of design capacity.			
<u>Temporary Sediment Trap</u>			
Outlet structure is constructed per the approved plan or drawing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Geotextile fabric has been placed beneath rock fill.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sediment accumulation is XX % of design capacity.			
<u>Temporary Sediment Basin</u>			
Basin and outlet structure constructed per the approved plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Basin side slopes are stabilized with seed/mulch.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drainage structure flushed and basin surface restored upon removal of sediment basin facility.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sediment accumulation is XX % of design capacity.			

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.

Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.



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DEFICIENCIES:

1.

COMMENTS:

1.



PHOTOGRAPHIC (DATE STAMPED) APPENDIX (See Sketch Plan for Locations)

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Appendix K. | Stabilization Form



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STABILIZATION SCHEDULE FOR MAJOR GRADING ACTIVITIES

CONSTRUCTION SITE – SUN COMMUNITIES – HOVEYS ISLAND
TOWN OF HENDERSON
JEFFERSON COUNTY, NEW YORK

STORMWATER POLLUTION PREVENTION PLAN INCLUDING ALL SUBSEQUENT AMENDMENTS AS MAY BE REQUIRED.

			Note: When these activities cease and if activities cease for more than 14 days these columns need to be completed.					
Major Site Construction Activity Areas	Begin Date	Completion Date	Temporary Cease Date	Resume Date	Begin Date for Stabilization Temporary	Begin Date for Stabilization Permanent	Type of Stabilization (List measures used such as stone, seeding, mulch, landscaping, etc...)	Contractor Responsible for Work
Temp. Gravel Const. Entrance								
Existing Pavements and Structures Removed, Utilities Removed/Relocated								
Mass Grading								
Access Drives Constructed								
Walkways Constructed								
Building Foundation								
Storm Sewers and Utility Installations								
Pervious Areas Stabilized								

Appendix L. | Implementation Form

IMPLEMENTATION SCHEDULE

CONSTRUCTION SITE – SUN COMMUNITIES – HOVEYS ISLAND
TOWN OF HENDERSON
JEFFERSON COUNTY, NEW YORK

STORMWATER POLLUTION PREVENTION PLAN INCLUDING ALL SUBSEQUENT AMENDMENTS AS MAY
BE REQUIRED.

*To be completed prior to initiation of construction by the contractor.

The Contractor will be responsible for implementing all Erosion and Sediment Control and Storm Water Management control structures. The Contractor may designate these tasks to certain subcontractors as they see fit, but the ultimate responsibility for implementing these controls and ensuring their proper functioning remains with the Contractor.

Construction Activity	*Proposed Initiation Date	*Proposed Completion Date	Actual Initiation Date	Actual Completion Date	Contractor Responsible for Implementation
Preconstruction Meeting					
Temporary Construction Access					
Material laydown/staging area prep					
Install inlet protection					
Install perimeter protection					
Stabilize all areas					
Remove inlet protection					
Clean storm Sewers					
Final inspection					

Appendix M. | Modification Report

MODIFICATION LOG

CONSTRUCTION SITE – SUN COMMUNITIES – HOVEYS ISLAND
TOWN OF HENDERSON
JEFFERSON COUNTY, NEW YORK

STORMWATER POLLUTION PREVENTION PLAN INCLUDING ALL SUBSEQUENT AMENDMENTS AS MAY
BE REQUIRED.

CHANGES REQUIRED FOR STORMWATER POLLUTION PREVENTION PLAN

The SWPPP must be amended whenever there is a change in design, construction, operation, or maintenance at the construction site that has a significant effect on the discharge of pollutants to the Waters of the United States that has not been previously addressed in the SWPPP, if inspections or investigations by site staff, local, state or federal officials determine that discharges are causing water quality exceedances or the SWPPP is ineffective in eliminating or significantly minimizing pollutants in storm water discharges from the construction site, or based on the results of an inspection, or there is a release containing a Hazardous Substance or Oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302 occurs during a 24 hour period, the SWPPP must be modified to include additional or modified BMPs designed to correct identified problems. Revisions to the SWPPP must be completed within seven (7) calendar days following the inspection. Modifications that are the result of inspections shall be initialed within 24 hours and completed within 48 hours. All modifications are to be referenced on both the forms and on a Progress Drawing.

MODIFICATION LOG

MODIFICATION NUMBER*	DATE	BRIEF DESCRIPTION	PROJECT MANAGER REVIEW

*Modification Log Number to correspond with Modification Report Number

MODIFICATION REPORT

CONSTRUCTION SITE – SUN COMMUNITIES – HOVEYS ISLAND
TOWN OF HENDERSON
JEFFERSON COUNTY, NEW YORK

STORMWATER POLLUTION PREVENTION PLAN INCLUDING ALL SUBSEQUENT AMENDMENTS AS MAY
BE REQUIRED.

NUMBER _____

DATE _____

TO:

ADDRESS:

TELEPHONE:

FACSIMILE:

SENT VIA: ☐ Facsimile

☐ Courier

☐ US Mail

INSPECTOR: _____
(Print Name)

(Inspector Signature)

QUALIFICATIONS OF INSPECTOR: _____

CHANGES REQUIRED TO THE STORMWATER POLLUTION PREVENTION PLAN:

REASONS FOR CHANGES:

TO BE PERFORMED BY: _____

ON OR BEFORE: _____

Project Manager: _____

Other Operator: _____

Appendix N. | Final Stabilization/Notice of Termination Checklist

FINAL STABILIZATION CERTIFICATION NOTICE OF TERMINATION CHECKLIST

CONSTRUCTION SITE – SUN COMMUNITIES – HOVEYS ISLAND
TOWN OF HENDERSON
JEFFERSON COUNTY, NEW YORK

STORMWATER POLLUTION PREVENTION PLAN INCLUDING ALL SUBSEQUENT AMENDMENTS AS MAY
BE REQUIRED.

1. ☐ All soil disturbing activities are complete and the facility no longer discharges storm water associated with Construction Activities.
2. ☐ Temporary Erosion and Sediment Control Measures have been removed or will be removed at the appropriate time.
3. ☐ All areas of the Construction Site not otherwise covered by a permanent pavement or structure have been stabilized with a uniform perennial vegetative cover with a density of 80% or equivalent measures have been employed.

CONTRACTOR'S CERTIFICATION:

"I certify under penalty of law that all storm water discharges associated with Construction Activity from the identified project that are authorized by the NPDES Construction General Permit have been eliminated and that all disturbed areas and soils at the construction site have achieved Final Stabilization and all temporary erosion and sediment control measures have been remove in addition all permanent stormwater structures have been constructed as described in the SWPPP"

Company Name: _____

Name (Print): _____

Signature: _____

Title: _____

Date: _____

Date: _____

Received by: _____
[Name]

Appendix O. | Reportable Quantity Release Form



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REPORTABLE QUANTITY RELEASE FORM

CONSTRUCTION SITE – SUN COMMUNITIES – HOVEYS ISLAND
TOWN OF HENDERSON
JEFFERSON COUNTY, NEW YORK

STORMWATER POLLUTION PREVENTION PLAN INCLUDING ALL SUBSEQUENT AMENDMENTS AS MAY
BE REQUIRED.

The discharges of Hazardous Substances or Oil in storm water discharges from construction sites must be prevented or minimized in accordance with the SWPPP. Where a release containing a Hazardous Substance or Oil in an amount equal to or in excess of a reportable quantity established under 40CFR Part 110, 40CFR Part 117 and 40CFR Part 302 occurs, the following steps must be taken:

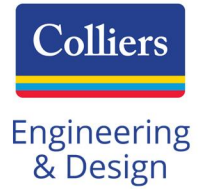
1. All measures must be taken to contain and abate the spill and to prevent the discharge of Hazardous Substances or Oil to storm water or off-site.
2. Contact the Project Manager or Operator's Engineer immediately upon knowledge of release.
3. If a release is equal to or in excess of a reportable quantity, the SWPPP must be modified within seven (7) calendar days of knowledge of the discharge to provide a description of the release, the circumstances leading to the release, and the date of the release. The plans must identify measures to prevent the recurrence of such releases and to respond to such releases

Date of Spill	Material Spilled	Approximate Quantity of Spill (in gallons)	Agency(s) Notified	Date of Notification	SWPPP Revision Date

Appendix P. | Project Rainfall Log

Year 20__

PROJECT RAINFALL LOG
CONSTRUCTION SITE – SUN COMMUNITIES
HOVEYS ISLAND
TOWN OF HENDERSON
JEFFERSON COUNTY, NEW YORK



STORMWATER POLLUTION PREVENTION PLAN INCLUDING ALL SUBSEQUENT AMENDMENTS AS MAY BE REQUIRED

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Day												
1												
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												
31												
PM Initials												

Note: Rainfall amounts are to be based on a 24-hour rainfall event, instead of a cumulative total of rainfall over several days.

Appendix Q. | Pre-Construction Meeting Attendance Record

OPTIONAL PRE-CONSTRUCTION MEETING AGENDA AND ATTENDANCE RECORD

CONSTRUCTION SITE – SUN COMMUNITIES – HOVEYS ISLAND
TOWN OF HENDERSON
JEFFERSON COUNTY, NEW YORK

STORMWATER POLLUTION PREVENTION PLAN INCLUDING ALL SUBSEQUENT AMENDMENTS AS MAY
BE REQUIRED.

Topic	Discussed	Further action or Information Required (Yes or No)
Overview of SPDES Permit Program		
General Discussion of SWPPP and Records Retention Requirements		
Phasing of Project		
Review of Erosion and Sediment Control Plans (to include all temporary and permanent structural and stabilization measures)		
Locating solid waste containers, portable toilets, concrete washout areas, fueling areas and tank storage area on Progress Drawing		
Posting the Progress Drawing (marked on the Erosion and Sediment Control Plans) at job trailer		
Posting requirements for the Notice of Intent (NOI), Must be posted at Project entrance and inside job trailer wall.		
Allowable non-storm water discharges and handling procedures		
Materials management to include proper material storage, etc.		
Signatory Authorization Delegation		
Contractor's Certification		
Subcontractor's Certification		
Inspection form and required inspection timeframe		
Stabilization schedule		
Implementation schedule		
Modification report and modifying plans		
Final stabilization		
Reportable quantity release procedures		
Rain gage requirement and rainfall logs		
State specific requirements		
Import/Export – Fill and Spoil Materials		
SWPPP accessibility to regulatory officials		
Inspections – assisting and cooperating with regulatory officials – inspection reports and notices of violation (any response must be coordinated through Project Manager)		



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Attendance Roster

Date: _____

Name	Company	Telephone Number	Signature

Items which require further action or additional information: _____

Additional items discussed (not addressed above): _____

*This completed form must be included in both the Project Manager's and Construction Site SWPPP Ledger.

Appendix R. | Stormwater Management Report



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Sun Communities Inc. – Hovey’s Island Stormwater Management Report

October 20, 2023

Sun Communities Inc.
Hovey’s Island
Town of Henderson,
Jefferson County, New York, 12051

Prepared for:

Sun Communities Inc.
27777 Franklin Road #200
Southfield, MI 48034

Prepared by:

Paul Holsberger, PE
NYS Professional Engineer
License No. 104532

Colliers Engineering & Design
18 Corporate Woods Boulevard 4th
Floor Albany New York 12211
Main: 877 627 3772
Colliersengineering.com

Project No. 23007679A

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Section I General Information

A. Project Description

This Stormwater Management Report is for the proposed development located at 15530 Snowshoe Road in the Town of Henderson, Jefferson County, New York. The proposed project consists of the development of approximately 28± acres of an existing 39.1 ± acre island, known as Hovey's Island. Hovey's Island and the contiguous Association Island are owned by Sun Communities, which has a total acreage of 98.33 ± acres. The project will include 117 new campsites, each with an associated single-family cabin, driveways and access roadways, utilities, and landscaping. Proposed site disturbance will total approximately 27.62 acres of land.

This report addresses Water Quality Volume (WQv), Runoff Reduction Volume (RRv) and stormwater quantity mitigation for the proposed development as shown in the project drawings. The proposed design complies with both the New York State Department of Environmental Conservation (NYSDEC) State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (GP-0-20-001) and Town of Henderson requirements.

B. Soil Classification

According to the Natural Resources Conservation Service (NRCS) Soils Report, there are five (5) mapped soil units identified within the project boundary (see Appendix D). Beaches (0 to 8% slopes) (Be), has a hydrologic soil group A meaning it has a high infiltration rate (low runoff potential) when thoroughly wet. Chaumont silty clay (0 to 3% slopes) (CIA), has a hydrologic soil group D meaning it has a poor infiltration rate (high runoff potential) when thoroughly wet. Chaumont silty clay (3 – 8% slopes) (CIB), has a hydrologic soil group D meaning it has a poor infiltration rate (high runoff potential) when thoroughly wet. Kingsbury silty clay (0 – 2% slopes) (KgA) has a hydrologic soil group D meaning it has a low infiltration rate (high runoff potential) when thoroughly wet. Udorthents, smoothed (0 – 8% slopes) (Ub), has a hydrologic soil group A meaning it has a High infiltration rate (low runoff potential) when thoroughly wet.

The complete list of soils found within the project boundary is identified in the table below (see Appendix D for the NRCS Soils Report).

Table I – Jefferson County Soils Summary

Symbol	Soil Name	Hydrologic Soil Group
Be	Beaches (0 to 3% slopes)	A
CIA	Chaumont silty clay (3 to 8% slopes)	D
CIB	Chaumont silty clay (0 to 3% slopes)	D
KgA	Kingsbury silty clay (0 to 3% slopes)	D
Ub	Udorthents, smoothed (0 to 8% slopes)	A

Section II Hydrology

A. Methodology

Stormwater runoff rates discharged from the site under the existing conditions provide the basis on which to compare the impacts of the proposed site improvements. Design points are established where runoff exits the site to provide a fixed location at which existing and proposed stormwater discharge rates and quantities can be compared. The areas draining to each design point were delineated using topographic survey maps, grading plans and utility plans. HydroCAD 10.00 by HydroCAD Software Solutions LLC was used to model the existing and proposed conditions. This program simulates the USDA Soil Conservation Service's TR-20 hydrologic model to analyze discharges from drainage areas.

The parameters required to calculate stormwater runoff are area, curve number, and time of concentration. Each drainage area is evaluated using the guidelines described in USDA Soil Conservation Service's TR-55 to determine the curve number and time of concentration.

The runoff curve number (CN) is based on a weighted average of ground cover and soil type. The underlying soil types are described in site-specific soil maps provided in Appendix D. Site and grading plans and survey maps outline existing and proposed ground cover. CN values for specific locations are determined from the tables presented in TR-55.

Time of concentration (T_c) represents the amount of time it takes for runoff to travel from the hydraulically most distant point of the watershed to the point of analysis. Surface roughness, slope, channel shape and flow patterns are the factors that affect the time of concentration. Stormwater runoff flows through the drainage area as sheet flow, shallow concentrated flow, open channel flow, or concentrated flow (such as in storm sewers). For this report sheet flow will become shallow concentrated flow after a maximum of 100 feet for the existing and proposed conditions. The sum of the travel times over the various surfaces within the assumed flow path for a specific drainage area determines that area's time of concentration. The figures and formulas in TR-55 are employed to compute travel times for sheet flow and shallow concentrated flow. A value of 3 feet per second was used for flow velocity through pipes. A minimum time of concentration of 0.1 hours (6 minutes) as specified within TR-55 was utilized.

The stage-storage-discharge relationship for the proposed underground detention area is determined from structural data and outlet structure characteristics. Discharge rates and storage volumes at various elevations (stage) are represented by this relationship.

B. Existing Conditions

The existing drainage area is comprised of a total of 26.15± acres. The drainage area was analyzed as one whole area, EX-1, as all drainage flows into the same adjacent watercourse, Lake Ontario. The parcel to be developed consists of under-developed land and is a localized island that drains straight into the adjacent lake, so no drainage enters the site from adjacent off-site properties.

Drainage Area EX-1, consisting of 26.15± acres, encompasses the project site. This area consists of grass and wooded areas with a small amount of gravel and some small buildings. entirely of grass and landscaped areas. Runoff travels via sheet and shallow concentrated flow in all directions, and continues off-site into Lake Ontario.

Lake Ontario's water line will be designated as Design Point #1 (DP-1).

Table II summarizes the hydrologic characteristics of the drainage areas described above. See Appendix A for computations for the existing drainage conditions.

Table II - Existing Conditions Summary

Drainage Area	Description	Size (ac)	Composite Cn	Tc (min)
Area EX-1	Consists primarily of grass and wooded areas. Runoff from this area travels via sheet and shallow concentrated flow in all directions and continues off site.	26.15 ±	80	28.5

C. Proposed Conditions

The proposed drainage area is comprised of a total of 26.15± acres and consists of impervious rooftop and paved areas along with grassed and landscaped areas. The drainage area was divided into five (5) separate areas designated as Drainage Areas PR-1, PR-2, PR-3, PR-4 & PR-5. These areas have unique flow paths and therefore have been analyzed separately.

Drainage Area P-1, consisting of 5.08± acres, encompasses the north-western portion of the site. This area consists primarily of impervious paved areas and buildings with landscaped area. Runoff from this area travels via sheet flow, shallow concentrated flow and pipe flow in a westerly direction to a proposed aboveground bioretention area, which eventually discharges into Lake Ontario. This discharge point will be designated as Design Point #1 (DP-1).

Drainage Area P-2, consisting of 4.36± acres, encompasses the northern portion of the site. This area consists primarily of impervious paved areas and buildings with landscaped area. Runoff from this area travels via sheet flow, shallow concentrated flow and pipe flow in an easterly direction to a proposed aboveground bioretention area, which eventually discharges into Lake Ontario. This discharge point will be designated as Design Point #2 (DP-2).

Drainage Area P-3, consisting of 4.43± acres, encompasses the south-western portion of the site. This area consists primarily of impervious paved areas and buildings with landscaped area. Runoff from this area travels via sheet flow, shallow concentrated flow and pipe flow in a southerly direction to a proposed aboveground wet-swale, which eventually discharges into Lake Ontario. This discharge point will be designated as Design Point #3 (DP-3).

Drainage Area P-4, consisting of 5.03± acres, encompasses the southern portion of the site. This area consists primarily of impervious paved areas and buildings with landscaped area. Runoff from this area travels via sheet flow, shallow concentrated flow and pipe flow in a southerly direction to a proposed aboveground wet-swale, which eventually discharges into Lake Ontario. This discharge point will be designated as Design Point #4 (DP-4).

Drainage Area P-5, consisting of 7.24± acres, encompasses the eastern portion of the site. This area consists primarily of impervious paved areas and buildings with landscaped area. Runoff from this area travels via sheet flow, shallow concentrated flow and pipe flow in an easterly direction to a proposed aboveground wet-swale, which eventually discharges into Lake Ontario. This discharge point will be designated as Design Point #5 (DP-5).

Table III summarizes the hydrologic characteristics of the drainage areas described above. See Appendix B for computations for the proposed drainage conditions.

Table III - Proposed Conditions Summary

Drainage Area	Description	Size (ac)	Composite Cn	Tc (min)
Area P-1	Consists primarily of impervious and landscaped areas. Runoff from this area travels via sheet and shallow concentrated flow into a bioretention area and continues off site.	5.08 ±	87	6.0
Area P-2	Consists primarily of impervious and landscaped areas. Runoff from this area travels via sheet and shallow concentrated flow into a bioretention area and continues off site.	4.63 ±	86	6.0
Area P-3	Consists primarily of impervious and landscaped areas. Runoff from this area travels via sheet and shallow concentrated flow into a wet swale and continues off site.	4.43 ±	88	6.0
Area P-4	Consists primarily of impervious and landscaped areas. Runoff from this area travels via sheet and shallow concentrated flow into a wet swale and continues off site.	5.03 ±	87	6.0
Area P-5	Consists primarily of impervious and landscaped areas. Runoff from this area travels via sheet and shallow concentrated flow into a wet swale and continues off site.	7.24 ±	88	6.0

The following site planning practices were used to prepare the final site plan.

Table IV - Site Planning Practices

Practice	Description
Preservation of Undisturbed Areas	Grading limits are minimized to the maximum extent practical. Existing wetlands have been kept to a minimum. A portion of the site will remain undisturbed as wooded areas.
Preservation of Buffers	The existing wetland buffer will be preserved in its existing condition to the maximum extent possible.
Reduction of clearing and Grading	Clearing of trees will be minimized. A portion of the site will remain as wooded areas. Grading has been limited to the minimum amount needed for roads, driveways, foundations, utilities, and stormwater management facilities.
Locating Development in Less Sensitive Areas	The development will occur outside of the existing wetland areas. The development will also take place on less steep areas of site, preserving the wooded areas and areas of the floodplains.
Roadway Reduction	Roadways have been reduced to the maximum extent practical to limit the amount of impervious area.
Sidewalk Reduction	Sidewalks have been reduced to the maximum extent practical to limit the amount of impervious area.
Driveway Reduction	Driveways have been reduced to the maximum extent practical to limit the amount of impervious area.
Cul-de-sac Reduction	Cul-de-sac reduction is not applicable to this project.
Building Footprint Reduction	The building footprint has been reduced to the maximum extent practical to limit the amount of impervious area.
Parking Reduction	Parking has been reduced to the minimum extent needed for the project.
Soil Restoration and Open Space Design	In disturbed areas where no permanent construction shall occur, soil shall undergo de-compaction treatment and additional topsoil shall be installed to allow for establishing of a uniform, dense vegetative cover.

aa

Section III Stormwater Management & NPDES Phase II Requirements

A. State Pollutant Discharge Elimination System (SPDES)

Since the subject site will have land disturbance of more than 1-acre a State Pollutant Discharge Elimination System (SPDES) permit will be required as part of the project. A Storm Water Pollution Prevention Plan (SWPPP) will be developed in accordance with the permit regulations. The SWPPP will be prepared in compliance with the New York State DEC Design Manual and meet the following criteria as the principal objectives contained in an approved SWPPP.

- 1) Reduction or elimination of erosion and sediment loading to water-bodies during construction activities. Controls will be designed in accordance with the New York State Standards and Specifications for Erosion and Sediment Control.
- 2) Control the impact of stormwater runoff on the water quality of the receiving waters.
- 3) Control the increase in volume and peak runoff rate of runoff during and after construction.
- 4) Maintenance of stormwater controls during and after completion of construction.

The aforementioned objectives will be accomplished by incorporating several of the design criteria outlined within the Technical Guidelines provided by the New York State Department of Environmental Conservation Stormwater Management Design Manual and summarized below.

B. Runoff Reduction Volum

The required Runoff Reduction Volume (RRv) of 7,351 CF has been achieved via the Bioretention Areas (F-5) utilizing soil media for filtration and underdrains. Drainage areas P-1 & P-2 will each have a separate Bioretention Area (F-5) to accommodate the required RRv for the project site.

RRv calculations are provided in Appendix C and are summarized in the Table below.

Table V - Runoff Reduction Volume

Runoff Reduction Volume			
Drainage Area	Runoff Reduction Volume Required (CF)	Runoff Reduction Volume Provided (CF)	Practice
P-1	5,351	6,840	Bioretention Area
P-2	2,000	2,448	Bioretention Area

C. Water Quality Volume

The Water Quality Volume (WQv) requirement is designed to improve the quality of stormwater leaving the site. The WQv is based on the site area that drains to the stormwater treatment practices. Due to poor draining soils and bedrock encountered close to the surface (Refer to

Appendix D, Geotechnical report) across the project site limiting practice depth, Bioretention Areas (F-5) and Wet Swales (O-2) were chosen to provide the necessary

Water Quality Volume (WQv). This project is not located within a section 303(d) watershed requiring enhanced phosphorus treatment, therefore additional WQv requirements are not necessary for this project.

The required WQv for the full site development is 39,563 CF. Drainage areas P-1 & P-2 will each have a separate Bioretention Area (F-5) to accommodate the required WQv for the drainage area. Drainage areas P-3, P-4 & P-5 will each have a separate Wet Swale (O-2) to accommodate the required WQv for the drainage area. WQv calculations for each drainage area are provided in Appendix C and are summarized in the Table below.

Table VI - Water Quality Volume

Water Quality Volume Summary			
Drainage Area	Water Quality Volume Required (CF)	Water Quality Volume Provided (CF)	Practice
P-1	7,293	7,293	Bioretention Area
P-2	5,879	5,879	Bioretention Area
P-3	7,063	7,063	Wet Swale
P-4	7,411	7,411	Wet Swale
P-5	11,917	11,917	Wet Swale

D. Channel Protection Volume (Cpv), Overbank Flood Volume (Qp) and Extreme Storm Volume (Qu) 1, 10 & 100-Year Storm Event

Channel Protection Volume, Overbank Flood and Extreme Storm control is not required as the site discharges directly into a fifth order stream, Henderson Bay, which is a part of Lake Ontario.

E. Green Infrastructure

Provided in Table VIII below is a list of green infrastructure techniques acceptable for runoff reduction and a justification of technical feasibility

Table VIII - Green Infrastructure Practices

Group	Practice	Description
Runoff Reduction Techniques	Conservation of Natural Areas	Grading limits are minimized to the maximum extent practical. Existing wetlands will not be disturbed, wooded areas within the property will not be disturbed to the maximum extent possible. No permanent conservation areas or easements are applicable to this project.

	Sheetflow to Riparian Buffers or Filter Strips	A majority of the forested areas, stream buffers, and riparian buffers will be conserved.
	Vegetated Open Swale	The existing poorly-drained soils and high bedrock do not allow for use of vegetated swales.
	Tree Planting / Tree Box	Clearing of trees will be minimized. Grading has been limited to the minimum amount needed for roads, driveways, foundations, utilities, and stormwater management facilities. Existing trees will be saved to the maximum extent practical while new trees will be added on-site.
	Stream Daylighting for Redevelopment Projects	Not applicable for the proposed site.
	Rain Garden	Not technically feasible. Rain gardens cannot be used to treat runoff from parking lots or roadways. Additionally, the on-site soils are very poorly drained and not conducive to using rain gardens.
	Green Roof	This is not a practical alternative for this development.
	Stormwater Planter	Stormwater planters are not designed to treat runoff from parking lots or roadways. Additionally, the on-site soils are very poorly drained and not conducive for stormwater planters.
	Rain Tank / Cistern	Not feasible due to space constraints around buildings and quantity of residential houses.
	Porous Pavement	Porous pavement is not feasible due to poorly drained soils and residential driveways.
	Standard Management Practices	Due to poorly drained soils and existing high levels of bedrock, infiltration could not be utilized. Bioretention areas were chosen where bedrock was determined to be lower, and wet-swales in areas of high bedrock as they had no minimum separation to impermeable layers.

Section IV Summary of Findings

A. Conclusion

Based on the analysis provided in this report, the proposed stormwater management practices will have been designed in accordance with the New York State Stormwater Management Design Manual for water quality treatment. Therefore, this project meets the NYSDEC and Town of Henderson requirements for stormwater quality and runoff from the developed site.

Appendices

Appendix A | Existing Conditions Drainage Map

UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY OR ENGINEERING MAP BEARING A LICENSED LAND SURVEYOR OR PROFESSIONAL ENGINEER IS A VIOLATION OF SECTION 7209, SUB-DIVISION 2, OF THE NEW YORK STATE EDUCATION LAW.
ONLY MAPS WITH THE LAND SURVEYOR OR PROFESSIONAL ENGINEER'S SEAL ARE GENUINE TRUE AND CORRECT COPIES OF THE LAND SURVEYOR OR PROFESSIONAL ENGINEER'S ORIGINAL WORK AND OPINION.

Appendix B | Proposed Conditions Drainage Map

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION

Appendix C | NYSDEC GI Worksheets – Water Quality and Runoff Reduction Calculations

Is this project subject to Chapter 10 of the NYS Design Manual (i.e. WQv is equal to post-development 1 year runoff volume)?.....

No

Design Point: 1

P=

1.00

inch

Manually enter P, Total Area and Impervious Cover.

Breakdown of Subcatchments

Catchment Number	Total Area (Acres)	Impervious Area (Acres)	Percent Impervious %	Rv	WQv (ft ³)	Description
1	5.08	1.95	38%	0.40	7,293	Bioretention
2	4.36	1.56	36%	0.37	5,879	Bioretention
3	4.43	1.92	43%	0.44	7,063	Wet Swale
4	5.03	1.99	40%	0.41	7,411	Wet Swale
5	7.24	3.25	45%	0.45	11,917	Wet Swale
6						
7						
8						
9						
10						
Subtotal (1-30)	26.14	10.66	41%	0.42	39,563	Subtotal 1
Total	26.14	10.66	41%	0.42	39,563	Initial WQv

Identify Runoff Reduction Techniques By Area

Technique	Total Contributing Area	Contributing Impervious Area	Notes
	(Acre)	(Acre)	
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"	26.14	10.66	41%	0.42	39,563
Subtract Area	0.00	0.00			
WQv adjusted after Area Reductions	26.14	10.66	41%	0.42	39,563
Disconnection of Rooftops		0.00			
Adjusted WQv after Area Reduction and Rooftop Disconnect	26.14	10.66	41%	0.42	39,563
WQv reduced by Area Reduction techniques					0

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	25.99	20%
Total Area	25.99	

Calculate the Minimum RRv

S =	0.20	
Impervious =	10.66	<i>acre</i>
Precipitation	1	<i>in</i>
Rv	0.95	
Minimum RRv	7,351	<i>ft3</i>
	0.17	<i>af</i>

Runoff Reduction Volume and Treated volumes						
	Runoff Reduction Techniques/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	0	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	0.00			
	Bioretention & Infiltration Bioretention	F-5	9.44	3.51	9288	3884
	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	16.70	7.15		26391.000
Totals by Area Reduction →			0.00	0.00	0	
Totals by Volume Reduction →			0.00	0.00	0	
Totals by Standard SMP w/RRV →			9.44	3.51	9288	3884
Totals by Standard SMP →			16.70	7.15		26391
Totals (Area + Volume + all SMPs) →			26.14	10.66	9,288	30,275
	Impervious Cover v	okay				

NOI QUESTIONS

#	NOI Question	Reported Value	
		cf	af
28	Total Water Quality Volume (WQv) Required	39563	0.908
30	Total RRV Provided	9288	0.213
31	Is RRV Provided \geq WQv Required?	No	
32	Minimum RRV	7351	0.169
32a	Is RRV Provided \geq Minimum RRV Required?	Yes	
33a	Total WQv Treated	30275	0.695
34	Sum of Volume Reduced & Treated	39563	0.908
34	Sum of Volume Reduced and Treated	39563	0.908
35	Is Sum RRV Provided and WQv Provided \geq WQv Required?	Yes	

Apply Peak Flow Attenuation			
36	Channel Protection	C_{pv}	
37	Overbank	Q_p	
37	Extreme Flood Control	Q_f	
	Are Quantity Control requirements met?		

Bioretention Worksheet

(For use on HSG C or D Soils with underdrains)

$$Af = WQv * (df) / [k * (hf + df)(tf)]$$

<i>Af</i>	Required Surface Area (ft ²)	<i>k</i>	The hydraulic conductivity [ft/day], can be varied depending on the properties of the soil media. Some reported conductivity values are: <i>Sand</i> - 3.5 ft/day (City of Austin 1988); <i>Peat</i> - 2.0 ft/day (Galli 1990); <i>Leaf Compost</i> - 8.7 ft/day (Claytor and Schueler, 1996); <i>Bioretention Soil</i> (0.5 ft/day (Claytor &
<i>WQv</i>	Water Quality Volume (ft ³)		
<i>df</i>	Depth of the Soil Medium (feet)		
<i>hf</i>	Average height of water above the planter bed		
<i>tf</i>	Volume Through the Filter Media (days)		

Design Point:	1						
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	5.08	1.95	0.38	0.40	7292.67	1.00	Bioretention
Enter Impervious Area Reduced by Disconnection of Rooftops		0.00	38%	0.40	7,293	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.					0	ft ³	
Soil Information							
Soil Group		D					
Soil Infiltration Rate		0.00	in/hour	Okay			
Using Underdrains?		Yes	Okay				
Calculate the Minimum Filter Area							
				Value	Units	Notes	
WQv				7,293	ft ³		
Enter Depth of Soil Media				<i>df</i>	2.5	ft	2.5-4 ft
Enter Hydraulic Conductivity				<i>k</i>	0.5	ft/day	
Enter Average Height of Ponding				<i>hf</i>	0.5	ft	6 inches max.
Enter Filter Time				<i>tf</i>	2	days	
Required Filter Area				<i>Af</i>	6077	ft ²	
Determine Actual Bio-Retention Area							
Filter Width		190	ft				
Filter Length		75	ft				
Filter Area		14250	ft ²				
Actual Volume Provided		17100	ft ³				
Determine Runoff Reduction							
Is the Bioretention contributing flow to another practice?			No	Select Practice			
RRv		6,840					
RRv applied		6,840	ft ³	This is 40% of the storage provided or WQv whichever is less.			
Volume Treated		453	ft ³	This is the portion of the WQv that is not reduced in the practice.			
Volume Directed		0	ft ³	This volume is directed another practice			
Sizing v		OK	Check to be sure Area provided ≥ Af				

Bioretention Worksheet

(For use on HSG C or D Soils with underdrains)

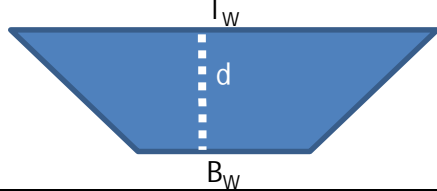
$$Af = WQv * (df) / [k * (hf + df)(tf)]$$

Af Required Surface Area (ft²)
WQv Water Quality Volume (ft³)
df Depth of the Soil Medium (feet)
hf Average height of water above the planter bed
tf Volume Through the Filter Media (days)

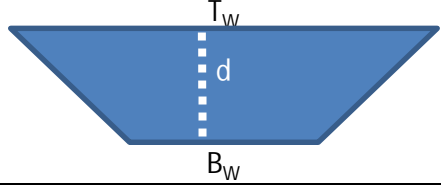
k The hydraulic conductivity [ft/day], can be varied depending on the properties of the soil media. Some reported conductivity values are: *Sand* - 3.5 ft/day (City of Austin 1988); *Peat* - 2.0 ft/day (Galli 1990); *Leaf Compost* - 8.7 ft/day (Claytor and Schueler, 1996); *Bioretention Soil* (0.5 ft/day (Claytor & Schueler, 1996)

Design Point:	1						
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
2	4.36	1.56	0.36	0.37	5879.37	1.00	Bioretention
Enter Impervious Area Reduced by Disconnection of Rooftops			36%	0.37	5,879	<<WQv after adjusting for Disconnected Rooftops	
Enter the portion of the WQv that is not reduced for all practices routed to this practice.						ft ³	
Soil Information							
Soil Group		D					
Soil Infiltration Rate		0.00	in/hour	Okay			
Using Underdrains?		Yes	Okay				
Calculate the Minimum Filter Area							
				Value	Units	Notes	
WQv				5,879	ft ³		
Enter Depth of Soil Media			df	2.5	ft	2.5-4 ft	
Enter Hydraulic Conductivity			k	0.5	ft/day		
Enter Average Height of Ponding			hf	0.5	ft	6 inches max.	
Enter Filter Time			tf	2	days		
Required Filter Area			Af	4899	ft ²		
Determine Actual Bio-Retention Area							
Filter Width		85	ft				
Filter Length		60	ft				
Filter Area		5100	ft ²				
Actual Volume Provided		6120	ft ³				
Determine Runoff Reduction							
Is the Bioretention contributing flow to another practice?			No	Select Practice	N/A		
RRv		2,448					
RRv applied		2,448	ft ³	This is 40% of the storage provided or WQv whichever is less.			
Volume Treated		3,431	ft ³	This is the portion of the WQv that is not reduced in the practice.			
Volume Directed		0	ft ³	This volume is directed another practice			
Sizing v		OK	Check to be sure Area provided ≥ Af				

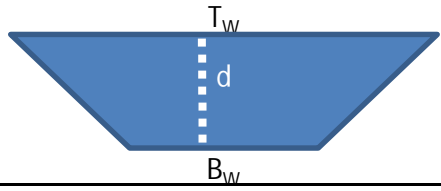
Dry Swale Worksheet

Design Point:	1						
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
3	4.43	1.92	0.43	0.44	7062.64	1.00	
Enter Impervious Area Reduced by Disconnection of Rooftops			43%	0.44	7,063	<<WQv after adjusting for Disconnected Rooftops	
Pretreatment Provided					Pretreatment Technique		
Pretreatment (10% of WQv)			706	ft ³			
Calculate Available Storage Capacity							
Bottom Width	8	ft	Design with a bottom width no greater than eight feet to avoid potential gullyng and channel braiding, but no less than two feet				
Side Slope (X:1)	8	Okay	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope				
Longitudinal Slope	1%	Okay	Maximum longitudinal slope shall be 4%				
Flow Depth	1.5	ft	Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)				
Top Width	32	ft					
Area	30.00	sf					
Minimum Length	212	ft					
Actual Length	230	ft					
End Point Depth check	1.50	Okay	A maximum depth of 18" at the end point of the channel (for storage of the WQv)				
Storage Capacity	7,606	ft ³					
Soil Group (HSG)			D				
Runoff Reduction							
Is the Dry Swale contributing flow to another practice?			No	Select Practice			
RRv	1,521	ft ³	Runoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv				
Volume Treated	5,541	ft ³	This is the difference between the WQv calculated and the runoff reduction achieved in the swale				
Volume Directed	0	ft ³	This volume is directed another practice				
Volume v	Okay		Check to be sure that channel is long enough to store WQv				

Dry Swale Worksheet

Design Point:	1						
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
4	5.03	1.99	0.40	0.41	7411.01	1.00	
Enter Impervious Area Reduced by Disconnection of Rooftops			40%	0.41	7,411	<<WQv after adjusting for Disconnected Rooftops	
Pretreatment Provided					Pretreatment Technique		
Pretreatment (10% of WQv)			741	ft ³			
Calculate Available Storage Capacity							
Bottom Width	8	ft	Design with a bottom width no greater than eight feet to avoid potential gullyng and channel braiding, but no less than two feet				
Side Slope (X:1)	4	Okay	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope				
Longitudinal Slope	1%	Okay	Maximum longitudinal slope shall be 4%				
Flow Depth	1.5	ft	Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)				
Top Width	20	ft					
Area	21.00	sf					
Minimum Length	318	ft					
Actual Length	400	ft					
End Point Depth check	1.50	Okay	A maximum depth of 18" at the end point of the channel (for storage of the WQv)				
Storage Capacity	9,141	ft ³					
Soil Group (HSG)			D				
Runoff Reduction							
Is the Dry Swale contributing flow to another practice?				Select Practice			
RRv	1,828	ft ³	Runoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv				
Volume Treated	5,583	ft ³	This is the difference between the WQv calculated and the runoff reduction achieved in the swale				
Volume Directed	0	ft ³	This volume is directed another practice				
Volume v	Okay		Check to be sure that channel is long enough to store WQv				

Dry Swale Worksheet

Design Point:	1						
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
5	7.24	3.25	0.45	0.45	11917.44	1.00	
Enter Impervious Area Reduced by Disconnection of Rooftops			45%	0.45	11,917	<<WQv after adjusting for Disconnected Rooftops	
Pretreatment Provided					Pretreatment Technique		
Pretreatment (10% of WQv)			1,192	ft ³			
Calculate Available Storage Capacity							
Bottom Width	8	ft	Design with a bottom width no greater than eight feet to avoid potential gullyng and channel braiding, but no less than two feet				
Side Slope (X:1)	9	Okay	Channels shall be designed with moderate side slopes (flatter than 3:1) for most conditions. 2:1 is the absolute maximum side slope				
Longitudinal Slope	1%	Okay	Maximum longitudinal slope shall be 4%				
Flow Depth	1.5	ft	Maximum ponding depth of one foot at the mid-point of the channel, and a maximum depth of 18" at the end point of the channel (for storage of the WQv)				
Top Width	35	ft					
Area	32.25	sf					
Minimum Length	333	ft					
Actual Length	350	ft					
End Point Depth check	1.50	Okay	A maximum depth of 18" at the end point of the channel (for storage of the WQv)				
Storage Capacity	12,479	ft ³					
Soil Group (HSG)			D				
Runoff Reduction							
Is the Dry Swale contributing flow to another practice?				Select Practice			
RRv	2,496	ft ³	Runoff Reduction equals 40% in HSG A and B and 20% in HSG C and D up to the WQv				
Volume Treated	9,422	ft ³	This is the difference between the WQv calculated and the runoff reduction achieved in the swale				
Volume Directed	0	ft ³	This volume is directed another practice				
Volume v	Okay		Check to be sure that channel is long enough to store WQv				

Appendix D | NRCS Soil Report and Geotechnical Investigation 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 **Jefferson County, New York**



August 3, 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.

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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

Custom Soil Resource Report

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.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

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 1:15,800.

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: Jefferson County, New York
Survey Area Data: Version 22, 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: Jul 19, 2020—Nov 5, 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
Be	Beaches	3.4	6.9%
CIA	Chaumont silty clay, 0 to 3 percent slopes	8.8	17.9%
CIB	Chaumont silty clay, 3 to 8 percent slopes	16.3	33.2%
KgA	Kingsbury silty clay, 0 to 2 percent slopes	5.8	11.8%
Ub	Udorthents, smoothed	6.0	12.2%
Totals for Area of Interest		49.0	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.

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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.

Jefferson County, New York

Be—Beaches

Map Unit Setting

National map unit symbol: 9slw
Elevation: 0 to 100 feet
Mean annual precipitation: 33 to 50 inches
Mean annual air temperature: 45 to 46 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Udipsamments, Beaches

Typical profile

H1 - 0 to 70 inches: loamy sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 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: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Aquents

Percent of map unit: 8 percent
Landform: Depressions
Hydric soil rating: Yes

Windsor

Percent of map unit: 7 percent
Hydric soil rating: No

Saprists

Percent of map unit: 5 percent
Landform: Swamps, marshes
Hydric soil rating: Yes

CIA—Chaumont silty clay, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9sms

Elevation: 250 to 1,020 feet

Mean annual precipitation: 33 to 50 inches

Mean annual air temperature: 45 to 46 degrees F

Frost-free period: 110 to 170 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Chaumont and similar soils: 75 percent

Minor components: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chaumont

Setting

Landform: Lake plains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Clayey glaciolacustrine deposits or glaciomarine deposits

Typical profile

H1 - 0 to 5 inches: silty clay

H2 - 5 to 11 inches: clay

H3 - 11 to 22 inches: clay

H4 - 22 to 27 inches: silty clay

H5 - 27 to 31 inches: unweathered bedrock

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Depth to water table: About 6 to 18 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: D

Ecological site: F142XB005VT - Clayplain

Hydric soil rating: No

Minor Components

Kingsbury

Percent of map unit: 5 percent

Hydric soil rating: No

Covington

Percent of map unit: 5 percent

Landform: Depressions

Hydric soil rating: Yes

Wilpoint

Percent of map unit: 5 percent

Hydric soil rating: No

Guffin

Percent of map unit: 5 percent

Landform: Depressions

Hydric soil rating: Yes

Unnamed soils, rock outcrop and fragments

Percent of map unit: 3 percent

Livingston

Percent of map unit: 2 percent

Landform: Depressions

Hydric soil rating: Yes

CIB—Chaumont silty clay, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9smt

Elevation: 250 to 950 feet

Mean annual precipitation: 33 to 50 inches

Mean annual air temperature: 45 to 46 degrees F

Frost-free period: 110 to 170 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Chaumont and similar soils: 80 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chaumont

Setting

Landform: Lake plains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Linear

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Parent material: Clayey glaciolacustrine deposits or glaciomarine deposits

Typical profile

H1 - 0 to 5 inches: silty clay
H2 - 5 to 11 inches: clay
H3 - 11 to 22 inches: clay
H4 - 22 to 27 inches: silty clay
H5 - 27 to 31 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Ecological site: F142XB005VT - Clayplain
Hydric soil rating: No

Minor Components

Kingsbury

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

Wilpoint

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

Unnamed soils, rock fragments and rock outcrops

Percent of map unit: 3 percent

Covington

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

Guffin

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

Livingston

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

KgA—Kingsbury silty clay, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 9spq

Elevation: 80 to 600 feet

Mean annual precipitation: 33 to 50 inches

Mean annual air temperature: 45 to 46 degrees F

Frost-free period: 110 to 170 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Kingsbury and similar soils: 80 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kingsbury

Setting

Landform: Lake plains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Calcareous, clayey glaciomarine deposits or glaciolacustrine deposits

Typical profile

H1 - 0 to 12 inches: silty clay

H2 - 12 to 28 inches: clay

H3 - 28 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)

Depth to water table: About 6 to 18 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: D

Ecological site: F142XB005VT - Clayplain

Hydric soil rating: No

Minor Components

Chaumont

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

Livingston

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

Vergennes

Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 4 percent

Guffin

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

Ub—Udorthents,smoothed

Map Unit Setting

National map unit symbol: 9srx
Elevation: 250 to 1,330 feet
Mean annual precipitation: 33 to 50 inches
Mean annual air temperature: 45 to 46 degrees F
Frost-free period: 110 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, smoothed, and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Smoothed

Typical profile

H1 - 0 to 4 inches: channery loam
H2 - 4 to 70 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high
(0.06 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches

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Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Urban land

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

Collamer

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

Canandaigua

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

Dumps

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

Sun

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

Bombay

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

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Appendix S. | Post Construction Stormwater BMP Operations and Maintenance Plan.

Post Construction BMP Operations and Maintenance Plan

Introduction

Stormwater Facility Maintenance is important so that the water quality features, incorporated into the project design, continue to function as expected. The scope of this program includes the maintenance and inspection of: the ground surface, where runoff is generated and directed to the stormwater conveyance system; the storm sewer network system; and the stormwater mitigation features. The following guidelines are to be used for keeping the post construction stormwater facilities functional and detecting potential failures in the system. In addition, regularly scheduled maintenance will reduce the pollutants entering the system and improve and preserve the overall performance of the stormwater system.

Road Maintenance and Inspection

1. Roads shall be cleaned or swept on an as needed basis but at a minimum once per year. Sweeping removes dirt and debris that absorbs oils and other liquid discharges from automobiles.
2. Spills that cannot be cleaned by sweeping operations shall be addressed with proper absorbent material and manual sweeping/removal when brought to the attention of the maintenance staff.
3. Annual pavement maintenance includes the inspection of all asphalt surfaces for cracking, potholes, rutting, etc. at minimum every spring after all snow has melted. Repairs necessary for the proper functioning of the storm sewer system shall be made as soon as practicable and weather permits. Broken gutters from snow removal operations, that impedes the flow of runoff, shall be repaired or replaced as needed.

Landscape and Lawn Areas

1. In the late spring, after lawn areas have recovered from the winter season, inspect lawn areas for loss of adequate ground cover. Disc and reseed areas with less than 80% lawn coverage to protect against erosion. Fertilizers may be applied in order to maintain a healthy lawn and to promote longevity. All fertilizers shall be applied per the manufacturer's recommendations. Planting beds shall be re-mulched annually, as necessary.
2. Canvass the site in spring, summer and fall for trash or other debris that may enter the storm sewer system. Collect and properly dispose of debris.

Storm Sewer Maintenance and Inspection

1. All catch basins and manholes shall be inspected annually and cleaned as necessary. Remove debris from all sumps. Storm inlets should be cleaned after first pavement sweeping in the spring. Liquid and/or solids removed from inlets will be disposed of at an approved waste treatment facility or landfill. Any debris remaining on inlet grates after sweeping operations shall be manually removed.

Bioretention Areas

1. Bioretention Areas shall not be removed or altered.
2. All Bioretention Areas shall be inspected semi-annually, at a minimum, and cleaned as necessary. Remove trash and debris from pretreatment area, inlets, and outlets as needed.
3. Remove sediment as required when infiltration is reduced.
4. Replace soil as required when infiltration is reduced. Removed clogged layer of soil from Bioretention Areas with appropriate equipment and replace with new material.
5. Replace all mulch every 2-3 years and as needed to cover eroded or voided areas as necessary.
6. Refer to Bioretention Stormwater Management Practices Inspection Checklist located on the NYSDEC Website, Construction Stormwater Toolbox. A copy is attached to this Appendix.

Wet Swales

1. Wet Swales shall not be removed or altered.
2. All Wet Swales shall be inspected semi-annually, at a minimum, and cleaned as necessary. Remove trash and debris from inlets, and outlets as needed.
3. Replace soil as required when drainage capacity is reduced. Removed clogged layer of soil from drainage swales with appropriate equipment and replace with new material.
4. Replace all mulch every 2-3 years and as needed to cover eroded or voided areas as necessary.
5. Refer to Swale Stormwater Management Practices Inspection Checklist located on the NYSDEC Website, Construction Stormwater Toolbox. A copy is attached to this Appendix.

Maintenance Schedule


Storm System Maintenance Schedule	
Inspection Item	Frequency
Road sweeping	Annually in Spring
Spills reported to Facilities Manager	As needed
Pavement and wing gutter condition	Annually in Spring
Lawn and landscaping condition	Annually in Spring
Canvass site for trash and debris	Spring, Summer, Fall
Debris in catch basins and manholes	Annually in Spring
Sumps in catch basins and inlets	Annually in Spring
Debris blocking grates	Annually in Spring
Outfalls	Annually
Bioretention Areas	Semi-Annually in Spring and Fall
Wet Swales	Semi-Annually in Spring and Fall

Bioretention Stormwater Management Practices Level 1 Inspection Checklist

SMP ID #		SMP Owner		<input type="checkbox"/> Private <input type="checkbox"/> Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		Longitude	
Party Responsible for Maintenance	System Type			Type of Site
<input type="checkbox"/> Same as SMP Owner <input type="checkbox"/> Other 	<input type="checkbox"/> Seasonal <input type="checkbox"/> Continuous Use <input type="checkbox"/> Other	<input type="checkbox"/> Above Ground <input type="checkbox"/> Below Ground	<input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> State	
Inspection Date			Inspection Time	
Inspector				
Date of Last Inspection				

BR Drainage Area

Look for areas that are uphill from the Bioretention cell.

Problem (Check if Present)	Follow-Up Actions
<div style="display: flex; align-items: center;">  <div> <input type="checkbox"/> Bare soil, erosion of the ground (rills washing out the dirt) </div> </div>	<div style="margin-top: 20px;"> <input type="checkbox"/> Seed and mulch areas of bare soil to establish vegetation. <input type="checkbox"/> Fill in erosion areas with soil, compact, and seed and straw to establish vegetation. <input type="checkbox"/> If a rill or small channel is forming, try to redirect water flowing to this area by creating a small berm or adding topsoil to areas that are heavily compacted. <input type="checkbox"/> Other: </div>

BR Drainage Area

Look for areas that are uphill from the Bioretention cell.

Problem (Check if Present)

Follow-Up Actions



- ☐ Kick-Out to Level 2 Inspection: Large areas of soil have been eroded, or larger channels are forming. May require rerouting of flow paths.



- ☐ Piles of grass clippings, mulch, dirt, salt, or other materials

- ☐ Remove or cover piles of grass clippings, mulch, dirt, etc.
- ☐ Other:





- ☐ Open containers of oil, grease, paint, or other substances

- ☐ Cover or properly dispose of materials; consult your local solid waste authority for guidance on materials that may be toxic or hazardous.
- ☐ Other:



BR Inlets

Stand in the Bioretention cell itself and look for all the places where water flows in. Often there will be multiple points of inflow to the practice.

Problem (Check if Present)	Follow-Up Actions
 <p><input type="checkbox"/> Inlets collect grit and debris or grass/weeds. Some water may not be getting into the Bioretention cell. The objective is to have a clear pathway for water to flow into the cell.</p>	<p> <input type="checkbox"/> Use a flat shovel to remove grit and debris (especially at curb inlets or openings). Parking lots generate fine grit that will accumulate at these spots. </p> <p> <input type="checkbox"/> Pull out clumps of growing grass or weeds and scoop out the soil or grit that the plants are growing in. </p> <p> <input type="checkbox"/> Remove any grass clippings, leaves, sticks, and other debris that is collecting at inlets. </p> <p> <input type="checkbox"/> For pipes and ditches, remove sediment and debris that is partially blocking the pipe or ditch opening where it enters the Bioretention cell. </p> <p> <input type="checkbox"/> Dispose of all material properly where it will not re-enter the Bioretention cell. </p> <p> <input type="checkbox"/> Other: </p>
	<p> <input type="checkbox"/> Kick-Out to Level 2 Inspection: Inlets are blocked to the extent that most of the water does not seem to be entering the Bioretention cell. </p>
 <p><input type="checkbox"/> Some or all of the inlets are eroding so that rills, gullies, and other erosion is present, or there is bare dirt that is washing into the Bioretention cell.</p>	<p> <input type="checkbox"/> For small areas of erosion, smooth out the eroded part and apply rock or stone (e.g., river cobble) to prevent further erosion. Usually, filter fabric is placed under the rock or stone. </p> <p> <input type="checkbox"/> In some cases, reseeding and applying erosion-control matting can be used to prevent further erosion. Some of these materials may be available at a garden center, but it may be best to consult a landscape contractor. </p> <p> <input type="checkbox"/> Other: </p>
	<p> <input type="checkbox"/> Kick-Out to Level 2 Inspection: Erosion is occurring at most of the inlets, and it looks like there is too much water that is concentrating at these points. The inlet design may have to be modified. </p>



BR Ponding Area

Examine the entire Bioretention surface and side slopes

Problem (Check if Present)	Follow-Up Actions
 <p><input type="checkbox"/> Mulch (if used) needs to be replaced or replenished. The mulch layer had decomposed or is less than 1-inch thick.</p>	<p><input type="checkbox"/> Add new mulch to a total depth (including any existing mulch that is left) of 2 to 3 inches. The mulch should be shredded hardwood mulch that is less likely to float away during rainstorms.</p> <p><input type="checkbox"/> Avoid adding too much mulch so that inlets are obstructed or certain areas become higher than the rest of the Bioretention surface.</p> <p><input type="checkbox"/> Other:</p>
 <p><input type="checkbox"/> Minor areas of sediment, grit, trash, or other debris are accumulating on the bottom.</p>	<p><input type="checkbox"/> Use a shovel to scoop out minor areas of sediment or grit, especially in the spring after winter sanding materials may wash in and accumulate. Dispose of the material where it cannot re-enter the Bioretention cell .</p> <p><input type="checkbox"/> If removing the material creates a hole or low area, fill with soil mix that matches original mix and cover with mulch so that the Bioretention surface area is as flat as possible.</p> <p><input type="checkbox"/> Remove trash, vegetative debris, and other undesirable materials.</p> <p><input type="checkbox"/> Other:</p> <p><input type="checkbox"/> Kick-Out to Level 2 Inspection: Sediment has accumulated more than 2-inches deep and covers 25% or more of the Bioretention surface.</p> <p><input type="checkbox"/> Kick-Out to Level 2 Inspection: The Bioretention cell is too densely vegetated to assess sediment accumulation or ponding; see BR-4, Vegetation.</p>


BR Ponding Area

Examine the entire Bioretention surface and side slopes

Problem (Check if Present)	Follow-Up Actions
<div>  </div> <div> <ul style="list-style-type: none"> <input type="checkbox"/> There is erosion in the bottom or on the side slopes. Water seems to be carving out rills as it flows across the Bioretention surface or on the slopes, or sinkholes are forming in certain areas. <input type="checkbox"/> Source: Stormwater Maintenance, LLC. </div>	<div> <ul style="list-style-type: none"> <input type="checkbox"/> Try filling the eroded areas with clean topsoil or sand, and cover with mulch. <input type="checkbox"/> If the problem recurs, you may have to use stone (e.g., river cobble) to fill in problem areas. <input type="checkbox"/> If the erosion is on a side slope, fill with clay that can be compacted and seed and mulch the area. <input type="checkbox"/> Other: </div> <div> <ul style="list-style-type: none"> <input type="checkbox"/> Kick-Out to Level 2 Inspection: The problem persists or the erosion is more than 3-inches deep and seems to be an issue with how water enters and moves through the Bioretention cell. <input type="checkbox"/> Kick-Out to Level 2 Inspection: The problem does not seem to be caused by flowing water, but a collapse or sinking of the surface (e.g., "sinkhole") due to some underground problem. </div>
<div>  </div> <div> <ul style="list-style-type: none"> <input type="checkbox"/> The bottom of the Bioretention cell is not flat, and the water pools at one end, along an edge, or in certain pockets. The whole bottom is not uniformly covered with water. See design plan to verify that bioretention surface is intended to be flat. Check during or immediately after a rainstorm. </div>	<div> <ul style="list-style-type: none"> <input type="checkbox"/> If the problem is minor (just small, isolated areas are not covered with water), try raking the surface OR adding mulch to low spots to create a more level surface. You may need to remove and replace plantings in order to properly even off the surface. <input type="checkbox"/> Check the surface with a string and bubble level to get the surface as flat as possible. <input type="checkbox"/> Other: </div> <div> <ul style="list-style-type: none"> <input type="checkbox"/> Kick-Out to Level 2 Inspection: Ponding water is isolated to less than half of the Bioretention surface area, and there seem to be elevation differences of more than a couple of inches across the surface. </div>


BR Ponding Area

Examine the entire Bioretention surface and side slopes

Problem (Check if Present)	Follow-Up Actions
 <p><input type="checkbox"/> Water stands on the surface more than 72 hours after a rainstorm and /or wetland-type vegetation is present. The Bioretention cell does not appear to be draining properly.</p>	<p><input type="checkbox"/> Kick-Out to Level 2 Inspection: This is generally a serious problem, and it will be necessary to activate a Level 2 Inspection.</p>


BR Vegetation

Examine all Bioretention cell vegetation.

Problem (Check if Present)	Follow-Up Actions
 <p><input type="checkbox"/> Vegetation requires regular maintenance—pulling weeds, removing dead and diseased plants, replacing mulch around plants, adding plants to fill in areas that are not well vegetated, etc.</p>	<p><input type="checkbox"/> If you can identify which plants are weeds or not intended to be part of the planting plan, eliminate these, preferably by hand pulling.</p> <p><input type="checkbox"/> If weeds are widespread, check with the local stormwater authority and/or Extension Office about proper use of herbicides for areas connected with the flow of water.</p> <p><input type="checkbox"/> Even vegetation that is intended to be present can become large, overgrown, and/or crowd out surrounding plants. Prune and thin accordingly.</p> <p><input type="checkbox"/> If weeds or invasive plants have overtaken the whole Bioretention cell, bush-hog the entire area before seedheads form in the spring. It will be necessary to remove the root mat manually or with appropriate herbicides, as noted above.</p> <p><input type="checkbox"/> Re-plant with species that are aesthetically pleasing and seem to be doing well in the Bioretention cell.</p> <p><input type="checkbox"/> Other:</p> <p><input type="checkbox"/> Kick-Out to Level 2 Inspection: You are unsure of the original planting design, or the vegetation maintenance task is beyond your capabilities of time, expertise, or resources. If you are unsure of the health of the vegetation (e.g. salt damage, invasives, which plants are undesirable) or the appropriate season to conduct vegetation management, consult a landscape professional before undertaking any cutting, pruning, mowing, or brush hogging.</p>


BR Vegetation

Examine all Bioretention cell vegetation.

Problem (Check if Present)	Follow-Up Actions
 <input type="checkbox"/> Vegetation is too thin, is not healthy, and there are many spots that are not well vegetated.	<div> <input type="checkbox"/> The original plants are likely not suited for the actual conditions within the Bioretention cell . If you are knowledgeable about plants, select and plant more appropriate vegetation (preferably native plants) so that almost the entire surface area will be covered by the end of the second growing season. <input type="checkbox"/> Other: </div> <div> <input type="checkbox"/> Kick-Out to Level 2 Inspection: For all but small practices (e.g., rain gardens), this task will likely require a landscape design professional or horticulturalist. </div>

BR Outlets

Examine outlets that release water out of the Bioretention cell.

Problem (Check if Present)	Follow-Up Actions
<input type="checkbox"/> Erosion at outlet	<div> <input type="checkbox"/> Add stone to reduce the impact from the water flowing out of the outlet pipe or weir during storms. <input type="checkbox"/> Other: </div> <div> <input type="checkbox"/> Kick-Out to Level 2 Inspection: Rills have formed and erosion problem becomes more severe. </div>
 <input type="checkbox"/> Outlet obstructed with mulch, sediment, debris, trash, etc.	<div> <input type="checkbox"/> Remove the debris and dispose of it where it cannot re-enter the Bioretention cell . <input type="checkbox"/> Other: </div> <div> <input type="checkbox"/> Kick-Out to Level 2 Inspection: Outlet is completely clogged or obstructed; there is too much material to remove by hand or with simple hand tools. </div>

Additional Notes:

Inspector: _____

Date: _____

Complete the following if follow-up/corrective actions were identified during this inspection:

Certified Completion of Follow-Up Actions:

"I hereby certify that the follow-up/corrective actions identified in the inspection performed on _____ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected."

Inspector/Operator: _____

Date: _____

Bioretention Stormwater Management Practices Level 2 Inspection Checklist

SMP ID #		SMP Owner		<input type="checkbox"/> Private <input type="checkbox"/> Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		Longitude	
Party Responsible for Maintenance	System Type		Type of Site	
<input type="checkbox"/> Same as SMP Owner <input type="checkbox"/> Other _____	<input type="checkbox"/> Seasonal <input type="checkbox"/> Continuous Use <input type="checkbox"/> Other	<input type="checkbox"/> Above Ground <input type="checkbox"/> Below Ground	<input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> State	
Inspection Date		Inspection Time		
Inspector				
Date of Last Inspection				

Level 2 Inspection: BIORETENTION
NOTE: Key Source for this Information (CSN, 2013)

Recommended Repairs	Triggers for Level 3 Inspection
Observed Condition: Water Stands on Surface for More than 72 Hours after Storm	
<p><input type="checkbox"/> Condition 1: Small pockets of standing water</p> <p>Use a soil probe or auger to examine the soil profile. If isolated areas have accumulated grit, fines, or vegetative debris or have bad soil media, try scraping off top 3 inches of media and replacing with clean material. Also check to see that surface is level and water is not ponding selectively in certain areas.</p> <p><input type="checkbox"/> Condition 2: Standing water is widespread or covers entire surface</p> <p>Requires diagnosis and resolution of problem:</p> <ul style="list-style-type: none"> • Clogged underdrain? • Filter fabric between soil media and underdrain stone? • Need to install underdrain if not present? • Too much sediment/grit washing in from drainage area? • Too much ponding depth? • Improper soil media? 	<ul style="list-style-type: none"> • Soil media is clogged and problem is not evident from Level 2 inspection. • Level 2 inspection identifies problem, but it cannot be resolved easily or is associated with the original design of the practice. <p><input type="checkbox"/> Level 3 inspection necessary</p>
Observed Condition: Vegetation is sparse or out of control	
<p><input type="checkbox"/> Condition 1: Original design planting plan seems good but has not been maintained, so there are many invasives and/or dead plants</p> <p>Will require some horticultural experience to restore vegetation to intended condition by weeding, pruning, removing plants, and adding new plants.</p> <p><input type="checkbox"/> Condition 2: Original design planting plan is unknown or cannot be actualized</p> <p>A landscape architect or horticulturalist will be needed to redo the planting plan. Will likely require analysis of soil pH, moisture, organic content, sun/shade, and other conditions to make sure plants match conditions. Plan should include invasive plant management and maintenance plan to include mulching, watering, disease intervention, periodic thinning/pruning, etc.</p>	<ul style="list-style-type: none"> • Vegetation deviates significantly from original planting plan; Bioretention has been neglected and suffered from deferred maintenance. • Owner/responsible party does not know how to maintain the practice. <p><input type="checkbox"/> Level 3 inspection necessary</p>
Observed Condition: Bioretention does not conform to original design plan in surface area or storage	
<p><input type="checkbox"/> Condition 1: Level 2 Inspection reveals that practice is too small based on design dimension, does not have adequate storage (e.g., ponding depth) based on the plan, and/or does not treat the drainage area runoff as indicated on the plan</p> <p>Small areas of deviation can be corrected by the property owner or responsible party, but it is likely that a Qualified Professional will have to revisit the design and attempt a redesign that meets original objectives or that can be resubmitted to the municipality for approval.</p>	<ul style="list-style-type: none"> • More than a 25% departure from the approved plan in surface area, storage, or drainage area; sometimes less than this threshold at the discretion of the Level 2 inspector. <p><input type="checkbox"/> Level 3 inspection necessary</p>

Level 2 Inspection: BIORETENTION
NOTE: Key Source for this Information (CSN, 2013)

Recommended Repairs	Triggers for Level 3 Inspection
<p>Observed Condition: Severe erosion of filter bed, inlets, or around outlets</p>	
<p><input type="checkbox"/> Condition 1: Erosion at inlets</p> <p>The lining (e.g., grass, matting, stone, rock) may not be adequate for the actual flow velocities coming through the inlets. First line of defense is to try a more non-erosive lining and/or to extend the lining further down to where inlet slopes meet the Bioretention surface. If problem persists, analysis by a Qualified Professional is warranted.</p> <p><input type="checkbox"/> Condition 2: Erosion of Bioretention filter bed</p> <p>This is often caused by “preferential flow paths” through and along the Bioretention surface. The source of flow should be analyzed and methods employed to dissipate energy and disperse the flow (e.g., check dams, rock splash pads).</p> <p><input type="checkbox"/> Condition 3: Erosion on side slopes</p> <p>Again, the issue is likely linked with unanticipated flow paths down the side slopes (probably overland flow that concentrates as it hits the edge of the slope). For small or isolated areas, try filling, compacting, and re-establishing healthy ground cover vegetation. If the problem is more widespread, further analysis is required to determine how to redirect the flow.</p>	<ul style="list-style-type: none"> Erosion (rills, gullies) is more than 12 inches deep at inlets or the filter bed or more than 3 inches deep on side slopes. If the issue is not caused by moving water but some sort of subsurface defect. This may manifest as a sinkhole or linear depression and be associated with problems with the underdrain stone or pipe or underlying soil. <p><input type="checkbox"/> Level 3 inspection necessary</p>
<p>Observed Condition: Significant sediment accumulation, indicating an uncontrolled source of sediment</p>	
<p><input type="checkbox"/> Condition 1: Isolated areas of sediment accumulation, generally less than 3-inches deep</p> <p>Sediment source may be from a one-time or isolated event. Remove accumulated sediment and top 2 to 3 inches of Bioretention soil media; replace with clean material. Check drainage area for any ongoing sources of sediment.</p> <p><input type="checkbox"/> Condition 2: Majority of the surface is caked with “hard pan” (thin layer of clogging material) or accumulated sediment that is 3-inches deep or more</p> <p>This can be caused by an improper construction sequence (drainage area not fully stabilized prior to installation of Bioretention soil media) or another chronic source of sediment in the drainage area. Augering several holes down through the media can indicate how severe the problem is; often the damage is confined to the first several inches of soil media. Removing and replacing this top layer (or to the depth where sediment incursion is seen in auger holes) can be adequate, as long as the problem does not recur.</p>	<ul style="list-style-type: none"> More than 2 inches of accumulated sediment cover 25% or more of the Bioretention surface area. “Hard pan” of thin, crusty layer covers majority of Bioretention surface area and seems to be impeding flow of water down through the soil media. New sources of sediment seem to be accumulating with each significant rainfall event. <p><input type="checkbox"/> Level 3 inspection necessary</p>

Notes:

Inspector: _____

Date: _____

Complete the following if follow-up/corrective actions were identified during this inspection:

Certified Completion of Follow-Up Actions:

"I hereby certify that the follow-up/corrective actions identified in the inspection performed on _____ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected."

Inspector/Operator: _____

Date: _____

Disconnection & Sheetflow Stormwater Management Practices Level 1 Inspection Checklist

SMP ID #		SMP Owner		<input type="checkbox"/> Private <input type="checkbox"/> Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		Longitude	
Party Responsible for Maintenance	System Type		Type of Site	
<input type="checkbox"/> Same as SMP Owner <input type="checkbox"/> Other _____	<input type="checkbox"/> Seasonal <input type="checkbox"/> Continuous Use <input type="checkbox"/> Other	<input type="checkbox"/> Above Ground <input type="checkbox"/> Below Ground	<input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> State	
Inspection Date			Inspection Time	
Inspector				
Date of Last Inspection				

Table 2.4.1 D&S Drainage Area

Visually inspect any surfaces in the drainage area.


Problem (Check if Present)	Follow-Up Actions
 <input type="checkbox"/> Changes in flow; more runoff; runoff bypassing the practice	<input type="checkbox"/> For rooftop areas, make sure downspouts are still disconnected and conveying water into the treatment area. <input type="checkbox"/> Look for and remove any "dams" of sediment and grass clippings that prevent water from entering the treatment area as sheet flow. <input type="checkbox"/> Other:

Table 2.4.1 D&S Drainage Area

Visually inspect any surfaces in the drainage area.




Problem (Check if Present)	Follow-Up Actions
	<input type="checkbox"/> Kick-Out to Level 2 Inspection: Changes to drainage area size or amount of runoff due to construction, tillage, etc.
 <input type="checkbox"/> For parking lots in the drainage area—sediment, grass clippings, or other debris has accumulated at pavement edge.	<input type="checkbox"/> For small, isolated amounts of debris, sweep up by hand and dispose properly so that it will not be exposed to runoff. <input type="checkbox"/> Other:
 <input type="checkbox"/> For parking lots in the drainage area—dips or damage at pavement edge caused flow to concentrate.	<input type="checkbox"/> Kick-Out to Level 2 Inspection: This will likely require special expertise to diagnose and fix pavement edge.

Table 2.4.2 D&S Level Spreader/Energy Dissipator

Inspect the energy dissipator closely, during a rain event if possible.



Problem (Check if Present)	Follow-Up Actions
 <p><input type="checkbox"/> Debris and/or sediment accumulated behind or around the level spreader.</p>	<p><input type="checkbox"/> Remove debris and sediment by hand and ensure that the area behind the level spreader is relatively flat. Too much debris and sediment can cause runoff to bypass the level spreader structure.</p> <p><input type="checkbox"/> Other:</p>
 <p><input type="checkbox"/> Sinking, cracking, sloughing, or other structural problem makes the energy dissipator no longer level.</p>	<p><input type="checkbox"/> For stone/gravel spreaders, add new material or rake out as needed to make it even.</p> <p><input type="checkbox"/> Other:</p> <p><input type="checkbox"/> Kick-Out to Level 2 Inspection: Structural issues that cannot be easily fixed by hand</p>

Table 2.4.3 D&S Treatment Area

Examine where flow enters the treatment area as well as the whole flow path. Look for signs of concentrated flow.



Problem (Check if Present)	Follow-Up Actions
<p><input type="checkbox"/> Trash and/or debris in the treatment area</p>	<p><input type="checkbox"/> Collect trash/debris and dispose of properly.</p>
 <p><input type="checkbox"/> Grass filter strip has grown very tall, to the point that runoff cannot easily enter or is getting concentrated.</p>	<p><input type="checkbox"/> Mow filter strip twice a year or more frequently in a residential yard.</p>

Table 2.4.3 D&S Treatment Area

Examine where flow enters the treatment area as well as the whole flow path. Look for signs of concentrated flow.

Problem (Check if Present)	Follow-Up Actions
<input type="checkbox"/> Sparse vegetation or bare spots	<input type="checkbox"/> For grassy areas, add topsoil (as needed), grass seed, mulch, and water during the growing season to re-establish consistent vegetation cover. <input type="checkbox"/> Other:
 <input type="checkbox"/> Rills or gullies are forming in treatment area where flow has become concentrated	<div> <input type="checkbox"/> For minor rills, fill in with soil, compact, and add seed and straw to establish vegetation. <input type="checkbox"/> Other: </div> <div> <input type="checkbox"/> Kick-Out to Level 2 Inspection: Rills are more than 2" to 3" deep and require more than just hand raking and re-seeding. </div>

Additional Notes:

Inspector: _____

Date: _____

Complete the following if follow-up/corrective actions were identified during this inspection:

Certified Completion of Follow-Up Actions:

"I hereby certify that the follow-up/corrective actions identified in the inspection performed on _____ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected."

Inspector/Operator: _____

Date: _____

Disconnection & Sheetflow Stormwater Management Practices Level 2 Inspection Checklist

SMP ID #		SMP Owner		<input type="checkbox"/> Private <input type="checkbox"/> Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		Longitude	
Party Responsible for Maintenance	System Type		Type of Site	
<input type="checkbox"/> Same as SMP Owner <input type="checkbox"/> Other _____	<input type="checkbox"/> Seasonal <input type="checkbox"/> Continuous Use <input type="checkbox"/> Other	<input type="checkbox"/> Above Ground <input type="checkbox"/> Below Ground	<input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> State	
Inspection Date			Inspection Time	
Inspector				
Date of Last Inspection				

Level 2 Inspection – DISCONNECTION AND SHEETFLOW

Recommended Repairs

Triggers for Level 3 Inspection

Observed Condition: Significant sediment on pavement that drains to disconnection area (e.g., grass strip)

- ☐ Condition 1: Sediment on parking lot is widespread

Enlist a mechanical sweeper or vacuum sweeper to remove sediment across entire pavement surface. Pay special attention to downhill edges of pavement where more sediment may have accumulated.

- Sediment accumulation is so serious that it cannot be sufficiently removed with mechanical sweeper. May indicate a high sediment load from uphill in the drainage area that needs to be mitigated.

- ☐ Level 3 inspection necessary

Observed Condition: Pavement edge deteriorating

- ☐ Condition 1: Dips or damage at pavement edge causing runoff to concentrate

Determine whether the damaged edge is causing significant enough concentration of runoff to warrant repair or regrading of the pavement.

- Edge must be patched or re-paved to make secure and level.
- Parking lot not draining properly to the energy dissipator and treatment area.

- ☐ Level 3 inspection necessary

Observed Condition: Level spreader/energy dissipator

- ☐ Condition 1: Level spreader sinking or uneven

If basic equipment can be used, prop up and secure any section of level spreader that is sinking. Regrade soil all around level spreader and add stone as necessary to prevent erosion and bypassing.

- ☐ Condition 2: Level spreader is broken

These repairs can be simple for small, residential-scale practices, such as at a downspout. Ensure the level spreader is level across, keyed in to soil at the edges, and made of durable material that can withstand the flow of water running across it.

Larger or more complicated level spreaders (e.g., concrete) will likely require specialized skill and equipment.

- Level spreader requires specialized equipment, regrading, or large amount of material to make level again.
- Level spreader needs to be re-designed and replaced.

- ☐ Level 3 inspection necessary

Level 2 Inspection – DISCONNECTION AND SHEETFLOW

Recommended Repairs	Triggers for Level 3 Inspection
<p>Observed Condition: Erosion in treatment area</p> <p><input type="checkbox"/> Condition 1: Rills from concentrated flow</p> <p>Inspect energy dissipator to see whether it needs to be improved to better spread out incoming flow. Regrade flow path to ensure that it is relatively flat (if minor). If major re-grading is needed, the treatment area may need to be redesigned and fixed with specialized equipment.</p>	<ul style="list-style-type: none"> • Major rills and gullies • Treatment area needs to be re-designed and major grading needed. <p><input type="checkbox"/> Level 3 inspection necessary</p>

Notes:

Inspector: _____

Date: _____

Complete the following if follow-up/corrective actions were identified during this inspection:

Certified Completion of Follow-Up Actions:

"I hereby certify that the follow-up/corrective actions identified in the inspection performed on _____ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected."

Inspector/Operator: _____




Date: _____

Swale Stormwater Management Practices Level 1 Inspection Checklist

SMP ID #		SMP Owner		<input type="checkbox"/> Private <input type="checkbox"/> Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		Longitude	
Party Responsible for Maintenance	System Type		Type of Site	
<input type="checkbox"/> Same as SMP Owner <input type="checkbox"/> Other _____	<input type="checkbox"/> Seasonal <input type="checkbox"/> Continuous Use <input type="checkbox"/> Other	<input type="checkbox"/> Above Ground <input type="checkbox"/> Below Ground	<input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> State	
Inspection Date		Inspection Time		
Inspector				
Date of Last Inspection				


SW Drainage Area

Look at areas that are uphill from the swale.

Problem (Check if Present)	Follow-Up Actions
 <p><input type="checkbox"/> Bare soil, erosion of the ground (rills washing out the dirt)</p>	<p> <input type="checkbox"/> Seed and mulch or sod areas of bare soil to establish vegetation. <input type="checkbox"/> Fill in erosion areas with soil, compact, and add seed and straw to establish vegetation. <input type="checkbox"/> If a rill or small channel is forming, try to redirect water flowing to this area by creating a small berm or adding topsoil to areas that are heavily compacted. <input type="checkbox"/> Other: </p> <p> <input type="checkbox"/> Kick-Out to Level 2 Inspection: Large areas of soil have been eroded, or larger channels are forming. May require rerouting of flow paths </p>
 <p><input type="checkbox"/> Piles of grass clippings, mulch, dirt, salt, or other materials</p>	<p> <input type="checkbox"/> Remove or cover piles of grass clippings, mulch, dirt, etc. <input type="checkbox"/> Other: </p>
 <p><input type="checkbox"/> Open containers of oil, grease, paint, or other substances</p>	<p> <input type="checkbox"/> Cover or properly dispose of materials; consult your local solid waste authority for guidance on materials that may be toxic or hazardous. </p>
<p><input type="checkbox"/> Grass dying at edge of road</p>	<p> <input type="checkbox"/> Seed and mulch; add topsoil or compost if needed. <input type="checkbox"/> Other: </p> <p> <input type="checkbox"/> Kick-Out to Level 2 Inspection: Grass on edge of pavement continues to die off for unknown reasons. Swale edge may need to be replaced with other materials (e.g., stone diaphragm). </p>


SW Inlets

Stand in the swale and look for all the places where water flows in.

Problem (Check if Present)	Follow-Up Actions
<input type="checkbox"/> Inlets or the swale edge are collecting grit, grass clippings, or debris or have grass/weeds growing. Some water may not be getting into the swale. The objective is to have a clear pathway for water to flow into the swale.	<div> <input type="checkbox"/> Use a flat shovel to remove grit and debris (especially at curb inlets or opening). Parking lots will generate fine grit that will accumulate at these spots. <input type="checkbox"/> Pull out clumps of growing grass or weeds, and scoop out the soil or grit that the plants are growing in. <input type="checkbox"/> Remove any grass clippings, leaves, sticks, and other debris that is collecting at inlets or along the edge of the swale where water is supposed to enter. <input type="checkbox"/> For pipes and ditches, remove sediment and debris that is partially blocking the pipe or ditch opening where it enters the swale. <input type="checkbox"/> Dispose of all material properly in an area where it will not re-enter the swale. <input type="checkbox"/> Other: </div> <div> <input type="checkbox"/> Kick-Out to Level 2 Inspection: Inlets are blocked to the extent that most of the water does not seem to be entering the swale. </div>
<div>  </div> <input type="checkbox"/> Some or all of the inlets are eroding so that rills, gullies, and other erosion are present, or there is bare dirt that is washing into the swale.	<div> <input type="checkbox"/> For small areas of erosion, smooth out the eroded part and apply rock or stone (e.g., river cobble) to prevent further erosion. Usually, filter fabric is placed under the rock or stone. <input type="checkbox"/> In some cases, reseeding and applying an erosion control matting can be used to prevent further erosion. Some of these materials may be available at a garden center, but it may be best to consult a landscape contractor. <input type="checkbox"/> Other: </div> <div> <input type="checkbox"/> Level 2 Inspection: Erosion is occurring at most of the inlets or along much of the swale edge. The inlet design may have to be modified. </div>


SW Surface Area

Examine the entire swale surface and side slopes.

Problem (Check if Present)	Follow-Up Actions
<input type="checkbox"/> Minor areas of sediment, grit, trash, or other debris are accumulating in the swale.	<div> <input type="checkbox"/> Use a shovel to scoop out minor areas of sediment or grit, especially in the spring after winter sanding materials may wash in and accumulate. Dispose of the material where it cannot re-enter the swale. <input type="checkbox"/> If removing the material creates a hole or low area, fill with good topsoil and add seed and straw to re-vegetate. <input type="checkbox"/> Remove trash, vegetative debris, and other undesirable materials. <input type="checkbox"/> If the swale is densely vegetated, it may be difficult to do the maintenance; check for excessive ponding or other issues described in this section to see if the accumulated material is causing a problem. <input type="checkbox"/> Other: </div> <div> <input type="checkbox"/> Kick-Out to Level 2 Inspection: Sediment has accumulated more than 3 inches deep and covers 25% or more of the swale surface. <input type="checkbox"/> The source of sediment is unknown or cannot be controlled with simple measures. </div>
 <input type="checkbox"/> There is erosion in the bottom or on the side slopes. Water seems to be carving out rills as it flows through the swale or on the slopes.	<div> <input type="checkbox"/> Try filling the eroded areas with clean topsoil, and then seed and mulch to establish vegetation. <input type="checkbox"/> If the problem recurs, you may have to use some type of matting, stone (e.g., river cobble), or other material to fill in eroded areas. <input type="checkbox"/> If the erosion is on a side slope, fill with soil and cover with erosion-control matting or at least straw mulch after re-seeding. </div> <div> <input type="checkbox"/> Kick-Out to Level 2 Inspection: The problem persists or the erosion is more than 3 inches deep and seems to be an issue with how water enters and moves through the swale. <input type="checkbox"/> Kick-Out to Level 2 Inspection: The problem does not seem to be caused by flowing water, but a collapse or sinking of the surface (e.g., "sinkhole") due to some underground problem. </div>
<input type="checkbox"/> Water does not flow evenly down the length of the swale, but ponds in certain areas for long periods of time (e.g., 72 hours after a storm). The swale does not seem to have "positive drainage." Check during or immediately after a rain storm.	<div> <input type="checkbox"/> If the problem is minor (just small, isolated areas), try using a metal rake or other tools to create a more even flow path; remove excessive vegetative growth, sediment, or other debris that may be blocking the flow. <input type="checkbox"/> Other: </div> <div> <input type="checkbox"/> Kick-Out to Level 2 Inspection: Water ponds in more than 25% of the swale for three days or more after a storm. The issue may be with the underlying soil or the grade of the swale. <input type="checkbox"/> Water ponds behind check dams for three days or more after a storm. Check dams may be clogged or not functioning properly. </div>


SW Surface Area

Examine the entire swale surface and side slopes.

Problem (Check if Present)	Follow-Up Actions
 <p><input type="checkbox"/> Check dams (if present): water is flowing around the edges of check dams, creating erosion or sinkholes on the uphill or downhill side, or the check dams are breaking apart or breaching .</p>	<p><input type="checkbox"/> If the problem is isolated to just a few check dams, try simple repairs.</p> <p><input type="checkbox"/> It is very important for the center of each check dam (where most of the water flows) to be lower (by at least several inches) than the edges of the check dams where they meet the side slopes. Also, the check dams should be keyed into side slopes so water does not flow between the check dam and side slope.</p> <p><input type="checkbox"/> Use a level to check the right check-dam configuration, as noted above. Repair by moving around stone, filling and compacting soil, or adding new material so that water will be directed to the center of the check dam instead of the edges.</p> <p><input type="checkbox"/> Other:</p>
	<p><input type="checkbox"/> Kick-Out to Level 2 Inspection: Many check dams are impacted and/or the problem seems to be a design issue with height, spacing, shape, or materials used to construct them.</p>


SW Vegetation

Assess the swale vegetation.

Problem (Check if Present)	Follow-Up Actions
 <p><input type="checkbox"/> Vegetation is too overgrown to access swale for maintenance activities</p>	<p><input type="checkbox"/> Mow or bush-hog the path.</p> <p><input type="checkbox"/> Other:</p>

SW Vegetation

Assess the swale vegetation.

Problem (Check if Present)	Follow-Up Actions
 <p><input type="checkbox"/> Vegetation requires regular maintenance: pulling weeds, removing dead and diseased plants, adding plants to fill in areas that are not well vegetated, etc.</p>	<p><input type="checkbox"/> If you can identify which plants are weeds or not intended to be part of the planting plan, eliminate these, preferably by hand pulling.</p> <p><input type="checkbox"/> If weeds are widespread, check with the local stormwater authority and/or Extension Office about proper use of herbicides for areas connected with the flow of water.</p> <p><input type="checkbox"/> Even vegetation that is intended to be present can become large, overgrown, block flow, and/or crowd out surrounding plants. Prune and thin accordingly.</p> <p><input type="checkbox"/> If weeds or invasive plants have overtaken the whole swale, bush-hog the entire area before seed heads form in the spring. It will be necessary to remove the root mat manually or with appropriate herbicides, as noted above.</p> <p><input type="checkbox"/> Replant with species that are aesthetically pleasing and seem to be doing well in the swale.</p> <p><input type="checkbox"/> Other:</p>
	<p><input type="checkbox"/> Kick-Out to Level 2 Inspection: You are unsure of the original planting design or the vegetation maintenance task is beyond your capabilities of time, expertise, or resources. If you are unsure of the health of the vegetation (e.g. salt damage, invasives, which plants are undesirable) or the appropriate season to conduct vegetation management, consult a landscape professional before undertaking any cutting, pruning, mowing, or brush hogging.</p>
<p><input type="checkbox"/> Vegetation is too thin, is not healthy, and there are many spots that are not well vegetated.</p>	<p><input type="checkbox"/> The original plants are likely not suited for the actual conditions within the swale. If you are knowledgeable about plants, select and plant more appropriate vegetation (preferably native plants) so that almost the entire surface area will be covered by the end of the second growing season.</p> <p><input type="checkbox"/> Other:</p>
	<p><input type="checkbox"/> Kick-Out to Level 2 Inspection: For all but small practices (e.g., in residential yards), this task will likely require a landscape design professional or horticulturalist.</p>

SW Outlets

Examine outlets that release water out of the swale.

Problem (Check if Present)	Follow-Up Actions
<p><input type="checkbox"/> Outlet is obstructed with mulch, sediment, debris, trash, etc.</p>	<p><input type="checkbox"/> Remove the debris and dispose of it where it cannot re-enter the swale.</p> <p><input type="checkbox"/> Other:</p>
	<p><input type="checkbox"/> Kick-Out to Level 2 Inspection: Outlet is completely clogged or obstructed; there is too much material to remove by hand or with simple hand tools.</p>

Additional Notes:

Inspector: _____

Date: _____

Complete the following if follow-up/corrective actions were identified during this inspection:

Certified Completion of Follow-Up Actions:

"I hereby certify that the follow-up/corrective actions identified in the inspection performed on _____ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected."

Inspector/Operator: _____

Date: _____

Swale Stormwater Management Practices Level 2 Inspection Checklist

SMP ID #		SMP Owner		<input type="checkbox"/> Private <input type="checkbox"/> Public
SMP Location (Address; Latitude & Longitude)				
	Latitude		Longitude	
Party Responsible for Maintenance	System Type		Type of Site	
<input type="checkbox"/> Same as SMP Owner <input type="checkbox"/> Other _____	<input type="checkbox"/> Seasonal <input type="checkbox"/> Continuous Use <input type="checkbox"/> Other	<input type="checkbox"/> Above Ground <input type="checkbox"/> Below Ground	<input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> State	
Inspection Date			Inspection Time	
Inspector				
Date of Last Inspection				

Level 2 Inspection: SWALE

Recommended Repairs	Triggers for Level 3 Inspection
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Observed Condition: Water Stands on Surface for More than 72 Hours after Storm

<p><input type="checkbox"/> Condition 1: Small pockets of standing water</p> <p>Use a soil probe or auger to examine the soil profile. If isolated areas have accumulated grit, fines, or vegetative debris or have compacted soil, try scraping off top 3 to 6 inches of soil and replacing with clean material. Also check to see that surface is level and water is not ponding selectively in certain areas.</p> <p><input type="checkbox"/> Condition 2: Standing water is widespread or covers entire surface</p> <p>Requires diagnosis and resolution of problem:</p> <ul style="list-style-type: none"> • Bad or compacted soil • Filter fabric on the swale bottom • Too much sediment/grit washing in from drainage area? • Too much ponding depth? • Longitudinal slope is too flat? 	<ul style="list-style-type: none"> • Soil is overly compacted or clogged and problem is not evident from Level 2 inspection. • Level 2 inspection identifies problem, but it cannot be resolved easily or is associated with the original design of the practice (e.g., not enough slope down through the swale). <p><input type="checkbox"/> Level 3 inspection necessary</p>
--	--

Observed Condition: Vegetation is predominantly weeds and invasive species

<p>For a small area, weed and dig up invasive plants. Replant with natives or plants from original planting plan.</p> <p>If longer than 100 feet, develop a new planting plan and have it professionally reviewed.</p>	<ul style="list-style-type: none"> • Vegetation deviates significantly from original planting plan; swale has been neglected and suffered from deferred maintenance. • Owner/responsible party does not know how to maintain the practice. • For large area, hire a professional to develop a grading plan and develop a planting plan. <p><input type="checkbox"/> Level 3 inspection necessary</p>
--	---

Notes:

Inspector: _____

Date: _____

Complete the following if follow-up/corrective actions were identified during this inspection:

Certified Completion of Follow-Up Actions:

"I hereby certify that the follow-up/corrective actions identified in the inspection performed on _____ (DATE) have been completed and any required maintenance deficiencies have been adequately corrected."

Inspector/Operator: _____

Date: _____

Appendix T. | Historical Mapping and Supporting Documentation



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Appendix D

Wetland Delineation Report



October 20, 2023

Mr. Bill Raffoul
Sun Communities
27777 Franklin Road, Suite 300
Southfield, Michigan 48034

Re: **REVISED** Wetland/Watercourse Delineation &
Preliminary Threatened and Endangered Species Habitat Study Report
Hovey's Island Planned Development District (PDD) Application Project
Parcel I.D. No. 97.00-1-11
Town of Henderson, Jefferson County, New York

Dear Mr. Raffoul:

In accordance with our Scope of Services, Bergmann performed a wetland and watercourse delineation and preliminary threatened and endangered species habitat study of the proposed Hovey's Island Planned Development District (PDD) Application Project ("Project") for Sun Communities ("Client"). The Property parcel (Tax # 97.00-1-11) is approximately 98.0-acres (the "Property") (refer to Figure 1, Study Area Location Map). The Client requested Bergmann to review a portion of the property referred to as the "Study Area." A map that depicts the outlined Study Area can be found on Figure 2, Aerial Imagery Map.

The field delineation and preliminary habitat study ("Field Study") was initially performed by Bergmann on July 13, 2021 and confirmed on September 20, 2023. The intent of the Field Study was to identify and delineate the boundaries of any potentially jurisdictional aquatic resources (i.e., wetlands and streams) and to assess habitat within the Study Area in relation to potential threatened and/or endangered species that may be located within the Study Area.

Preliminary Data Gathering

Preliminary data gathering was used to compile and review information that may be helpful in identifying wetlands and/or areas of interest during the Field Study. Preliminary data gathering included a review of the following resources:

- United States Natural Resources Conservation Service (NRCS) Hydric Soil Survey Map and NRCS Custom Soil Resource Report for Jefferson County, New York,
- United States Federal Emergency Management Agency (FEMA) Flood Hazard Area Map for Jefferson County, New York,
- United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) mapping,
- New York State Department of Environmental Conservation (NYSDEC) Freshwater Wetlands (FWW) mapping, and
- New York State Water Quality Classifications mapping.



The NRCS Hydric Soil Survey Map for Jefferson County, New York showed that the Study Area contained the following eight (8) soil types and their hydric soil classifications (refer to Figure 3. NRCS Hydric Soil Survey Map and Attachment B, NRCS Hydric Soil Report for Jefferson County, New York):

- Beaches (Be). Rated 13% hydric.
- Chaumont silty clay, 0 to 3 percent slopes (CIA). Rated 12% hydric.
- Chaumont silty clay, 3 to 8 percent slopes (CIB). Rated 7% hydric.
- Guffin clay (Gv). Rated 85% hydric.
- Kingsbury silty clay, 0 to 2 percent slopes (KgA). Rated 7% hydric.
- Kingsbury silty clay, 2 to 6 percent slopes (KgB). Rated 6% hydric.
- Rhinebeck variant silty clay loam (Rn). Rated 15% hydric.
- Udorthents, smoothed (Ub). Rated 10% hydric.

Review of the available FEMA data indicated that the Study Area is located on one (1) Flood Insurance Rate Map (FIRM) (Panel #36045C0690G). The Study Area is located within Zone C – “500-year Floodplain, area of minimal flood hazard” (refer to Figure 4. FEMA Flood Hazard Area Map).

A desktop review of the available USFWS NWI digital data indicated that the Study Area is located within the Lake Ontario Watershed (HUC 04150200). There is one (1) lake (L1UBx) NWI feature mapped within the Study Area (refer to Figure 5. National Wetland Inventory Map).

Review of the available NYSDEC FWW mapping indicated there are no NYSDEC FWW located within the Study Area; however, the 500-foot Checkzone for FWW HB-5 is within the northeastern portion of the Study Area (refer to Figure 6. NYSDEC Freshwater Wetland and Stream Map).

Review of the New York State Water Quality Classification mapping revealed that there are no NYS streams mapped within the Study Area (refer to Figure 6. NYSDEC Freshwater Wetland and Stream Map). The Study Area is surrounded by Lake Ontario, a Class A / Standard A Lake.

Field Delineation Results

During the Field Study, wetlands were identified and delineated in accordance with the Corps of Engineers 1987 Wetland Delineation Manual and accompanying 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0. Any location meeting the three (3) wetland criteria (wetland hydrology, hydrophytic vegetation and hydric soils) was identified and delineated.

Streams were identified and delineated based on morphological and hydrological characteristics of the channel. For streams with a top-of-bank width of less than ten feet (<10') the centerline of the stream was delineated. If a stream was observed to have a top-of-bank width of ten feet or greater (≥10') both streambanks were delineated.

The regulatory jurisdiction of each delineated feature was assessed using current Waters of the United States (WOTUS) guidelines (September 2023). Jurisdictional status is based on the professional opinion of Bergmann and must be confirmed through the Jurisdictional Determination (JD) process by Corps. Bergmann recommends obtaining a JD from the USACE and a Freshwater Wetland Verification from the NYSDEC for the Study Area prior to any development in the area.



Generally, the upland habitat observed within the Study Area on Hovey's Island consisted of maintained ornamental landscaped lawns associated with unoccupied buildings, cleared ruderal fields with fill and abandoned heavy equipment, and relatively undisturbed forested areas dominated by green ash (*Fraxinus pennsylvanica*). The Study Area on Hovey's Island was bounded to the north by an asphalt paved road immediately adjacent to Lake Ontario, and relatively undisturbed shoreline abutting Lake Ontario to the east, south and west. The portion of the Study Area located on Association Island was entirely developed as part of the currently operated commercial campground (refer to Attachment D, Representative Study Area Photographs).

There was one (1) palustrine emergent wetland (PEM) wetland delineated within the Study Area (refer to Table 1. and Figure 7. Delineated Resources Map). To document site conditions, a Corps Wetland Determination Data Form was completed for each cover type within each wetland as well as upland references (Attachment E, USACE Wetland Determination Data Forms). Information on the delineated wetlands can be found in Table 1 and photographs are included in Attachment D.

There were no streams identified or delineated within the Study Area (Figure 7, Delineated Resources Map).



Table 1: Wetlands Identified within the Study Area

Wetland I.D. ¹	Cover Type ²	Latitude ³	Longitude ³	Size ⁴ (acres)	Jurisdiction ⁵	Hydrology Indicator(s) ⁶	Dominant Species ⁶	Hydric Soil Indicator(s) ⁶
Wetland 1	PEM	43.886778	-76.226554	0.97	USACE	A3, B3, B9, B13, C4, D2, D4	Salix alba, Fraxinus pennsylvanica, Typha latifolia, Phragmites australis	S7

Notes:

1. Bergmann map designation.
2. PEM- Palustrine Emergent.
3. Center of wetland in North American Datum, 1983.
4. Total acreage of wetland located within the Study Area.
5. Jurisdictional status is the opinion of Bergmann and must be confirmed by the USACE and/or state agencies through the JD process.
6. As determined using the USACE Wetland Determination Data Form, Northcentral & Northeast Regional Supplement.



Preliminary Threatened and Endangered Species Habitat Study Results

The Study Area was reviewed using the NYSDEC Environmental Resource Mapper (ERM). The Study Area does not occur within the "Significant Natural Communities" or "Rare Plants and Animals" layer (refer to Attachment C). The Study Area was reviewed using the USFWS's online Information, Planning and Consultation System (IPaC) and an Official Species List was obtained on September 15, 2023 (Project Code 2023-0129411). The Official Species List identified two (2) federal endangered and one (1) federal candidate species that may occur within the Study Area including:

- Indiana Bat (*Myotis sodalis*); federal endangered
- Northern Long-eared Bat (*Myotis septentrionalis*); federal endangered
- Monarch butterfly (*Danaus plexippus*); federal candidate.

There are no USFWS designated critical habitats located within the Study Area (refer to Attachment C, IPaC Official Species List).

The Species Conclusion Table (Table 2) provides identification of suitable habitat for each species, and our effect determination and rationale regarding the Project's effect on this species. For reasons described in Table 2 we concluded that the Project is not likely to adversely affect federally listed species.



Table 2: Species Conclusion Table

Common Name	Scientific Name	Suitable Habitat	Listing Status ¹	Critical Habitat Present	Suitable Habitat Present Within the Study Area?	Effect Determination ²
Bats						
Northern Long-Eared Bat	<i>Myotis septentrionalis</i>	Roost in cavities or in crevices of both live trees and snags; Hibernates in caves and mines with constant temperatures, high humidity, and no air currents.	FE, SE	No	Yes	May affect but not adversely affect; Suitable summer habitat is presented within the Study Area. If tree cutting/clearing is to be conducted, it should be performed between November 1 to March 31 (as recommend and required by USFWS) when bats would be in their winter hibernaculum.
Indiana Bat	<i>Myotis sodalis</i>	Trees >3" dbh, caves abandoned mines, wooded areas with loose tree bark or dead or dying trees	FE	No	Yes	May affect but not adversely affect; Suitable summer habitat is presented within the Study Area. If tree cutting/clearing is to be conducted, it should be performed between November 1 to March 31 (as recommend and required by USFWS) when bats would be in their winter hibernaculum.
Insects						
Monarch Butterfly	<i>Danaus plexippus</i>	Prairies, meadows, grasslands and along roadsides with milkweed	FC	No	Yes	N/A: Species is a candidate for listing and is not protected under the Endangered Species Act

Notes:

- FE = Federal Endangered; FC = Federal Candidate; SE = State Endangered; SC = State Species of Special Concern
- Effect determination should be considered with each iteration of Project design



If you have any questions or require additional information, contact me by phone at 585-498-7962 or email at jlynch@bergmannpc.com.

Sincerely,

Jenna Lynch

Jenna Lynch
Assistant Project Manager

Attachments:

- Attachment A: Figures
 - Figure 1. Study Area Location Map
 - Figure 2. Aerial Imagery Map
 - Figure 3. NRCS Hydric Soil Survey Map
 - Figure 4. FEMA Flood Hazard Area Map
 - Figure 5. National Wetland Inventory Map
 - Figure 6. NYSDEC Freshwater Wetland and Stream Map
 - Figure 7. Delineated Resources Map
- Attachment B: NRCS Hydric Soil Report for Jefferson County, New York
- Attachment C: IPaC Official Species List & NYSDEC ERM Results
- Attachment D: Representative Study Area Photographs
- Attachment E: USACE Wetland Determination Data Forms



ATTACHMENT A

Figures

Sun Communities Hovey's Island Planned Development District (PDD) Application Project

STUDY AREA LOCATION
MAP

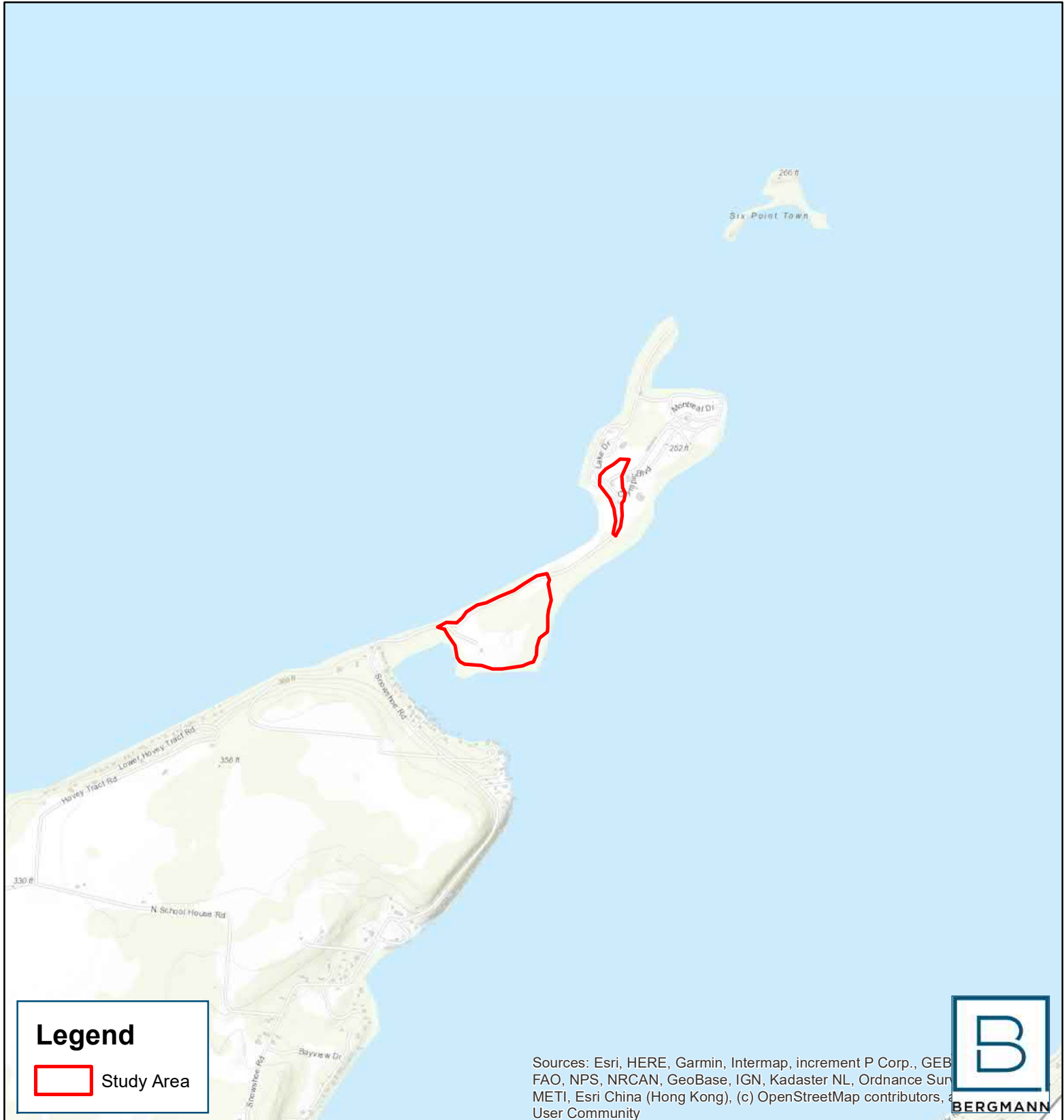
Fig. 1

2,000


Feet



Town of Henderson, Jefferson County, New York



Legend

 Study Area

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri China (Hong Kong), Swisstopo, Mapbox, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the User Community



Sun Communities Hovey's Island Planned Development District (PDD) Application Project

AERIAL IMAGERY
MAP

Fig. 2

700

Feet



Town of Henderson, Jefferson County, New York



Sun Communities Hovey's Island Planned Development District (PDD) Application Project

NRCS HYDRIC SOIL
SURVEY MAP

Fig. 3

700

Feet



Town of Henderson, Jefferson County, New York



Sun Communities Hovey's Island Planned Development District (PDD) Application Project

FEMA FLOOD HAZARD
AREA MAP

Fig. 4

700

Feet



Town of Henderson, Jefferson County, New York



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Sun Communities Hovey's Island Planned Development District (PDD) Application Project

NATIONAL WETLAND
INVENTORY MAP

Fig. 5

700

Feet



Town of Henderson, Jefferson County, New York



Sun Communities Hovey's Island Planned Development District (PDD) Application Project

NYSDEC FRESHWATER
WETLAND & STREAM MAP

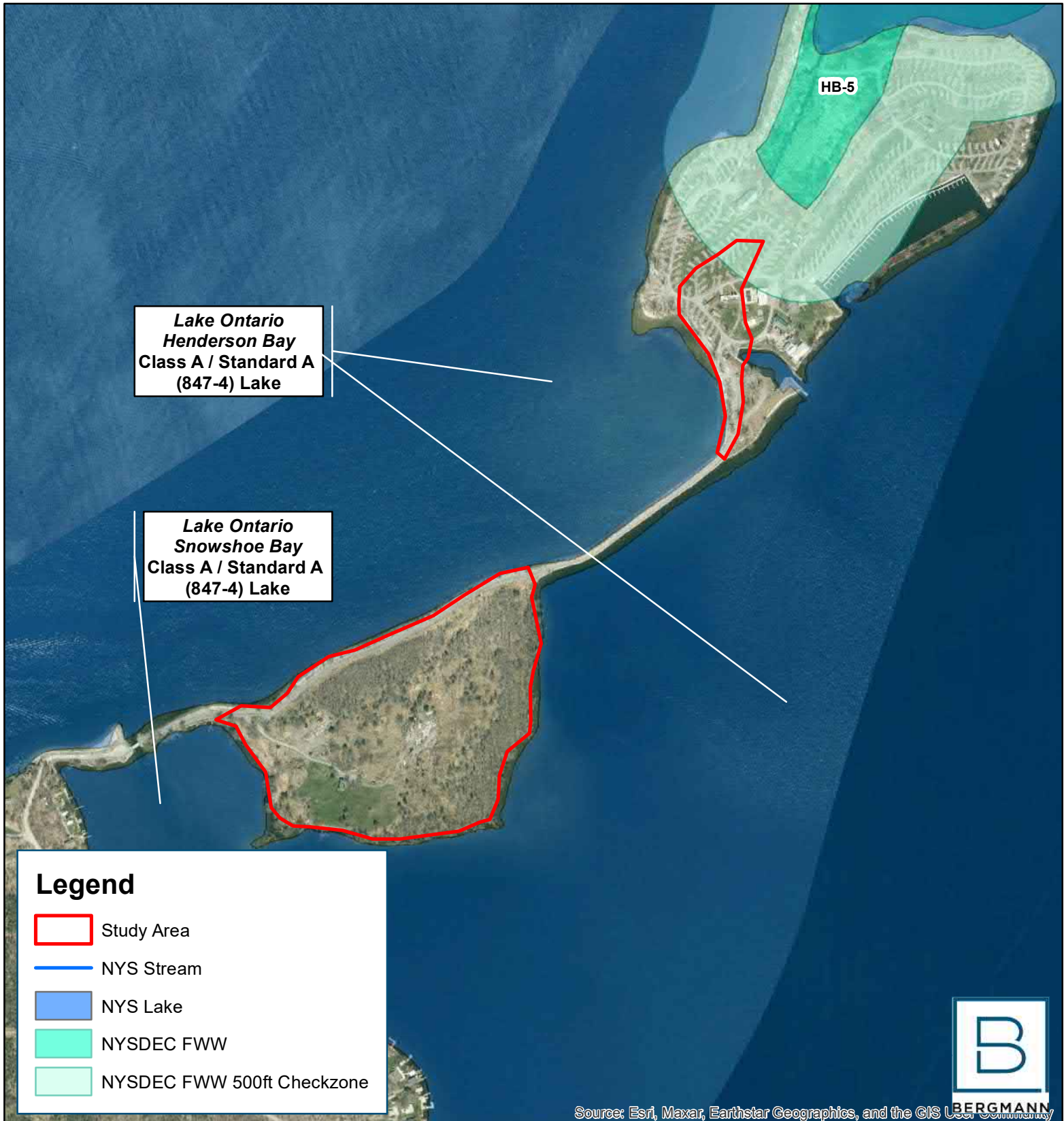
Fig. 6

700

Feet



Town of Henderson, Jefferson County, New York



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Sun Communities Hovey's Island Planned Development District (PDD) Application Project

DELINEATED RESOURCES
MAP

Fig. 7


600

Feet



Town of Henderson, Jefferson County, New York

Legend

 Study Area

Wetland

 PEM

 NYSDEC FWW


 NYSDEC FWW 100ft Adjacent Area

Data Point

 Upland

 Wetland

 Drainage Feature

 Culvert

Wetland 1

HB-5



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



ATTACHMENT B


NRCS Hydric Soil Report

Custom Soil Resource Report Map—Hydric Rating by Map Unit









MAP LEGEND

Area of Interest (AOI)







 Area of Interest (AOI)

Soils







Soil Rating Polygons

 Hydric (100%)
 Hydric (66 to 99%)
 Hydric (33 to 65%)
 Hydric (1 to 32%)
 Not Hydric (0%)
 Not rated or not available

Soil Rating Lines

 Hydric (100%)
 Hydric (66 to 99%)
 Hydric (33 to 65%)
 Hydric (1 to 32%)
 Not Hydric (0%)
 Not rated or not available






Soil Rating Points

 Hydric (100%)
 Hydric (66 to 99%)
 Hydric (33 to 65%)
 Hydric (1 to 32%)
 Not Hydric (0%)
 Not rated or not available

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 1:15,800.

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: Jefferson County, New York
 Survey Area Data: Version 20, Jun 11, 2020

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

Date(s) aerial images were photographed: Dec 31, 2009—Apr 1, 2017

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.

Table—Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Be	Beaches	13	2.3	5.7%
CIA	Chaumont silty clay, 0 to 3 percent slopes	12	8.4	21.1%
CIB	Chaumont silty clay, 3 to 8 percent slopes	7	15.2	38.2%
Gv	Guffin clay	85	1.6	3.9%
KgA	Kingsbury silty clay, 0 to 2 percent slopes	7	6.0	15.1%
KgB	Kingsbury silty clay, 2 to 6 percent slopes	6	1.9	4.8%
Rn	Rhinebeck variant silty clay loam	15	1.5	3.8%
Ub	Udorthents, smoothed	10	2.8	7.0%
Totals for Area of Interest			39.9	100.0%

Rating Options—Hydric Rating by Map Unit*Aggregation Method: Percent Present**Component Percent Cutoff: None Specified**Tie-break Rule: Lower*



ATTACHMENT C

Threatened and Endangered Species Research



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
Phone: (607) 753-9334 Fax: (607) 753-9699
Email Address: fw5es_nyfo@fws.gov

In Reply Refer To:

September 15, 2023

Project Code: 2023-0129411

Project Name: Association Island RV Park Expansion Project

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

To Whom It May Concern:

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

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

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

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)).

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

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

<https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <https://www.fws.gov/program/migratory-bird-permit/what-we-do>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/library/collections/threats-birds>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/partner/council-conservation-migratory-birds>.

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

Attachment(s):

- Official Species List
- Coastal Barriers

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
(607) 753-9334

PROJECT SUMMARY

Project Code: 2023-0129411

Project Name: Association Island RV Park Expansion Project

Project Type: Residential Construction

Project Description: Development/RV park expansion on a portion of Association Island.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@43.88778515,-76.22368046858458,14z>



Counties: Jefferson County, New York

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

COASTAL BARRIERS

Projects within the [John H. Chafee Coastal Barrier Resources System](#) (CBRS) may be subject to the restrictions on Federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local [Ecological Services Field Office](#) or visit the [CBRA Consultations website](#). The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

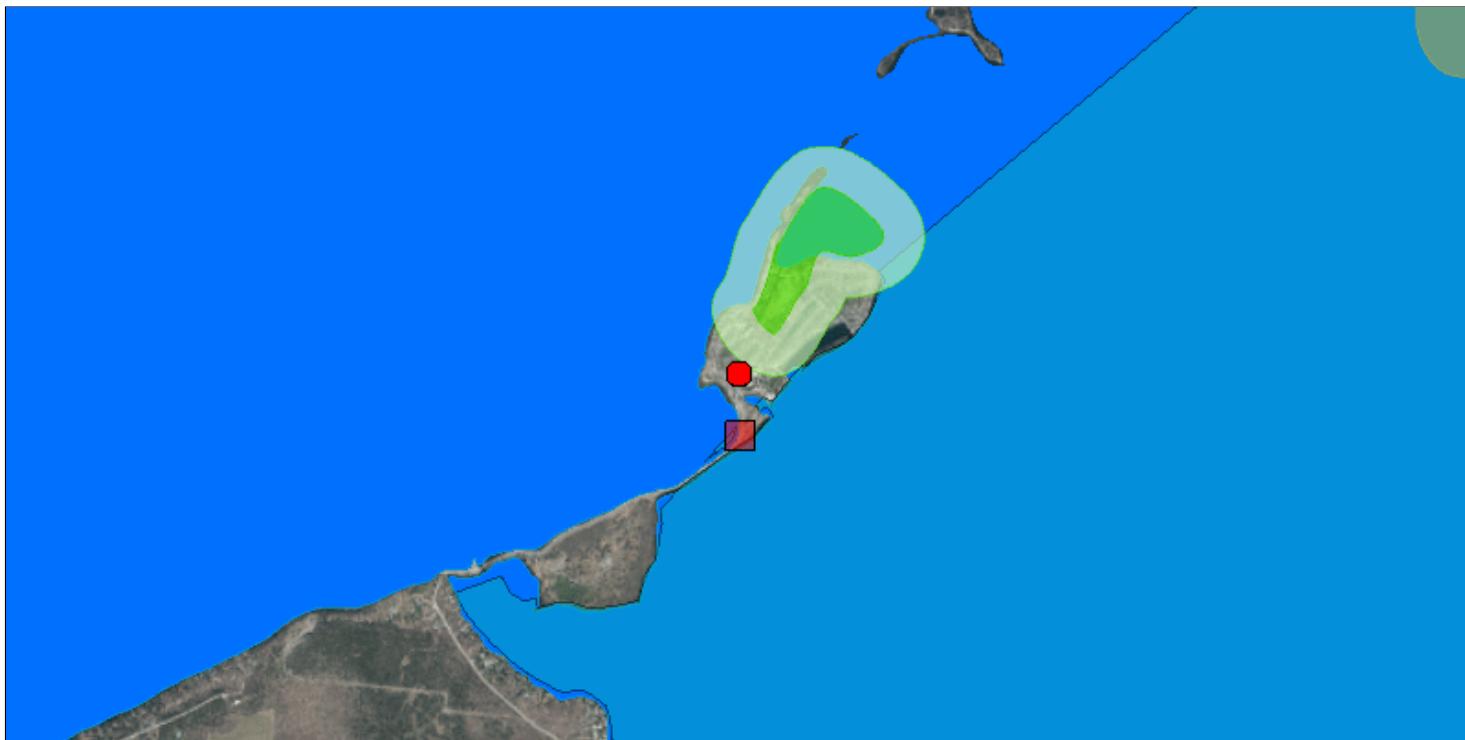
UNIT	NAME	TYPE	SYSTEM UNIT ESTABLISHMENT DATE	FLOOD INSURANCE PROHIBITION DATE
NY-69	Association Island	UNKNOWN	11/16/1990	11/16/1990

PLEASE NOTE: *If this project is Federally funded by the U.S. Fish and Wildlife Service through the [Great Lakes Restoration Initiative \(GLRI\)](#), there may be a [programmatic GLRI CBRA consultation](#) that applies. Please contact the lead Ecological Services Field Office shown on the letterhead for more information.*

IPAC USER CONTACT INFORMATION

Agency: Bergmann
Name: Jenna Lynch
Address: 280 E Broad St #200, Rochester, NY 14604
City: Rochester
State: NY
Zip: 14604
Email: jlynch@bergmannpc.com
Phone: 5854748794

Environmental Resource Mapper



The coordinates of the point you clicked on are:

UTM 18

Easting: 402243.7849033586

Northing: 4860781.299080387

Longitude/Latitude

Longitude: -76.2171258306872

Latitude: 43.893663004452975

The approximate address of the point you clicked on is:

Site E46 Elfun Cir, Henderson, New York, 13650

County: Jefferson

Town: Henderson

USGS Quad: HENDERSON BAY

[Freshwater Wetlands Checkzone](#)

This location is in the vicinity of one or more Regulated Freshwater Wetlands.

If your project or action is within or near an area with a rare animal, a permit may be required if the species is listed as endangered or threatened and the department determines the action may be harmful to the species or its habitat.

If your project or action is within or near an area with rare plants and/or significant natural communities, the environmental impacts may need to be addressed.

The presence of a unique geological feature or landform near a project, unto itself, does not trigger a requirement for a NYS DEC permit. Readers are advised, however, that there is the chance that a unique feature may also show in another data layer (ie. a wetland) and thus be subject to permit jurisdiction.

Please refer to the "Need a Permit?" tab for permit information or other authorizations regarding these natural resources.



ATTACHMENT D

Representative Study Area Photographs



Photo 1: Wetland 1, PEM, facing south. Suitable habitat present for the northern long-eared bat and Indiana bat.



Photo 2: Wetland 1, PEM, facing west.





Photo 3: Representative upland habitat, facing east. Suitable habitat present for the northern long-eared bat and Indiana bat.



Photo 4: Representative upland habitat, facing west towards Lake Ontario.





Photo 5: Representative upland habitat, facing east.



Photo 6: Representative upland habitat, facing south.





Photo 7: Representative upland habitat, facing east. Suitable habitat present for the northern long-eared bat, Indiana bat and monarch butterfly.



Photo 8: Representative upland habitat, facing west. Suitable habitat present for the northern long-eared bat, Indiana bat and monarch butterfly.





ATTACHMENT E

USACE Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Association Island/Hovey's Island City/County: Henderson, Jefferson County Sampling Date: 07/13/2021
 Applicant/Owner: Sun Communities State: NY Sampling Point: PEM-1
 Investigator(s): Michael Robson, Ph.D. Section, Township, Range: _____
 Landform (hillside, terrace, etc.): lakeshore island Local relief (concave, convex, none): none Slope %: 0
 Subregion (LRR or MLRA): LRR R, MLRA 142 Lat: 43.886480 Long: -76.226280 Datum: WGS84
 Soil Map Unit Name: CIA—Chaumont silty clay, 0 to 3 percent slopes NWI classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: <u>PEM-1</u>
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	
Remarks: (Explain alternative procedures here or in a separate report.) Sample taken from west-southwest facing wetland above OHWM for Henderson Bay on Lake Ontario. Area showed evidence of repeated inundation. Several non-native, invasive species in wetland and throughout the island.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u>		<u>Secondary Indicators (minimum of two required)</u>	
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input checked="" type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input checked="" type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input checked="" type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)		Wetland Hydrology Present? Yes _____ No <u>X</u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

VEGETATION – Use scientific names of plants.

 Sampling Point: PEM-1

Tree Stratum (Plot size: <u>30 ft diam</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Salix alba</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. <u>Fraxinus pennsylvanica</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
	<u>30</u>	<u>=Total Cover</u>		Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th>Total % Cover of:</th> <th>Multiply by:</th> </tr> <tr> <td>OBL species <u>40</u></td> <td>x 1 = <u>40</u></td> </tr> <tr> <td>FACW species <u>90</u></td> <td>x 2 = <u>180</u></td> </tr> <tr> <td>FAC species <u>5</u></td> <td>x 3 = <u>15</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>135</u></td> <td>(A) <u>235</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>1.74</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>40</u>	x 1 = <u>40</u>	FACW species <u>90</u>	x 2 = <u>180</u>	FAC species <u>5</u>	x 3 = <u>15</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>135</u>	(A) <u>235</u> (B)	Prevalence Index = B/A = <u>1.74</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>40</u>	x 1 = <u>40</u>																			
FACW species <u>90</u>	x 2 = <u>180</u>																			
FAC species <u>5</u>	x 3 = <u>15</u>																			
FACU species <u>0</u>	x 4 = <u>0</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>135</u>	(A) <u>235</u> (B)																			
Prevalence Index = B/A = <u>1.74</u>																				
Sapling/Shrub Stratum (Plot size: <u>15 ft diam</u>)																				
1. <u>Fraxinus pennsylvanica</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
	<u>10</u>	<u>=Total Cover</u>																		
Herb Stratum (Plot size: <u>3 ft diam</u>)																				
1. <u>Typha latifolia</u>	<u>25</u>	<u>Yes</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> <u>2</u> - Dominance Test is >50% <u>X</u> <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u>Phragmites australis</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>																	
3. <u>Calamagrostis canadensis</u>	<u>10</u>	<u>No</u>	<u>OBL</u>																	
4. <u>Verbena hastata</u>	<u>10</u>	<u>No</u>	<u>FACW</u>																	
5. <u>Teucrium canadense</u>	<u>5</u>	<u>No</u>	<u>FACW</u>																	
6. <u>Impatiens capensis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>																	
7. <u>Boehmeria cylindrica</u>	<u>5</u>	<u>No</u>	<u>OBL</u>																	
8. <u>Calystegia sepium</u>	<u>5</u>	<u>No</u>	<u>FAC</u>																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
	<u>95</u>	<u>=Total Cover</u>																		
Woody Vine Stratum (Plot size: <u>15 ft diam</u>)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
	<u>=Total Cover</u>																			

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: PEM-1

[illegible]

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Association Island/Hovey's Island City/County: Henderson, Jefferson County Sampling Date: 07/13/2021
 Applicant/Owner: Sun Communities State: NY Sampling Point: UPL-1
 Investigator(s): Michael Robson, Ph.D. Section, Township, Range: _____
 Landform (hillside, terrace, etc.): lakeshore island Local relief (concave, convex, none): none Slope %: 2
 Subregion (LRR or MLRA): LRR R, MLRA 142 Lat: 43.886418 Long: -76.225809 Datum: WGS84
 Soil Map Unit Name: CIB—Chaumont silty clay, 3 to 8 percent slopes NWI classification: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation X, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks: (Explain alternative procedures here or in a separate report.) Sample taken from southwest facing gentle island slope. Soils likely compacted and contain fill of unknown origin but did not appear significantly disturbed at time of sample. Vegetation regularly cut/mowed with several non-native, invasive species throughout the island. Sample area appeared well drained and several feet in elevation above OHWM of Lake Ontario.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u>		<u>Secondary Indicators (minimum of two required)</u>	
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes _____ No <u>X</u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

VEGETATION – Use scientific names of plants.

 Sampling Point: UPL-1

Tree Stratum (Plot size: <u>30 ft diam</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u><i>Tilia americana</i></u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33.3%</u> (A/B)																
2. <u><i>Fraxinus pennsylvanica</i></u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
		<u>25</u>	=Total Cover	Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>10</u></td> <td>x 2 = <u>20</u></td> </tr> <tr> <td>FAC species <u>5</u></td> <td>x 3 = <u>15</u></td> </tr> <tr> <td>FACU species <u>110</u></td> <td>x 4 = <u>440</u></td> </tr> <tr> <td>UPL species <u>10</u></td> <td>x 5 = <u>50</u></td> </tr> <tr> <td>Column Totals: <u>135</u> (A)</td> <td><u>525</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>3.89</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>10</u>	x 2 = <u>20</u>	FAC species <u>5</u>	x 3 = <u>15</u>	FACU species <u>110</u>	x 4 = <u>440</u>	UPL species <u>10</u>	x 5 = <u>50</u>	Column Totals: <u>135</u> (A)	<u>525</u> (B)	Prevalence Index = B/A = <u>3.89</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>10</u>	x 2 = <u>20</u>																			
FAC species <u>5</u>	x 3 = <u>15</u>																			
FACU species <u>110</u>	x 4 = <u>440</u>																			
UPL species <u>10</u>	x 5 = <u>50</u>																			
Column Totals: <u>135</u> (A)	<u>525</u> (B)																			
Prevalence Index = B/A = <u>3.89</u>																				
Sapling/Shrub Stratum (Plot size: <u>15 ft diam</u>)																				
1. <u><i>Lonicera morrowii</i></u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>																	
2. <u><i>Rhamnus cathartica</i></u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
		<u>15</u>	=Total Cover	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>2</u> - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
Herb Stratum (Plot size: <u>3 ft diam</u>)																				
1. <u><i>Galium mollugo</i></u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>																	
2. <u><i>Trifolium pratense</i></u>	<u>10</u>	<u>No</u>	<u>FACU</u>																	
3. <u><i>Trifolium repens</i></u>	<u>5</u>	<u>No</u>	<u>FACU</u>																	
4. <u><i>Plantago lanceolata</i></u>	<u>10</u>	<u>No</u>	<u>FACU</u>																	
5. <u><i>Clinopodium vulgare</i></u>	<u>5</u>	<u>No</u>	<u>UPL</u>																	
6. <u><i>Elymus repens</i></u>	<u>35</u>	<u>Yes</u>	<u>FACU</u>																	
7. <u><i>Taraxacum officinale</i></u>	<u>5</u>	<u>No</u>	<u>FACU</u>																	
8. <u><i>Potentilla recta</i></u>	<u>5</u>	<u>No</u>	<u>UPL</u>																	
9. <u><i>Saponaria officinalis</i></u>	<u>5</u>	<u>No</u>	<u>FACU</u>																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
		<u>95</u>	=Total Cover	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																
Woody Vine Stratum (Plot size: <u>15 ft diam</u>)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
		_____	=Total Cover	Hydrophytic Vegetation Present? Yes <u> </u> No <u> X </u>																

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPL-1

[illegible]

Appendix E

Water Treatment Plant Evaluation



Engineering
& Design

Water Treatment Plant Evaluation

Association Island Expansion to
Hovey's Island

November 14, 2023

Prepared for:

Sun Communities, Inc.
27777 Franklin Road #200 Southfield, MI 48034

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Accelerating success.

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Appendix A | Design Report and Specifications for Water System Project No. 115-00 for association Island Resort & Marina

Appendix B | Memorandum prepared by Atwell dated November 16, 2020, RE: 1000 Island RV Resort Field Review

Appendix C | Letter RE: RV Flow Analysis for Association Island

Colliers Engineering & Design (CED) has been retained to evaluate the existing water system serving Association Island and its ability to serve the proposed neighboring development, Hovey's Island. This report summarizes information collected on the existing Association Island water treatment system and compares the proposed uses against the understood capacity of same.

It is noted that CED did not perform any visual or operational inspections of the existing water treatment plant or distribution system. No information on water quality or available system pressure was collected as a part of this investigation.

Existing Conditions

The Association Island Resort & Marina is a seasonal campground located in the Town of Henderson, Jefferson County, New York. The existing development includes 293 RV campsites, 7 cabin rentals, 2 wash facilities, 1 restaurant and retail space. Discussions with Ron Elmer of P&T Supply Services, the water plant operator, concluded that the water system is in good operating condition, and they have not experienced capacity issues to serve the existing development.

Currently, water is pumped from Lake Ontario through an offshore well at 25 gallons per minute (gpm). The treatment system includes flocculation, slow sand and carbon filtration followed by chlorine contact. Two (2) 14,000-gallon storage tanks are included in the system, one of which is used for additional chlorine contact time.

A 300-gpm supply pump conveys water to the distribution system at a typical pressure of 40-60 psi. System pressures are likely low due to small diameter distribution mains which are typically less than 4-inches.

According to the Design Report and Specifications for Water System Project No. 115-00 prepared by Charles L. Fluno PE & Associates, dated July 2000 (Appendix A), the estimated demand for the existing water treatment plant is 33,343 gpd. The design capacity of the plant is 36,000 gpd.

Water is metered prior to distribution. The memorandum prepared Atwell dated November 16, 2020, included in this report as Appendix B, reported that the existing water treatment plant serving Association Island typically sees an average daily demand of **8,900 gpd** (2020) with a peak of around **12,900 gpd** (July 2020). It is noted that the estimated demand from Fluno's report stated above is significantly higher than the actual average daily demand. This may be due to a lower quantity of visitors, the seasonality of the development, the use of water savings fixtures since 2000, etc.

The treated water is tested daily for chlorine residual and turbidity. Monthly reports are submitted to the State by the plant operator and the system is reported to be in compliance with the State limitations for these constituents.

Proposed Improvements – Hovey's Island Planned Development District (PDD)

The project involves the development of seasonal cabins on Hovey's Island. The proposed uses on Hovey's Island include residential space for 117 two- and three-bedroom seasonal cabins and a community center which will have a small kitchen for food preparation only. The proposed facilities also include recreational uses and a maintenance building. Water supply will come from Association

Island by installation of a water main extension across the lake using horizontal directional drilling. Wastewater will be pumped to Association Island for treatment via a force main that will be horizontally directional drilled from Hovey's Island.

Treatment Capacity Analysis

The treatment capacity analysis for the proposed improvements is based on the existing uses on Association Island and design capacity of 36,000 gpd. Due to the seasonal nature of the existing uses, the system is expected to operate much lower than the design capacity.

A letter report prepared by Atwell, dated November 2, 2023, found in Appendix C details water metering history for four (4) similar seasonal cabin developments. The total average daily flow of three of the four developments is calculated to be approximately 80 gpd per site. The fourth development was eliminated from the calculation due to unusually low average daily demands of approximately 27 gpd per site. The 80 gpd per site estimated demand calculated from the average of the three developments is consistent with the letter's recommendation of utilizing a seasonal average (April-October) of 75 to 85 gpd per site.

Based on the above calculated average daily flow projections, the proposed uses will generate the following demand:

$$117 \text{ Cabins} \times 80 \frac{\text{gpd}}{\text{Cabins}} = 9,360 \text{gpd}$$

The proposed development also includes a small kitchen (food prep only) and recreational restrooms. In the effort of providing a conservative estimate, it can be assumed that these additional uses will generate an additional demand of 30 gpd based on New York State Design Standards for a Public Park (5 gpd per toilet). Overall, it is estimated that the proposed uses will generate a total onsite daily demand of **9,390 gpd**.

Adding the proposed daily demand to the existing average demand of 8,900 gpd results in a total proposed demand of **18,260 gpd**.

Proposed Water System Improvements

The addition of the proposed Hovey's Island demand, combined with the existing daily demand of Association Island, falls within the limits of the existing permitted capacity of 36,000 gpd. In order to provide adequate water service to both islands, the distribution system will need to be extended and the system pressure will need to be evaluated. As mentioned in the Existing Conditions section, the typical pressure of the existing system is 40-60 psi, which will further decrease with the larger distribution system and additional service taps. Potential solutions to be evaluated include upsizing smaller diameter distribution mains, replacement of the distribution pump or addition of a booster pump station.

Backflow prevention is not provided at the treatment plant or the individual site connections. It is recommended that backflow preventors or vacuum breakers be installed at service connections.

It is noted that the existing water system is likely incapable of providing adequate fire protection to the development. A fire protection engineer should be retained to evaluate the capacity and pressure available for fire flow scenarios. At minimum, a new water storage tank should be constructed within the community to provide additional storage capacity and fire protection.

Appendix

Appendix A | Design Report and Specifications for Water System Project No. 115-00 for association Island Resort & Marina

**DESIGN REPORT
AND
SPECIFICATIONS
FOR
WATER SYSTEM
PROJECT No. 115-00
FOR**

**ASSOCIATION ISLAND RESORT & MARINA
ASSOCIATION ISLAND
TOWN OF HENDERSON
COUNTY OF JEFFERSON
STATE OF NEW YORK**

JULY 2000

**[Revised Sept. 2000]
[Revised Oct. 2000]
[Revised May 2001]**

PREPARED BY:

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JUN 25 2001

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APPENDIX

A - CHLORING CONTACT CALCULATIONS

B - HYDROPNEUMATIC TANK ENGINEERING DATA

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D - PLATE SETTLER

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L - REDUCED PRESSURE ZONE[RPZ] BACKFLOW PREVENTER

M - DUMP STATION TANKS, DA-485

N - DUMP STATION, DA-486

A. BACKGROUND

THE ASSOCIATION ISLAND RESORT & MARINA IS PROPOSING TO CONSTRUCT AN R.V. PARK AND MARINA ON ASSOCIATION ISLAND IN THE TOWN OF HENDERSON.

THE PROJECT WILL HAVE A WATER SYSTEM AND A SEWAGE SYSTEM. THE SEWAGE WILL BE A SEPARATE REPORT.

WATER WILL BE PUMPED FROM LAKE ONTARIO THROUGH AN OFF SHORE WELL. A 25 GPM PUMP WILL PUMP THE LAKE WATER TO ONE PLATE SETTLER. POLYALUMINUM CHLORIDE AND A HYPOCHLORITE SOLUTION WILL BE ADDED TO THE WATER FLOW TO THE PLATE SETTLER.

THE FLOW FROM THE PLATE SETTLER WILL GO TO THE CHLORINE CONTACT AND FILTER TANK AND BE PUMPED BY A 25 GPM PUMP TO THE TWO PRESSURE FILTERS AND THEN TO TWO 14,000 GALLON STORAGE TANKS. THE FIRST TANK OF THE STORAGE TANKS WILL BE USED AS A CHLORINE CONTACT TANK. A 300 GPM SUPPLY PUMP WILL PUMP THE WATER TO THE DISTRIBUTION SYSTEM. THE WATER SYSTEM WILL HAVE A PRESSURE CONTROL TANK WITH A CONTROL SYSTEM.

EACH PUMP WILL HAVE A BACKUP PUMP.

FOR ADDITIONAL WATER SYSTEM DETAILS AND DISTRIBUTION SYSTEM LAYOUT, SEE DRAWINGS NO. 109-91-4W-1 AND 115-00-1.

A. DESIGN BASIS

1. FLOWS

THE DAILY FLOW WILL BE AS FOLLOWS:

DESCRIPTION	FLows, G.P.D.
[1] R.V. CAMPGROUND, 338 UNITS x 55 GAL./UNIT	18,590
* MARINA, 70 SLIPS x 17.5 GAL./PERSON x 2.5 PERSONS (25 GAL. LESS 30%)	3,063
(3) FUEL PUMP STATION AND STORE 4 PERSON x 15 GAL./PERSON	60
(4) BATHHOUSES, 200 PERSONS x 10 GAL./PERSON	2,000
(5) APARTMENTS, 10 BEDROOMS x 150 GAL.BEDROOM	1,500
(6) RESTAURANT, 80 SEATS x 35 GAL./SEAT	2,800
(7) RECREATION HALL & YOUTH ACTIVITY BUILDING 100 PERSONS x 10 GAL./PERSON	1,000
(8) COMMUNITY BUILDING, 100 PERSONS x 3 GAL./PERSON	300
(9) OFFICE/STORE 4 PERSONS x 15 GAL./PERSON	60
(10) STAFF HOUSING, 12 PERSONS x 75 GAL./PERSON	900
(11) COTTAGES, 5 COTTAGES x 150 GAL./COTTAGE	750
(12) LAUNDROMAT, 4 MACHINES x 580 GAL./MACHINE	<u>2,320</u>
TOTAL.....	33,343

* MARINA WILL HAVE 250 SLIPS, 180 SLIPS WILL BE RESERVED FOR RESIDENT CAMPERS, ONLY 70 SLIPS WILL BE AVAILABLE TO THE GENERAL PUBLIC.

AVERAGE HOURLY FLOW RATE - $33,343 \div 24 = 1,389$ G.P.H. OR 23 G.P.M.

MAXIMUM HOURLY FLOW RATE - $9.0 \times 1,389 = 12,501$ G.P.H. OR 208 G.P.M.

2. PLATE SETTLERS

EACH PLATE SETTLER IS 8'-0" LONG x 32" WIDE x 39" DEEP WITH 30 PLATES AND HAS BEEN APPROVED TO HANDLE 25 GPM FOR A TOTAL OF 50 GPM.

3. FILTERS

THE FILTER SYSTEM WILL CONSIST OF AN AG FILTER FOLLOWED BY A AC FILTER IN SERIES. EACH FILTER WILL HANDLE A FLOW OF 50 GPM WITH AN OVER FLOW RATE OF 4 GPM PER SQ. FT.

FILTER SIZE - $25 \text{ GPM} / 4 \text{ GPM/FT}^2 = 6.25 \text{ FT}^2$

36" DIA. - TANK AREA = $\text{PIE}[1.5]^2 = 7.06 \text{ SQ. FT.}$

USE 36" DIA. FILTERS

BACKWASH

WHEN THE BACK PRESSURE OF THE BED REACHES 5 TO 8 PSI, BED SHOULD BE BACKWASHED FOR 15 MINUTES. THE AG FILTER IS TO BE BACKWASHED AT A RATE OF 10 GPM/SQ. FT. ANF THE AC FILTER AT A RATE OF 7 GPM/SQ. FT.

BACKWASH FLOW

AG FILTER - $10 \text{ GPM/SQ. FT.} \times 7.06 = 71 \text{ GPM}$

AC FILTER - $7 \text{ GPM/SQ. FT.} \times 7.06 \text{ SQ. FT.} = 49 \text{ GPM./DAY}$

BACKWASH [AG FILTER] - $71 \text{ GPM} \times 15 \text{ MIN.} = 1,065 \text{ GAL.}$

BACKWASH [AC FILTER] - $49 \text{ GPM} \times 15 \text{ MIN.} = \underline{735 \text{ GAL.}}$

TOTAL BACKWASH FOR BOTH FILTERS - 1,800 GAL.

BACK WASH WATER WILL FLOW TO SEWER SYSTEM

4. CHLORINE CONTACT TANK

CHLORINE CONTACT TANK TO HAVE A USEABLE VOLUME OF 3,000 GALLONS. THE TANK WILL BE A 3,000 GALLON PRE-CAST CONCRETE TANK, SUCH AS SUPPLIED BY JEFFERSON CONCRETE CORP., OR APPROVED EQUAL. THE TANK WILL HAVE OPENINGS AND BAFFLES AS SHOWN ON DRAWING NO. 109-91-4W-1.

FOR CHLORINE CONTACT TIME CALCULATIONS, SEE APPENDIX "A".

5. STORAGE TANKS

TWO STORAGE TANKS WITH A CAPACITY OF 14,000 GALLONS EACH WILL BE USED. THE FIRST TANK WILL BE USED AS A CONSTANT LEVEL TANK AND WILL PROVIDE ADITIONAL CHLORINE CONTACT TIME. SEE TANKS ON DRAWING NO. 109-91-4W-1.

6. CHLORINE DEMAND [5% NaOCL]

AVERAGE DAILY DEMAND

$$\frac{33,343 \text{ GPD} \times 8.34 \text{ LBS/GAL.} \times 5 \text{ PPM}}{0.42 \text{ LBS/GAL.} \times 1,000,000} = 3.31 \text{ GPD}$$

PUMPING RATE

$$\frac{25 \text{ GPM} \times 1440 \text{ MIN/DAY} \times 8.34 \text{ LBS/GAL.} \times 5 \text{ PPM}}{0.42 \text{ LBS/GAL.} \times 1,000,000} = 3.57 \text{ GPD}$$

7. INTAKE PUMPS [SHORE WELL PUMPS]

2 - 25 GPM PUMPS WITH ONE PUMP SERVING AS A BACK-UP PUMP.

8. FILTER SUMP PUMPS

2 - 25 GPM PUMPS WITH ONE PUMP SERVING AS A BACK-UP PUMP.

9. SUPPLY PUMPS

2 - 300 GPM PUMPS WITH ONE PUMP SERVING AS A BACK-UP PUMP.

10. HYDROPNEUMATIC PRESSURE TANK

SIZE FOR 10 MIN. x 300 GPM = 3,000 GAL.

USE A 6,500 GAL. TANK

USE 40% WATER and 60% AIR

PRESSURE SETTLING - 40 TO 65 PSI

TANK DRAW-DOWN = $0.275 \times 6,500 = 1,787.5 \text{ GAL.}$

DRAW-DOWN TIME = $1,787.5/300 = 5.96 \text{ MIN}$

NOTE: SEE HYDROPNEUMATIC TANK ENGINEERING DATA IN APPENDIX.

C. EQUIPMENT AND MATERIAL SPECIFICATIONS

1. PUMPS

[a] INTAKE PUMPS

2- GRUNDFOS SUBMERSIBLE PUMPS, MODEL NO. 25S05-3, ½ HP, 3450 RPM, DELIVERS 25 GPM AT 60 FT. T.D.H., 1½" NPT PUMP OUTLET FOR 115 VOLTS 60 CYCLE, SINGLE PHASE OR APPROVED EQUAL.

NOTE: INTAKE LINES TO PLATE SETTLERS TO HAVE A FLOW METER WITH A 6 TO 60 GPM RANGE AND A THROTTLE VALVE TO TO CONTROL THE FLOW RATE.

[b] FILTER SUMP PUMPS

2- JACUZZI CENTRIFUGAL PUMPS, MODEL NO. 1DB1, 1 HP, 3500 RPM, DELIVERS 25 GPM AT 75 FT. T.D.H., 1½" FLANGED SUCTION AND 1" DISCHARGE CONNECTIONS FOR 115/230 VOLTS, 60 CYCLES, THREE PHASE OR APPROVED EQUAL. *Wow*

NOTE: FLOW FROM FILTERS TO HAVE A FLOW METER WITH A 6 TO 60 GPM RANGE WITH A THROTTLE VALVE TO CONTROL THE FLOW RATE.

[c] SUPPLY PUMPS

2- CLOSE-COUPLED WATER PUMPS, JACUZZI MODEL NO. DB2, 2" DISCHARGE X 3" SUCTION, 300 GPM AT 150 FT. T.D.H.[65 PSI], SHUT-OFF HEAD- 226 FT. T.D.H.[98 PSI], WITH 15 HP HEAVY DUTY NEMA JM MOTOR, 3500 RPM, FOR 208 VOLTS, 60 CYCLES, THREE PHASE OR APPROVED EQUAL,

NOTE: FOR PERFORMANCE CURVES FOR ALL WATER PUMPS, SEE APPENDIX "C".

2. PLATE SETTLERS

1- PLATE SETTLERS, EACH WITH 30 PLATES @ 21½" SPACING SET AT A 55° ANGLE. TANK IS 96" LONG x 32" WIDE x 39" DEEP WITH A 3" DIAMETER HALF COUPLING FOR OUTLET AND BOTTOM DRAINS. PLATE SETTLER IS RATED AT 25 GPM AND IS TO BE AS SUPPLIED BY PEARSON AND TIMMERMAN, INC. OR APPROVED EQUAL.

NOTE: FOR DRAWING OF PLATE SETTLER, SEE APPENDIX "D".

3. AG FILTER.

AG FILTER TO BE A 36" DIAMETER x 60" HIGH FILTER AS MANUFACTURED BY ERMCO THEIR CATALOG NO. AG-GEF36. FILTER TANK TO BE HEAVY STEEL CONSTRUCTION WITH EPOXY LINING AND PAINTED EXTERIOR. GATES VALVES TO BE OPERATED MANUALLY WHEN BACKWASHING. BACK WASHING IS RECOMMENDED WHEN PRESSURE DROPS 5 TO 8 POUNDS BETWEEN THE INLET AND OUTLET OF THE FILTER. FILTER MEDIA TO BE GRADULAR NON-HYDROUS ALUMINUM SILICATE.

FOR FILTER SPECIFICATION, SEE APPENDIX "F"

4. ACTIVATED CARBON FILTER

ACTIVATED CARBON FILTER TO BE 36" DIAMETER x 60" HIGH FILTER AS MANUFACTURED BY ERMCO THEIR CATALOG NO. AG-GEF36. FILTER TANK TO BE HEAVY STEEL SHEET CONSTRUCTION WITH EPOXY LINING AND PAINTED EXTERIOR. GATE VALVES TO BE OPERATED MANUALLY WHEN BACKWASHING. BACKWASHING IS RECOMMENDED WHEN PRESSURE DROPS 5 TO 8 POUNDS BETWEEN THE INLET AND OUTLET OF THE FILTER. FILTER MEDIA TO BE BLACK GRANULAR HIGH DENSITY CARBON.

FOR FILTER SPECIFICATIONS, SEE APPENDIX "F".

5. WATER STORAGE TANKS

2- STEEL WATER TANKS, 13 FT. IN DIAMETER WITH A 14 FT. STRAIGHT WALL AND CONICAL TOP AND BOTTOM FOR AN OVERALL HEIGHT OF 30 FT

THE TANKS HAVE A CAPACITY OF 14,000 GALLONS. SEE DRAWING NO. 109-91-4W-1 AND DRAWING NO. 115-00-2W.

FOR PREPARATION AND PAINTING OF WATER TANKS, SEE APPENDIX "E".

6. CHLORINE CONTACT TANK

THE CHLORINE CONTACT TANK IS TO BE A PRE-CAST CONCRETE TANK WITH A CAPACITY OF 3,000 GALLONS SUCH AS SUPPLIED BY JEFFERSON CONCRETE CORP., OR APPROVED EQUAL.

FOR A DRAWING OF THE TANK WHICH SHOWS THE OPENINGS AND BAFFLES, SEE DRAWING NO. 109-91-4W-1.

7. PRESSURE TANK AND CONTROLS

THE PRESSURE TANK IS TO BE A 6,500 GALLONS HORIZONTAL HYDROMATIC PRESSURE TANK [7 FT. DIA. x 24 FT LONG]. TANK IS TO HAVE A 11" x 15" HAND HOLE AND IS TO BE PAINTED, INSIDE AND OUTSIDE, WITH A DESIGN PRESSURE OF 100 PSI. FOR PREPARATION AND PAINTING SPECIFICATIONS, SEE APPENDIX "E".

THE CONTROL SYSTEM IS TO BE AS SHOWN ON THE SCHEMATIC DIAGRAM, DRAWING NO. 115-00-2W. CONTROLS SHALL INCLUDE 5 MERCURY FLOAT SWITCHES WITH 30 FT. OF CORD [Length to be checked in the field] TO BE USED FOR FILTER PUMPS ON, FILTER PUMPS OFF, LOW LEVEL ALARM, SUPPLY PUMPS OFF AND SUPPLY PUMPS RESTORED. BOTH FILTER PUMPS ARE TO OPERATE SIMULTANEOUSLY WITH THE HYPOCHLORINATOR PUMP.

SUPPLY PUMPS SHALL BE CONTROLLED BY AN ADJUSTABLE PRESSURE SWITCH [Set at 40 to 65 PSI]. AN ALTERNATOR IS TO BE INCLUDED TO ALTERNATE THE OPERATION OF THE 2 PUMPS.

WATER LEVEL IN THE PRESSURE TANK IS TO BE CONTROLLED AT 40% WATER AND 60% AIR.

SYSTEM IS TO BE COMPLETE WITH A SELF-CONTAINED AIR COMPRESSOR WHICH WILL BE OPERATED BY THE CONTROL SYSTEM.

ALSO INCLUDED IN THE CONTROL SYSTEM SHALL BE PUMP RUNNING LIGHTS, LOW LEVEL ALARM OR BELL, MOTOR STARTERS, SAFETY VALVE FOR PRSSURE TANK AND ANY OTHER NECESSARY APPURTENANCES.

CONTROL PANEL IS TO HAVE A NEMA 4 ENCLOSURE.

CONTROL SYSTEM SHALL BE A HYDROMASTER CONTROL SYSTEM SUCH AS MADE BY MASTER LEVEL CONTROLS CO.

8. PUMP CONTROLS

[a] INTAKE PUMPS [Shore Well Pumps]

THE CONTROL SYSTEM FOR THE INTAKE PUMPS TO BE AS SHOWN ON THE SCHEMATIC DIAGRAM, DWG. NO.115-00-2W. CONTROLS SHALL INCLUDE 5 MERCURY FLOAT SWITCHES WITH 20 FT. OF CORD [Length to be checked in field] TO BE USED FOR FILTER PUMP OFF, FILTER PUMP ON, LOW WATER LEVEL, FILTER PUMPS RESTORED AND FILTER PUMPS OFF. CONTROLS TO INCLUDE AN ALTERNATOR WHICH WILL OPERATE THE INTAKE PUMPS ON AN ALTENATE BASIS. THE INTAKE PUMPS ARE TO OPERATE SIMULTANEOUSLY TOGETHER WITH THE POLYALUMINUM CHLORIDE PERISALTIC PUMP AND THE PRE-CHLORINATOR PUMP.

[b] FILTER PUMPS AND SUPPLY PUMPS

FOR CONTROL SPECIFICATIONS, SEE SECTION "I".

NOTE: LOCATE ALL ALARM LIGHTS AND BELLS IN RESORT OFFICE.

9. POLYALUMINUM CHLORIDE FEEDER

UNIT TO CONSIST OF A 55 GALLON HIGH DENSITY POLYETHYLENE POLYALUMINUM CHLORIDE SOLUTION TANK WITH COVER, 22" ID x 36" DEEP AND A PERISTALTIC INJECTOR PUMP. PUMP IS TO BE A BLUE WHITE FLEX FLO MODEL A-1830V-3N, OR APPROVED EQUAL, CAPABLE OF PUMPING UP TO 5 GPD AT 40 PSI, MOTOR IS TO BE SUPPLIED WITH TUBING, CHECK VALVE AND SHUT-OFF VALVE. [A Spare Must be Kept on Hand].

NOTE: FOR PUMP SPECIFICATIONS, SEE APPENDIX "M".

10. HYPOCHLORINATOR

UNIT IS TO CONSIST OF A 55 GALLON HIGH DENSITY POLYETHYLENE HYPOCHLORITE SOLUTION TANK WITH COVER, 22" ID x 36" DEEP AND ADJUSTABLE CHEMICAL FEED PUMP. PUMP IS TO BE A BLUE WHITE CHEM-FEED INJECTOR PUMP, MODEL NO. C-1530LP, OR APPROVED EQUAL, CAPABLE OF PUMPING UP TO 31 GPD AT 100 PSI, MOTOR TO BE FOR 115 VOLTS, 60 CYCLES, SINGLE PHASE. PUMP TO BE SUPPLIED WITH DISCHARGE TUBE, CHECK VALVE AND SHUT-OFF VALVE.

NO. REQUIRED: 2 - COMPLETE UNITS FOR PRE AND POST CHLORINATION.

1 - SPARE PUMP ONLY

NOTE: FOR PUMP SPECIFICATIONS, SEE APPENDIX "H".

11. FLOWMETER

FLOWMETER TO BE AN IN-LINE FLOWMETER AS MANUFACTURED BY BLUE WHITE THEIR MODEL NO. F-452060LH OR APPROVED EQUAL. FLOWMETER TO BE A ONEPIERCE BODY OF HEAT AND CHEMICAL RESISTANT INJECTING MOLDED POLYSULFONE, HAVE 2" FPT POLYSULFONE ADAPTERS EACH END O-RINGS ARE VITON AND FLOATS TO BE #316 STAINLESS STEEL OR TEFLON. FLOAT GUIDE TO BE #316 STAINLESS STEEL.

CAPACITY - 6.0 TO 60 GPM

NOTE FOR COMPLETE SPECIFICATIONS, SEE APPENDIX "I".

12. MIXING TANKS

MIXING TANKS TO BE A 55 GALLON HIGH-DENSITY POLYETHYLENE TANK WITH COVER, APPROX. O.D. x DEPTH, 22" x 36". 2" INLET PIPE TO EXTEND TO BOTTOM OF TANK AND THEN BE REDUCED TO 1". PIPE TO DISCHARGE PARALLEL TO TANK WALL SO AS TO CAUSE A MIXING ACTION IN THE TANK BEFORE THE WATER OVERFLOWS TO THE PLATE SETTLER.

13. WATER METER

WATER METER TO BE NEPTUNE HP TURBINE 3" SIZE WITH NORMAL OPERATING RANGE OF 5 TO 550 GPM. METER TO READ IN GALLONS.

FOR SPECIFICATIONS, SEE APPENDIX "J".

14. PIPING

1. LINE FROM SHORE WELL TO WATER TREATMENT BUILDING TO BE POLYETHYLENE PIPE SDR7, RATED AT 160 PSI [73.4°F] AND SHALL CONFORM TO ASTM D-2239 OR BE THE SAME AS PARAGRAPH 2.
2. LINES IN WATER TREATMENT BUILDING TO BE GALVANIZED STEEL PIPING, SCHEDULE 40, MADE IN ACCORDANCE WITH ASTM A120. FITTINGS TO BE SAME AS PIPE.
3. DISTRIBUTION LINES TO BE PVC PLASTIC PIPE, WITH GASKET TYPE JOINTS, RATED AT 160 PSI, SDR 26, MADE IN ACCORDANCE WITH ASTM D-2441 WITH FITTINGS EQUIVALENT TO PIPE.
4. VALVES SHALL BE PVC, EQUAL TO PIPING, OR BRASS OR BRONZE RATED AT 125 PSI.
5. ALL PIPE, FITTINGS AND VALVES SHALL BE APPROVED BY NSF FOR POTABLE WATER SERVICE.
6. DRAIN LINES TO BE SERVICE WEIGHT CAST IRON OR BETTER. FITTINGS SHALL BE EQUIVALENT TO PIPE.

15. TESTING

WATER SYSTEM PIPING TO BE TESTED AT 150% OF WORKING PRESSURE [100 PSI] FOR A DURATION OF 2 HOURS. ANY LEAKS ARE TO BE REPAIRED AND TEST REPEATED.

16. DISINFECTION

ALL PIPING AND EQUIPMENT SHALL BE DISINFECTED WITH A CHLORINE SOLUTION HAVING A CHLORINE CONTENT OF 50 ppm. THE SOLUTION SHALL STAY IN THE PIPING AND EQUIPMENT FOR 24 HOURS AND THEN SHALL BE DRAINED. A MINIMUM OF 25 ppm FREE CHLORINE RESIDUAL MUST STILL BE PRESENT IN THE SYSTEM AFTER 24 HOURS. THE SYSTEM IS TO BE THOROUGHLY FLUSHED AND CHECKED FOR COLIFORM BACTERIA. [A MINIMUM OF 2 SAMPLES MUST BE TAKEN AT 24 HOURS INTERVALS]. IF COLIFORM BACTERIA IS PRESENT, THE DISINFECTION MUST BE REPEATED.

17. TEST KITS

1. LAMOTTE CHLORINE TEST KIT, 6988/LP- 16 OCTET COMPARATOR DPD TABLETS TESTS FOR FREE AND TOTAL CHLORINE. TWO COMPAPATORS FOR HIGH AND LOW RANGE: 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8 AND 1.0 ppm CHLORINE - 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0 AND 6.0 ppm CHLORINE.

18. TURBIBIMETER

PORTABLE TURBIDIMETER AS SUPPLIED BY THE HACH COMPANY, MODEL 2100P, OR APPROVED EQUAL. TURBIBIMETER TO HAVE DIRECT DIGITAL READOUT OF RESULTS WITH A MEASUREMENT RANGE OF 0 TO 1,000 NTU'S AND A RESOLUTION OF 0.01 NTU. TURBIDIMETER TO BE COMPLETE WITH INSTRUCTION MANUAL AND NECESSARY ACCESSORIES

FOR ADDITIONAL SPECIFICATIONS, SEE APPENDIX K - TURBIDIMETER.

19. MISCELLANEOUS

[a] LAVATORY

LAVATORY TO BE VITROUS CHINA, 22" x 19", COUNTER TOP LAVATORY, FRONT OVERFLOW, COMPLETE WITH LAVATORY FAUCET, SUPPLY PIPES, TAIL PIPE AND P TRAP.

[b] PRESSURE GAUGES

PRERSSURE GAUGES TO BE ASHCROFT NUMBER 1009, OR APPROVED EQUAL, 2½" DIAMETER, ¼" LOWER CONNECTION, WITH A RANGE OF 0-100 PSI OR 0-60 PSI AS NOTED ON PLANS.

[c] HOSE BIB

HOSE BIB TO BE BRASS BODY UNIT WITH CONNECTION TO ¼" DIAMETER SUPPLY LINE AND HAVE A ¾" MALE HOSE THREAD NOZZLE.

[d] NSF APPROVAL

ALL VALVES, PIPING, ECT. TO BE APPROVED FOR POTABLE WATER SERVICE.

D. GENERAL

1. ALL WORK IS TO BE DONE IN STRICT ACCORDANCE WITH PLANS AND SPECIFICATIONS AND/OR ENGINEER' WRITTEN INSTRUCTIONS.
2. CHANGES IN EITHER MATERIALS OR INSTALLATION OF SYSTEM ARE NOT TO BE MADE WITHOUT PRIOR APPROVAL OF THE ENGINEER, IN WRITING.
3. THE ENGINEER MUST APPROVE ALL PURCHASES OF EQUIPMENT AND MATERIALS AND MUST MAKE PERIODIC INSPECTIONS AT THE SITE AS CONSTRUCTION WORK PROGRESSES SO THAT THE ENGINEER CAN CERTIFY THE MATERIALS AND WORK AT THE COMPLETION OF THE PROJECT.

E. ADDENDUM [October 20, 2000]A-1 FLOWMETER

FLOWMETER TO BE AN IN-LINE FLOWMETER AS MANUFACTURED BY BLUE WHITE THER MODEL NO. F-452175LH OR APPROVED EQUAL. FLOWMETER TO BE A ONE PIERCE BODY OF HEAT AND CHEMICAL RESISTANT INJECTING MOLDED POLYSULFONE, HAVE 2" FPT POLYSULFONE ADAPTERS EACH END, O-RINGS ARE VITON AND FLOATS TO BE #316 STAINLESS STEEL OR TEFLON. FLOAT GUIDE TO BE #316 STAINLESS STEEL.

CAPACITY - 20 TO 175 GPM

NOTE: FOR COMPLETE SPECIFICATIONS, SEE APPENDIX "I".

A-2 REDUCED PRESSURE ZONE BACKFLOW PREVENTER

REDUCED PRESSURE ZONE[Rpz] BACKFLOW PREVENTER TO BE A 2" WATTS MODEL 909M1QT-S, ORDER NO. 385725, AND IS TO HAVE A BRONZE BODY AND STRAINER WITH REPLACEABLE SEATS AND "DUAL PORTED" RELIEF.

NOTES: 1. FOR COMPLETE SPECIFICATIONS, SEE APPENDIX "I".

2. UNIT TO BE INSTALLED IN WATER LINE TO AND IN WASTEWATER TREATMENT PLANT.

APPENDIX

A - CHLORING CONTACT CALCULATIONS

B - HYDRO-PNEUMATIC TANK ENGINEERING DATA

C - PUMP PERFORMANCE CURVES

D - PLATE SETTLER

E - PREPARATION OF TWO PORTABLE WATER TANKS AND PRESSURE TANK

F - FILTER SPECIFICATIONS

G - PERISTALTIC INJECTOR

H - CHEM-FEED INJECTOR PUMP

I - FLOW METER

J - WATER METER

K TURBIDIMETER

L - REDUCED PRESSURE ZONE[Rpz] BACKFLOW PREVENTER

M - DUMP STATION TANKS, DA-485

N - DUMP STATION, DA-486

CHLORINE CONTACT TANK CALCULATIONS

REFERENCE - TABLE 14A-CT VALUES
[COPY ATTACHED]

ph.....	7.5
TEMPERATURE.....	0.5 CELSIUS OR LOWER [33°]
C [CHLORINE RESIDUAL].....	1.0
CT	253 [3 LOG]

NOTE: FILTRATION REMOVES 2 LOG

DISINFECTION TO REMOVE 1 LOG

$$CT [1 \text{ LOG}] = \frac{253}{3} = 84.33$$

STAGE 1 - PLATE SETTLERS [1 UNIT]

V [VOLUME].....	419 GALLONS
B.F. [BAFFLE FACTOR].....	1.0
FLOW [MAX].....	25 GPM
T.....	CONTACT TIME

$$T = \frac{\text{VOLUME} \times \text{B.F.}}{\text{GPM}}$$

$$T = \frac{419 \times 1.0}{25} = 16.76 \text{ MIN.}$$

$$CT = 1.0 \times 16.76 = 16.76$$

$$CT \text{ INACT. RATIO} = \frac{16.76}{84.33} = 0.198$$

STAGE 2 - CHLORINE CONTACT TANK

V [VOLUME].....	3,000 GALLONS
B.F. [BAFFLE FACTOR].....	0.5-
FLOW [MAX].....	25 GPM
T.....	CONTACT TIME

$$T = \frac{\text{VOLUME} \times \text{B.F.}}{\text{GPM}}$$

$$T = \frac{3000 \times 0.5}{25} = 60 \text{ MIN.}$$

Serpentine Baffle

$$CT = 1.0 \times 60 = 60$$

$$CT \text{ INACT. RATIO} = \frac{60}{84.33} = 0.71$$

STAGE 3 - AG FILTER

V [VOLUME].....	134.6 GALLONS
B.F[BAFFLE FACTOR].....	1.0
FLOW[MAX].....	25 GPM
T.....	CONTACT TIME

$$T = \frac{134.6 \times 1.0}{25} = 5.38 \text{ MIN.}$$

$$CT = 1.0 \times 5.38 = 5.38$$

$$CT \text{ INACT. RATIO} = \frac{5.38}{84.33} = 0.063$$

STAGE 4 - 14,000 GALLON TANK

$$T = \frac{\text{VOLUME(TANK)} \times \text{BAFFLE FACTOR}}{\text{P.H.F.}}$$

$$T = \frac{14,000 \times 0.1}{300} = 4.66$$

$$CT = 4.66 \times 0.1 = 0.47$$

$$CT \text{ INACT. RATION} = 0.1 \times 0.47 = 0.047$$

This is a constant level Tank w/ 25 GPM in + out

$$T = \frac{14,000 \times 0.1}{25} = 56$$

$$\textcircled{0.3 BF} = 168 \text{ min}$$

$$CT \text{ INACT. RATIO} = 0.198 + 0.71 + 0.063 + 0.047 = 1.018 > 1.0$$

$$\text{TOTAL CONTACT TIME} = 16.76 + 60 + 5.38 + 4.66 = 86.8$$

REVISED ON 9/11/00
REVISED ON 5/15/01

ITALICS

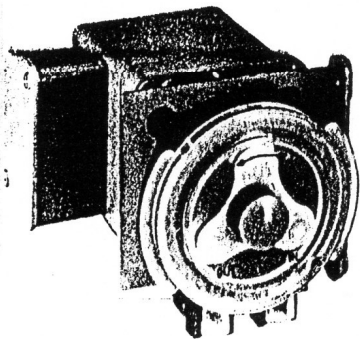
TABLE 14A-CT VALUES (CT_{99.9}) FOR 99.9 PERCENT INACTIVATION OF GIARDIA LAMBLIA CYSTS BY FREE CHLORINE
AT 0.5 DEGREES CELSIUS OR LOWER¹

Free chlorine residual (mg/l)	pH						
	≤6.0	6.5	7.0	7.5	8.0	8.5	≥9.0
≤0.4	137	163	195	237	277	329	390
0.6	141	168	200	239	286	342	407
0.8	145	172	205	246	295	354	422
1.0	148	176	210	253	304	365	437
1.2	152	180	215	259	313	376	451
1.4	155	184	221	266	321	387	464
1.6	157	189	226	273	329	397	477
1.8	162	193	231	279	338	407	489
2.0	165	197	236	286	346	417	500
2.2	169	201	242	297	353	426	511
2.4	172	205	247	298	361	435	522
2.6	175	209	252	304	368	444	533
2.8	178	213	257	310	375	452	543
3.0	181	217	261	316	382	460	552

¹These CT values achieve greater than a 99.99 percent inactivation of viruses. CT values between the indicated pH values may be determined by linear interpolation. CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT_{99.9} value at the lower temperature, and at the higher pH.

ITALICS

A-1600 PERISTALTIC INJECTOR



The A-1600 unit is the ideal metering pump for OEM applications. Its ~~high quality pump head assembly, the compact housing of the CHEM-FEED® C-600P Series,~~ free. Standard A-1600 units have our exclusive FLEXFLO pump head assembly, the compact housing of the CHEM-FEED® C-600P Series, and a fixed feed rate with a variety of RPM's from which to choose. A-1600 is available with a cycle control percentage timer. Add the letter "T" to model number (i.e., A-1614T-4). Included with every A-1600 is an accessory kit package with foot valve with ceramic weight, threadless injector fitting, two spare tubes, 10' of tubing and a Feed Indicator*.

SPECIFICATIONS

- Pump head material: Glass reinforced polyamide
- Roller assembly: 3 roller
- Feed controller: Solid state
- Pump tube material: Tygon®, options NORprene®, Tygon® tube with PVC adapters
- O-Ring material standard: Viton®, optional - EP
- Motors: 14, 30, 45 RPM
- Voltage: 115V/60Hz optional - 230V/60Hz, 220V/50Hz, 24V/60Hz 24V/50Hz
- Wall mount
- Overall dimensions: 7" w X 4 1/2" h X 5 1/2" d
- Shipping weight: 9 lbs. (approx.)

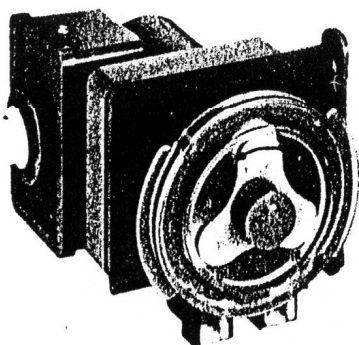
ORDERING INFORMATION

Model Number	RPM	Max. GPD	Feed GPH	Rate ML/MN	Pump Tube O.D.	Feed Line O.D.	Max. PSI
A-1614-3N	14	1.6	0.07	5	3/16"	1/4"	25
A-1630-3N	30	4.0	0.19	12	3/16"	1/4"	25
A-1645-3N	45	3.0	0.23	15	3/16"	1/4"	25
A-1614-4	14	6.0	0.26	17	1/4"	1/4"	25
A-1630-4	30	15	0.63	40	1/4"	1/4"	25
A-1614-6	14	22	0.95	60	3/8"	3/8"	25
A-1614-7	14	28	1.20	76	7/16"	3/8"	25
A-1630-6	30	49	2.05	130	3/8"	3/8"	25
A-1630-7	30	74	3.10	197	7/16"	3/8"	25
A-1645-6	45	74	3.10	197	3/8"	3/8"	25
A-1645-7	45	112	4.70	294	7/16"	3/8"	25

Available with NORprene® pump tube assembly, add the letter "N" to the model number (i.e., A-1614-4N).

*Not available on 1/4" tubing.

A-1800V VARIABLE SPEED PERISTALTIC INJECTOR



A-1800V units utilize a solid state controller and a permanent magnet motor for precise feed control.

The A-1800V is a durable variable speed and output peristaltic pump. The unique design provides easy access to important components such as the motor. Other notable features are: very fast tube replacement, high quality ball bearing permanent magnet motor, and a straightforward dial feed rate adjustment.

Each unit comes with a complete accessory pack which includes: Ft. valve, weight, 10' tubing, two pump tubes, T.I. fitting (saddle type injection fitting) and a Feed Indicator*. An excellent value and a favorite of OEM's.

SPECIFICATIONS

- Pump head material: Glass reinforced polyamide
- Roller assembly: 3 roller
- Feed controller: Solid state
- Pump tube material: Tygon® or NORprene®, Tygon® with P.V.C. adapters
- O-ring material: Viton®, optional EP
- Motors: 14, 30, 45, 60, 125 RPM
- Voltage: Standard 115V optional 24V (DC ONLY)
- Wall mount
- Overall dimensions: 7 3/4" w X 6" h X 5 3/4" d
- Shipping weight: 7 lbs. (approx.)

ORDERING INFORMATION

Model Number	RPM	Max. GPD	Feed GPH	Rate ML/MN	Pump Tube O.D.	Feed Line O.D.	Max. PSI
A-1814V-3N	14	2.2	.09	6.0	3/16"	1/4"	25
A-1830V-3N	30	5.0	.22	14	3/16"	1/4"	25
A-1814V-4	14	8.0	.33	21	1/4"	1/4"	25
A-1830V-4	30	18	.77	49	1/4"	1/4"	25
A-1814V-6	14	29	1.2	76	3/8"	3/8"	25
A-1814V-7	14	38	1.6	102	7/16"	3/8"	25
A-1830V-6	30	61	2.5	162	3/8"	3/8"	25
A-1830V-7	30	88	3.6	232	7/16"	7/16"	25
A-1845V-6	45	100	4.1	265	3/8"	3/8"	25
A-1845V-7	45	138	5.7	265	7/16"	3/8"	25

Available with NORprene® pump tube assembly, add the letter "N" to the model number (i.e., A-1814V-3N)

*Not available on 1/4" tubing.

HYDROPNEUMATIC TANK ENGINEERING DATA

BULLETIN A3
PAGE 2

A3

A hydropneumatic tank is not only a water storage vessel, it must also contain compressed air which makes water flow from it under pressure.

The most efficient air/water ratio is that which permits maximum withdrawal between high and low pressure settings.

A common setting is 40% water and 60% air, between pressure limits of 40 and 60 PSI. This provides about 22% of the tank for use without pumping.

A hydropneumatic tank is different from an open tank as follows:

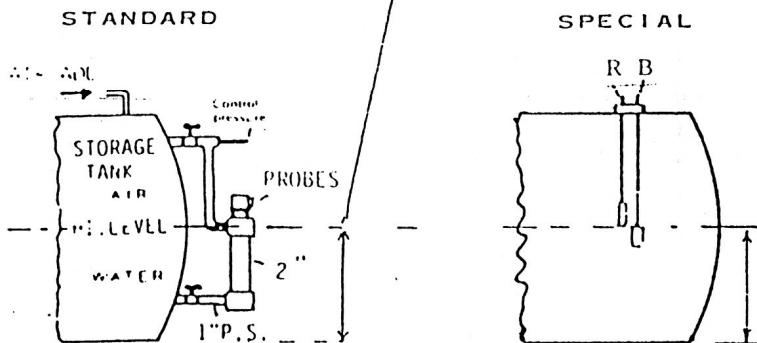
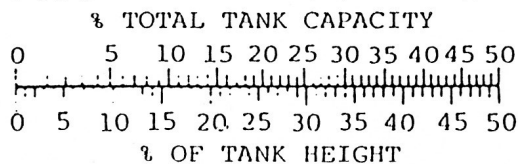
TANK FILL

Raising water level in the tank will not give more usable water, it gives LESS.

PRESSURE

Decreasing pressure spread between high and low pressure limits to less than 20 PSI gives LESS usable water. At least 20 PSI is recommended; 40-60, 50-70, etc.

CONVERSION CHART: Depth of liquid in horizontal cylindrical tank to volume.



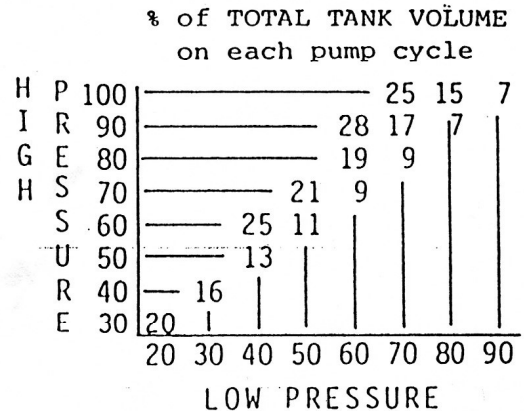
STANDARD
H-H PROBE ASSEMBLY
fits into customer's
plumbing.

SPECIAL
Give diam. of tank &
tank fill desired.
Requires 2" tap in tank.

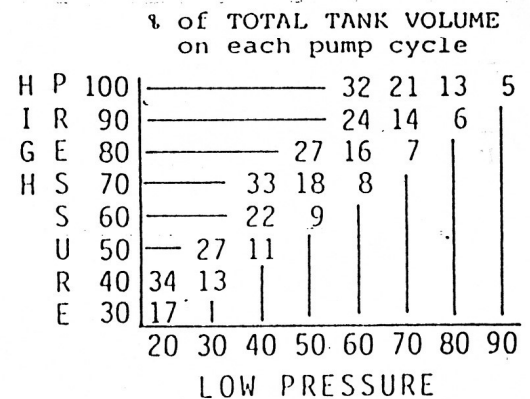
CHARTS

These charts show percentage of the total tank volume available on each pump cycle.

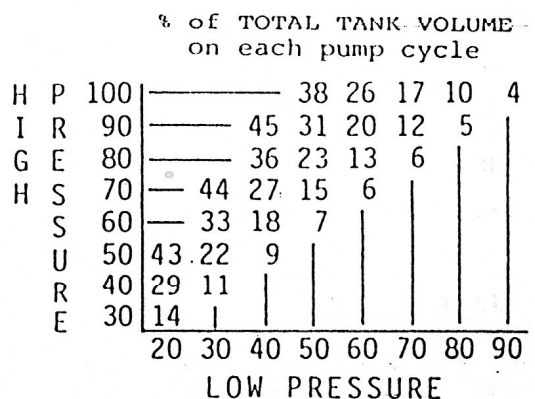
30% WATER IN TANK



40% WATER IN TANK



50% WATER IN TANK



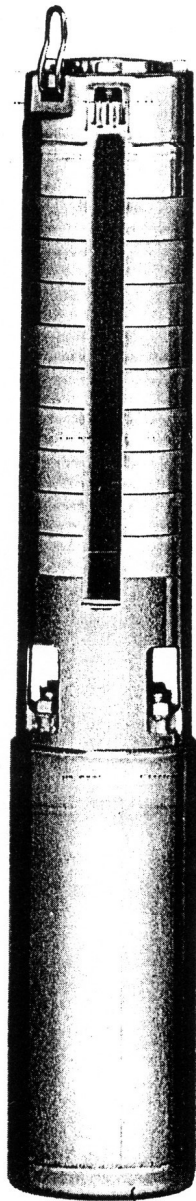
MODEL
25S

25 GPM

GRUNDFOS

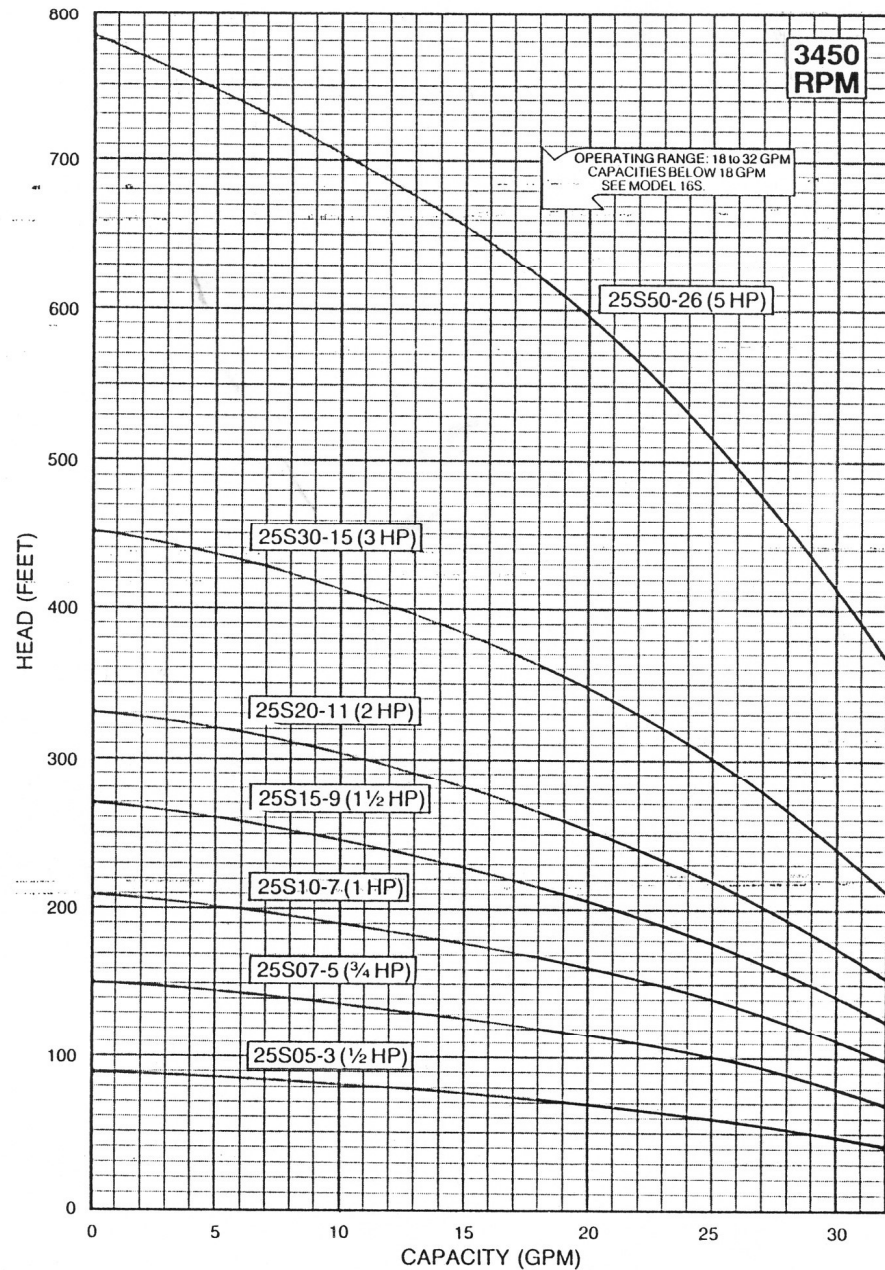
FLOW RANGE
18 to 32 GPM

PUMP OUTLET
1½" NPT



PERFORMANCE CURVES

APPENDIX "C1"



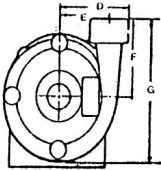
DIMENSIONS AND WEIGHTS

MODEL NO.	HP	LENGTH (INCHES)	WIDTH (INCHES)	APPROX. UNIT SHIPPING WT. (LBS.)
25S05-3	½	20 ¼	3 ⅛	26
25S07-5	¾	22 ¾	3 ⅛	28
25S10-7	1	24 ⅞	3 ⅛	29
25S15-9	1 ½	28	3 ⅛	34
25S20-11	2	28 ⅞	3 ⅛	37
25S30-15	3	39 ⅞	3 ⅛	59
25S50-26	5	51 ⅞	3 ⅛	76

Specifications are subject to change without notice.
See Deep Set models for higher head.

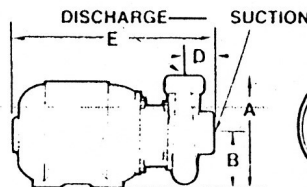
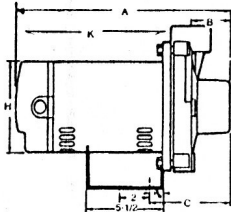
D Series

End Suction Centrifugal Pump Dimensions



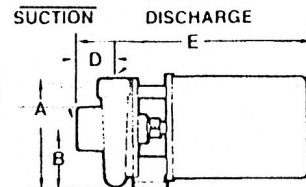
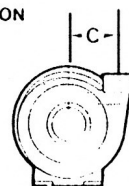
56Z Frame Motors

Pump Model	HP	Disc. (NPT)	Suct. (NPT)	A	B	C	D	E	F	G	H	K
5DDD1-S	1/2	1	1-1/4	14-11/16"	2-3/8"	5-5/16"	4-7/16"	3-1/2"	4-5/8"	8-3/4"	5-5/8"	11.41
7DDD1-S	3/4	1	1-1/4	14-11/16"	2-3/8"	5-5/16"	4-7/16"	3-1/2"	4-5/8"	8-3/4"	5-5/8"	12.41
1DDD1-S	1	1	1-1/4	14-11/16"	2-3/8"	5-5/16"	4-7/16"	3-1/2"	4-5/8"	8-3/4"	5-5/8"	12.41
15DDD1-S	1-1/2	1	1-1/4	15-13/16"	2-3/8"	5-5/16"	4-7/16"	3-1/2"	4-5/8"	8-3/4"	5-5/8"	12.16
2DDD1-1/4-S	2	1-1/4	1-1/2	16-11/16"	2-13/16"	6-1/8"	5"	3-9/16"	5"	9-1/8"	6.31	13.69
25DDD1-1/2-S	2-1/2	1-1/2	2	16-11/16"	2-13/16"	6-1/8"	5"	3-9/16"	5"	9-1/8"	6.31	13.69



JM FRAME MOTORS

56C Frame Motors

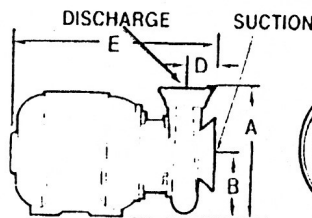


56C FRAME MOTORS

Pump Model	Disch. (NPT)	Suction (NPT)	A	B	C	D	E-56 Frame Motor Horsepower						
							1/3	1/2	3/4	1	1 1/2	2	3
DA1A	1	1-1/4	7-1/4	3-3/4	3-1/2	1-3/4	13-1/2	14-1/2	14-1/2	15	--	--	--
DA1B	1	1-1/4	7-1/4	3-3/4	3-1/2	1-3/4	--	14-1/2	14-1/2	15	15	16	--
DB1	1	1-1/2	9	5	3-3/4	2-1/4	--	--	15-1/4	15-3/4	15-3/4	16-1/2	17
DB1-1/2	1-1/2	2	9-1/2	5	4	2-1/2	--	--	--	15-3/4	15-3/4	16-1/2	17
DB2	2	3	9-3/4	5	4-1/4	3-3/4	--	--	--	--	17-1/4	18	18-1/2

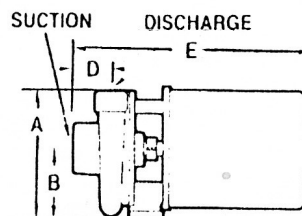
JM Frame Motors

Pump Model	Disch.	Suction	A	B	C	D	E-JM Frame Motor Horsepower					
							3	5	7 1/2	10	15	20
DB1	1	1-1/2	9	5	3-3/4	2-1/4	--	18	--	--	--	--
DB1-1/2	1-1/2	2	9-1/2	5	4	2-1/2	--	18-1/4	19-1/2	--	--	--
DB2	2	3	9-3/4	5	4-1/4	3-3/4	--	19-3/4	21	21	--	--
DB3	3	4	11-5/8-13-3/8	4-1/2-6-1/4	4-1/8	3-1/2	--	20-1/4	21-1/2	21-1/2	23	26-1/2
DC1-1/2	1-1/2	2	9-11	3-1/2-5-1/4	5-3/4	2-1/2	17-1/4	18-1/4	19-1/2	19-1/2	21	--
DC2	2	3	9-3/4-12-1/2	3-1/2-6-1/4	4-3/4	3-3/4	18-3/4	19-3/4	21	21	22-1/2	26



FLANGED CASE

JM Frame Motors



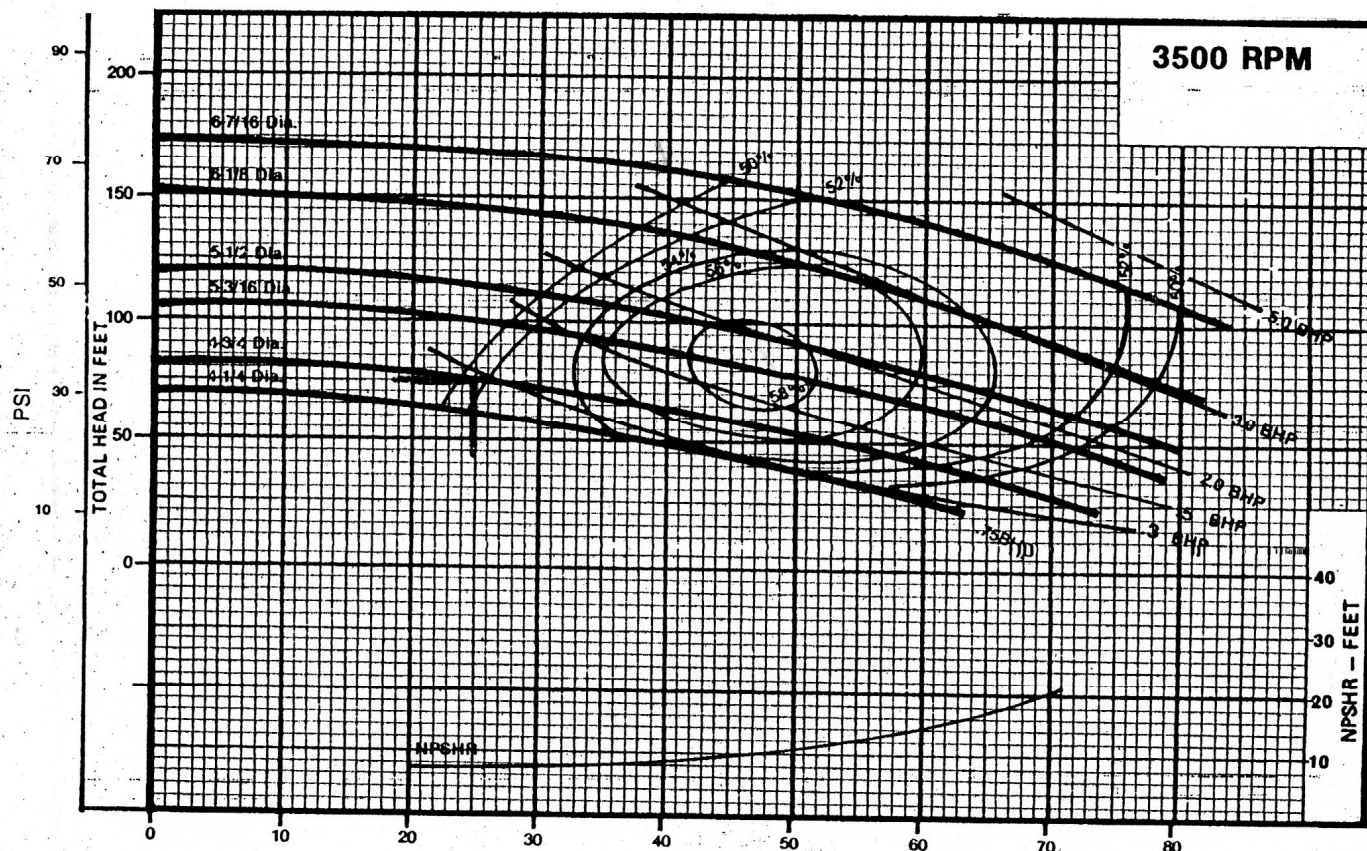
FNPT CASE

Pump Model	Disch. (NPT)	Suction (NPT)	A	B	C	D	E-JM Frame Motor Horsepower				
							20	25	30	40	50
DC4 - FNPT	4	4	16-1/2	7-5/8	6-29/64	4-23/32	28-21/32	28-21/32	29-17/32	30	30
DC4 - flanged	4	5	16-1/2	7-5/8	6-29/64	3-13/16	28-21/32	28-21/32	29-17/32	30	30



Model DB1 Performance for 3500 RPM

1" Discharge x 1-1/2" Suction



Performance Chart - 3500RPM

DB1 1" Discharge x 1-1/2" Suction			CAPACITIES GPM																	Shut Off Head
			Total Head in Feet																	
Model	HP	Imp. Dia.	25	30	35	40	45	50	60	70	80	90	100	110	120	130	140	150	160	
7DB1	3/4	4-1/4"	61	58	54	49	46	41	29											72
1DB1	1	4-3/4"			67	63	59	56	46	36	20									84
15DB1	1-1/2	5-3/16"						72	65	58	50	39	28							109
2DB1	2	5-1/2"							74	68	61	53	45	33						122
3DB1	3	6-1/8"									78	73	67	61	54	46	37			151
5DB1	5	6-7/16"												80	74	68	62	53	42	174

Note: All performance data based on rated nameplate voltage.

ENVIRONMENTAL HEALTH MANUAL

NEW YORK STATE DEPARTMENT OF HEALTH
OFFICE OF PUBLIC HEALTH

CENTER FOR ENVIRONMENTAL HEALTH

TECHNICAL REFERENCE

ITEM NO: PWS 41 DATE:

SUBJECT: CT Disinfection Concept:
Evaluation of Disinfection
Efficiency of PWS
Utilizing Surface Sources

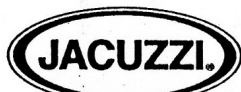
Page 3 of 9

In actual contact times as low as ten percent of theoretical hydraulic residence times using full storage volumes. The table below provides tank baffling classification and expected actual-to-theoretical contact time ratios which should be used for determining (T).

BAFFLING CLASSIFICATION TABLE

<u>Baffling Condition</u>	<u>$T_{10}^* < T$</u>	<u>Baffling Description</u>
Unbaffled (mixed flow)	0.1	None, agitated basin, very low length to width ratio, high inlet and outlet flow velocities.
Poor	0.3	Single or multiple unbaffled inlets and outlets, no intra-basin baffles
Average	0.5	Baffled inlet <u>or</u> outlet with some intra-basin baffles
Superior	0.7	Perforated inlet baffle, serpentine or perforated intra-basin baffles, outlet weir or perforated launders
Excellent	0.9	Serpentine baffling throughout basin, very high length to width ratio
Perfect (plug flow)	1.0	Very high length to width ratio (pipeline flow), perforated inlet, outlet, and intro-basin baffles.

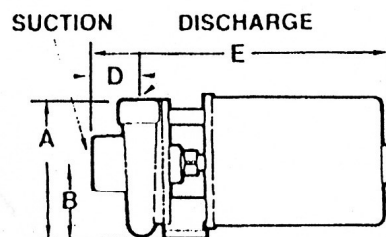
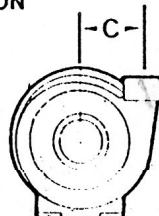
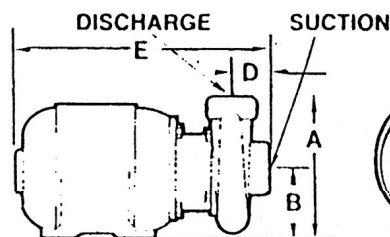
* T_{10} represents actual time for 90% of water to be in contact with the specified residual concentration and should be used for calculating the CT.



"The Most Trusted Name In Water."™

D Series

End Suction Centrifugal Pump Dimensions



JM FRAME MOTORS

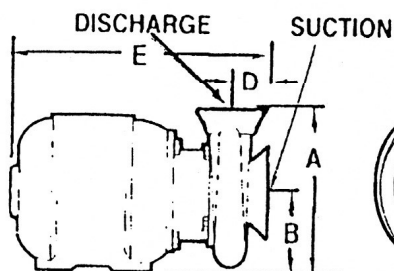
56C FRAME MOTORS

56C Frame Motors

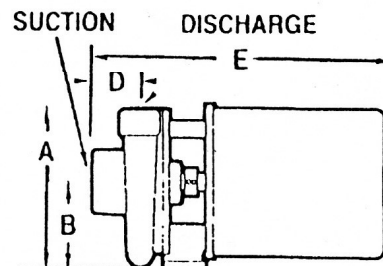
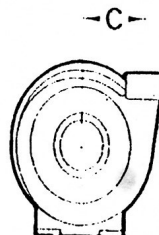
Pump Model	Disch. (NPT)	Suction (NPT)	A	B	C	D	E-56 Frame Motor Horsepower						
							1/3	1/2	3/4	1	1 1/2	2	3
DA1A	1	1-1/4	7-1/4	3-3/4	3-1/2	1-3/4	13-1/2	14-1/2	14-1/2	15	--	--	--
DA1B	1	1-1/4	7-1/4	3-3/4	3-1/2	1-3/4	--	14-1/2	14-1/2	15	15	16	--
DB1	1	1-1/2	9	5	3-3/4	2-1/4	--	--	15-1/4	15-3/4	15-3/4	16-1/2	17
DB1-1/2	1-1/2	2	9-1/2	5	4	2-1/2	--	--	--	15-3/4	15-3/4	16-1/2	17
DB2	2	3	9-3/4	5	4-1/4	3-3/4	--	--	--	--	17-1/4	18	18-1/2

JM Frame Motors

Pump Model	Disch.	Suction	A	B	C	D	E-JM Frame Motor Horsepower					
							3	5	7 1/2	10	15	20
DB1	1	1-1/2	9	5	3-3/4	2-1/4	--	18	--	--	--	--
DB1-1/2	1-1/2	2	9-1/2	5	4	2-1/2	--	18-1/4	19-1/2	--	--	--
DB2	2	3	9-3/4	5	4-1/4	3-3/4	--	19-3/4	21	--	--	--
DB3	3	4	11-5/8-13-3/8	4-1/2-6-1/4	4-1/8	3-1/2	--	20-1/4	21-1/2	21-1/2	23	26-1/2
DC1-1/2	1-1/2	2	9-11	3-1/2-5-1/4	5-3/4	2-1/2	17-1/4	18-1/4	19-1/2	19-1/2	21	--
DC2	2	3	9-3/4-12-1/2	3-1/2-6-1/4	4-3/4	3-3/4	18-3/4	19-3/4	21	21	22-1/2	26



FLANGED CASE



FNPT CASE

JM Frame Motors

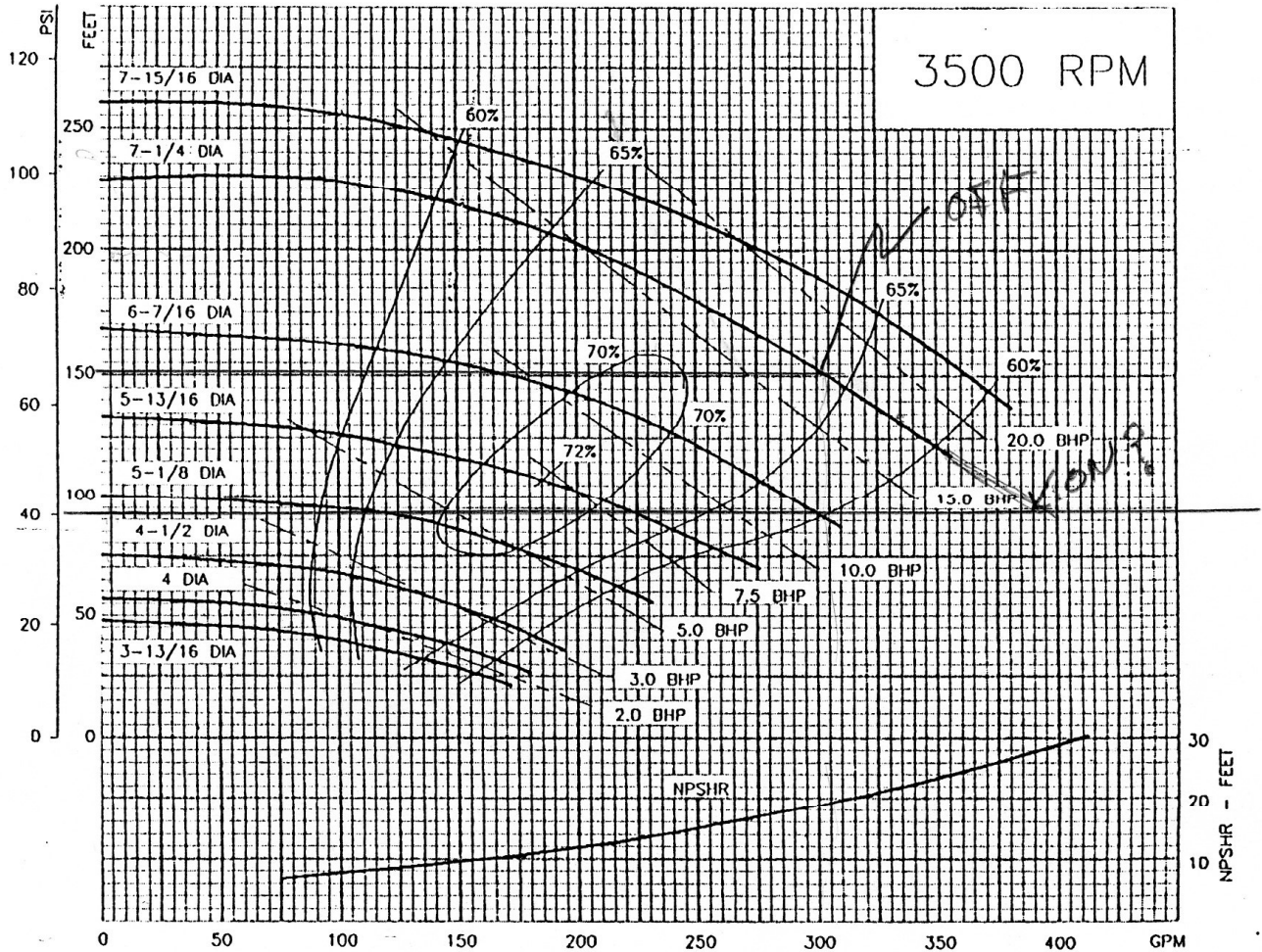
Pump Model	Disch. (NPT)	Suction (NPT)	A	B	C	D	E-JM Frame Motor Horsepower				
							20	25	30	40	50
DC4 - FNPT	4	4	16-1/2	7-5/8	6-29/64	4-23/32	28-21/32	28-21/32	29-17/32	30	30
DC4 - flanged	4	5	16-1/2	7-5/8	6-29/64	3-13/16	28-21/32	28-21/32	29-17/32	30	30



Model DB2 Performance for 3500 RPM

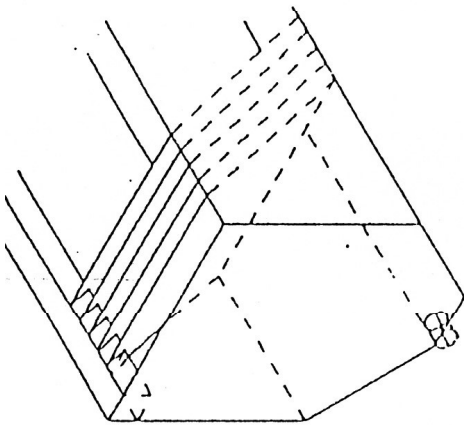
2" Discharge x 3" Suction

switch setting 40-65



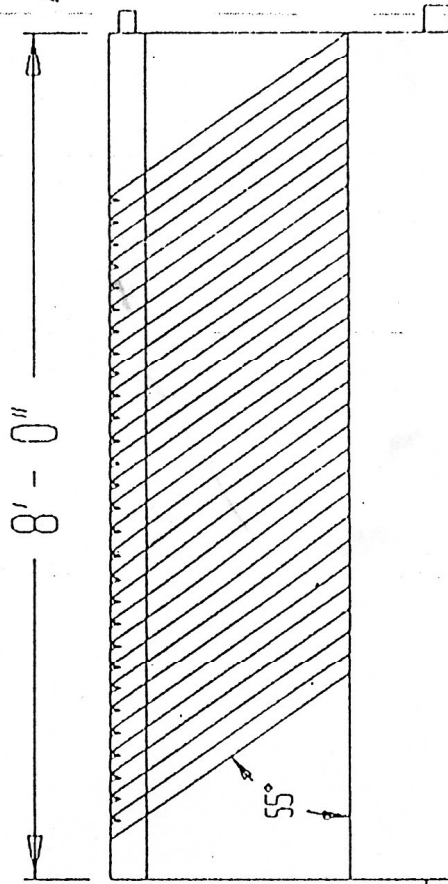
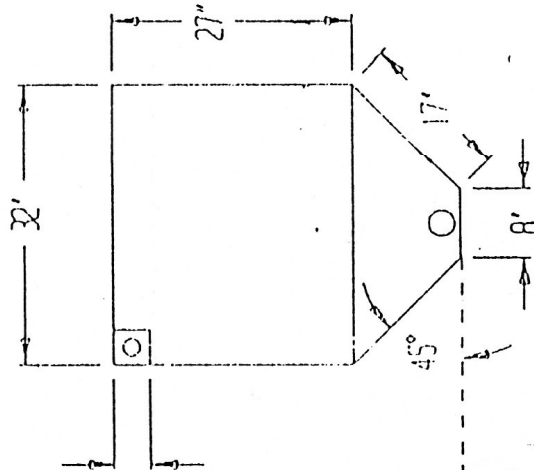
Performance Chart - 3500RPM

DB2 2" Discharge x 3" Suction			CAPACITIES GPM																		Shut Off Head
			Total Head in Feet																		
Model	HP	Imp. Dia.	20	25	30	35	40	45	50	60	70	80	90	100	110	120	150	200	250		
15DB2	1-1/2	3-3/16"	175	160	145	125	100	65											50		
2DB2	2	4"		185	170	160	145	125	100										58		
3DB2	3	4-1/2"						175	165	140	90								75		
5DB2	5	5-1/8"								235	210	190	160						100		
75DB2	7-1/2	5-13/16"										260	240	225	200	160			135		
10DB2	10	6-7/16"											310	290	275	260	185		170		
15DB2	15	7-1/4"														350	305	205	230		
20DB2	20	7-15/16"															365	275	130	260	



30 PLATES 2 1/2' SPACING

HALF COUPLING



PEARSON & TIMMERMAN INC			
DRAWING NAME SSSS	DR. # 1-2	SCALE NONE	
DRAWN BY PATRICK JARED	DATE 2APR93		

Preparation of Two Potable Water Tank

Those two steel tanks were made on site of the use on former Black and Clawson Co. Watertown, NY. It was said that those two tanks were utilized as a sand-dispensing bin for foundry. Each tank capacity is calculated at 15,000 gallons.

- 1 All interior surfaces of the tanks were sandblasted clean to near white specification --SSPC- SP10.
- 2 Primed with one complete coat of Porter line 6000 High Build Epoxy Tank Liner. All welds, seams, etc. received a stripe coat of it applied by brush and roller.
- 3 All surfaces then received a finish coat of Tank Liner.
- 4 Prior to going on line with the system, tank interiors to be sprayed with a 200 parts/million solutions of chlorine as per NYS Dept. of Health regulation and water samples tested.
- 5 All exteriors of tanks were sandblasted clean, commercial grade -- SSPC-SP#6 --Porters Recoatable Epoxy Primer, and one urethane finish coat was applied.

Specifications

Application

Cold water measurement (up to 120°) of flow in one direction

Maximum Operating Pressure

150 psi (1034 kPa)

Register

Direct reading, center sweep, roll-sealed, magnetic drive, with low flow indicator

Measuring Element

AWWA Class II Turbine, dual suspension

Options

Units of Measure

U.S. Gallons
Imperial Gallons
Cubic Feet
Cubic Metres

Register Types

Direct Reading
Remote Reading Systems:
ARB
Pulser RM
Tricon/S
Tricon/E

Companion Flanges

1½" & 2" (oval): bronze or cast iron
3", 4" & 6": bronze or cast iron
8" & 10": cast iron

Strainers

2" - 6": bronze
8" & 10": cast iron

REGIONAL SALES and SERVICE OFFICES

- NORTHEAST: 230 Gardner St., Suite 4
Hingham, MA 02043
(617) 749-5080
- CENTRAL: 14700 Farmington Rd., Suite 106
Livonia, MI 48154
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- SOUTHEAST: Hwy. 229 South
Tallahassee, AL 36078
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Santa Fe Springs, CA 90670
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CANADIAN SALES

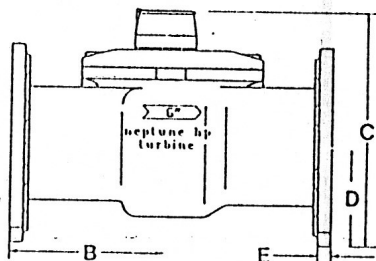
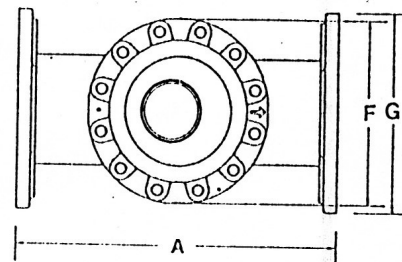
- Schlumberger Canada, Ltd.
Measurement Division
7275 West Credit Ave.
Mississauga, Ontario, L5N 5M9
(416) 858-4211
FAX (416) 858-0428

Operating Characteristics: Neptune HP Turbine

Meter Size	Normal Operating Range @ 100% Accuracy (± 1.5%)	Maximum Intermittent Flow	AWWA Standard
1½"	4 to 160 US gpm 0.91 to 36.3 m³/h	200 gpm	N/A
2"	4 to 200 US gpm 0.91 to 45.4 m³/h	250 gpm	4 to 160 US gpm .91 to 36.3 m³/h
3"	5 to 550 US gpm 1.1 to 102 m³/h	675 gpm	8 to 350 US gpm 1.8 to 79.5 m³/h
4"	10 to 1,200 US gpm 2.3 to 227 m³/h	1500 gpm	15 to 630 US gpm 3.4 to 143.0 m³/h
6"	20 to 3,000 US gpm 4.5 to 454 m³/h	3750 gpm	30 to 1400 US gpm 6.8 to 317.9 m³/h
8"	35 to 4,000 US gpm 7.9 to 795 m³/h	5000 gpm	50 to 2400 US gpm 11.4 to 545 m³/h
10"	50 to 6,500 US gpm 11.4 to 1,249 m³/h	8000 gpm	75 to 3800 US gpm 17.0 to 863 m³/h

Registration

Registration (per sweep hand revolution)		
	1½", 2", 3", 4"	6", 8", 10"
1,000 US Gallons		✓
1,000 Imperial Gallons		✓
100 US Gallons	✓	
100 Imperial Gallons	✓	
100 Cubic Feet		✓
10 Cubic Feet	✓	
10 Cubic Metres		✓
1 Cubic Metre	✓	
Register Capacity (6-wheel odometer)		
	1½", 2", 3", 4"	6", 8", 10"
1,000,000,000 US Gallons		✓
1,000,000,000 Imperial Gallons		✓
100,000,000 US Gallons	✓	
100,000,000 Imperial Gallons	✓	
100,000,000 Cubic Feet		✓
10,000,000 Cubic Feet	✓	
10,000,000 Cubic Metres		✓
1,000,000 Cubic Metres	✓	



Dimensions

Meter Size	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	Weight lbs/kg
1½"	10 ¹ 254	6½ 165	7⅞ 181	1¾ 44	¾ 19	4½ 114	5⅞ 137	19 8.6
2"	10 ² 254	6½ 165	7⅞ 181	2⅞ 44	13/16 19	4½ 114	5⅞ 137	20 9.1
3"	12 301	6 152	10 254	3¾ 95	⅝ 16	6¼ 159	7½ 190	40 18.1
4"	14 366	6½ 165	10⅞ 276	4½ 114	¾ 19	8⅞ 206	9 229	52 23.6
6"	18 457	8⅞ 219	13 330	5½ 140	1 25	10¼ 260	11 279	115 52.2
8"	20 508	9⅞ 244	15½ 394	6¾ 171	1⅞ 29	10¼ 260	13½ 343	195 88.4
10"	26 660	12⅞ 321	15½ 394	8 203.2	1¼ 32	10¼ 260	16 406	275 124.7

Note: 1½" and 2" Connections are oval.

3" - 10" Connections are round, per ANSI B16.1 Class 125.

¹ 13" Length available with bronze spacer/test port.

² 17" Length available with bronze strainer or bronze spacer.



commercial and industrial

FILTERS

to improve water quality

BY REMOVING

IRON • MANGANESE • TURBIDITY • SEDIMENT • TASTE • ODOR

automatic and manual models for every application

How our water filters work—

Inlet raw water is directed "downflow" through a bed of filter material, in steel pressure tank, and out bottom distributor system to outlet as clear filtered water.

Periodically, it is necessary to clean the filter bed of what was removed by it. To do this, inlet water is reversed and directed "upflow" through bed (called backwashing) to a drain. This can be done "manually" through use of budget Gate Valve Models or "automatically" with our Diaphragm Valve Models initiated by time clock or push-button.

The period of time between backwashes depends on the raw water condition and amount used. Weekly backwash (half-hour) is recommended. Also when pressure drops 5 to 8 pounds between "inlet" and "outlet" of water filter.

With the exception of Manganese Greensand, backwashing is all that is required with our quality filter materials.

Benefits derived by improving water quality, to an extent to do a specific job, justifies an investment in filtration.

How to select filter size—

It is important that sufficient water is available for backwashing. On all filter models, the "backwash flow rate" is greater than the service flow. Specifications on page 3.

If available water for backwashing is only about as much as service flow needed, use twin models so each "twin" provides one-half the service flow needed. Backwashing each twin separately, during idle periods, can be done.

Where very large flow rates are needed, or where severe water problems exist, use Automatic Multiple Unit System

Water Filters (3 to 5 units) in tank diameter sizes from 20" to 72". Each unit automatically backwashes, in sequence, using filtered water from the other units. See back page.

Choice of 4 filter materials—

MANGANESE GREENSAND

for removal of iron and manganese

Purplish-black zeolite made out of glauconitic greensand having a silica base. It oxidizes ferrous or manganous bicarbonates to the higher oxides and filters them out of water. In addition to backwashing, this material requires an occasional "potassium permanganate" regeneration.

REGULAR BIRM

for removal of iron and manganese

Black granular material. Active insoluble catalyst will precipitate iron, in hydroxide form, and filter it out when no oil or hydrogen sulfide is in raw water, pH is 6.5 or higher, dissolved oxygen content is at least 15% of the iron, and organic matter not over 5 ppm (oxygen consumed value).

ACTIVATED CARBON

for removal of taste, odor and color

Black granular high density filter carbon distinguished by internal structure with balanced proportion of large and small pores to absorb and retain the taste, odor, color and excess chlorine in water. Raw water should be relatively free of iron for best results.

FILTER "AG"

for removal of suspended matter

Granular non-hydrous aluminum silicate. Irregular surface of grain removes about twice as many solids per cu. ft. as with sand. This allows smaller tank or longer service runs.

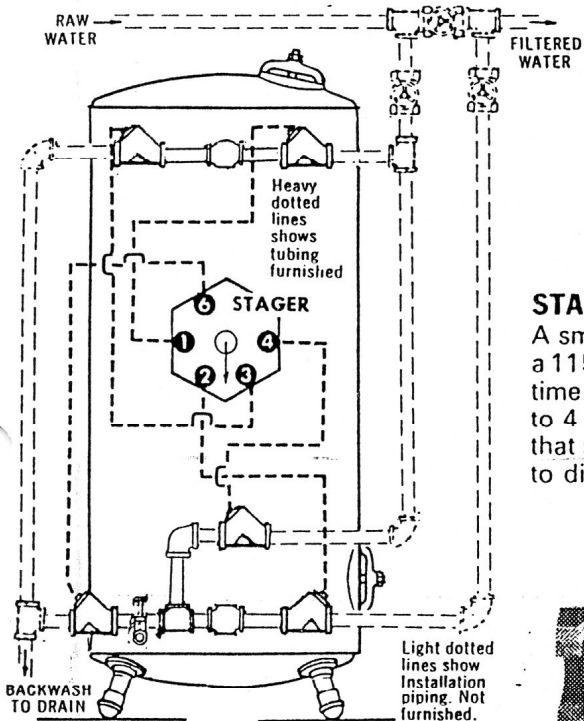
Heavy Duty Water Filters for Big Tough Jobs

DIAPHRAGM VALVE MODELS

(AUTOMATIC OPERATION)

The ultimate water filter for commercial and industrial applications. Five rugged diaphragm valves provide labor-saving automatic water filtering. Diaphragm valves, hydraulically operated by a "Stager", open and close to backwash the filter and return it to service without manual attention. Rugged tanks, designed for 100 p.s.i. operating pressure, are made of heavy sheet steel with flanged and dished heads. The lower distribution system has non-clogging orifice openings covered by a supporting bed of graded gravel. Any filter material, described on front page, can be used in diaphragm valve automatic water filters.

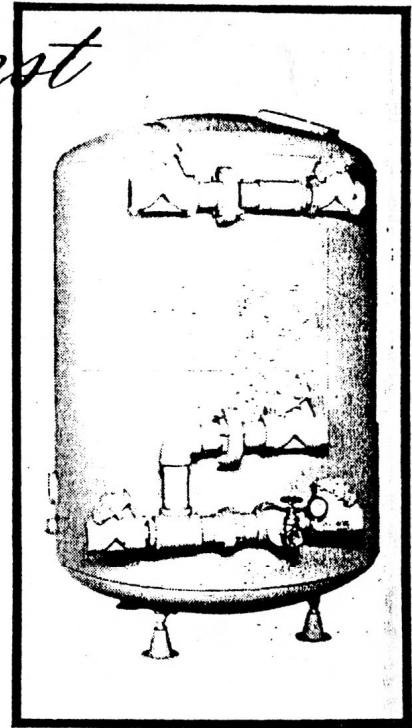
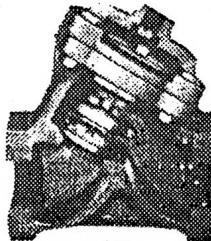
the finest



STAGER POSITION	FUNCTION	VALVES OPEN
4	SERVICE	1 & 2
	OFF	2 & 3
1	BACKWASH	3 & 4
2	OFF	4
	OFF	6
3	RAPID RINSE	6 & 1

STAGER CONTROLLER

A small brass rotary valve driven by a 115 v. motor, actuated by program time clock or push-button, turns cam to 4 different positions (see above) that relays pressure, in plastic tubing, to diaphragm valves. During power failure, cam is manually set.



HEAVY STEEL TANKS

Filter tanks are shipped completely assembled. Ready for installation. Epoxy lining and painted exteriors assures long tank life. Larger tanks (42" to 72") have jack legs, lifting lugs and are shipped on skids.

DIAPHRAGM VALVES

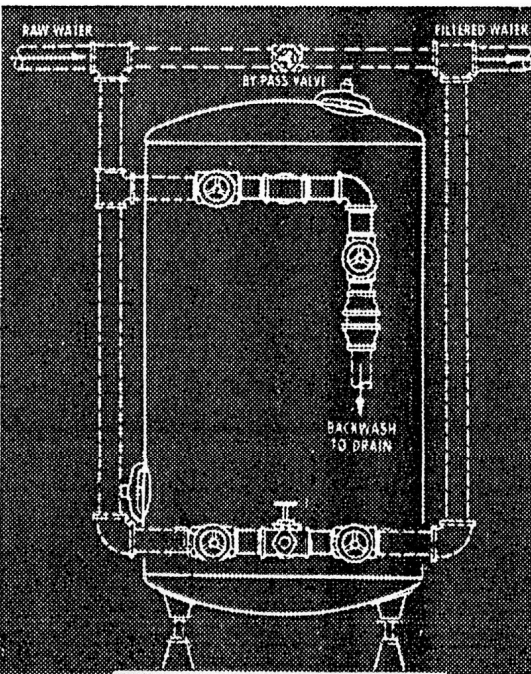
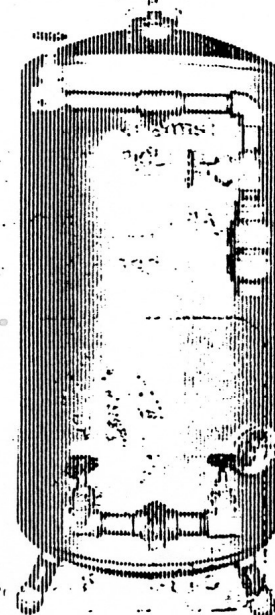
Cut-away illustration (at left) shows angular design of rugged cast iron diaphragm valves allowing minimum restriction to flow and pressure. Quiet positive closing.

GATE VALVE MODELS

(MANUAL OPERATION)

The budget water filter for commercial and industrial applications. Gate valves are "manually" opened and closed, per simple instructions, when backwashing is needed. Designed for 100 p.s.i. operating pressure, rugged tanks are made of heavy sheet steel with flanged and dished heads. Lower distribution system has non-clogging orifices covered by a supporting bed of graded gravel. Any filter material, described on front page, can be used in gate valve water filters.

Typical installation piping



GENERAL SPECIFICATIONS FOR ALL AUTOMATIC & MANUAL MODELS

Choose filter size based on flow & backwash rates below.

Automatic Model	Manual Model	Filter Media Cubic Meters (cubic feet)	Bed Area Square Meters (sq. ft.)	PRESSURE DROP Atm. (psid)	PIPE SIZE mm (in.)	TANK SIZE Dia. x Height mm (in.)	Est. Ship Wt. Kgs. (lbs.)
AEF-20	GEF-20	0.085 (5)	0.200 (2.16)	0.4-0.8 (6-12)	26 (1.0)	512 x 1540 (20 x 60)	386 (850)
AEF-24	GEF-24	0.227 (8)	0.292 (3.14)	Same	26 (1.0)	615 x 1540 (24 x 60)	602 (1325)
AEF-30	GEF-30	0.340 (12)	0.456 (4.91)	Same	32 (1.25)	770 x 1540 (30 x 60)	727 (1600)
AEF-36	GEF-36	0.510 (18)	0.740 (7.97)	Same	38 (1.50)	923 x 1540 (36 x 60)	1045 (2300)
AEF-42	GEF-42	0.680 (24)	0.894 (9.62)	Same	38 (1.50)	1077 x 1540 (42 x 60)	1590 (3500)
AEF-48	GEF-48	0.907 (32)	1.168 (12.57)	Same	52 (2.0)	1230 x 1540 (48 x 60)	2068 (4550)
AEF-54	GEF-54	1.133 (40)	1.477 (15.90)	Same	64 (2.5)	1385 x 1540 (54 x 60)	2590 (5700)
AEF-60	GEF-60	1.416 (50)	1.824 (19.63)	Same	77 (3.0)	1540 x 1540 (60 x 60)	3181 (7000)
AEF-66	GEF-66	1.700 (60)	2.267 (23.76)	Same	77 (3.0)	1692 x 1540 (66 x 60)	3750 (8250)
AEF-72	GEF-72	2.125 (75)	2.626 (28.27)	Same	*77 (3.0)	1846 x 1540 (72 x 60)	4681 (10300)
AEF-78	GEF-78	2.408 (85)	3.082 (33.18)	Same	*103 (4.0)	2000 x 1540 (78 x 60)	5364 (11800)
AEF-84	GEF-84	2.833 (100)	3.575 (38.48)	Same	*103 (4.0)	2154 x 1540 (84 x 60)	6409 (14100)
AEF-90	GEF-90	3.125 (110)	4.104 (44.18)	Same	*103 (4.0)	2308 x 1540 (90 x 60)	7364 (16200)
AEF-96	GEF-96	3.541 (125)	4.669 (50.26)	Same	**154 (6.0)	2461 x 1540 (96 x 60)	8409 (18500)
AEF-102	GEF-102	4.107 (145)	5.271 (56.74)	Same	**154 (6.0)	2615 x 1540 (102 x 60)	10090 (22200)
AEF-108	GEF-108	4.533 (160)	5.910 (63.61)	Same	**154 (6.0)	2770 x 1540 (108 x 60)	11227 (24700)
AEF-114	GEF-114	4.958 (175)	6.585 (70.88)	Same	**154 (6.0)	2923 x 1540 (114 x 60)	12636 (27800)
AEF-120	GEF-120	5.667 (200)	7.297 (78.54)	Same	**154 (6.0)	3077 x 1540 (120 x 60)	14136 (31100)

* Service pipe size can be increased to 154 mm (6.0") for increased flow.

** Service pipe size can be increased to 205 mm (8.0") for increased flow - For manual models only.

Please contact the factory for exact dimensions and weight for each of the above filters.

NOTE: EACH OF THE ABOVE FILTERS IS AVAILABLE WITH STANDARD 220 V/50 HZ TIME CLOCK CONTROLS WHEN ORDERED WITH THE AUTOMATIC DIAPHRAGM VALVES OR WITH ELECTRONIC CONTROLS ACTUATED BY PRESSURE DIFFERENTIAL SWITCHES. PLEASE CONSULT THE FACTORY FOR A QUOTATION ON THE PROPER SYSTEM FOR YOUR APPLICATION.

Larger filter tanks can be constructed to specification. Please call the factory for a quotation.

WATER TREATMENT MATERIALS SPECIFICATIONS

1. "BIRM" - For removal of Iron & Manganese

Service Flow Rates - 3.5 to 5.0 U.S. Gallons per Minute per Square Foot of bed surface area.
8.6 to 12.2 Cubic Meters per Hour per Meter Square of bed surface area.

Backwash Flow Rate - 10 to 12 U.S. Gallons per Minute per Square Foot of bed surface area.
24.5 to 29.3 Cubic Meters per Hour per Meter Square of bed surface area.

2. "MANGANESE GREENSAND" - For removal of Iron & Manganese

Service Flow Rates - 3.5 to 5.0 U.S. Gallons per Minute per Square Foot of bed surface area.
8.6 to 12.2 Cubic Meters per Hour per Meter Square of bed surface area.

Backwash Flow Rate - 10 to 12 U.S. Gallons per Minute per Square Foot of bed surface area.
24.5 to 29.3 Cubic Meters per Hour per Meter Square of bed surface area.

3. "ACTIVATED CARBON" - For removal of Taste, Odor, and Color.

Service Flow Rates - 4.0 to 6.0 U.S. Gallons per Minute per Square Foot of bed surface area.
9.8 to 14.7 Cubic Meters per Hour per Meter Square of bed surface area.

Backwash Flow Rate - 10 to 12 U.S. Gallons per Minute per Square Foot of bed surface area.
24.5 to 29.3 Cubic Meters per Hour per Meter Square of bed surface area.

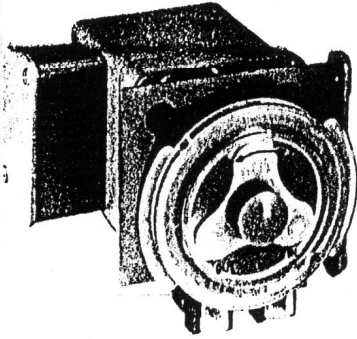
4. "FILTER AG" - For removal of Turbidity & Sediment.

Service Flow Rates - 5.0 to 15.0 U.S. Gallons per Minute per Square Foot of bed surface area.
12.2 to 36.7 Cubic Meters per Hour per Meter Square of bed surface area.

Backwash Flow Rate - 13.0 to 15.0 U.S. Gallons per Minute per Square Foot of bed surface area.
31.8 to 36.7 Cubic Meters per Hour per Meter Square of bed surface area.

NOTE: IN ORDER TO CALCULATE THE SIZE OF THE FILTER REQUIRED FOR EACH APPLICATION, DETERMINE THE FLOW RATE FROM THE ABOVE CHOICE OF MATERIALS AND THE ACTUAL FLOW RATE NEEDED. REFER TO THE PROPER RATES ABOVE AND DETERMINE THE BED SURFACE AREA FOR THE SIZE OF THE TANKS LISTED ABOVE.

A-1600 PERISTALTIC INJECTOR



The A-1600 unit is the ideal metering pump for OEM applications. Its ~~high quality pump head assembly, the compact housing of the CHEM-FEED® C-600P Series,~~ free. Standard A-1600 units have our exclusive FLEXFLO pump head assembly, the compact housing of the CHEM-FEED® C-600P Series, and a fixed feed rate with a variety of RPM's from which to choose. A-1600 is available with a cycle control percentage timer. Add the letter "T" to model number (i.e., A-1614T-4). Included with every A-1600 is an accessory kit package with foot valve with ceramic weight, threadless injector fitting, two spare tubes, 10' of tubing and a Feed Indicator*.

SPECIFICATIONS

- Pump head material: Glass reinforced polyamide
- Roller assembly: 3 roller
- Feed controller: Solid state
- Pump tube material: Tygon®, options NORprene®, Tygon® tube with PVC adapters
- O-Ring material standard: Viton®, optional - EP
- Motors: 14, 30, 45 RPM
- Voltage: 115V/60Hz optional - 230V/60Hz, 220V/50Hz, 24V/60Hz 24V/50Hz
- Wall mount
- Overall dimensions: 7" w X 4 1/2" h X 5 1/2" d
- Shipping weight: 9 lbs. (approx.)

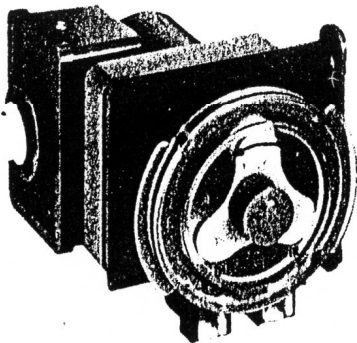
ORDERING INFORMATION

Model Number	RPM	Max. GPD	Feed GPH	Rate ML/MN	Pump Tube O.D.	Feed Line O.D.	Max. PSI
A-1614-3N	14	1.6	0.07	5	3/16"	1/4"	25
A-1630-3N	30	4.0	0.19	12	3/16"	1/4"	25
A-1645-3N	45	3.0	0.23	15	3/16"	1/4"	25
A-1614-4	14	6.0	0.26	17	1/4"	1/4"	25
A-1630-4	30	15	0.63	40	1/4"	1/4"	25
A-1614-6	14	22	0.95	60	3/8"	3/8"	25
A-1614-7	14	28	1.20	76	7/16"	3/8"	25
A-1630-6	30	49	2.05	130	3/8"	3/8"	25
A-1630-7	30	74	3.10	197	7/16"	3/8"	25
A-1645-6	45	74	3.10	197	3/8"	3/8"	25
A-1645-7	45	112	4.70	294	7/16"	3/8"	25

Available with NORprene® pump tube assembly, add the letter "N" to the model number (i.e., A-1614-4N).

*Not available on 1/4" tubing.

A-1800V VARIABLE SPEED PERISTALTIC INJECTOR



A-1800V units utilize a solid state controller and a permanent magnet motor for precise feed control.

The A-1800V is a durable variable speed and output peristaltic pump. The unique design provides easy access to important components such as the motor. Other notable features are: very fast tube replacement, high quality ball bearing permanent magnet motor, and a straightforward dial feed rate adjustment.

Each unit comes with a complete accessory pack which includes: Ft. valve, weight, 10' tubing, two pump tubes, T.I. fitting (saddle type injection fitting) and a Feed Indicator*. An excellent value and a favorite of OEM's.

SPECIFICATIONS

- Pump head material: Glass reinforced polyamide
- Roller assembly: 3 roller
- Feed controller: Solid state
- Pump tube material: Tygon® or NORprene®, Tygon® with P.V.C. adapters
- O-ring material: Viton®, optional EP
- Motors: 14, 30, 45, 60, 125 RPM
- Voltage: Standard 115V optional 24V (DC ONLY)
- Wall mount
- Overall dimensions: 7 3/4" w X 6" h X 5 3/4" d
- Shipping weight: 7 lbs. (approx.)

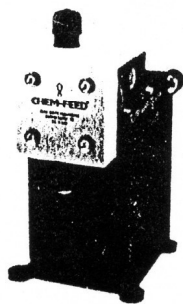
ORDERING INFORMATION

Model Number	RPM	Max. GPD	Feed GPH	Rate ML/MN	Pump Tube O.D.	Feed Line O.D.	Max. PSI
A-1814V-3N	14	2.2	.09	6.0	3/16"	1/4"	25
A-1830V-3N	30	5.0	.22	14	3/16"	1/4"	25
A-1814V-4	14	8.0	.33	21	1/4"	1/4"	25
A-1830V-4	30	18	.77	49	1/4"	1/4"	25
A-1814V-6	14	29	1.2	76	3/8"	3/8"	25
A-1814V-7	14	38	1.6	102	7/16"	3/8"	25
A-1830V-6	30	61	2.5	162	3/8"	3/8"	25
A-1830V-7	30	88	3.6	232	7/16"	7/16"	25
A-1845V-6	45	100	4.1	265	3/8"	3/8"	25
A-1845V-7	45	138	5.7	265	7/16"	3/8"	25

Available with NORprene® pump tube assembly, add the letter "N" to the model number (i.e., A-1814V-3N)

*Not available on 1/4" tubing.

CHEM-FEED® C-1500P INJECTOR PUMP



The C-1500P pumps have a front mounted pump head and top mounted, dial type feed adjustment. The C-1500P has a bracket design that allows the unit to be wall, shelf or tank top mounted. The C-1500P may be ordered with a variety of head and diaphragm options. Also a solid state percentage timer, mounted directly to the pump housing is available. The timer option provides maximum feed control and is recommended for applications where precise feed and better turndown is required, where chemical demand varies greatly, or where one pump must be suited to several applications. The C-1500P is a reliable metering pump, easy to use and maintain, a proven workhorse.

SPECIFICATIONS

- Pump head material: Standard acrylic, optional polypropylene, polyethylene, Teflon®, nylon.
- Diaphragm material: Standard Teflon®/EP
- O-Ring material and check-valves: Viton®, options: ethylene propylene, silicone
- Motors: 14, 30, 45, 60 125 RPM
- Voltage: 115V/60Hz, Options: 230V/60Hz, 220V/50Hz, 24V/60Hz, 24V/50Hz, 12V/DC.
- Shelf or wall mount.
- Overall dimensions: 4 1/2" w X 9" h X 6" d.
- Shipping weight: 10 lbs. (approx.)

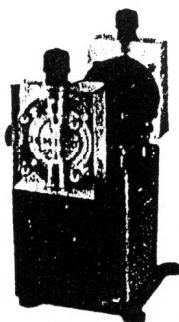
ORDERING INFORMATION

Model Number	RPM	Max. GPD	Feed GPH	Rate ML/MN	Pump Tube O.D.	Max. PSI
C-1514LP	14	12	0.5	33	3/8"	100
C-1530LP	30	31	1.3	82	3/8"	100
C-1560SP	60	40	1.7	107	3/8"	100
C-1560LP	60	54	2.3	144	3/8"	60
C-15125LP2	125	64	2.7	174	3/8"	80
C-15125LP	125	117	4.9	308	3/8"	20

PUMP HEAD OPTIONS

Option Number	Head Type	Model SP or LP	Head Material	O-Ring Material	Diaph. Material
53	Hvy. Dty. Cart.	LP	Acrylic	Viton®	Teflon®/Viton®
52	Hvy. Dty. Cart.	LP	Acrylic	EP	Teflon®/EP
07P	Standard	LP	Poly-Pro	Viton®	Teflon®/EP
18	Standard	LP	Teflon®	Viton®	Teflon®/Viton®
28H	Std. Cart.	SP	Acrylic	Viton®	EP

CHEM-FEED® C-1700P DUAL HEAD INJECTOR PUMP



The C-1700P Dual Head injector pumps offer the ultimate in small metering injector versatility. These pumps feature dual, side mounted pump heads, independent top mounted, dial-type feed adjustments, and may be ordered with dissimilar head materials and diaphragms. Standard C-1700P metering pumps are equipped with a standard acrylic pump head, Teflon® coated EP diaphragm, Viton® O-Ring seals and 3/8" connections. These units are designated by an "LP" in the model number. "SP" units have a smaller diaphragm, constructed of EP or Viton®, O-Ring seals, standard acrylic pump head. C-1700P Duplex is a good choice when you need more output than the C-1500P series.

SPECIFICATIONS

- Pump head material: Standard Acrylic, Optional polypropylene, polyethylene, Teflon®, nylon
- Diaphragm material: Standard EP/Teflon®, Optional-Viton®, Viton®/Teflon®
- O-Ring material and check valves: Viton®, Options: Ethylene propylene, silicone
- Motors: 14, 30, 45, 60, 125 RPM
- Voltage: 115V/60Hz, Options: 230V/60Hz, 220V/50Hz, 24V/60Hz, 24V/50Hz, 12V/DC
- Shelf or wall mount.
- Overall dimensions: 7 1/2" w X 9 1/2" h X 4" d
- Shipping weight: 12 lbs. (approx.)

ORDERING INFORMATION

Model Number	RPM	Max. GPD	Feed GPH	Rate ML/MN	Pump Tube O.D.	Max. PSI
C-1714SP2	14	4.0	0.2	20	3/8"	120
C-1714SP	14	16	0.6	44	3/8"	120
C-1714LP	14	24	1.0	66	3/8"	100
C-1730SP	30	34	1.4	92	3/8"	120
C-1745SP	45	52	2.2	138	3/8"	100
C-1730LP	30	62	2.6	164	3/8"	100
C-1760LP	60	108	4.6	288	3/8"	60
C-17125LP	125	234	9.8	616	3/8"	20

PUMP HEAD OPTIONS

Option Number	Head Type	Model SP or LP	Head Material	O-Ring Material	Diaph. Material
53	Hvy. Dty. Cart.	LP	Acrylic	Viton®	Teflon®/Viton®
52	Hvy. Dty. Cart.	LP	Acrylic	EP	Teflon®/Viton®
07P	Standard	LP	Poly-Pro	Viton®	Teflon®/EP
18	Standard	LP	Teflon®	Viton®	Teflon®/Viton®
28H	Std. Cart.	SP	Acrylic	Viton®	EP

NOTE: Duplex outputs are listed as the combined total of both heads.

F-452 HIGHEST CAPACITY IN-LINE UNITS



The newest addition to the **molded Polysulfone** line is the high capacity F-452 Series. These units offer many of the capabilities of glass and metal flowmeters costing many times more.

In addition to the heat and chemical resistant Polysulfone meter body, F-452 units feature: 2" FPT adapters, Quik Loc™ (half union) adapter connectors which couple the meter body to the adapters, Viton o-ring seals and #316 stainless steel internal parts.

F-452 flowmeters offer excellent accuracy and repeatability, ease of installation, and are virtually maintenance free.

F-452 flowmeters have liquid calibrations between 2 and 130 GPM (30 to 500 LPM). Scales are screen printed onto the meter body, directly in front of the float, for easy reading.

Consider the F-452 Series for your next installation that requires high volume measurement with low pressure loss.

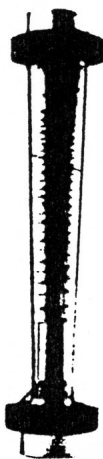
SPECIFICATIONS

- Accuracy: $\pm 3\%$
- Material of Construction (meter body): Molded Polysulfone
- O-Ring Material: Viton®
- Temperature Limits: 150°F†
- Pressure Limits: 130 psit
- Capacities: Up to 130 GPM
- Adapter Size: 2" FPT
- Shipping Weight: 5 lbs. (Approx.)

ORDERING INFORMATION

Model Number	GPM	LPM	Float Material	Adapter Size
F-452020LH	2.0 to 20	—	Teflon®	2" FPT
F-452060LH	6.0 to 60	30 to 230	#316 S.S.	2" FPT
F-452080LH	10 to 80	40 to 300	#316 S.S.	2" FPT
F-452100LH	5.0 to 100	20 to 380	#316 S.S.	2" FPT
F-452130LH	15 to 130	60 to 500	#316 S.S.	2" FPT
Calibration SCFM				
F-452250GH	30 to 230		#316 S.S.	2" FPT

F-452 SPECIALLY EQUIPPED



Blue White injection molded Polysulfone flowmeters may be ordered with the Specially Equipped, "K" option. The Specially Equipped option is ideal for many applications where chemicals, pressure or temperature extremes are a consideration.

Blue White's Specially Equipped flowmeters can, in many cases, be used in applications where formerly only very expensive glass or metal units were suitable.

In addition to the amber color Polysulfone meter body, Specially Equipped units have Polysulfone connectors and Hastelloy floats and float guides.

A complete guide to chemical resistance is available from the factory. As with all Blue White products, Specially Equipped flowmeters are available with a plain label optional to volume purchasers.

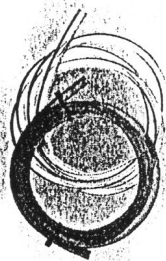
SPECIFICATIONS

- Accuracy: $\pm 3\%$
- Material of Construction (meter body): Molded Polysulfone
- O-Ring Material: Viton®
- Temperature Limits: 150°F†
- Pressure Limits: 130 psit
- Capacities: Up to 130 GPM
- Pipe Size: 2" FPT
- Shipping Weight: 5 lbs. (Approx.)

ORDERING INFORMATION

Model Number	GPM	LPM	Float Material	Adapter Size
F-452060LHK	6.0 to 60	30 to 230	Hastelloy	2" FPT
F-452080LHK	10 to 80	40 to 300	Hastelloy	2" FPT
F-452100LHK	5.0 to 100	20 to 380	Hastelloy	2" FPT
F-452130LHK	15 to 130	60 to 500	Hastelloy	2" FPT

FLUID HANDLING ACCESSORIES CONTINUED



TUBING

Blue-White stocks high quality discharge and intake tubing in a variety of convenient bulk lengths to cut in the specific lengths you need.

DISCHARGE TUBING

ORDERING INFORMATION		
PART NO.	TUBE SIZE O.D.	LENGTH
C-335-6-25	3/8"	25 ft.
C-335-6-100	3/8"	100 ft.
C-335-6-500	3/8"	500 ft.
C-335-4-100	1/4"	100 ft.
C-335-4-500	1/4"	500 ft.

SUCTION TUBING

ORDERING INFORMATION		
PART NO.	TUBE SIZE O.D.	LENGTH
C-334-6-25	3/8"	25 ft.
C-334-6-100	3/8"	100 ft.



FOOTVALVE STRAINERS

Blue-White Footvalve strainer bodies are constructed of molded Polypropylene with Polypropylene screens. The screens act as filters (strainers) to keep particles from entering the suction line. They may be used as either an integral footvalve, or, when equipped with an adapter nut and gasket, a bulkhead fitting.

ORDERING INFORMATION

PART NO.	TUBE SIZE O.D.	O-RING MAT.	PART NO.	BULKHEAD FITTING	TUBE SIZE O.D.	O-RING MAT.
C-340N-4E	1/4"	EP	C-345N-4E	Bulkhead fitting	1/4"	EP
C-340N-4V	1/4"	Viton	C-345N-4V	Bulkhead fitting	1/4"	Viton
C-340N-6E	3/8"	EP	C-345N-6E	Bulkhead fitting	3/8"	EP
C-340N-6V	3/8"	Viton	C-345N-6V	Bulkhead fitting	3/8"	Viton

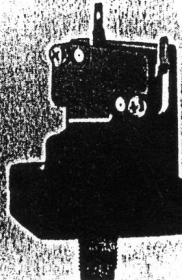
THE B-TEC PERCENTAGE TIMER

This compact and efficient timer has all solid state circuitry, precise control (by means of a front mounted knob control), and durable plastic housing. It is available in time cycles of 5 seconds, 6 seconds, 60 seconds and 10 minutes. It may be ordered as an accessory, with cords attached, or mounted directly to the pump housing of the C-600P or C-3000P.

ORDERING INFORMATION

TIMERS DESCRIPTION

BTEC 1-0	Solid State Timer, 1 minute cycle, 115V
BTEC 1-20	Solid State Timer, 1 minute cycle, 230V
BTEC 10-0	Solid State Timer, 10 minute cycle, 115V



PRESSURE SWITCHES

Blue-White P-105N pressure switches are constructed of glass filled Noryl, making them well suited for use with a variety of chemicals. The pressure switch is designed so that no metal surface comes in contact with the liquid in the system. The P-105N pressure switch will handle 3 amps at 125V AC. Switch normally open or normally closed contacts.

ORDERING INFORMATION

PART NUMBER	DESCRIPTION
P-105NE	Pressure switch with EP elastomer
P-105NV	Pressure switch with Viton elastomer

BLUE-WHITE FLOWMETERS

Performance You Can Depend On!

Blue-White manufactures top quality, variable area flowmeters in more than 240 configurations. There are styles for in-line, panel mount and closed pipe installation, with such innovative features as integral flow adjustment valves, high/low level alarms, and protective shields.

Meter bodies are offered in clear-as-glass machined acrylic, or injection molded Polysulfone. Polysulfone is a highly engineered thermoplastic, with excellent heat and chemical resistant properties. In addition to standard units, Blue-White can provide a number of OEM options, including, private labeling and packaging; custom calibrations; special materials; and design modifications. For additional information, please contact our Sales Staff.

HIGH CAPACITY F-452

The F-452 Series is Blue-White's highest capacity in-line meter. These units offer many of the capabilities of glass and metal flowmeters costing many times more. In addition to the tough Polysulfone meter body, F-452 units feature: 2" FPT adapters, half union adapter connectors which couple the meter body to the adapters, Viton o-ring seals and #316 Stainless Steel internal parts. F-452 flowmeters have liquid calibrations between 2 and 175 GPM (30 to 500 LPM). Scales are screen printed onto the meter body, directly in front of the float, for easy reading. For harsh* applications, consider the specially equipped F-452. It features a Hastelloy float guide and floats of either Hastelloy or Teflon.

Consider the F-452 Series for your next installation that requires high volume measurement with low pressure loss.

ORDERING INFORMATION

MODEL NUMBER	U.S. GPM	LPM	FLOAT MATERIAL	ADAPTER SIZE
F-452020LH	2.0 to 20	—	Teflon	2" FPT
F-452060LH	6.0 to 60	30 to 230	#316 S.S.	2" FPT
F-452080LH	10 to 80	40 to 300	#316 S.S.	2" FPT
F-452100LH	5.0 to 100	20 to 380	#316 S.S.	2" FPT
F-452130LH	15 to 130	60 to 500	#316 S.S.	2" FPT
F-452175LH	20 to 175	—	#316 S.S.	2" FPT

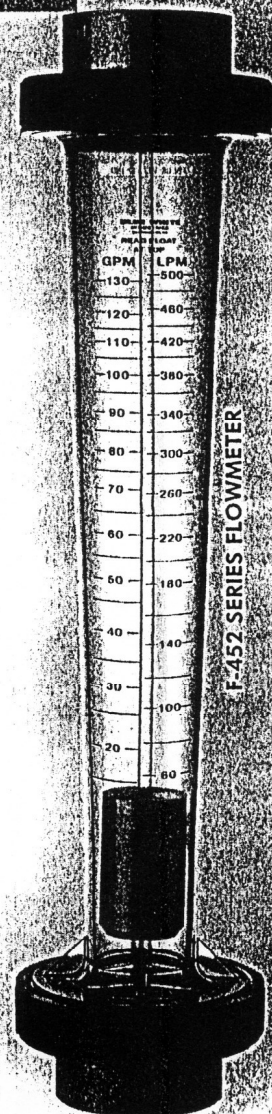
Calibration SCFM

F-452250GH	30 to 230	#316 S.S.	2" FPT
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SPECIALY EQUIPPED

MODEL NUMBER	U.S. GPM	LPM	FLOAT MATERIAL	ADAPTER SIZE
F-452060LHK	6.0 to 60	30 to 230	Hastelloy	2" FPT
F-452080LHK	10 to 80	40 to 300	Hastelloy	2" FPT
F-452100LHK	5.0 to 100	20 to 380	Hastelloy	2" FPT
F-452130LHK	15 to 130	60 to 500	Hastelloy	2" FPT

* The factory does not guarantee their flowmeters for use with liquids, other than water. Customers are required to do their own compatibility testing. Request Kit #70000-718, at no charge.



Specifications

Application

Cold water measurement (up to 120°) of flow in one direction

Maximum Operating Pressure

150 psi (1034 kPa)

Register

Direct reading, center sweep, roll-sealed, magnetic drive, with low flow indicator

Measuring Element

AWWA Class II Turbine, dual suspension

Options

Units of Measure

U.S. Gallons

Imperial Gallons

Cubic Feet

Cubic Metres

Register Types

Direct Reading

Remote Reading Systems:

ARB

Pulser RM

Tricon/S

Tricon/E

Companion Flanges

1½" & 2" (oval): bronze or cast iron

3", 4" & 6": bronze or cast iron

8" & 10": cast iron

Strainers

2" - 6": bronze

8" & 10": cast iron

REGIONAL SALES and SERVICE OFFICES

- NORTHEAST: 230 Gardner St., Suite 4
Hingham, MA 02043
(617) 749-5080
- CENTRAL: 14700 Farmington Rd., Suite 106
Livonia, MI 48154
(313) 421-3065
- SOUTHEAST: Hwy. 229 South
Tallahassee, AL 36078
(205) 283-6555
- SOUTHWEST: 14285 Midway Rd., Suite 170
Dallas, TX 75244
(214) 404-8251
- WEST: 11725 Willake St.
Santa Fe Springs, CA 90670
(213) 948-4428
- CUSTOMER SERVICE:
Highway 229 South
Tallahassee, AL 36078
1-800-645-1892

CANADIAN SALES

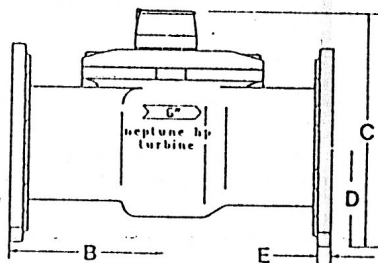
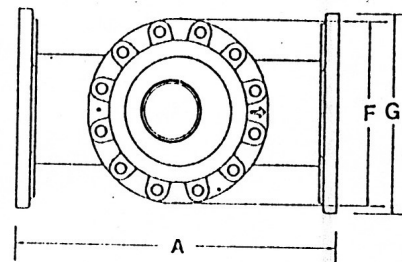
- Schlumberger Canada, Ltd.
Measurement Division
7275 West Credit Ave.
Mississauga, Ontario, L5N 5M9
(416) 858-4211
FAX (416) 858-0428

Operating Characteristics: Neptune HP Turbine

Meter Size	Normal Operating Range @ 100% Accuracy (± 1.5%)	Maximum Intermittent Flow	AWWA Standard
1½"	4 to 160 US gpm 0.91 to 36.3 m³/h	200 gpm	N/A
2"	4 to 200 US gpm 0.91 to 45.4 m³/h	250 gpm	4 to 160 US gpm .91 to 36.3 m³/h
3"	5 to 550 US gpm 1.1 to 102 m³/h	675 gpm	8 to 350 US gpm 1.8 to 79.5 m³/h
4"	10 to 1,200 US gpm 2.3 to 227 m³/h	1500 gpm	15 to 630 US gpm 3.4 to 143.0 m³/h
6"	20 to 3,000 US gpm 4.5 to 454 m³/h	3750 gpm	30 to 1400 US gpm 6.8 to 317.9 m³/h
8"	35 to 4,000 US gpm 7.9 to 795 m³/h	5000 gpm	50 to 2400 US gpm 11.4 to 545 m³/h
10"	50 to 6,500 US gpm 11.4 to 1,249 m³/h	8000 gpm	75 to 3800 US gpm 17.0 to 863 m³/h

Registration

Registration (per sweep hand revolution)		
	1½", 2", 3", 4"	6", 8", 10"
1,000 US Gallons		✓
1,000 Imperial Gallons		✓
100 US Gallons	✓	
100 Imperial Gallons	✓	
100 Cubic Feet		✓
10 Cubic Feet	✓	
10 Cubic Metres		✓
1 Cubic Metre	✓	
Register Capacity (6-wheel odometer)		
	1½", 2", 3", 4"	6", 8", 10"
1,000,000,000 US Gallons		✓
1,000,000,000 Imperial Gallons		✓
100,000,000 US Gallons	✓	
100,000,000 Imperial Gallons	✓	
100,000,000 Cubic Feet		✓
10,000,000 Cubic Feet	✓	
10,000,000 Cubic Metres		✓
1,000,000 Cubic Metres	✓	



Dimensions

Meter Size	A in/mm	B in/mm	C in/mm	D in/mm	E in/mm	F in/mm	G in/mm	Weight lbs/kg
1½"	10 ¹ 254	6½ 165	7⅞ 181	1¾ 44	¾ 19	4½ 114	5⅞ 137	19 8.6
2"	10 ² 254	6½ 165	7⅞ 181	2⅞ 44	13/16 19	4½ 114	5⅞ 137	20 9.1
3"	12 301	6 152	10 254	3¾ 95	⅝ 16	6¼ 159	7½ 190	40 18.1
4"	14 366	6½ 165	10⅞ 276	4½ 114	¾ 19	8⅞ 206	9 229	52 23.6
6"	18 457	8⅞ 219	13 330	5½ 140	1 25	10¼ 260	11 279	115 52.2
8"	20 508	9⅞ 244	15½ 394	6¾ 171	1⅞ 29	10¼ 260	13½ 343	195 88.4
10"	26 660	12⅞ 321	15½ 394	8 203.2	1¼ 32	10¼ 260	16 406	275 124.7

Note: 1½" and 2" Connections are oval.

3" - 10" Connections are round, per ANSI B16.1 Class 125.

¹ 13" Length available with bronze spacer/test port.

² 17" Length available with bronze strainer or bronze spacer.

APPENDIX "K"

Key Features

- Laboratory-level performance in the field
- Range: 0 to 1000 NTUs
- Direct digital readout in NTU
- Meets or exceeds USEPA method 180.1 criteria

The 2100P Portable Turbidimeter features a level of performance normally associated with laboratory instruments. Its microprocessor-controlled touch-key functions and patented Ratio™ Optical System bring greater accuracy, sensitivity and reliability to field testing. The two-detector optical system compensates for color in the sample, light fluctuation, and stray light, allowing analysts to achieve laboratory-level results with a wide range of samples, even under difficult on-site conditions.

Direct Digital Readout of Results

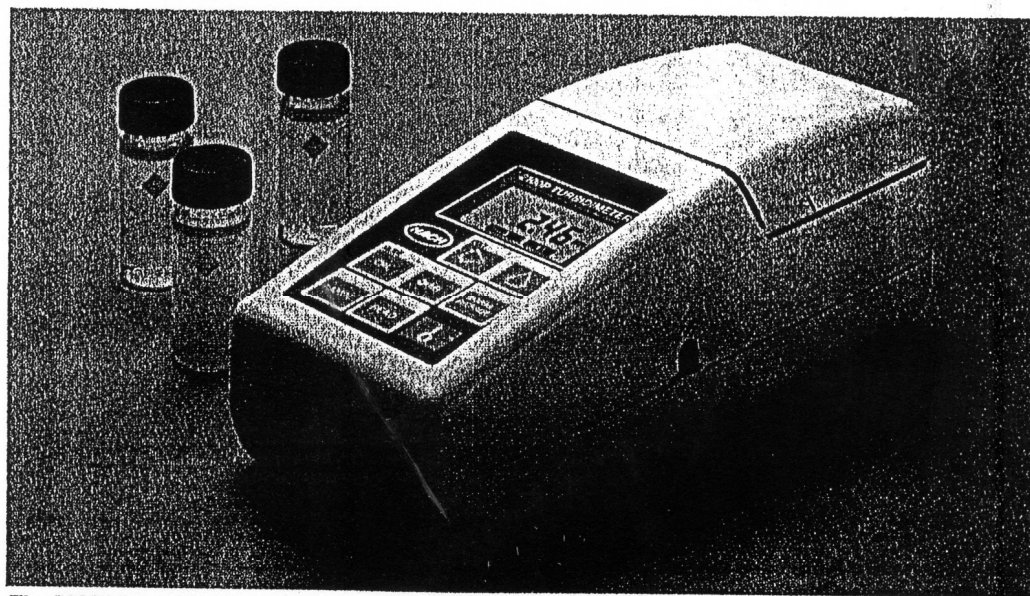
The 2100P provides direct digital readout in nephelometric turbidity units (NTUs), completely eliminating the uncertainty of analog indicators, and the need for calculations or interpolation of calibration charts.

Ideal for Regulatory Reporting

With a measurement range of 0 to 1000 NTUs and resolution to 0.01 NTU, the 2100P is ideal for regulatory monitoring*, process control applications, and field studies.

Choose from three manual range modes: 0 to 9.99, 0 to 99.9, or 0 to 1000 NTU. Or select automatic range mode for samples that vary widely in turbidity.

* Meets or exceeds design and performance criteria as specified in the U.S. Environmental Protection Agency method 180.1.



The 2100P Portable Turbidimeter brings laboratory-level performance on-site, offering fast, accurate results and the ease of use analysts demand in the field.

Ready for Field Use

The 2100P comes field-ready with four AA alkaline batteries (optional battery eliminator available), all necessary apparatus, a set of primary and secondary standards, and a rugged carrying case. The instrument itself weighs less than 0.45 kg (1 lb). The complete analytical package, including case, apparatus, standards, and instructions, weighs just under 2.7 kg (6 lb).

Reduced Training Requirements

Because the 2100P is so easy to calibrate and use, personnel can get accurate test results even with minimal training. Each instrument is supplied with a complete instruction manual to guide you step-by-step through calibration, testing and maintenance procedures. Information on sampling and measuring technique is also provided, along with a quick reference card to save time during daily operation.

Meets Worldwide Safety and Performance Standards

The 2100P Portable Turbidimeter carries the European CE compliance mark for safety and electromagnetic compatibility.

Simplified Calibration and Standardization

Calibration of the 2100P is accomplished through a pre-programmed procedure that allows the microprocessor to adjust the calibration curve as needed. There are no potentiometers to adjust. Calibration is based on formazin, the accepted primary standard for turbidity measurement. For convenient routine verification of calibration accuracy, Hach supplies a set of Gelex® secondary standards with each instrument.

Standard Features

- Selectable signal averaging mode compensates for fluctuations in readings caused by movement of large particles in the light path.
- Pre-programmed calibration procedure, with microprocessor-controlled adjustment of calibration curve. No potentiometers to adjust.
- Electronic zeroing: compensates for electronic and optical offsets. No manual adjustments are required.
- Built-in diagnostics accessible with one keystroke.
- Two-year warranty.

How To Order

46500-00 Each Model 2100P Portable Turbidimeter is supplied with nine sample cells, 100 mL each of <0.1, 20, 100, and 800 NTU StabiCal™ Stabilized Formazin Primary Standards, a set of secondary Gelex® Standards, silicone oil and sample cell oiling cloth, manual, quick reference card, and carrying case. **\$775.00**

Optional Accessories

1269-36	Silicone Oil, 15	5.75
43975-00	Degassing Kit	16.50
43975-10	Sample Filtration and Degassing Kit	38.00
47076-00	Sample Cell Oiling Cloth	5.25
46079-00	Battery Eliminator, 110 Vac	35.00
46080-00	Battery Eliminator, 220 Vac	44.50

Circle 1429 for more information and sample specification.

For calibration and verification standards, see pages 202-203.

backflow preventers

Series 909 ($\frac{3}{4}$ " - 2")

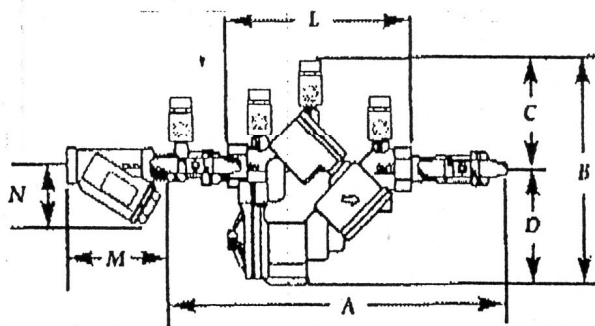
Reduced pressure zone (RPZ) backflow preventers

- For health hazard cross connections and continuous pressure applications.
- Provides protection in cross-connection control and containment for cold and hot water installations.
- Unique patented "air-in/water-out" design provides high capacity relief valve discharge performance during emergency conditions of back siphonage and backpressure with both checks fouled.

Specifications

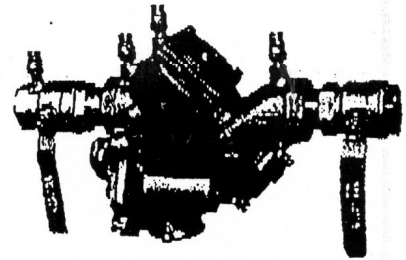
- Sizes $\frac{3}{4}$ " - 2" (20-50 mm), quarter-turn, full port resilient seated bronze ball valve shut-offs with NPT female connections (Model 909QT).
- Sizes $\frac{3}{4}$ " - 1" (20-25 mm) have female threaded NPT valve body connections and sizes $1\frac{1}{4}$ " - 2" (32-50 mm) have male threaded NPT valve body connections.
- $\frac{3}{4}$ " (20 mm) and 1" (25 mm) shut-offs have Tee handles.
- Pressures up to 175 psi (12.1 bars).
- Temperatures to 140°F (60°C) continuous and 180°F (82°C) intermittent.

Dimensions/Wgts.



Features

- Bronze body construction
- Replaceable seats
- "Dual ported" relief
- Requires no special servicing tools
- Captured spring assemblies
- Modular design



909QT $\frac{3}{4}$ "

For additional information, request ES-909S/C-BPD.

For information on Air Gaps and Vent Elbows, request ES-AG/EL.

For WattsBox Enclosures, request ES-WB and ES-WB-T.

Options

Sizes $\frac{3}{4}$ " - 2" (20-50 mm)

add Prefix:

C - Sizes $\frac{3}{4}$ " (20 mm) and 1" (25 mm) only; "Clean and Check™" strainer (eliminates intermittent relief valve discharge due to fluctuating supply pressures).

FAE - Sizes $1\frac{1}{4}$ " (32 mm), $1\frac{1}{2}$ " (40 mm), 2" (50 mm) only with flanged adapter ends.

U - Sizes $\frac{3}{4}$ " (20 mm) and 1" (25 mm) only with integral body unions.

add Suffix:

HW - with stainless steel check modules for hot water and aggressive water conditions. Water temperatures up to 210°F (99°C).

LF - without shut-off valves.

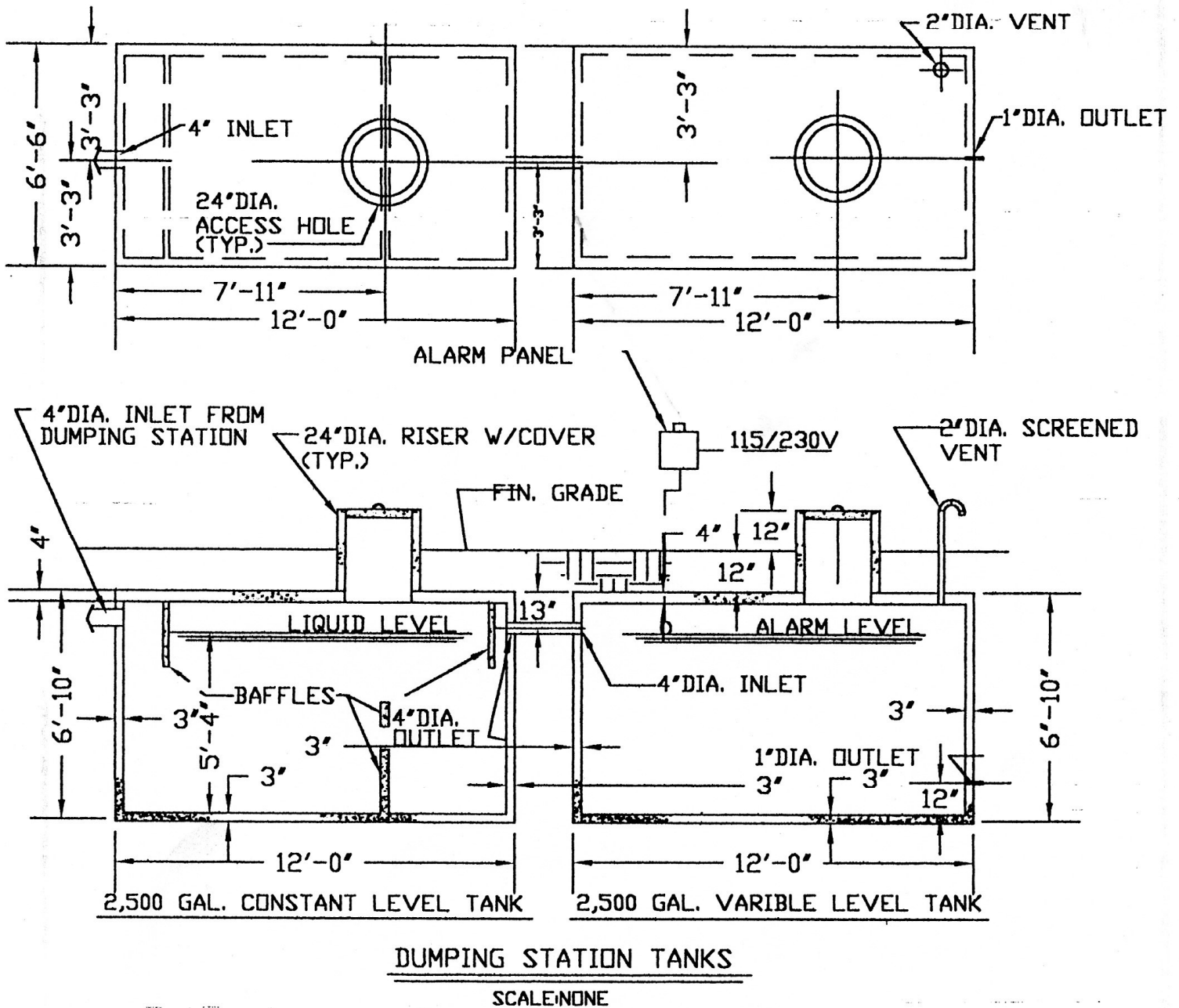
PC - internal polymer coated to reduce scale and mineral deposits.

S - with bronze strainer.

Model	Order No. §	Size (DN) In. mm	A		B		C		D		L		M		N		Weight	
			in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg.
909QT	387121	$\frac{3}{4}$ 20	14 $\frac{3}{8}$	365	8 $\frac{3}{4}$	222	4	102	4 $\frac{3}{4}$	121	7 $\frac{1}{2}$	191	-	-	-	-	14	6.3
909QT	387129	1 25	15 $\frac{3}{8}$	391	8 $\frac{3}{4}$	222	4	102	4 $\frac{3}{4}$	121	7 $\frac{1}{2}$	191	-	-	-	-	15	6.8
909M1QT	385717	1 $\frac{1}{4}$ 32	18 $\frac{1}{2}$	470	12	305	5 $\frac{1}{2}$	140	6 $\frac{1}{2}$	165	12	305	-	-	-	-	40	18.0
909M1QT	385718	1 $\frac{1}{2}$ 40	19	483	12	305	5 $\frac{1}{2}$	140	6 $\frac{1}{2}$	165	12	305	-	-	-	-	40	18.0
909M1QT	385719	2 50	19 $\frac{1}{2}$	495	12	305	5 $\frac{1}{2}$	140	6 $\frac{1}{2}$	165	12 $\frac{1}{4}$	311	-	-	-	-	40	18.0
909QT-S	385861	$\frac{3}{4}$ 20	14 $\frac{3}{8}$	365	8 $\frac{3}{4}$	222	4	102	4 $\frac{3}{4}$	121	7 $\frac{1}{2}$	191	3 $\frac{3}{16}$	81	2 $\frac{3}{4}$	70	15 $\frac{5}{8}$	7.1
909QT-S	385862	1 25	15 $\frac{3}{8}$	391	8 $\frac{3}{4}$	222	4	102	4 $\frac{3}{4}$	121	7 $\frac{1}{2}$	191	3 $\frac{3}{4}$	95	3	76	17 $\frac{1}{2}$	7.9
909M1QT-S	385723	1 $\frac{1}{4}$ 32	18 $\frac{1}{2}$	470	11 $\frac{3}{8}$	295	5 $\frac{1}{2}$	140	6 $\frac{1}{2}$	165	12	305	4 $\frac{7}{16}$	113	3 $\frac{1}{2}$	89	42 $\frac{3}{4}$	19.4
909M1QT-S	385724	1 $\frac{1}{2}$ 40	19	483	11 $\frac{3}{8}$	295	5 $\frac{1}{2}$	140	6 $\frac{1}{2}$	165	12	305	4 $\frac{7}{8}$	124	4	102	44	20.0
909M1QT-S	385725	2 50	19 $\frac{1}{2}$	495	11 $\frac{3}{8}$	295	5 $\frac{1}{2}$	140	6 $\frac{1}{2}$	165	12 $\frac{1}{4}$	311	5 $\frac{1}{16}$	151	5	127	47 $\frac{3}{4}$	21.5

§ - Contact your local Watts Agent or call Customer Service (978) 689-6066 for other models/order numbers or refer to PL-WR.

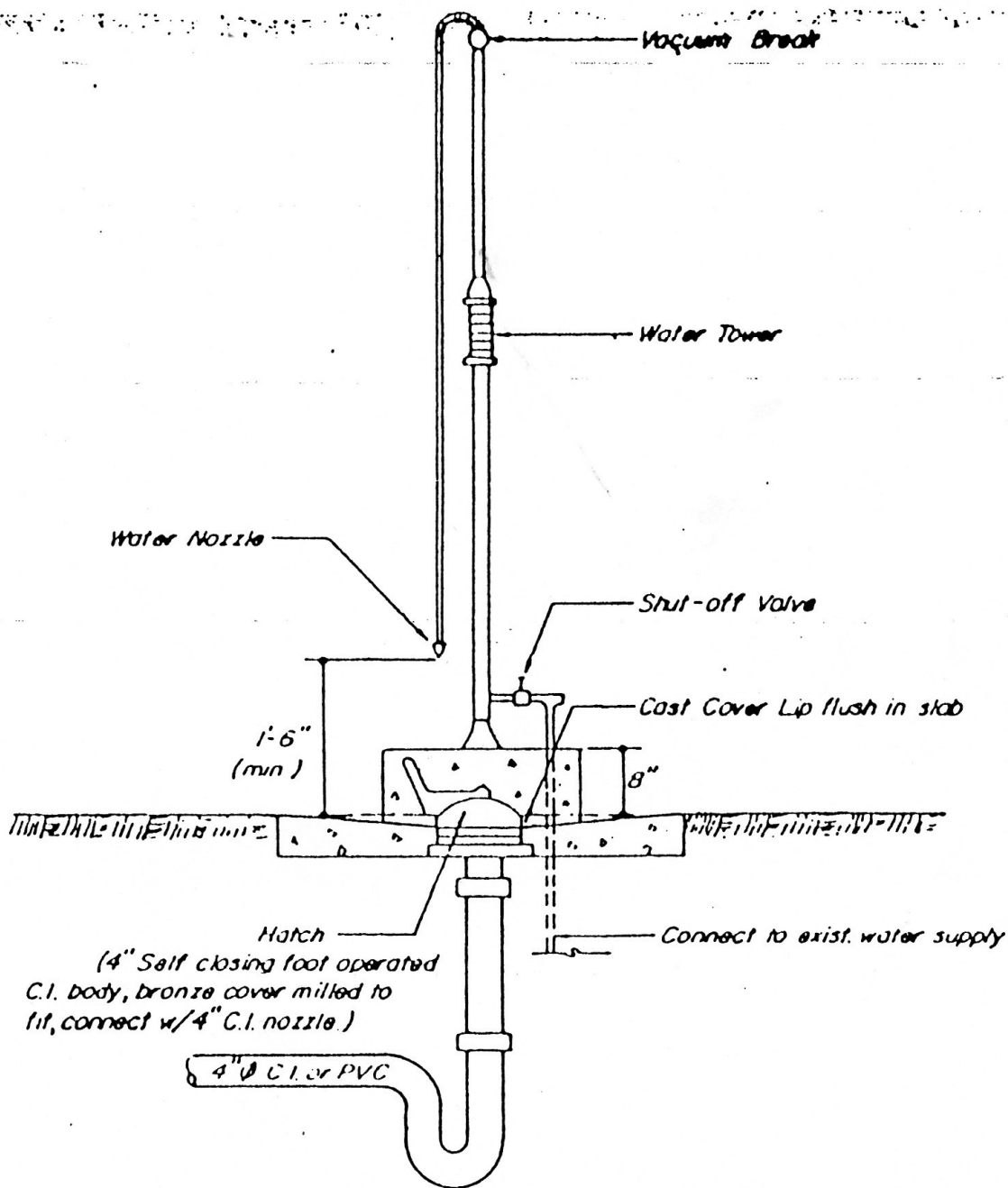
APPENDIX "M"



NOTE: SEE DUMP STATION DETAIL

DA-485

APPENDIX "N"



DUMP STATION

SCALE: NONE

Appendix B | Memorandum prepared by Atwell dated November 16, 2020 RE: 1000 Island RV Resort Field Review

Memo

TO: Kurt Beleck

FROM: Bob Hufnagel

DATE: November 16, 2020

RE: 1000 Island RV Resort Field Review

The following summarizes my field observations:

1. The water system consists of a water treatment plant that utilizes a water intake in Lake Ontario as a water source.
2. Treatment consist of flocculation, slow sand and carbon filtration followed by chlorination.
3. The plant complies with water quality requirements for Turbidity and Residual Chlorine. The plant does not test for other organic or inorganic compounds. This additional testing may be required in the future by the State Health Department which would result in an increase in testing costs.
4. The treatment plant appeared in good condition. Long term maintenance should include painting the filter tanks and the exterior storage tanks. During our inspection we noted surface rust accumulation on the filter tanks and some paint discoloration on the storage tanks.
5. Water is metered prior to distribution, water use for the 2020 season was 1,164,300 gallons which is approximately 8900 gallons per day. Peak month use during July was 12,900 gallons per day.
6. Capacity of the water system is 36,000 gallons per day.
7. The wastewater system consists of a treatment plant using rotating biological contactors (RBC) settling and ultra-violet disinfection, sanitary sewers and 7 pump stations. The treatment plant appears to be in good condition.
8. Discharge from the WWTP is through an outfall approximately 600 feet from shore into Lake Ontario.
9. The WWTP is licensed for 50,000 gpd. Current flow is under 10,000 gpd during peak use.

10. The collection system appears to have groundwater infiltration near pump station #7. We recommend that this be investigated so that excess water is not sent to the treatment plant
11. The park uses on-site staff as licensed operator for the water and wastewater plants. This will most likely need to be outsourced after the acquisition.
12. Stand-by power is provided for the water plant and WWTP but not for the sanitary pump stations. We recommend that a portable generator be purchased, and electrical modification be completed at the pump stations so that they can operate during a power failure. We recommend a budget of \$25,000.
13. Ongoing maintenance cost to replace pumps, purchase chemicals and minor system repairs should be expected.

Water Supply

- Water to the park is from a trench intake approximately 150 long along the bottom of Lake Ontario.
- 2 pumps are provided at the intake, each rated at 25 gpm. The system is set up with one pump running at a time.
- Water is pumped into a water treatment building and undergoes the following treatment:
 - Chlorine is added to the raw water.
 - Alum is added to promote flocculation and the water flows through a flocculation chamber.
 - Water from the flocculation chamber flows to a 1500-gallon tank for initial settling and chlorine contact time.
 - Water is then pumped through a slow sand filter and a carbon filter to remove sediment and any organic compounds. The filters are backwashed when pressure loss across the filters is between 6 -10 psi (approximately every 10 days during peak months). Backwash water goes to the WWTP.
 - After filtration, chlorine is added to maintain a chlorine residual in the treated water, and then pumped into one of 2 storage tanks with a capacity of 17,000 gallons each.
 - Water is then pumped to a 7000-gallon pressure tank and into the distribution system. Duplex pumps are provided with each having a capacity of 300 gpm. Pressure in the system is maintained at 40 – 60 psi.
- The system is rated at 36,000 gpd. Current use is noted as below the rated capacity.
- Standby power is provided for the water plant.

- The plant is operated by senior park staff (Mr. Nak Shim) who is a licensed operator. This will need contracting out after acquisition.
- The park submits monthly reports to the State that report daily values for chlorine residual and turbidity. Based on a review of reports submitted in 2020, the park complies with requirements for these items.
- The park does not test for other inorganic or organic compounds. We contacted the District Engineer for Watertown to find out if additional testing should be completed. He stated that a FOI request would need to be submitted for him to provide any information on the site. Based on our review of State regulations, additional testing could be required. This additional testing should not require modifications to the treatment processes but would add operating costs for testing.
- Water distribution through the park is through plastic pipe. The park blows out the lines in the fall when they close for the season. During spring startup, they air pressure the lines to check for leaks. This year they repaired 3 leaks; one at a tee connection to a RV site and two at plumbing fixtures in buildings. Staff reported that the system has been very reliable with few leaks each year.
- Backflow prevention is not provided at the treatment plant or the individual site connections. We recommend that vacuum breakers be provided at the site connections.
- A copy of State Health Department Permit for the campground, which includes operating the public water supply is attached.

Wastewater/Sanitary Sewers

- The wastewater system consists of a treatment plant using rotating biological contactors (RBC) settling tank and ultra-violet disinfection, sanitary sewers and 7 pump stations. The treatment system appears to be in good condition.
- Discharge from the WWTP is through an outfall approximately 600 feet from shore into Lake Ontario.
- The WWTP is licensed for 50,000 gpd. Current peak flow is under 10,000 gpd.
- The plant is operated by senior park staff (Mr. Nak Shim) who is a licensed operator. This will need contracting out after acquisition.
- The treatment includes the following processes:

- Wastewater is pumped to the influent side of Rotating Biological Contactors (RBC) for primary settling and overflow to the RBC. The RBC consist of a single tank with 4 modules.
- After flowing through the RBC, wastewater flows into a settling tank where sludge settles to the bottom. Some of the sludge is returned to the RBC with the remaining pumped to a 9000-gallon sludge storage tank.
- After settling, wastewater flows through a flume for metering, then through Ultraviolet Disinfection before an outfall to Lake Ontario. The outfall pipe extends approximately 600 feet from shore.
- Sludge from the storage tank is collected by an outside contractor and disposed of at the City of Watertown WWTP 3 – 4 times per year. A copy of the City permit is attached.
- Staff noted that this year they had high solid concentration and coliform counts exceeding permit limits in the effluent. They hired an engineer to assist in developing a corrective action plan. This plan included the addition of a solution (Slack Plus) to assist in settling solids. They reported that this helped and have submitted documents to the State to approve continued use. The State has approved this modification to the treatment process. Work needs to be completed at the plant for a pump and metering system so that the chemical is added during the 2021 season.
- The WWTP discharge permit issued by the State requires measuring Ph daily and collecting/testing 1 grab sample per month for reporting of BOD, Suspended Solids and coliform. A copy of the NPDES permit is attached.
- During our inspection, we noted groundwater flowing out from a RV sewer connection hub located near pump station #7. The collection system appears to have groundwater infiltration. We recommend that this be investigated, and leaks repaired so that excess water is not sent to the treatment plant. Based on review of meter readings at the water plant and wastewater plant, it does not appear that infiltration is a problem, however, we do recommend that the sewer hub noted above be investigated.
- 7 submersible pump stations are on-site, pump station #5 and #6 pump to station #7 which pumps to the WWTP. Pump station # 2, #3, and #4 pump top station #1 which pumps to the WWTP. Station # 1 and #7 are duplex pump station while the rest have a single pump. All pump stations have alarms (audible and light) for pump failure.
- Staff noted that they have replaced some of the pumps (less than 1 per year) and that the biggest issue is with pumps getting clogged from disposable wipes.

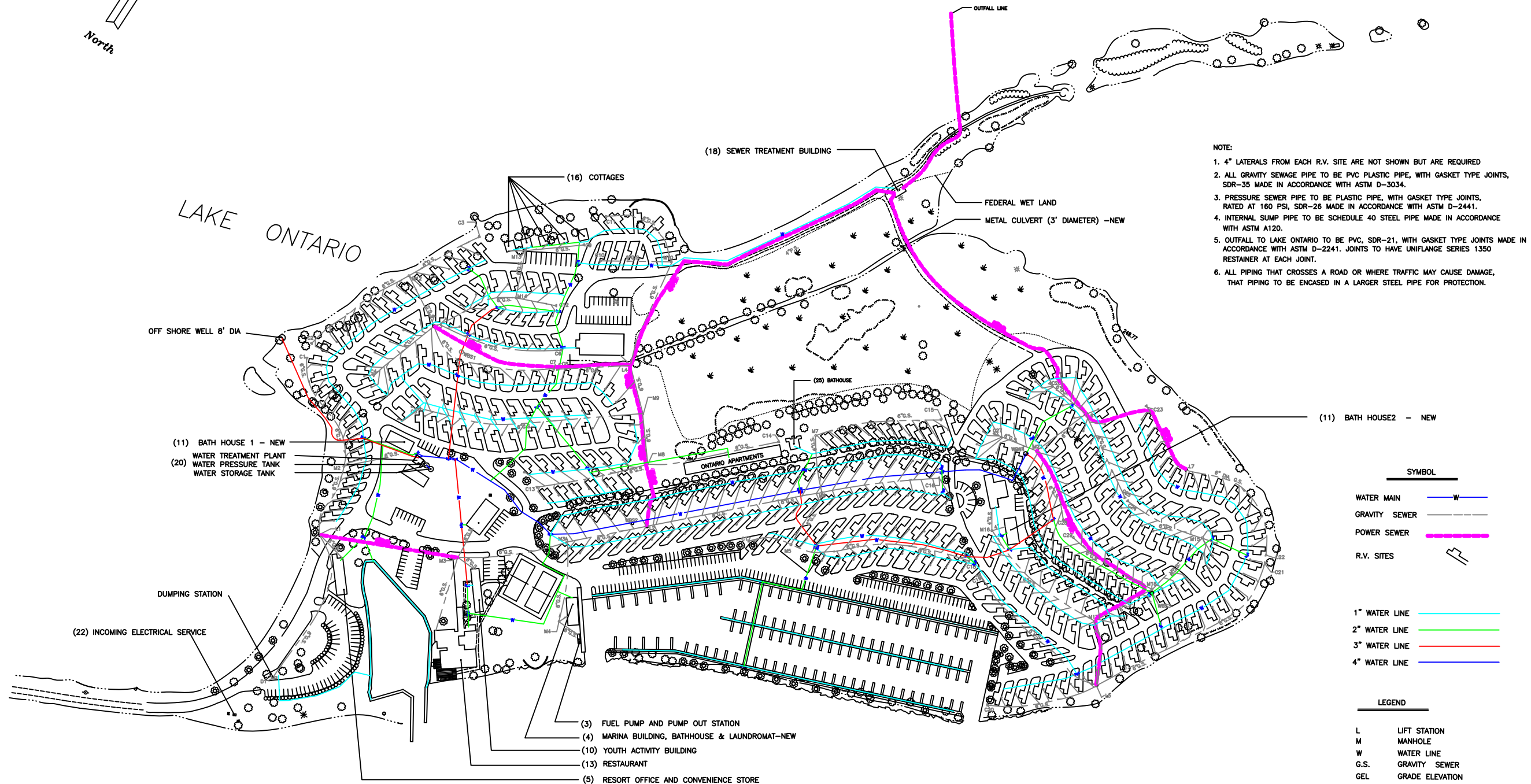
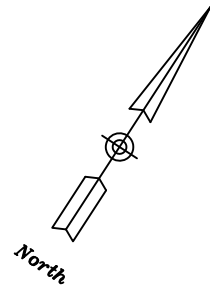
- Stand-by power is provided for the WWTP but not for the pump stations. We recommend that a portable generator be purchased, and electrical modification be completed at the pump stations so that they can operate during a power failure. We recommend a budget of \$25,000.

General Site Notes

- The causeway to the site appears to be in good condition, slopes along Lake Ontario and Henderson Bay are protected from erosion with large rock. The pavement surface is asphalt and is in good condition but does have some localized potholes that need patching.
- The site has 60 slips at the marina. During our visit, the floating docks had been moved away from shore for the winter so that they are not damaged by winter ice. The docks are in good condition. Electric power is only provided at a few of the docks and fuel is not available.
- Electric power to the campsite consist of 15, 30 and 50-amp connections at all sites. Power to the campsites is individually metered and billed to the camper.
- All sites have water and sewer hook-up connections.
- During our inspection we noted many areas of water ponding on sites. Most of these are small ponds near the road or back of the site. General site drainage is overland flow to the Lake.
- Campground roads are asphalt, RV pads are all stone.

The following documents are attached

- Overall Site and Utility plan (plan from initial construction)
- Letter from NYSDEC approving modifications for the addition of SlackPlus



- NOTE:
1. 4" LATERALS FROM EACH R.V. SITE ARE NOT SHOWN BUT ARE REQUIRED
 2. ALL GRAVITY SEWAGE PIPE TO BE PVC PLASTIC PIPE, WITH GASKET TYPE JOINTS, SDR-35 MADE IN ACCORDANCE WITH ASTM D-3034.
 3. PRESSURE SEWER PIPE TO BE PLASTIC PIPE, WITH GASKET TYPE JOINTS, RATED AT 160 PSI, SDR-26 MADE IN ACCORDANCE WITH ASTM D-2441.
 4. INTERNAL SUMP PIPE TO BE SCHEDULE 40 STEEL PIPE MADE IN ACCORDANCE WITH ASTM A120.
 5. OUTFALL TO LAKE ONTARIO TO BE PVC, SDR-21, WITH GASKET TYPE JOINTS MADE IN ACCORDANCE WITH ASTM D-2241. JOINTS TO HAVE UNIFLANGE SERIES 1350 RESTAINER AT EACH JOINT.
 6. ALL PIPING THAT CROSSES A ROAD OR WHERE TRAFFIC MAY CAUSE DAMAGE, THAT PIPING TO BE ENCASED IN A LARGER STEEL PIPE FOR PROTECTION.

- SYMBOL
- WATER MAIN — W —
- GRAVITY SEWER — — —
- POWER SEWER — — —
- R.V. SITES
- 1" WATER LINE — — —
- 2" WATER LINE — — —
- 3" WATER LINE — — —
- 4" WATER LINE — — —

- LEGEND
- L LIFT STATION
- M MANHOLE
- W WATER LINE
- G.S. GRAVITY SEWER
- GEL GRADE ELEVATION
- P.S. POWER SEWER
- C CLEAN OUT
- WBS WATER BLOW DOWN STATION
- MTP WATER TREATMENT PLANT

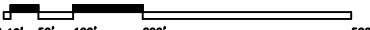
- NOTES AND SPECIFICATIONS
1. ZONING — PLANNED DEV. DISTRICT
 2. ISLAND BOUNDARY TAKEN FROM ARIAL PHOTO TAKEN ON 4/26/1991. LAKE ELEVATION WAS 246.9' + OR -.
 3. CONTOURS ARE TAKEN FROM SURVEY MAP.
 4. THE PROPOSED PROJECT IS A R.V. RESORT AND MARINA. ENVIRONMENTAL IMPACT STATEMENT SUBMITTED AND FINDING STATEMENT PRESENTED.
 5. R.V. SITES ARE A MINIMUM OF 2600 SQ. FT.
 6. SEWAGE WILL BE TREATED BY ROTATING BIOLOGICAL CONTACTOR UNIT.
 7. SEWAGE SYSTEM SUBMITTED TO N.Y.S.D.E.C. FOR APPROVAL. AND SPEDS PERMIT WAS GRANTED
 8. WATER SUPPLY WILL BE TREATED LAKE WATER AND WATER SYSTEM WILL BE SUBMITTED TO N.Y.S.D.O.H. FOR APPROVAL
 9. ROADWAYS ARE 22' WIDE FOR TWO WAY TRAFFIC AND 18' WIDE FOR ONE WAY TRAFFIC.

10. STORM WATER DRAINAGE, SEE DRAWING NUMBER 109-91-3.
11. ALL ELECTRICAL WORK TO BE DONE IN ACCORDANCE WITH THE LATEST NATIONAL ELECTRICAL CODE.
12. EACH R.V. SITE TO BE SUPPLIED WITH WATER, SEWER, AND ELECTRICAL HOOK-UPS.
13. JEFFERSON COUNTY TAX MAP DESCRIPTION IS SECTION 97 BLOCK 1, LOT 11.
14. AVERAGE DAILY TRAFFIC WILL BE 998. PEAK HOUR TRAFFIC 100 TRIPS PER HOUR.
15. GARBAGE AND SOLID WASTE WILL BE PICKED UP BIWEEKLY BY COMMERCIAL HAULER.

HENDERSON BAY

W/L 246.9±

SITE PLAN—ASSOCIATION ISLAND

DATE 10-22-00	REVISED		
DATE 09-04-00	ADD WATER & SANITARY SEWER LATERALS		
DESCRIPTION			
CHARLES L. FLUNO, P.E. & ASSOCIATES			
WATERTOWN, NEW YORK			
WATER DISTRIBUTION & SEWER COLLECTION			
ASSOCIATION ISLAND RESORT AND MARINA			
TOWN OF HENDERSON			
JEFFERSON COUNTY			
			
DW'N YNU	DATE 09-04-00	DRAWING NO.	REV
CHK'D C L F	SCALE AS NOTED	115-00-1WS	2



New York State Department of Environmental Conservation
Division of Water
SPDES Permit - WTC Notification Form Instructions Page

(Oct 2013)

APPLICABILITY:

New or increased use and discharge of a Water Treatment Chemical (WTC) requires prior NYSDEC review and authorization. At a minimum, the permittee must notify the NYSDEC in writing of its intent to change WTC use by submitting a completed WTC Form for each proposed WTC. The NYSDEC will review that submittal and determine if a SPDES permit modification is first necessary or whether WTC authorization may proceed without a formal permit modification. The majority of WTC authorizations do not require SPDES permit modification. In any event, use and discharge of most WTCs cannot proceed without prior authorization from the NYSDEC. NYSDEC staff may also direct you to use this form for review and authorization of other substances which could be present in wastewater.

Examples of WTCs include biocides, coagulants, conditioners, corrosion inhibitors, defoamers, deposit control agents, flocculants, scale inhibitors, sequestrants, and settling aids.

INSTRUCTIONS:

For **each** new or increased use of a WTC, please complete items 1.a., and 2 - 15 on the attached 3 page *WTC Notification Form*. Some WTC manufacturers may be reluctant to reveal product formulations to the permittee. In those cases the WTC manufacturer may take a partially completed form from the permittee, fill in the remaining information plus items 1.b. and 16, and send the completed form directly to the permit writer. **Email the completed form to:**

Permit writer:

Email:

Telephone:

Completing Item 8.b. (Outfall WTC Concentration) - In general, the average mg/l should be determined by dividing the average dosage in 6a by the average flow in 8a and then dividing by 8.34; the maximum mg/l should be determined by dividing the maximum dosage in 7a by the average flow in 8a and then dividing by 8.34. However, for blowdowns which are highly intermittent or are not tributary to a treatment system or some form of equalization, it may be appropriate to factor in the information in item 9 when completing this item.

Completing Item 12 (Toxicity Information) - All reported test data must represent tests conducted in accordance with current EPA toxicity testing manuals for appropriate species. Submission of acute (48 or 96 hour LC50 or EC50) and/or chronic (7 day NOEC or IC25) test results for at least one vertebrate and one invertebrate species is required.

In most cases, after reviewing the submission, **the NYSDEC permit writer will complete items 17 and 18** and send a copy of the completed form to the person identified in item 2.c and, if appropriate, to the facility inspector.

ADDITIONAL INFORMATION:

Please visit the NYSDEC website at <http://www.dec.ny.gov/permits/93245.html> for copies of this form, copies of the *WTC Annual Report Form*, and additional information on WTCs.



New York State Department of Environmental Conservation
Division of Water
SPDES Permit - WTC Notification Form Page 1 of 3

(Oct 2013)

For help completing this form refer to instructions page and to <http://www.dec.ny.gov/permits/93245.html>.

1.a. Date Signed by Permittee - 9/29/2020		1.b. Date Signed by WTC Manufacturer - 9/23/20	
2.a. Permittee Name - Association Island		2.b. SPDES No. - NY 0257583	
2.c. Contact Name - Dr. Nak Shim			
3.a. WTC Name - SlackPlus			
3.b. WTC Manufacturer - Slack Chemical Co. Inc.			
4.a. WTC Function - Solids Settling Enhancement in Secondary Clarifier			
4.b. If WTC is a biocide is it NYS registered?		4.c. Registration Number -	
5. WTC Point of Addition - Inlet to Secondary Clarifier			
6. Affected Outfall(s) - 001			
7.a. WTC Daily Dosage: average lbs/day =		15 , maximum lbs/day = 20	
7.b. Dosage Frequency: minutes/day =		1440 , days/week = 7	
8.a. Outfall Flow Rate: average MGD =		0.0125 , maximum MGD = 0.050	
8.b. Outfall WTC Concentration: average mg/l =		144 , maximum mg/l = 192	
9.a. System Blowdown Flow Rate: average gpm =		NA , maximum gpm = NA	
9.b. System Blowdown Frequency: minutes/day =		NA , days/week = NA	
10.a. WTC Composition - Ingredients/Impurities (note: ingredients/impurities must total to 100%)	10.b. %	10.c. CAS#	10.d. Outfall Concentration
Aluminum Chloride Hydroxide Sulfate	40	39290-78-3	57.6 mg/l
Polyamine Polymer	4	42751-79-1	5.76 mg/l
Water	56	7732-18-5	mg/l
			mg/l
			mg/l
			mg/l
			mg/l
10.e. Intermediate/Final Degradation Products - Aluminum Chlorohydrate and Aluminum			
11. WTC BOD and COD (lb/lb) - NA			



New York State Department of Environmental Conservation
Division of Water
SPDES Permit - WTC Notification Form Page 2 of 3

(Oct 2013)

1.a. Date Signed by Permittee - 9/29/2020		1.b. Date Signed by WTC Manufacturer - 9/23/20		
2.b. SPDES No. - NY 0257583				
3.a. WTC Name - SlackPlus		7.a. Avg/Max Daily Dosage = 15 / 20 lbs/day		
12. WTC Toxicity Info (most sensitive species) - Attach description of endpoint for each EC50.				
12.a. Vertebrate Species	Acute LC50	Acute EC50	Chronic NOEC	Chronic IC25
Oncorhynchus mykiss	96h 1555 mg/l	mg/l	mg/l	mg/l
12.b. Vertebrate Species	Acute LC50	Acute EC50	Chronic NOEC	Chronic IC25
	mg/l	mg/l	mg/l	mg/l
12.c. Invertebrate Species	Acute LC50	Acute EC50	Chronic NOEC	Chronic IC25
Ceriodaphnia dubia	48h 2000 mg/l	mg/l	mg/l	mg/l
12.d. Invertebrate Species	Acute LC50	Acute EC50	Chronic NOEC	Chronic IC25
	mg/l	mg/l	mg/l	mg/l
13. Summarize measures in place to ensure that excessive levels of WTC are not used - WTC is dispensed by a validated and calibrated dosing pump.				
14. WTCs to be discontinued when use of this WTC begins - NA				

15. Permittee Certification - I certify under penalty of law that this notification and all attachments are, to the best of my knowledge and belief, true, accurate and complete. I also certify that the WTC Usage Requirements and any additional requirements specified on page 3 of this form will be adhered to.

PRINT NAME - Dr. Nak Shim	SIGNATURE -
TITLE/COMPANY - Association Island B	
TELEPHONE - 315-938-5655	EMAIL - DangoodFriends@KOA1000IslandsR.com

16. WTC Manufacturer Certification - I certify under penalty of law that this notification and all attachments are, to the best of my knowledge and belief, true, accurate and complete.

PRINT NAME - Loren A. Swears	SIGNATURE -
TITLE/COMPANY - Technical Sales/Slack Chemical Co.	
TELEPHONE - 518 209-6123	EMAIL - lswears@slackchem.com



New York State Department of Environmental Conservation
Division of Water
SPDES Permit - WTC Notification Form Page 3 of 3

(Octg 2013)

1.a. Date Signed by Permittee - 9/29/2020	1.b. Date Signed by WTC Manufacturer - 9/23/20
2.b. SPDES No. - NY 0257583	
3.a.. WTC Name - SlackPlus	7.a. Avg/Max Daily Dosage = 15/ 20 lbs/day

WTC Usage Requirements:

- A. WTC use shall not exceed the rate explicitly authorized by the SPDES permit or otherwise authorized in writing (including this form) by the Department.
- B. The permittee shall **maintain a logbook** of all WTC use, noting for each WTC the date, time, exact location, and amount of each dosage, and, the name of the individual applying or measuring the chemical. The logbook must also document that adequate process controls are in place to ensure that excessive levels of WTCs are not used. The permittee shall retain the logbook for a period of at least 5 years.
- C. The permittee shall **submit a completed WTC Annual Report Form each year** that they use and discharge WTCs. This form shall be attached to either the December DMR or the annual monitoring report required by the SPDES permit. Copies of the form can be obtained at <http://www.dec.ny.gov/permits/93245.html>.

Items 17 - 18 must be completed by NYSDEC permit writer.

17. Review Decision - check appropriate box(es).

- ☒ The proposed WTC usage may proceed without permit modification subject to the WTC Usage Requirements noted above.
- ☒ Additional requirements are specified below.

☐ The proposed WTC usage may not proceed for one of the following reasons:

- ☐ As noted below, the information provided is insufficient to complete our review.
- ☐ As noted below, the SPDES permit must first be modified to add new requirements.
- ☐ As noted below, the proposed use is prohibited.

This WTC is approved for use as stated above, such that a discharge can not occur if the effluent pH is less than 6.5.

18. Permit Writer Information:

PRINT NAME - Brian Boyer	SIGNATURE - <i>Brian Boyer</i>
TITLE - Environmental Program Specialist	DATE - 11/9/2020
TELEPHONE - 315-785-2513	EMAIL - brian.boyer@dec.ny.gov

Appendix C | Letter RE RV Flow Analysis for Association Island



ONE COMPANY.
INFINITE SOLUTIONS.

November 2, 2023

MR. Ray Darling, P.E.
Colliers Engineering and Design
18 Corporate Woods Boulevard, 4th Floor
Albany, NY 12111

Re: RV Flow Analysis for Association Island
Summary of Wastewater Flows for Similar RV Resorts.

Dear Mr. Darling;

In order to provide you with expected wastewater flows for the analysis of the wastewater treatment plant on Sun's Association Island RV park, we have analyzed the flow patterns for various RV communities within Sun's ownership portfolio. Although not all of the resorts are similar in nature, we have identified parks with similar use as the proposed Association Island, that have a very detailed water metering history.

The data analyzed is from four (4) RV resorts that have metered flow history:

- 1.) Frontier Town: 585 sites located in Ocean City Maryland
- 2.) Moab Valley RV: 130 sites located in Moab Utah
- 3.) Jellystone Western New York: 300 sites located 30 miles outside of Buffalo
- 4.) Sherkston Shores: 1,720 sites located in Ontario, just west of Niagara Falls

Each resort is described below:

Frontier Town RV Resort & Campground is a 585 site resort located in Ocean City Maryland. This resort mainly contains conventional RV sites. The resort also contains a separate, open to the public, waterpark. Because the RV resort and Campground are tributary to different wastewater plants, a detailed study was performed last year on metered flows to the separate plants. Weekly flow data was analyzed for June and July of 2019. For the 2-month monitoring period, the daily flow average was 65 gpd/site. The peak usage was the week of July 4th which showed a consumption of 80 gpd/site.

Moab Valley RV Resort & Campground is a 130 site seasonal RV park located in the high-desert of Utah. The park contains mainly traditional RV sites with 20 tent camping sites. The park is serviced by municipal water and private septic. The water meter is read and billed monthly. For the period April-August 2019 this park showed an average of 72 gpd/site with a peak monthly flow in July of 114 gpd/site. Due to the location, the park must irrigate substantially in July to keep the landscape alive as well as dust control.



Jellystone Park of Western New York is a 302 site resort located in North Java, New York. The resort is serviced by onsite wells and a seasonally discharged lagoon. A flow study was completed in 2016 for a proposed expansion that looked at the seasonal flows. For the park season, April through September, the average flow was 27 gpd/site with a maximum flow of 75 gpd/site over the July 4th weekend.

Sherkston Shores Beach Resort & Campground is a 1,720 site resort located in Ontario, just west of Niagara Falls. Approximately 1,500 of the units are park models and the remainder are conventional RV and rentals. Sherkston is the largest park that has the most complete data set. The seasonal average is tracked going back to before 2010 indicates an average flow of 100 gpd. Since 2011, the park has an average daily flow of 648 m³/day or 180,700 gpd. Spread over the 1,720 units and including all of the amenities equates to 99.5 gpd average flow. We believe that these flows reflect a slightly higher average based on the high percentage of park model units, most of which include full kitchen and laundry facilities.

In conclusion, based on our analysis of the data, we would assume a seasonal average for the period April through October of 75-85 gpd/site based on the data analyzed. There is variability in flow based on where the park is located and the physical makeup of the park including seasonal rentals, park models, and conventional transient RV sites. For example, we would expect to see higher flows at Sherkston based on the large percentage of park models and the number of amenities. Also, it is our understanding that a lot of families stay at the park a good portion of the summer and commute. Jellystone Western New York is more of a quiet getaway, with the lower flows reflecting that and it is a closer match to the physical makeup of the Association Island campground. We have included water bills, meter summaries as well as an excerpt from a current study at Sherkston, which illustrates the variability in flow that the park experiences.

Please let us know if you have any questions or need any additional information.

Sincerely,

Douglas A. Pakkala, P.E.
Director of Water and Wastewater Services
Atwell, LLC

Enc. Data Summary Sheet
 Excerpt from Sherkston Shores Report
cc: S. Borgeson, Atwell



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Infrastructure • Geotechnical/Environmental • Telecommunications • Utilities/Energy*

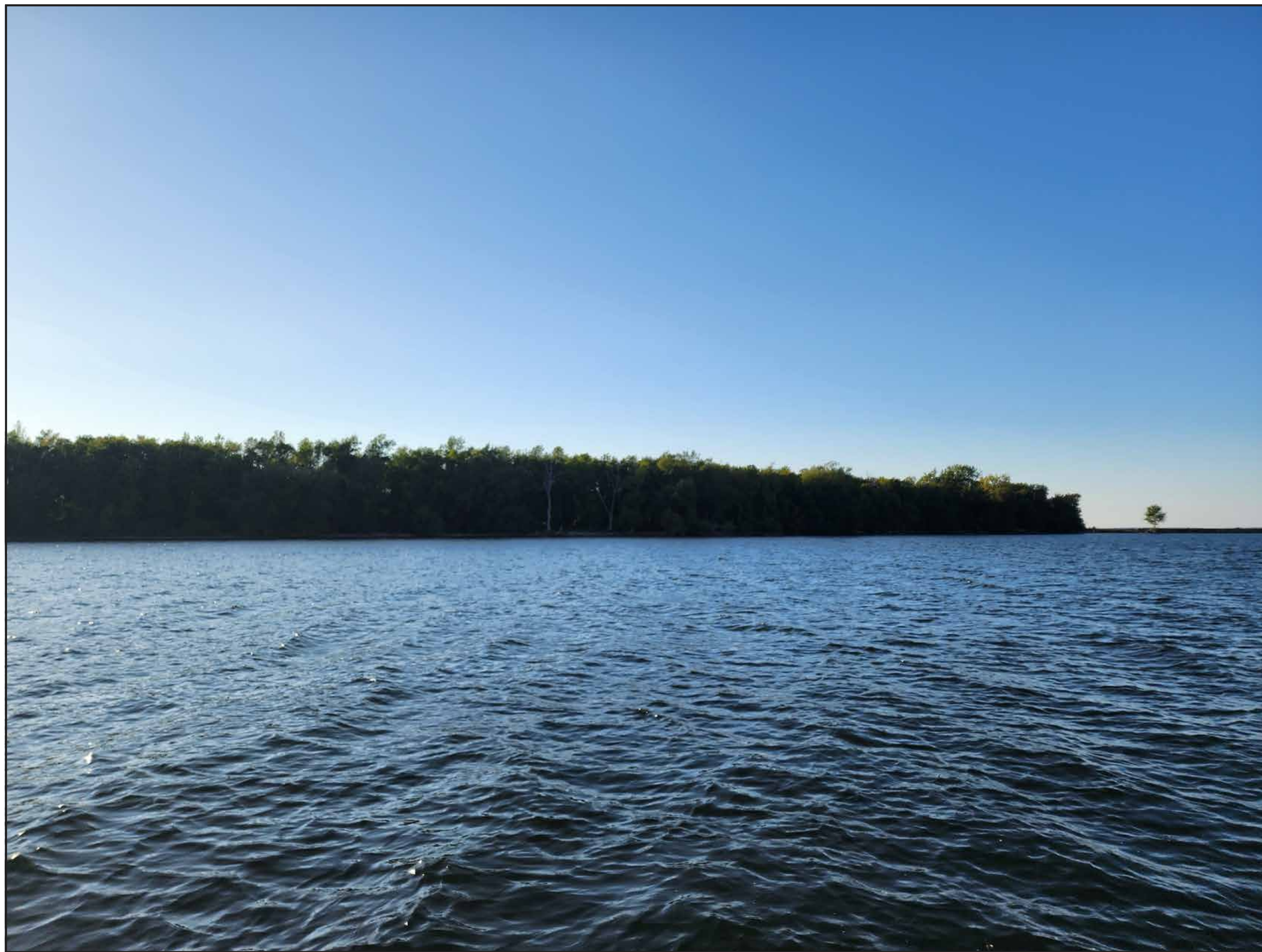
Accelerating success.

Appendix F

FEMA Flood Map

Appendix G

Photo Simulations



Existing



Proposed - 5 years



Location 1

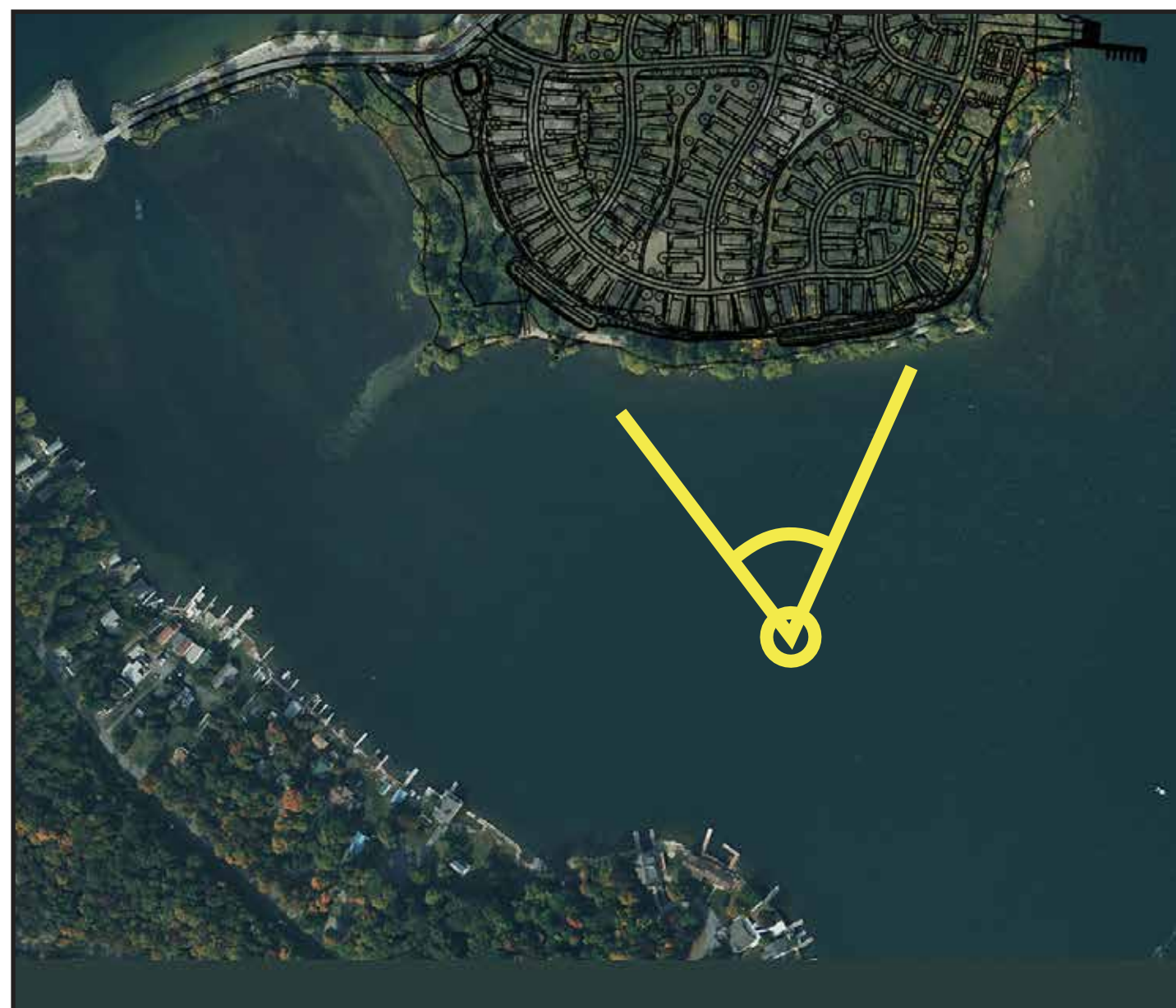
Looking West



Existing



Proposed - 5 years



Location 2

Looking North



Existing



Proposed - 5 years



Location 3

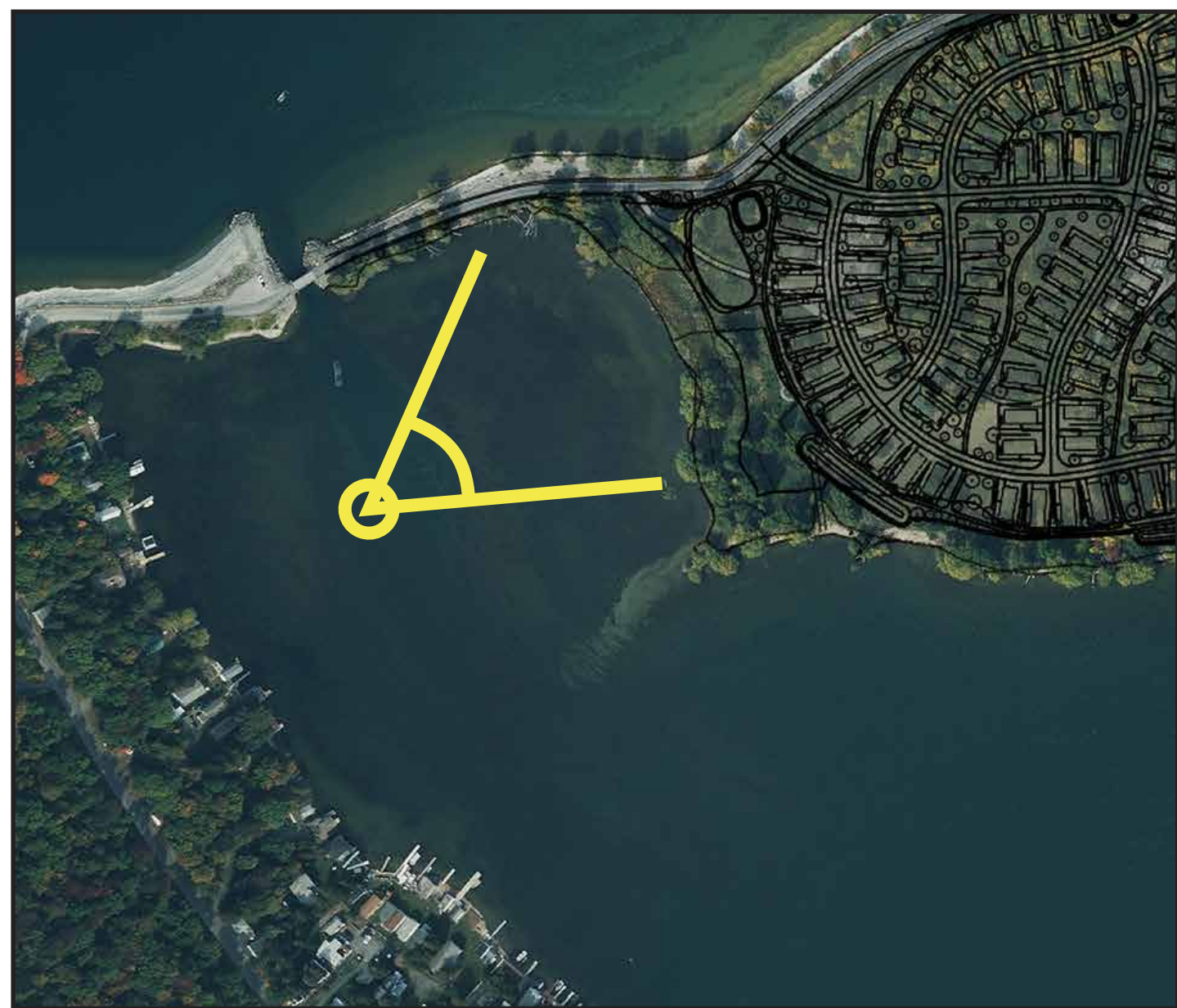
Looking North East



Existing



Proposed - 5 years



Location 4

Looking North East





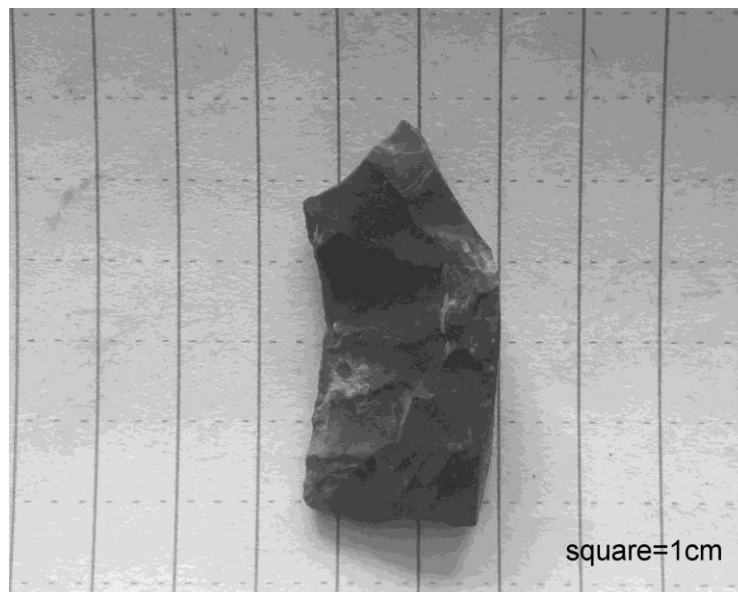
Appendix H

Phase 1 Archaeological Survey

Phase I Archaeological Sensitivity Assessment and Survey of the Hovey Island Residential Development, Town of Henderson, Jefferson County, New York



Figure 1 Political map showing the location of the APE

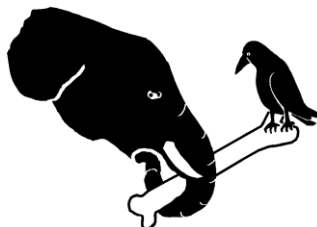


Photograph 15: Dorsal view of projectile point FS1 recovered from plowzone at ST14-22.

Phase I Archaeological Sensitivity Assessment and Survey of the Hovey Island Residential
Development, Town of Henderson, Jefferson County, New York

– prepared by –

H. A. Z. Ex.



Christopher M. Hazel, RPA (Principal Investigator)
Historical Archaeological Zoological Explorations - H.A.Z.Ex.
409 Hector St.
Ithaca, New York 14850
Tel. 607/ 793-7949
HAZExplorations.com

– prepared for –

Bergmann Associates, PC
280 East Broad Street, Suite 200
Rochester, New York 14605

August, 2023

MANAGEMENT SUMMARY

SHPO Project Review Number: 20PR07280

Involved State and Federal Agencies: US Army Corps of Engineers & New York State Department of Environmental Conservation

Phase of Survey: IA assessment & IB archaeological survey

Location: Hovey Island excluding beaches and existing paved road.

Minor Civil Division: Town of Henderson

County: Jefferson

Area of Potential Effect (APE): 13 hectares / 34 acres

APE Length: 468 meters / 1,538 feet (north-south)

APE Width: 293 meters / 962 feet

ST area, number and spacing:

348 at 15 meter intervals,

129 tests at 7.5 meter intervals in 2 acres surrounding MDS1 & MDS6 & FS1,

4 at 3 meter intervals surrounding FS 1,

4 at 1 meter intervals surrounding FS 1.

Total Area (square meters) Excavated: 76.3

USGS 7.5 Minute Quadrangle Map: Henderson, New York.

Number & name of NEW pre-contact sites identified: 1 isolated find spot, a fragment of a Late Archaic Period *Genesee* pp/k (FS1).

Number & name of NEW historic sites identified: None

Number & name of sites recommended for Phase II/Avoidance: None

Report Author: Christopher M. Hazel RPA

Date of Report: August, 2023

ABSTRACT

HAZEx conducted a Phase I archaeological assessment and survey for the proposed Hovey Island Residential Development located across Hovey Island in the Town of Henderson, Jefferson County, New York. The project consists of a multi-unit housing development and support facilities including buried utility trenches, and access roadways. The Project is permitted by the New York State Department of Environmental Conservation (NYSDEC) among other agencies. The current Phase IA assessment indicates that the Project had a high sensitivity to contain pre-contact Sites throughout the tract. Historic Site sensitivity is moderate in areas surrounding the house, foundation, boat ramp, sheds & cottage chimney in the southwestern and northern Project Area (Structures 1-6).

The Phase IB survey was conducted in the Fall of 2021 & Summer of 2023 covering the entire APE in sensitive areas to permit flexibility for potential changes to the design. This consisted of 477 subsurface tests (ST) on transects spaced at 15 meter intervals in 34 acres of the APE and 7.5 meter intervals within the two acre vicinity of Structures 1-6 and at isolated artifact find spots. No artifact concentrations were observed within ST. ST contained historic and one contained a pre-contact isolated find spot (FS) were collected during the survey. This consisted of a base of a *Genesee* knife (FS1). New Sites, especially any traces of Fort De L'Observation were NOT observed in the APE. No further work is recommended.

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INTRODUCTION

This report details the results of a Phase IA Archaeological Sensitivity Assessment and IB Survey of a proposed Residential development across Hovey Island in the Town of Henderson in Jefferson County, New York. The document research and survey was conducted by Bill Tsibulski, Autumn Hazel, Pierre Clavel and Chris Hazel in August, 2021 & 2023 in order to identify any possible National Register of Historic Places Eligible (NRE) Sites through IB survey in anticipation of the construction of new houses, access roads, utilities and other support facilities. Since this construction may be US Army Corps of Engineers & New York State Department of Environmental Conservation permitted or funded in the future, an archaeological sensitivity assessment must be conducted in compliance with state and federal implementation procedures (New York Archaeology Council 1994; State Historic Preservation Office - HPO- 2005) in consultation with the New York State Office of Parks, Recreation and Historic Preservation (OPRHP).

Project Area Description

The Hovey Island area of potential effect (APE) is based on maps provided by Bergmann Associates dating from July, 2021 & June, 2023 and is confined to proposed houses, roadways, buried utility trenches and recreational facilities. The APE is entirely within the center of Hovey Island excluding 75 feet from the shore within Lake Ontario on the western edge of Jefferson County, in northern New York State (Figure 1). The APE is a 34 acre woodland and field in either pasture or recent brush located east of Snowshoe Road. The Project Area is an irregular shaped tract with 468 meter (1,538 feet) length and 293 meters (962 feet) width with a vertical APE of no more than 1 meter (3 feet) below the current ground surface (Figure 5). The development will result in the removal of two sheds, a 1850s frame house, a boat ramp, a foundation of a circa. 1920 clubhouse, a chimney, and a few mature softwood trees (cottonwood & willow).

BACKGROUND RESEARCH

Topography & Geography

Within northern upstate New York, Jefferson County lies along the eastern shore of Lake Ontario and the southern bank of the St. Lawrence River. The project area falls within the westernmost section of the Ontario Lowlands region of New York, which has experienced heavy glacial erosion, accounting for the relatively minor contour variation within the area (Isachsen et al. 2000). The project area is located along a level bedrock formation covered in glacial clays, with elevations ranging from 247 to 262 feet above mean sea level (amsl) (Figure 3).

Drainage

The APE has no drainages but is entirely surrounded by Lake Ontario and Snowshoe Bay. The undisturbed northern two-thirds of the APE is within hummocky ground suggestive of seasonally flooded ground. No standing water was present in the APE at the time of investigations.

Soils

The pre-development soils of the project area belong to the Chaumont Association (MacDowell 1989, NRCS 2021) (Table 1, Figure 2). They are shallow to very shallow, poorly drained, clay soils on gentle slopes. Specific soil types present in the project area are summarized below. Analysis of these soil types indicates that cultural materials may be found between 0-20 cm (0-8 inches) for these soil types.

Table 1: Soil Summary.

Label / Type	lvl	Depth	soil description	% of Project Area
Cl	A'	0-5" (0-13 cm)	DkGrBr SiClLo	82
Chaumon silty clay, 0-8 percent slopes	B'	8-11" (13-28 cm)	GrBr ClLo	
Kg	A'	0-8" (0-20 cm)	DkGrBr SiClLo	18
Kingsbury silty clay, 0 to percent slopes	B'	8-18" (20-45 cm)	YIBr ClLo	

Climate

Jefferson County has four months of growing season with moderately warm summers and cold winters with average temperatures varying from 68 to 21 degrees F between the seasons (MacDowell 1989). Precipitation is evenly distributed throughout the year with an annual rainfall of 40 inches resulting in an average of 101 inches of snow (MacDowell 1989).

Prehistoric climates varied significantly from the present day. Prior to 12,000 years, the Laurentide Ice Sheet and then the fossil Lake Iroquois covered the region. When the ice sheets retreated north and this lake drained into the Mohawk Valley, this part of northern New York became a mixture of tundra and boreal forest with a climate approximately 10 degrees colder than today (Shane 1994). This environment supported mega-fauna and persisted for 2,000 years. Around this time until 6,000 years BP a series of relatively rapid changes in temperature and rainfall gradients during the Holocene (Hypsithermal) significantly altered vegetation patterns (Shane 1994). In general, climate reconstructions document a long transition from a post-Pleistocene environment including more boreal taxa to a warmer and drier climate containing pine forests (Isachsen et.al. 2000). The climate became slightly warmer and the present day north-south precipitation gradient was established by 6,000 years BP leading to a diverse mixed coniferous-deciduous forest (Shane 1994, Black 2000).

Flora and Fauna

The flora within the vicinity of the tract is currently within the Canadian-Carolinian Biotic Province and consists of a mixed coniferous-deciduous forest community (Cleland 1966). Large areas of tundra and stands of spruce, fir, birch and aspen would have predominated during the Early Archaic prior to the hypsithermal (Isachsen et. al. 2000). The forests were dominated during the warm dry hypsithermal by red pine with limited under-story vegetation, resulting in poor species diversity. The growth of maple-oak-hickory deciduous forest mixed with pine and cedar developed with the increased precipitation following this period (Isachsen et. al. 2000). Economically useful woody plant species identified within the vicinity of the tract include buckthorn, honey-suckle, maple, oak, fruit trees, and various berry bearing brambles (Martin, et. al. 1951). Mason (2002) notes at least 373 indigenous plants collected proto-historically for consumption and other uses within the forests, wetlands and grasslands within the Canadian-Carolinian Province.

The faunal resources of the study area would have been both varied and plentiful during the prehistoric and early historic periods. Mammalian fauna common to the tract historically, and probably prehistorically, include over a score of big game and furbearers (Olsen 1964; Martin, et. al. 1951, NYSDEC 2006). Mammals that would have been present prehistorically include the bison, elk and timber wolf. Upland game birds and several species of migratory birds would have been present prehistorically and historically (Martin, et. al. 1951).

Site File and Non-bibliographical Source Search The NYS Cultural Resource Information System survey identified no surveys within a mile of the APE. The HPO library at Peebles Island contained the 1994 Pratt & Pratt survey and Site evaluation of the entirety of Association Island (HPO report #97 from Jefferson County). These and any preceding professional and avocational investigations revealed no pre-contact sites and only a single historic site within the vicinity of the APE. This Site is the 1756 French Fort De L'Observation documented by Abel (2019), Parker (1922), Beauchamp (1900) & Squire (1851). This fort is described by the English as a single 48 feet square palisade with no embankments located 1.25

miles south of the north edge Six Town Point (aka. Duel Island). The next closest are surveys are of improvements to Robert Wehle State Park 2 miles southwest of the APE (Hazel 2004 & 2005). Other surveys have focused on parcels within the Hamlet of Henderson Harbor. Some historic sites have been documented as a result of these, including some within 2 miles of the APE. A New York State Museum survey (2004) along US 11 from the Town of Adams to SR 232 documented seven historic sites, including a 19th Century midden (A04520.000006) 10 miles to the east of the project area.

There are no National Register eligible (NRE), listed (NRL) or potentially eligible (PEP) properties within the APE. However the pre-1930 Dining Hall & Marina on Association Island are all previously inventoried and potentially NRE structures in the APE view shed.

PRE-CONTACT CONTEXT

The region east of Lake Ontario has been occupied by prehistoric peoples since about 10,800 years before present (BP). Fluted PaleoIndian bifaces, all of which are characteristic of the Barnes type, have been found sporadically throughout the region (Abel and Fuerst 1999). No intact sites have been discovered, however. Occupation continued into the Late PaleoIndian period, c. 9,500 BP, but was characterized mostly by lanceolate and Plano lithic cultures, rather than Early Archaic lithic cultures. The first well-defined cultural horizon in the region is the Laurentian Tradition, with numerous sites documented along the Black River and eastern Lake Ontario shoreline. Woodland cultural horizons are also all well represented within the region (Abel 2002; Abel and Fuerst 1999). Prehistoric Iroquoian occupations were abandoned by around 1525 (Engelbrecht 1995, 2003).

File searches of archaeological site inventory records indicate only a single pre-contact archaeological site within 3.2 km of the APE. This was listed in Parker (1922) as NYSM 3557 a “camp” within two kilometers of the APE.

There is documentation of a few sporadic frontier period occupations within the region. The area’s former inhabitants—Iroquoians possibly related to the Onondaga—likely utilized the area for several generations following their abandonment (Engelbrecht 2001, 2003). The first Europeans to regularly utilize the region were the French, at first as a staging area for raids against the Five Nations. Following their peace with the Five Nations in 1701, they established missions along the St. Lawrence River and in the Finger Lakes, travel between which was done primarily through Jefferson County. A site representing this transitory activity has been documented on Fort Drum.

HISTORIC CONTEXT

The earliest mention of the immediate area around the APE is 1746 when the French Captain De Villiers built a fort off Henderson Harbor in the midst of growing tension between his country and England. This *Au Sable* or *De L’Observation* stockade was later occupied by French troops from 1756-1758 under the direction of General Marquis de Montcalm. It’s precise location is unknown. However historical accounts and maps indicate a location 1.25 miles south of Six-Town Point. This fort is noted but the location not clearly depicted on several maps of Lake Ontario during the Seven Years War aka. French & Indian War. Hough (1854) described this fort as a 70 feet square single palisade with no earthworks at the location of Association Island a mile and a quarter south of the Six Town Point. This strictly French fortification was totally abandoned following the end war in 1763 and doesn’t appear on any more recent maps (Grant 1913).

Squire (1851) has the only post-war description of the fort. He writes that it is “*upon an island, outside of Sackett’s Harbor, known as Snowshoe Island. It is said there are traces of an ancient work. So far as could be gathered, it had been a palisade structure, unaccompanied by an embankment.*” Parker’s 1922 survey of archaeological Sites for the NYSM repeats Squire’s description as it is currently listed as NYSM #3489 “Stockade Site on Snowshoe Island outside of Sacketts Harbor”. Notably, he doesn’t indicate that any 20th century research has corroborated this. Notably, Snowshoe Island at that time was likely the original name of Association Island. The APE appears at that time to be on a peninsula around Snowshoe Bay and actually depicted as a continuation of Stony Point on the 1850s maps and never as Snowshoe Island.

Hough (1854) gives the most detailed description of the Site as follows:

"On a peninsula called Six Town Point, a few miles from Sackett's Harbor, is the trace of a slight work, in a square form with bastions at each angle and apparently a small stockade, erected during...the French & English War... Between the bastions the sides were but 48 feet, and the whole affair was a slight and transient character. The only traces left is a slight ditch along the sides, apparently formed by the decay of the wood that formed the defense. On one side is a row of mounds, five in number, probably for the mounting of cannon. The locality is about 1 ¼ mile from the end of the point on the inside, and but a few yards from the water's edge." (pp 20-21)

Recent research by Timothy Abel has indicated that the fort may be located on top of the north end of the bluffs on Stony Point. This is at least partially based one of the names of the fortification; De L'Observation (translation: *for the observation*). The elevation of 142 feet above Lake Ontario versus 10 feet above the Lake on Association and Hovey Islands is a more likely location for observation of and defense against the British Navy (Tim Able personal communication, 8/30/21). Late 20th century archaeological investigations across Association Island didn't successfully relocate the fort (Pratt & Pratt 1994). Both HPO and the NYSM records show this singular fort at all three possible locations: Association Island, Hovey Island & Stony Point.

Between the French and Indian War and the American Revolution, northern New York was again sparsely occupied along the St. Lawrence River and shores of Lake Ontario. There is no record of an historic Native American or European village within or near Henderson Harbor. Land speculation began in the region following its cessation by the Oneida in 1788 at Fort Stanwix. Between 1789-1790, surveyors were busy laying out tracts for sale. They divided the land into six Great Tracts. Alexander Macomb, acting as agent for a company of land speculators, purchased all six tracts in 1791. The land including the APE was the sixth sub-lot in part of Great Lot Number Five, aka. Boylstons Tract. After the Macomb Purchase went into default in 1792, the company assets in Great Lot Five fell to William Constable. Through various intermediate land deals, the area containing the APE became part of the *Black River Tract*, into which were carved the Towns of Hounsfield, Watertown, Rutland, Champion, Denmark, Henderson, Adams, Rodman, Pinkney, Harrisburg, and Lowville. Settlement began at Watertown in 1800. The Counties of Lewis and Jefferson were formed in 1805 (Hough 1854). The bay formed but Stony Point, the APE and the chain of islands forming the Six Town Point went through several name changes during this time as well, going from the French title of Baye de Niaoure (possibly derived from the Iroquois word for "black" referring to the Black River near Sacketts Harbor that feeds this Bay), to Hungry Bay and finally Henderson Bay in the 1850s.(Beauchamp 1907)

The Town of Henderson settled down to a typical North Country agrarian community after the 1815 Treaty of Ghent permanently ending naval combat on the Great Lakes. The agricultural based economy of predominately northern European settlers blossomed inland and eventually encompassed the peninsula off Stony Point. The Johnson, Sprague and Hovey families occupied and farmed this 40 acre spit of land for row crops and pasturage. No maps or other documents record any other structures (stockade, barn nor dock) in or near the APE during the 19th and early 20th centuries other than this homestead and farm. The house within the APE may have been a stop on the Underground Railroad. Anderson (2002) writes that "*The former Ralph Johnson home on Snowshoe Point is also believed to have been a stop for runaway slaves.*" However, there are multiple Johnson houses on what could be considered Snowshoe Point. None of these are recorded as R Johnson, including the one in the APE.

The end of the 19th century ushered in the current era of a recreation based economy in the Henderson Harbor area including the APE. The importance of recreational fishing to the Henderson Harbor resulted in the creation of a Hovey Island. Lake (2013) describes the Winnie Hovey farmhouse, aka. Snowshoe Inn & Structure 1, within the APE as a farmhouse, barn, boat house, fisherman's cabin and dock on the north side of Snowshoe Bay. Snowshoe Inn arose from this interest in sport fishing around Stony Point, and Stoney and Galoo Islands to the west. This APE became a nexus for this when the Town excavated a channel through the narrow strip of bedrock and gravel bar between the mainland and what is now Hovey Island (Lake 2013). This channel allowed fishermen to quickly get to the shelves and deeper water teaming with lake trout, walley and salmon without the extra 2 miles around Six Town Point, it also gave a

quick and safe harbor for any small craft caught out in a storm in this corner of Lake Ontario.

Snowshoe point and Hovey Island are mentioned as early as 1909 as a spot for a Y.M.C.A. camp and continued to be used for summer camps through the 1970s (Anon. *Cape Vincent Eagle* June 5, 1909, *Watertown Daily Times* April 4, 1935 & May 9, 1972). But four years before that (1905) the National Electric Light Company (NELC) purchase the nearby Association Island for a revolutionary corporate summer camp. This island became the center of a series of camps for both the NELC and their successor, the General Electric Company (GE). From 1911 until 1959 GE created an immense camp complex covering the Island and eventually including what would later be called Hovey Island (after the cutting of the channel). Snowshoe Island was also renamed Association Island in honor of the elite engineers organization the Elfun Association founded by the attendees of these GE camps (Elfun 2021).

At its heyday this camp for GE's electrical engineers and salespeople hosted a young Kurt Vonnegut (working as a advertisement writer) and an aged Thomas Edison not to mention many of the great performers from the Broadway stage and celebrities like Admiral Richard E. Byrd (Lake, 2013). The former's *Piano Player* (1952) appears to have been heavily influenced by the camps spirited activities. The facility included hundreds of "tent" cabins, a large dining facility, performance halls, swimming pools, yacht clubs, and a golf course and airplane landing strip that would cover the APE (Elfun Society 2021). The newest trend and greatest impact to the APE was the golf craze among corporate America in the 1920s. As the popularity of this sport swelled the camp expanded it its small single hole course on Association Island to a six-hole course across Hovey Island. This course appears on postcards and aerial photographs and consisted of six sand traps and a stone walled single story hipped roof clubhouse at the location of Structure 2. The former are visible on 2021 lidar images of the APE (Figure 13). A 1940s aerial photograph shows the entirety of Hovey Island shortly after GE had shifted their golf game to the expansive 18-hole par-9 course on Carleton Island.

GE began to relocate/expand their camp and golf course to the larger and more secluded Carleton Island in the 1950s. In 1959 they donated both Association and Hovey Island to the Y.M.C.A. Many of these facilities were then used by the Y.M.C.A. and the National Sailing up through the 1990s. The island was surveyed in 1994 (Pratt & Pratt) and converted in 1999 to a RV park for Kampgrounds of America (KOA) still in operation through 2021. Some of the foundations and features of these camp structures are still present on Association and Hovey Islands including Structure 6 cottage chimney in the northern APE (Table 2). Current groundskeepers for the KOA stated that the remains of most of the cabins and many other structures from the Y.M.C.A. camp, including a pile of iron beds just north of the APE, were hauled from Association Island to various piles throughout Hovey Island in the 1990s as part of this renovation.

The relative dearth of sites near the project area can be attributed to the level of development in the area prior to the enforcement of cultural resource protection laws. There has been only one archaeological survey within a mile, it was a survey and Site Test encompassing Association Island (Pratt & Pratt 1994). This study searched for evidence for the French Fort De L'Observation with shovel testing and trenching with negative results. Peter Pratt concluded that the traces of the fort would have been at the location of the Island's boathouse and was likely obliterated during its construction in the 1920s.

Prehistoric and Historic Site Sensitivity

Prehistoric site sensitivity was considered low for portions of the APE that were covered with standing water, or where the land was recently graded by recent trash removal. It was considered moderate for remaining APE. Historic site sensitivity was considered high for the small portion (2 acres) of the APE that were within 30 meters of MDS 1 associated to this house and its recreational facilities (boathouse, dry dock ramp, golf course) and MDS 6 associated to a post-1940 cottage and moderate for all other areas due to the limited but potential for the APE to contain the remains of the 1746 Fort De L'Observation.

Table 2: Summary of Map Documented Structures (S) within the APE.

M D S	Levy 1853	Beers 1864	Robinson 1888	USGS 1893	Aerial 1940	USGS 1942	USGS 1959	USGS 1980	current 2021
1	W Johnson	W Johnso n	L.L. Sprague Est.	+	+	+	+	+	renovated 1900 frame house
2	-	-	-	-	+	+	+	+	clubhouse stone foundation
3	-	-	-	-	+	-	-	-	dry-dock ramp & machine house
4	-	-	-	-	-	-		+	concrete dock & boathouse foundation
5	-	-	-	-	-	-	-	-	recent garden shed
6 *	-	-	-	-	-	+	+	+	chimney only

*Adjacent to but outside of the APE.

ARCHAEOLOGICAL SURVEY METHODOLOGY

A walkover was conducted over 100% of the Project Area, concurrent with the survey. Current environmental conditions, vegetation, evidence of disturbance or significant landscaping alterations and recent features were noted. Photographs were taken and sketch maps made of features and landforms thought significant (Photographs 1-14).

The entire APE was visually inspected (VI) along east-west Transects spaced at 15 meter intervals to identify possible structural features: embankments, docks, sand traps, and structures. Subsurface testing (ST) was conducted along transects spaced at 15 meter intervals within undisturbed ground and 7.5 meter intervals across the grass-covered northwestern and southeastern APE within the vicinity of Structures 1-6. ST were excavated along the survey grid in all four cardinal directions around the isolated pre-contact Find Spot #1 at 7.5, 3 and 1 meter intervals, respectively.

The size of ST was 40x40 centimeters square and excavated to a depth of at least 10 centimeters below ground surface (cmbs) into subsoil, rock refusal or bedrock (Table 4). All artifacts observed were documented with sub-meter accurate GPS (Table 3).

Artifacts observed within the APE were dry brushed in the field, photo documented, geo-referenced and left *in situ* with the exception of pre-contact and chronologically sensitive historic types. These latter artifacts were bagged and labeled by provenience and cleaned and curated for laboratory analysis. The artifacts will be temporarily curated at HAZEx offices at 409 Hector Street, Ithaca, New York 14850 until final curation at a State repository.

ARCHAEOLOGICAL SURVEY RESULTS

The vegetation within the APE varied with the terrain (Figure 4, Photographs 11-14). The majority of the APE was within weed and brush covered former fields with scattered softwood species (alder, willows and cottonwoods) along with a three small clusters of overgrown non-indigenous ornamental trees (arborvitae, fir & spruce). The southwestern corner of the APE is within mowed grasses down to the edge of the APE. These fields contained soils that conformed to the description within the USDA Soil Survey (NRCS 2021). This consisted of very gravelly silty soils. However, significant portions of the APE have been scrapped down close to bedrock. The grounds-keepers claimed that a long term dump had been located in these areas. The dump consisted of recent structural and mechanical debris originally brought from outside of

the APE and had been recently removed to another location. Earth moving equipment (backhoe, dozer & dump truck) from these efforts were within the APE during the survey.

A total of 477 ST were conducted from east-to-west along 19 transects within the 15 acres of the APE (Table 3). ST recorded numerous small pieces of modern debris (plastic, polystyrene, brown and green beer bottle) and ubiquitous farm-related artifacts (horseshoe, automobile glass, aluminum, seed bags, galvanized nail, etc.) and buried transmission wire for the former golf course electrical lighting. The ST within the yard of S1 also uncovered small fragments of undecorated hotelware, whiteware, aqua glass, asphalt shingle, galvanized nail, and coal. A solitary ST uncovered clear flat glass near S6. The only pre-contact artifact was an Onondaga chert projectile point or knife (PPK) base fragment recorded at Find Spot (FS) 1 in the southeastern APE. No concentrations of historic or pre-contact artifacts indicating a Site were observed within the APE. In general the ST surrounding historic structures demonstrated extensive recent mechanical disturbance.

This southeastern acre surrounding Structures 1-6 appears to be a former golf clubhouse, boatyard and cottage with overgrown gravel lots for parking boats in dry-dock. ST in these areas were problematic and had to be adjusted to avoid standing structures, exposed parking lot and gravel piles. ST were also excavated at all FS 1. All ST at this FS1 revealed typical depth of varied shades of brown gravelly silty clay loams overlying clay subsoils. The average depth of ST was 26 cmbs into gravel indicating Udorthents associated to the construction of recent buildings. The ST at FS revealed gravelly and silty plowzone overlying subsoils. Their soil profiles conformed to the description within the USDA Soil Survey (NRCS 2021). All of the ST around FS1 uncovered NO artifacts.

Cultural Resources

No potentially NRE archaeological properties were identified within the APE. No associated roots of mature trees will be cut and no features of architectural properties will be removed or altered. However, there are currently two potential NRE structural features within APE - Structure 1 consisting of a 1900s era two-story L-shaped clapboard frame house of the vernacular farm house style typical of the region. The house has had all windows replaced and had significant elements such as porchs and chimneys removed or replaced (Photographs 6-8). Structure 6 is a cobblestone chimney with all associated foundations mechanically removed.

The current survey identified the remains of three large recent trash dumps areas within the central and western APE. These areas had been cleared recently of debris prior to the current investigations. A 5 meter wide pile of rusted metal beds, barrels and machinery was also documented within the adjacent northern end of Hovey Island. This is supposedly of late 1970s origin and outside of the APE near the standing chimney of the post 1940 Structure 6. The survey did potentially relocate sand traps associated to the mid-20th century golf course within the APE. A total of 8 ST contained a layer of sand inconsistent with the current Soil Survey (Figure 4).

A total of 15 ST locations were positive for artifacts across the APE. These include a single ST with a solitary pre-contact artifact (FS1), 3 ST with historic 20th century artifacts often intermingled with modern artifacts (2), and 6 ST with only modern artifacts (Table 3). The former consists of a mottled Onondaga gray chert PPK. This is only a partial base fragment of a thin stemmed knife fragment suggestive of a possible Late Archaic Genesee type (Cover page). The majority of historic artifacts are NOT associated to MDS. No 19th or 18th century artifacts were observed except for a solitary cut nail located in a gravel layer adjacent to Structure 1 in MDS 1. No evidence for a 19th century buried midden or other historic features were observed with the exception of the mid-20th century Structure 1 chimney.

Table 3: Artifact Inventory

Tr - ST	Pre-contact	Historic				Modern						
	projectile point	plain hotelware	Aqua glass	cut nail	coal	"beer" bottle	plastic	electric wire	Asphalt shingle	aluminum	auto glass	galvanized nail
7-11		2						1				
-20							1					
8-22										1	1	1
8-23						6	4		2			
8-24		1		1	1							
9-13						1		1				
9-25						1						
11-21			1		1							
14-22	1 (FS1)											
16-19									1			
1.5-0.5											1	
TOTAL	1	3	1	1	2	7	5	2	3	1	2	1

RECOMMENDATIONS

This report has detailed the results of a Phase IA Archaeological Sensitivity Assessment and Phase IB Archaeological Survey of the proposed SunCommon Residential Development on Hovey Island in Jefferson County, New York, under contract with Bergmann Associates of Rochester, New York. The assessment and survey were conducted in anticipation of possible future construction of a housing development and associated features including roadways and utilities. Pre-contact and historic artifacts were identified through subsurface testing. The solitary Late Archaic pre-contact find spot FS1 is not NRE. No intact historic or pre-contact Sites were identified during the survey. No further work is recommended.

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Appendix A: PHOTOGRAPHS 1-14.

Photograph 1: Postcard *Golfing on Hovey Island* (no date).



Photograph 2 1940 Aerial Northeast view of Hovey Island.

Photograph 3: 2020 Aerial North view of Hovey Island.



Photograph 4: Northeast oblique of Structure 1 at MDS 1.

Photograph 5: North face of Structure 2 in at MDS 1.



Photograph 6: West view of bridge on Snowshoe Road from southern APE.

Photograph 7: View southwest of vacation homes on the south shore of Snowshoe Bay.



Photograph 8: View southwest of Structure 3 rails and Structure 4 dock and boathouse foundation outside of APE.

Photograph 9: West view of Structure 6 chimney in northern APE.



Photograph 10: Southwest view of rusted furniture and machinery from 1970s Y.M.C.A. camp.

Photograph 11: North view of overgrown field in northern APE.



Photograph 12: View west of wooded edge of eastern APE.

Photograph 13: View southeast of gravel pile and dozer in the central APE.



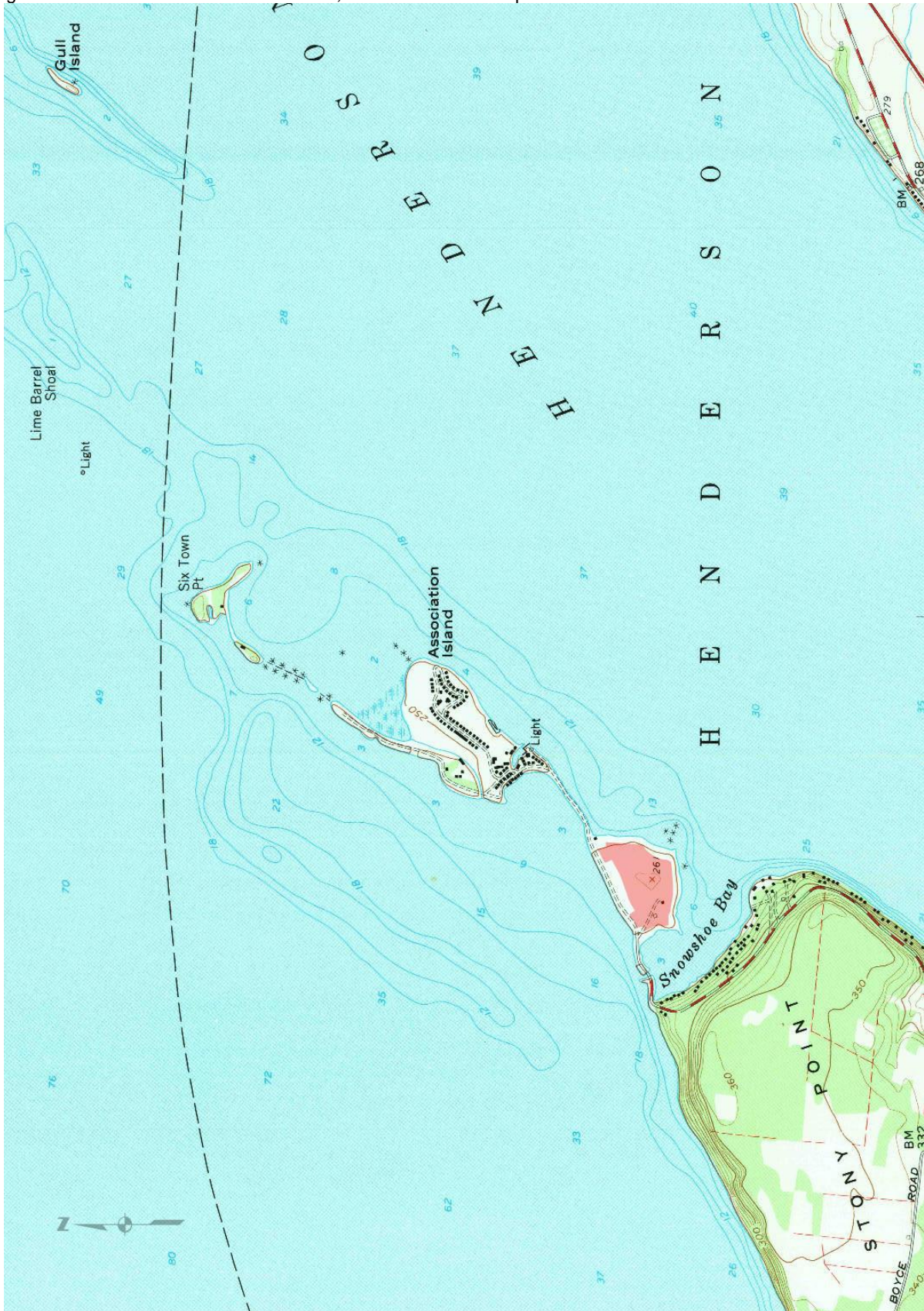
Photograph 14: View west of ST14-22 (FS1) at in grass covered southern APE.

Appendix B: FIGURES 2-9

Figure 2: NCRS 2021 Soil Survey of Jefferson County, New York showing the APE.



Figure 3: Plan of APE on 1980 *Henderson, New York* USGS Map.



[illegible]

Figure 5: 1757 La Broquerie Carte Dessinee Du Lac Ontario.

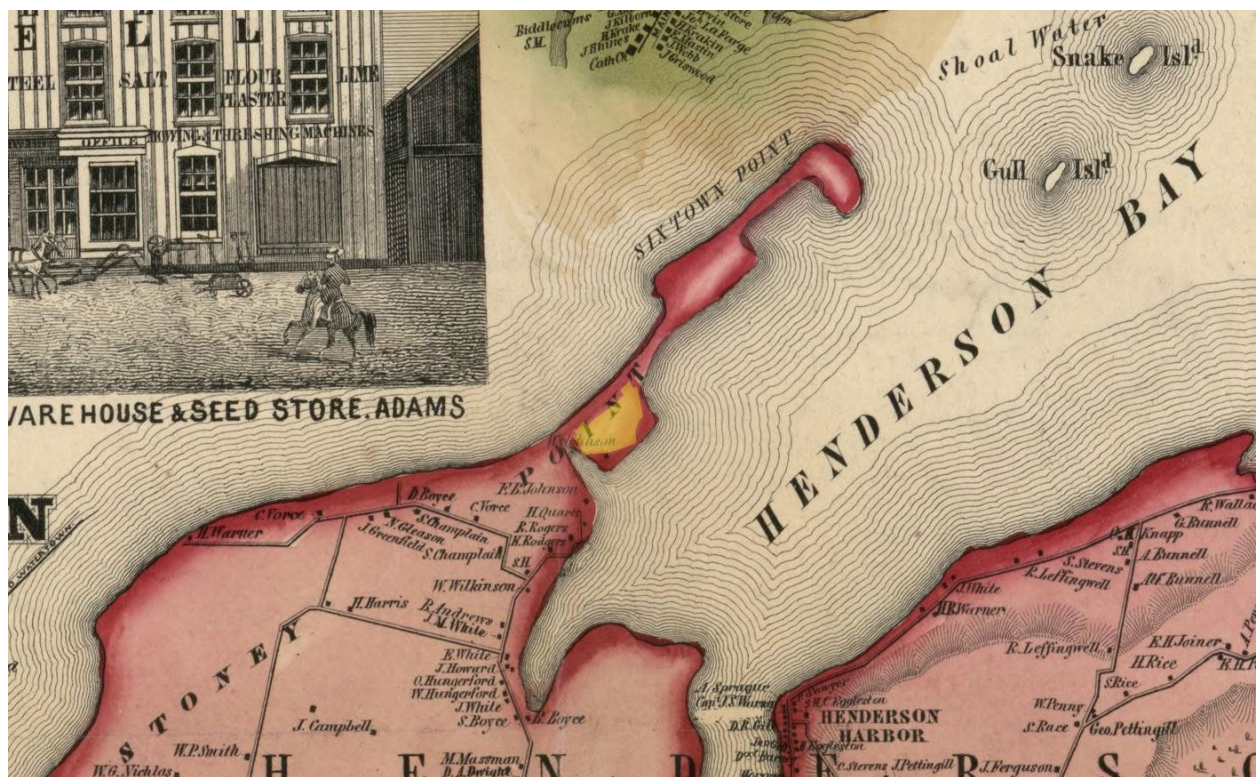


Figure 6: Plan of APE on 1853 Levy Map of Jefferson County, New York.

Figure 7: Plan of APE on 1864 Beers Atlas of Livingston County, New York.

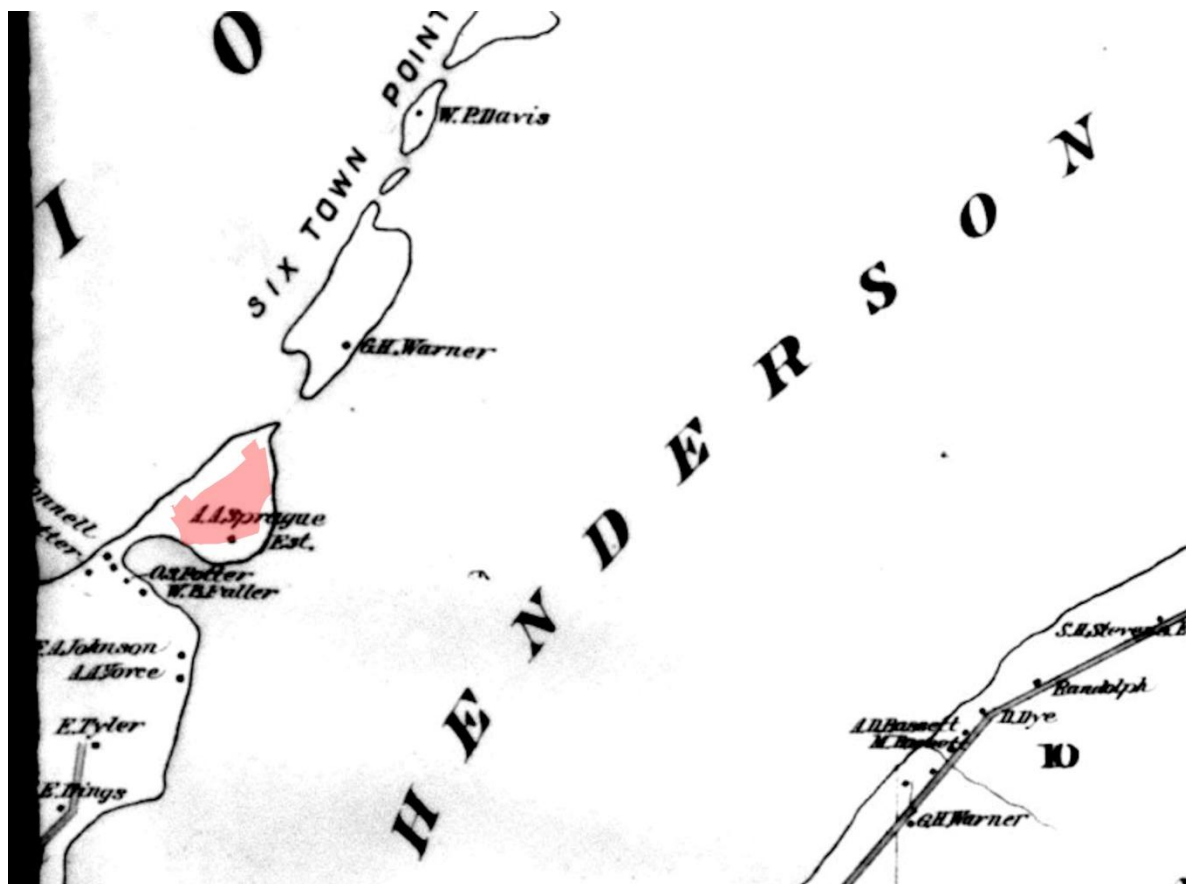


Figure 8: Plan of APE on 1888 Robinson Atlas of Jefferson County, New York.

Figure 9: Plan of APE on 1942 *Henderson, New York* USGS Map.

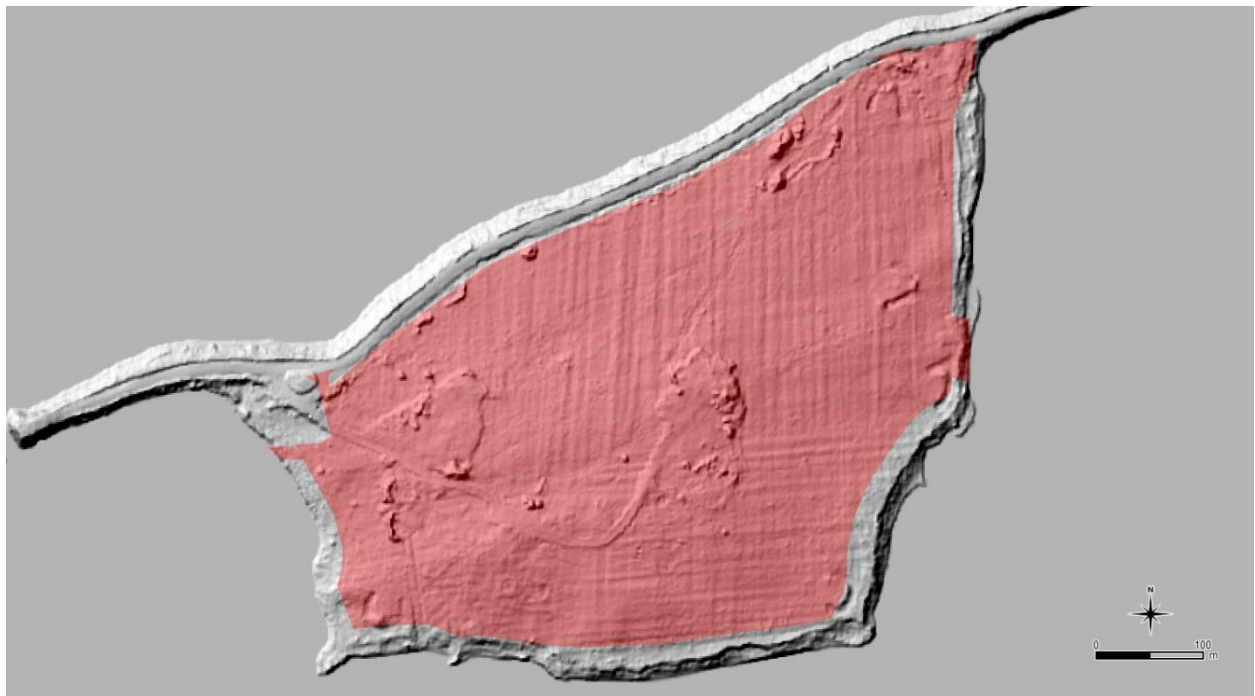
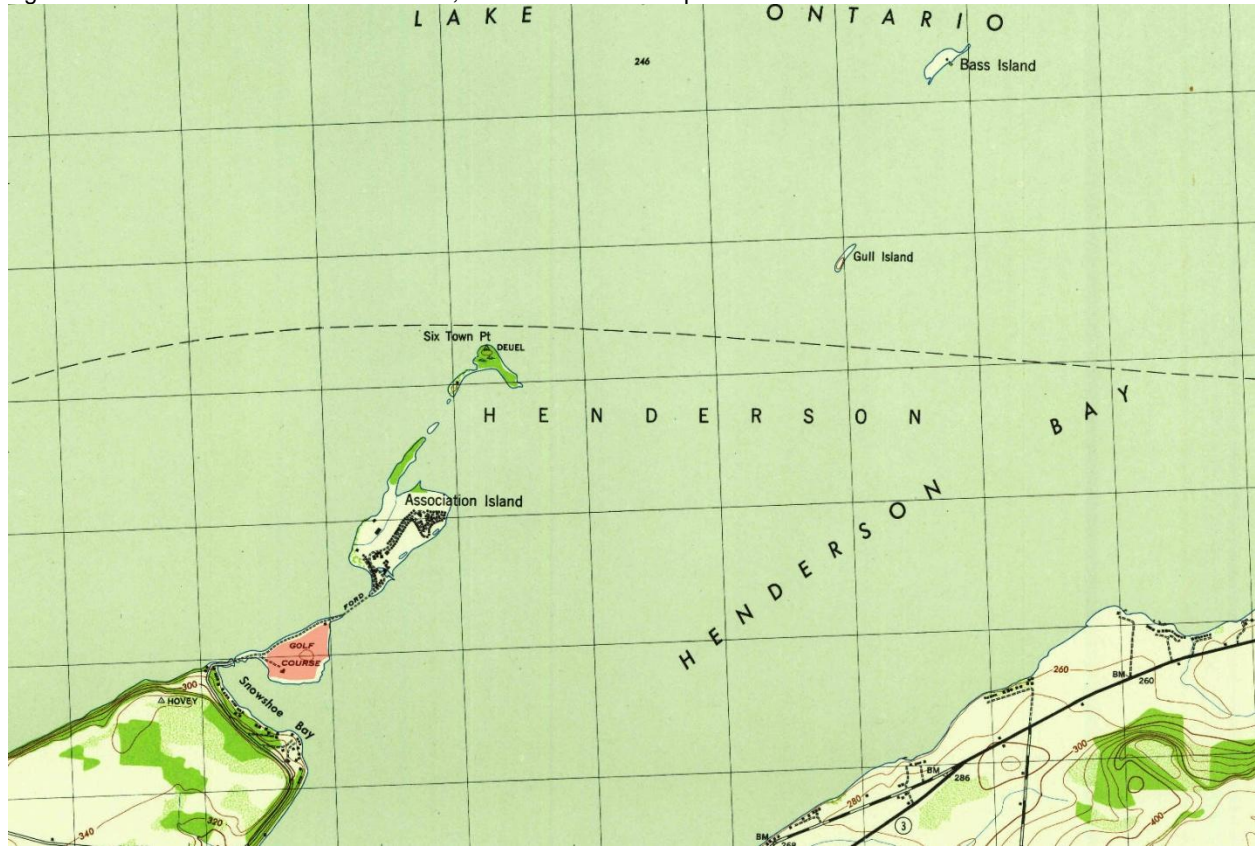


Figure 10: Plan of APE on 2021 USGS *Lidar Site Location Map*.

Appendix C - Table 4: Subsurface Test Inventory.

Transect	ST	Horizon A depth (cmbs)	Horizon A soil/artifacts	Horizon B depth (cmbs)	Horizon B soil
1	-2	11	Br SiLo Grv	21	Grv
1	-1.5	11	Br SiLo Grv	21	Grv
1	-1	11	Br SiLo Grv	21	Grv
1	-0.5	11	Br SiLo Grv	21	Grv
1	0	11	Br SiLo Grv	21	Grv
1	1	16	Br SiLo Grv	26	YBr SiLo Grv
1	2	17	Br SiLo	27	YBr SiLo Grv
1	3	22	Br SiLo	32	YBr SiLo Grv
1	4	18	Br SiLo	28	YBr SiLo Grv
1	5	23	Br SiLo	35	YBr SiLo Grv
1	6	40	Urd	50	YBr SiLo Grv
1	7	23	Br SiLo	33	YBr SiLo Grv
1	8	18	Br SiLo	28	YBr SiLo Grv
1	9	23	Br SiLo	33	YBr SiLo Grv
1	10	24	Br SiLo	34	YBr SiLo Grv
1	11	20	Br SiLo W	30	YBr SiLo Grv
1	12	23	Br SiLo	33	YBr SiLo Grv
1	13	21	Br SiLo	32	YBr SiLo Grv
1	14	24	Br SiLo W	34	YBr SiLo Grv
1	15	24	Br SiLo	34	YBr SiLo Grv
1	16	15	Br SiLo roots	32	YBr SiLo Grv
1	17	24	Br SiLo	34	YBr SiLo Grv
1	18	24	Urd	36	YBr SiLo Grv
1	19	18	Br SiLo	34	YBr SiLo Grv
1	20	26	Br SiLo roots	33	YBr SiLo Grv
1	21	26	Br SiLo	36	YBr SiLo Grv
1	22	26	Br SiLo	36	YBr SiLo Grv
1	23	28	Br SiLo roots	38	YBr SiLo Grv
1.5	-1.5	11	Br SiLo Grv	21	Grv
1.5	-1	11	Br SiLo Grv	21	Grv
1.5	-0.5	21	Br SiLo Grv auto glass at S6	31	Grv
2	-2	11	Br SiLo Grv	21	Grv
2	-1.5	11	Br SiLo Grv	21	Grv
2	-1	11	Br SiLo Grv	21	Grv
2	-0.5	11	Br SiLo Grv	21	Grv
2	0	11	Br SiLo Grv	21	Grv
2	1	16	Br SiLo roots	26	YBr SiLo Grv
2	2	16	Br SiLo roots	26	YBr SiLo Grv
2	3	24	Br SiLo	34	YBr SiLo Grv
2	4	13	Br SiLo	23	YBr SiLo Grv
2	5	0	Rk		
2	6	11	Br SiLo	27	YBr SiLo Grv
2	7	13	Br SiLo W	28	YBr SiLo Grv
2	8	18	Br SiLo	28	YBr SiLo Grv
2	9	24	Br SiLo	34	YBr SiLo Grv
2	10	22	Br SiLo	32	YBr SiLo Grv
2	11	24	Urd	34	YBr SiLo Grv
2	12	26	Urd	36	YBr SiLo Grv
2	13	18	Br SiLo	30	YBr SiLo Grv
2	14	20	Br SiLo	34	YBr SiLo Grv
2	15	19	Br SiLo	36	YBr SiLo Grv
2	16	15	Br SiLo W	34	YBr SiLo Grv
2	17	18	Br SiLo W	31	YBr SiLo Grv
2	18	15	Br SiLo	36	YBr SiLo Grv
2	19	23	Br SiLo	33	YBr SiLo Grv
2	20	22	Br SiLo	35	YBr SiLo Grv

Appendix C - Table 4: Subsurface Test Inventory.

Transect	ST	Horizon A depth (cmbs)	Horizon A soil/artifacts	Horizon B depth (cmbs)	Horizon B soil
2	21	18	Br SiLo	34	YBr SiLo Grv
2	22	25	Br SiLo	35	YBr SiLo Grv
2	23	20	Br SiLo	30	YBr SiLo Grv
3	-1	10	Br SiLo	20	YBr SiLo Grv
3	0	18	Br SiLo	28	YBr SiLo Grv
3	1	26	Br SiLo	36	YBr SiLo Grv
3	2	14	Br SiLo	24	YBr SiLo Grv
3	3	18	Br SiLo	28	YBr SiLo Grv
3	4	16	Br SiLo roots	26	YBr SiLo Grv
3	5	20	Br SiLo	25	YBr SiLo Grv
3	6	0	Rk		
3	7	0	W		
3	8	25	Urd	35	YBr SiLo Grv
3	9	23	Br SiLo	30	YBr SiLo Grv
3	10	24	Br SiLo	32	YBr SiLo Grv
3	11	25	Br SiLo	34	YBr SiLo Grv
3	12	24	Br SiLo	27	YBr SiLo Grv
3	13	26	Br SiLo roots	28	YBr SiLo Grv
3	14	20	Br SiLo	30	YBr SiLo Grv
3	15	25	Br SiLo	35	YBr SiLo Grv
3	16	23	Br SiLo	32	YBr SiLo Grv
3	17	21	Br SiLo	30	YBr SiLo Grv
3	18	24	Br SiLo	28	YBr SiLo Grv
3	19	23	Br SiLo W	30	YBr SiLo Grv
3	20	25	Br SiLo Grv	35	YBr SiLo Grv
3	21	25	Br SiLo Grv	34	YBr SiLo Grv
3	22	25	Br SiLo	35	YBr SiLo Grv
3	23	14	Br SiLo	24	YBr SiLo Grv
4	1	15	Br SiLo S	25	YBr SiLo Grv
4	2	22	Br SiLo	32	YBr SiLo Grv
4	3	19	Br SiLo	29	YBr SiLo Grv
4	4	18	Br SiLo	28	YBr SiLo Grv
4	5	22	Br SiLo	32	YBr SiLo Grv
4	9	17	Br SiLo	27	YBr SiLo Grv
4	10	18	Br SiLo	28	YBr SiLo Grv
4	11	16	Br SiLo	26	YBr SiLo Grv
4	12	20	Br SiLo W	30	YBr SiLo Grv
4	13	15	Br SiLo	25	YBr SiLo Grv
4	14	16	Br SiLo roots	26	YBr SiLo Grv
4	15	19	Br SiLo	29	YBr SiLo Grv
4	16	12	Br SiLo	22	YBr SiLo Grv
4	17	16	Br SiLo	26	YBr SiLo Grv
4	18	20	Br SiLo roots	30	YBr SiLo Grv
4	19	18	Br SiLo	28	YBr SiLo Grv
4	20	19	Br SiLo	29	YBr SiLo Grv
4	21	22	Br SiLo roots	32	YBr SiLo Grv
4	22	20	Br SiLo roots	30	YBr SiLo Grv
4	23	24	Br SiLo roots	34	YBr SiLo Grv
4	24	16	Br SiLo	26	YBr SiLo Grv
4	25	20	Br SiLo roots	30	YBr SiLo Grv
4	26	18	Br SiLo	28	YBr SiLo Grv
4	27	19	Br SiLo	29	YBr SiLo Grv
5	1	20	Br SiLo S	30	YBr SiLo Grv
5	2	18	Br SiLo	28	YBr SiLo Grv
5	3	20	Br SiLo	30	YBr SiLo Grv
5	4	23	Br SiLo	33	YBr SiLo Grv
5	5	25	Br SiLo roots	35	YBr SiLo Grv

Appendix C - Table 4: Subsurface Test Inventory.

Transect	ST	Horizon A depth (cmbs)	Horizon A soil/artifacts	Horizon B depth (cmbs)	Horizon B soil
5	9	19	Br SiLo	29	YBr SiLo Grv
5	10	20	Br SiLo	30	YBr SiLo Grv
5	11	16	Br SiLo	26	YBr SiLo Grv
5	12	19	Br SiLo	29	YBr SiLo Grv
5	13	14	Br SiLo	24	YBr SiLo Grv
5	14	20	Br SiLo	30	YBr SiLo Grv
5	15	18	Br SiLo	28	YBr SiLo Grv
5	16	24	Br SiLo	34	YBr SiLo Grv
5	17	14	Br SiLo	24	YBr SiLo Grv
5	18	18	Br SiLo	28	YBr SiLo Grv
5	19	21	Br SiLo	31	YBr SiLo Grv
5	20	18	Br SiLo	28	YBr SiLo Grv
5	21	21	Br SiLo	31	YBr SiLo Grv
5	22	20	Br SiLo	30	YBr SiLo Grv
5	23	19	Br SiLo	29	YBr SiLo Grv
5	22	17	Br SiLo	27	YBr SiLo Grv
5	23	20	Br SiLo	30	YBr SiLo Grv
5	23	20	Br SiLo	30	YBr SiLo Grv
5	23	20	Br SiLo	30	YBr SiLo Grv
5	24	16	Br SiLo	26	YBr SiLo Grv
5	25	20	Br SiLo roots	30	YBr SiLo Grv
5	26	18	Br SiLo	28	YBr SiLo Grv
5	27	19	Br SiLo	29	YBr SiLo Grv
5	28	16	Br SiLo	26	YBr SiLo Grv
5	29	20	Br SiLo roots	30	YBr SiLo Grv
5.5	25	18	Br SiLo	28	YBr SiLo Grv
5.5	25.5	24	Br SiLo	34	YBr SiLo Grv
5.5	26	14	Br SiLo	24	YBr SiLo Grv
5.5	26.5	18	Br SiLo	28	YBr SiLo Grv
6	1	22	Br SiLo	32	YBr SiLo Grv
6	2	24	Br SiLo	34	YBr SiLo Grv
6	3	17	Br SiLo	27	YBr SiLo Grv
6	4	16	Br SiLo	26	YBr SiLo Grv
6	5	17	Br SiLo	27	YBr SiLo Grv
6	6	16	Br SiLo	26	YBr SiLo Grv
6	9	21	Br SiLo	31	YBr SiLo Grv
6	10	20	Br SiLo	30	YBr SiLo Grv
6	11	19	Br SiLo	29	YBr SiLo Grv
6	12	17	Br SiLo roots	27	YBr SiLo Grv
6	13	16	Br SiLo	26	YBr SiLo Grv
6	14	15	Br SiLo	25	YBr SiLo Grv
6	15	17	Br SiLo	27	YBr SiLo Grv
6	16	20	Br SiLo	30	YBr SiLo Grv
6	17	22	Br SiLo	32	YBr SiLo Grv
6	18	24	Br SiLo	34	YBr SiLo Grv
6	19	20	Br SiLo	30	YBr SiLo Grv
6	20	17	Br SiLo	27	YBr SiLo Grv
6	21	20	Br SiLo	30	YBr SiLo Grv
6	22	22	Br SiLo	32	YBr SiLo Grv
6	23	24	Br SiLo	34	YBr SiLo Grv
6	24	20	Br SiLo	30	YBr SiLo Grv
6	24.5	19	Br SiLo	29	YBr SiLo Grv
6	25	17	Br SiLo	27	YBr SiLo Grv
6	26.5	20	Br SiLo	30	YBr SiLo Grv
6	27	18	Br SiLo	28	YBr SiLo Grv
6.5	24	24	Br SiLo	34	YBr SiLo Grv
6.5	24.5	14	Br SiLo	24	YBr SiLo Grv

Appendix C - Table 4: Subsurface Test Inventory.

Transect	ST	Horizon A depth (cmbs)	Horizon A soil/artifacts	Horizon B depth (cmbs)	Horizon B soil
6.5	26.5	18	Br SiLo	28	YBr SiLo Grv
6.5	27	22	Br SiLo	32	YBr SiLo Grv
7	1	17	Br SiLo	27	YBr SiLo Grv
7	2	20	Br SiLo	30	YBr SiLo Grv
7	3	22	Br SiLo	32	YBr SiLo Grv
7	4	18	Br SiLo	28	YBr SiLo Grv
7	5	25	Br SiLo	35	YBr SiLo Grv
7	6	15	Br SiLo	25	YBr SiLo Grv
7	9	18	Br SiLo	28	YBr SiLo Grv
7	10	16	Br SiLo	26	YBr SiLo Grv
7	11	20	Br SiLo historic & recent	30	YBr SiLo Grv
7	12	21	Br SiLo	31	YBr SiLo Grv
7	13	22	Br SiLo	32	YBr SiLo Grv
7	14	10	Br SiLo W	20	YBr SiLo Grv
7	15	24	Br SiLo	34	YBr SiLo Grv
7	16	22	Br SiLo roots	32	YBr SiLo Grv
7	17	21	Br SiLo	31	YBr SiLo Grv
7	18	26	Br SiLo	36	YBr SiLo Grv
7	19	24	Br SiLo	34	YBr SiLo Grv
7	20	23	Br SiLo recent	33	YBr SiLo Grv
7	21	26	Br SiLo	36	YBr SiLo Grv
7	22	26	Br SiLo	36	YBr SiLo Grv
7	23	28	Br SiLo roots	38	YBr SiLo Grv
7	23.5	20	Br SiLo	30	YBr SiLo Grv
7	24	18	Br SiLo	28	YBr SiLo Grv
7	24.5	24	Br SiLo	34	YBr SiLo Grv
7	25	14	Br SiLo	24	YBr SiLo Grv
7	25.5	18	Br SiLo	28	YBr SiLo Grv
7	26	21	Br SiLo	31	YBr SiLo Grv
7	26.5	18	Br SiLo	28	YBr SiLo Grv
7	27	21	Br SiLo	31	YBr SiLo Grv
7.5	22	24	Br SiLo Grv	34	YBr SiLo Grv
7.5	23	25	Br SiLo	35	YBr SiLo Grv
7.5	24	14	Br SiLo	24	YBr SiLo Grv
7.5	24.5	15	Br SiLo S	25	YBr SiLo Grv
7.5	25	22	Br SiLo	32	YBr SiLo Grv
7.5	25.5	19	Br SiLo	29	YBr SiLo Grv
7.5	26	18	Br SiLo	28	YBr SiLo Grv
8	1	12	Br SiLo roots	22	YBr SiLo Grv
8	2	16	Br SiLo roots	26	YBr SiLo Grv
8	3	24	Br SiLo	34	YBr SiLo Grv
8	4	13	Br SiLo	23	YBr SiLo Grv
8	5	17	Br SiLo	27	YBr SiLo Grv
8	6	20	Br SiLo	30	YBr SiLo Grv
8	9	22	Br SiLo	32	YBr SiLo Grv
8	10	24	Br SiLo	34	YBr SiLo Grv
8	11	17	Br SiLo	27	YBr SiLo Grv
8	12	20	Br SiLo	30	YBr SiLo Grv
8	13	26	Br SiLo	36	YBr SiLo Grv
8	14	24	Br SiLo	34	YBr SiLo Grv
8	15	26	Br SiLo	36	YBr SiLo Grv
8	16	24	Br SiLo	34	YBr SiLo Grv
8	17	21	Br SiLo	31	YBr SiLo Grv
8	18	26	Br SiLo	36	YBr SiLo Grv
8	19	22	Br SiLo	32	YBr SiLo Grv
8	20	25	Br SiLo	35	YBr SiLo Grv

Appendix C - Table 4: Subsurface Test Inventory.

Transect	ST	Horizon A depth (cmbs)	Horizon A soil/artifacts	Horizon B depth (cmbs)	Horizon B soil
8	21	24	Br SiLo	34	YBr SiLo Grv
8	21.5	22	Br SiLo	32	YBr SiLo Grv
8	22	25	Br SiLo recent	35	YBr SiLo Grv
8	22.5	20	Br SiLo	30	YBr SiLo Grv
8	23	20	Br SiLo recent	30	YBr SiLo Grv
8	23.5	20	Br SiLo	30	YBr SiLo Grv
8	24	20	Br SiLo historic	30	YBr SiLo Grv
8	24.5	19	Br SiLo	29	YBr SiLo Grv
8	25	20	Br SiLo	30	YBr SiLo Grv
8	25.5	16	Br SiLo	26	YBr SiLo Grv
8	26	19	Br SiLo	29	YBr SiLo Grv
8	27	14	Br SiLo	24	YBr SiLo Grv
8.5	22	20	Br SiLo	30	YBr SiLo Grv
8.5	23	18	Br SiLo	28	YBr SiLo Grv
8.5	23.5	24	Br SiLo	34	YBr SiLo Grv
8.5	24	14	Br SiLo	24	YBr SiLo Grv
8.5	24.5	18	Br SiLo	28	YBr SiLo Grv
8.5	25	21	Br SiLo	31	YBr SiLo Grv
8.5	25.5	18	Br SiLo	28	YBr SiLo Grv
8.5	26	19	Br SiLo	29	YBr SiLo Grv
8.5	26.5	20	Br SiLo	30	YBr SiLo Grv
9	1	26	Br SiLo	36	YBr SiLo Grv
9	2	14	Br SiLo	24	YBr SiLo Grv
9	3	18	Br SiLo	28	YBr SiLo Grv
9	4	16	Br SiLo roots	26	YBr SiLo Grv
9	5	15	Br SiLo	25	YBr SiLo Grv
9	6	20	Br SiLo	30	YBr SiLo Grv
9	7	15	Br SiLo	25	YBr SiLo Grv
9	8	17	Br SiLo	27	YBr SiLo Grv
9	9	20	Br SiLo	30	YBr SiLo Grv
9	10	22	Br SiLo	32	YBr SiLo Grv
9	11	24	Br SiLo	34	YBr SiLo Grv
9	12	17	Br SiLo	27	YBr SiLo Grv
9	13	18	Br SiLo recent	28	YBr SiLo Grv
9	14	20	Br SiLo	30	YBr SiLo Grv
9	15	25	Br SiLo	35	YBr SiLo Grv
9	16	22	Br SiLo	32	YBr SiLo Grv
9	17	20	Br SiLo	30	YBr SiLo Grv
9	18	18	Br SiLo	28	YBr SiLo Grv
9	19	20	Br SiLo W	30	YBr SiLo Grv
9	20	25	Br SiLo	35	YBr SiLo Grv
9	21	24	Br SiLo Grv	34	YBr SiLo Grv
9	22	25	Br SiLo	35	YBr SiLo Grv
9	22.5	14	Br SiLo	24	YBr SiLo Grv
9	23	25	Br SiLo	35	YBr SiLo Grv
9	23.5	22	Br SiLo	32	YBr SiLo Grv
9	24	17	Br SiLo	27	YBr SiLo Grv
9	24.5	18	Br SiLo	28	YBr SiLo Grv
9	25	14	Br SiLo recent	24	YBr SiLo Grv
9	25.5	22	Br SiLo	32	YBr SiLo Grv
9	26	17	Br SiLo	27	YBr SiLo Grv
9	26.5	18	Br SiLo	28	YBr SiLo Grv
9	27	16	Br SiLo	26	YBr SiLo Grv
9.5	23	22	Br SiLo	32	YBr SiLo Grv
9.5	23.5	19	Br SiLo	29	YBr SiLo Grv
9.5	24	18	Br SiLo	28	YBr SiLo Grv
9.5	24.5	22	Br SiLo	32	YBr SiLo Grv

Appendix C - Table 4: Subsurface Test Inventory.

Transect	ST	Horizon A depth (cmbs)	Horizon A soil/artifacts	Horizon B depth (cmbs)	Horizon B soil
9.5	25	17	Br SiLo	27	YBr SiLo Grv
9.5	25.5	18	Br SiLo	28	YBr SiLo Grv
9.5	26	16	Br SiLo	26	YBr SiLo Grv
9.5	26.5	20	Br SiLo W	30	YBr SiLo Grv
10	1	15	Br SiLo S	25	YBr SiLo Grv
10	2	22	Br SiLo	32	YBr SiLo Grv
10	3	19	Br SiLo	29	YBr SiLo Grv
10	4	18	Br SiLo	28	YBr SiLo Grv
10	5	22	Br SiLo	32	YBr SiLo Grv
10	9	17	Br SiLo	27	YBr SiLo Grv
10	10	18	Br SiLo	28	YBr SiLo Grv
10	11	16	Br SiLo	26	YBr SiLo Grv
10	12	20	Br SiLo W	30	YBr SiLo Grv
10	13	15	Br SiLo	25	YBr SiLo Grv
10	14	16	Br SiLo roots	26	YBr SiLo Grv
10	15	19	Br SiLo	29	YBr SiLo Grv
10	16	12	Br SiLo	22	YBr SiLo Grv
10	17	16	Br SiLo	26	YBr SiLo Grv
10	18	20	Br SiLo roots	30	YBr SiLo Grv
10	19	18	Br SiLo	28	YBr SiLo Grv
10	20	19	Br SiLo	29	YBr SiLo Grv
10	21	22	Br SiLo roots	32	YBr SiLo Grv
10	22	20	Br SiLo roots	30	YBr SiLo Grv
10	23	24	Br SiLo roots	34	YBr SiLo Grv
10	23.5	17	Br SiLo	27	YBr SiLo Grv
10	24	20	Br SiLo	30	YBr SiLo Grv
10	24.5	22	Br SiLo	32	YBr SiLo Grv
10	25	24	Br SiLo	34	YBr SiLo Grv
10	25.5	20	Br SiLo	30	YBr SiLo Grv
10	26	17	Br SiLo	27	YBr SiLo Grv
10	26.5	20	Br SiLo	30	YBr SiLo Grv
10	27	22	Br SiLo	32	YBr SiLo Grv
10.5	23.5	24	Br SiLo	34	YBr SiLo Grv
10.5	24	17	Br SiLo	27	YBr SiLo Grv
10.5	24.5	20	Br SiLo	30	YBr SiLo Grv
10.5	25	19	Br SiLo	29	YBr SiLo Grv
10.5	25.5	20	Br SiLo	30	YBr SiLo Grv
10.5	26	16	Br SiLo	26	YBr SiLo Grv
10.5	26.5	19	Br SiLo	29	YBr SiLo Grv
11	2	18	Br SiLo	28	YBr SiLo Grv
11	3	20	Br SiLo	30	YBr SiLo Grv
11	4	23	Br SiLo	33	YBr SiLo Grv
11	5	25	Br SiLo roots	35	YBr SiLo Grv
11	9	19	Br SiLo	29	YBr SiLo Grv
11	10	20	Br SiLo	30	YBr SiLo Grv
11	11	16	Br SiLo	26	YBr SiLo Grv
11	12	19	Br SiLo	29	YBr SiLo Grv
11	13	14	Br SiLo	24	YBr SiLo Grv
11	14	20	Br SiLo	30	YBr SiLo Grv
11	15	18	Br SiLo	28	YBr SiLo Grv
11	16	24	Br SiLo	34	YBr SiLo Grv
11	17	14	Br SiLo	24	YBr SiLo Grv
11	18	18	Br SiLo	28	YBr SiLo Grv
11	19	21	Br SiLo	31	YBr SiLo Grv
11	20	18	Br SiLo	28	YBr SiLo Grv
11	21	21	Br SiLo	31	YBr SiLo Grv
11	21.5	20	Br SiLo	30	YBr SiLo Grv

Appendix C - Table 4: Subsurface Test Inventory.

Transect	ST	Horizon A depth (cmbs)	Horizon A soil/artifacts	Horizon B depth (cmbs)	Horizon B soil
11	23	20	Br SiLo	30	YBr SiLo Grv
11	23.5	19	Br SiLo	29	YBr SiLo Grv
11	24	12	Br SiLo	22	YBr SiLo Grv
11	24.5	17	Br SiLo	27	YBr SiLo Grv
11	25	17	Br SiLo	27	YBr SiLo Grv
11	25.5	16	Br SiLo	26	YBr SiLo Grv
11	26	21	Br SiLo	31	YBr SiLo Grv
11	27	20	Br SiLo	30	YBr SiLo Grv
11.5	21	17	Br SiLo	27	YBr SiLo Grv
11.5	21.5	20	Br SiLo	30	YBr SiLo Grv
11.5	22	22	Br SiLo	32	YBr SiLo Grv
11.5	22.5	24	Br SiLo	34	YBr SiLo Grv
11.5	23	20	Br SiLo	30	YBr SiLo Grv
11.5	23.5	17	Br SiLo	27	YBr SiLo Grv
11.5	24	20	Br SiLo	30	YBr SiLo Grv
11.5	24.5	22	Br SiLo	32	YBr SiLo Grv
11.5	25	24	Br SiLo	34	YBr SiLo Grv
11.5	25.5	17	Br SiLo	27	YBr SiLo Grv
12	3	24	Br SiLo	34	YBr SiLo Grv
12	4	17	Br SiLo	27	YBr SiLo Grv
12	5	17	Br SiLo	27	YBr SiLo Grv
12	6	16	Br SiLo	26	YBr SiLo Grv
12	9	21	Br SiLo	31	YBr SiLo Grv
12	10	20	Br SiLo	30	YBr SiLo Grv
12	11	19	Br SiLo	29	YBr SiLo Grv
12	12	17	Br SiLo roots	27	YBr SiLo Grv
12	13	16	Br SiLo	26	YBr SiLo Grv
12	14	15	Br SiLo	25	YBr SiLo Grv
12	15	17	Br SiLo	27	YBr SiLo Grv
12	16	20	Br SiLo	30	YBr SiLo Grv
12	17	22	Br SiLo	32	YBr SiLo Grv
12	18	24	Br SiLo	34	YBr SiLo Grv
12	19	17	Br SiLo	27	YBr SiLo Grv
12	20	20	Br SiLo	30	YBr SiLo Grv
12	21	22	Br SiLo	32	YBr SiLo Grv
12	22	24	Br SiLo	34	YBr SiLo Grv
12	22.5	17	Br SiLo	27	YBr SiLo Grv
12	23	20	Br SiLo	30	YBr SiLo Grv
12	23.5	22	Br SiLo	32	YBr SiLo Grv
12	24	24	Br SiLo	34	YBr SiLo Grv
12	24.5	20	Br SiLo	30	YBr SiLo Grv
12	25	17	Br SiLo	27	YBr SiLo Grv
12	25.5	20	Br SiLo	30	YBr SiLo Grv
12	26	22	Br SiLo	32	YBr SiLo Grv
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13	4	24	Br SiLo	34	YBr SiLo Grv
13	5	17	Br SiLo	27	YBr SiLo Grv
13	6	16	Br SiLo	26	YBr SiLo Grv
13	9	21	Br SiLo	31	YBr SiLo Grv
13	10	20	Br SiLo	30	YBr SiLo Grv
13	11	19	Br SiLo	29	YBr SiLo Grv
13	12	17	Br SiLo roots	27	YBr SiLo Grv
13	13	16	Br SiLo	26	YBr SiLo Grv
13	14	15	Br SiLo	25	YBr SiLo Grv
13	15	17	Br SiLo	27	YBr SiLo Grv
13	16	20	Br SiLo	30	YBr SiLo Grv
13	17	22	Br SiLo	32	YBr SiLo Grv

Appendix C - Table 4: Subsurface Test Inventory.

Transect	ST	Horizon A depth (cmbs)	Horizon A soil/artifacts	Horizon B depth (cmbs)	Horizon B soil
13	18	24	Br SiLo	34	YBr SiLo Grv
13	19	20	Br SiLo	30	YBr SiLo Grv
13	20	17	Br SiLo	27	YBr SiLo Grv
13	21	20	Br SiLo	30	YBr SiLo Grv
13	22	22	Br SiLo	32	YBr SiLo Grv
13	23	24	Br SiLo	34	YBr SiLo Grv
13	24	20	Br SiLo	30	YBr SiLo Grv
13	25	22	Br SiLo	32	YBr SiLo Grv
14	1	17	Br SiLo	27	YBr SiLo Grv
14	2	20	Br SiLo	30	YBr SiLo Grv
14	3	22	Br SiLo	32	YBr SiLo Grv
14	4	18	Br SiLo	28	YBr SiLo Grv
14	5	25	Br SiLo	35	YBr SiLo Grv
14	6	15	Br SiLo	25	YBr SiLo Grv
14	9	18	Br SiLo	28	YBr SiLo Grv
14	10	16	Br SiLo	26	YBr SiLo Grv
14	11	20	Br SiLo	30	YBr SiLo Grv
14	12	21	Br SiLo	31	YBr SiLo Grv
14	13	22	Br SiLo	32	YBr SiLo Grv
14	14	10	Br SiLo W	20	YBr SiLo Grv
14	15	24	Br SiLo	34	YBr SiLo Grv
14	16	22	Br SiLo roots	32	YBr SiLo Grv
14	17	21	Br SiLo	31	YBr SiLo Grv
14	18	26	Br SiLo	36	YBr SiLo Grv
14	19	24	Br SiLo	34	YBr SiLo Grv
14	20	23	Br SiLo roots	33	YBr SiLo Grv
14	21	26	Br SiLo	36	YBr SiLo Grv
14	22	26	Br SiLo precontact	36	YBr SiLo Grv
14	22 W1	20	Br SiLo	30	YBr SiLo Grv
14	22 W3	26	Br SiLo	36	YBr SiLo Grv
14	22 W7.5	24	Br SiLo	34	YBr SiLo Grv
14	22 S1	26	Br SiLo	36	YBr SiLo Grv
14	22 S3	24	Br SiLo	34	YBr SiLo Grv
14	22 S7.5	21	Br SiLo	31	YBr SiLo Grv
14	22 E1	26	Br SiLo	36	YBr SiLo Grv
14	22 E3	20	Br SiLo	30	YBr SiLo Grv
14	22 E7.5	26	Br SiLo	36	YBr SiLo Grv
14	22 N1	24	Br SiLo	34	YBr SiLo Grv
14	22 N3	26	Br SiLo	36	YBr SiLo Grv
14	22 N7.5	24	Br SiLo	34	YBr SiLo Grv
14	23	28	Br SiLo roots	38	YBr SiLo Grv
15	1	12	Br SiLo roots	22	YBr SiLo Grv
15	2	16	Br SiLo roots	26	YBr SiLo Grv
15	3	24	Br SiLo	34	YBr SiLo Grv
15	4	13	Br SiLo	23	YBr SiLo Grv

Appendix C - Table 4: Subsurface Test Inventory.

Transect	ST	Horizon A depth (cmbs)	Horizon A soil/artifacts	Horizon B depth (cmbs)	Horizon B soil
15	5	17	Br SiLo	27	YBr SiLo Grv
15	6	20	Br SiLo	30	YBr SiLo Grv
15	9	22	Br SiLo	32	YBr SiLo Grv
15	10	24	Br SiLo	34	YBr SiLo Grv
15	11	17	Br SiLo	27	YBr SiLo Grv
15	12	20	Br SiLo	30	YBr SiLo Grv
15	13	26	Br SiLo	36	YBr SiLo Grv
15	14	24	Br SiLo	34	YBr SiLo Grv
15	15	26	Br SiLo	36	YBr SiLo Grv
15	16	24	Br SiLo	34	YBr SiLo Grv
15	17	21	Br SiLo	31	YBr SiLo Grv
15	18	26	Br SiLo	36	YBr SiLo Grv
15	19	22	Br SiLo	32	YBr SiLo Grv
15	20	25	Br SiLo	35	YBr SiLo Grv
15	21	24	Br SiLo	34	YBr SiLo Grv
15	22	25	Br SiLo	35	YBr SiLo Grv
15	23	20	Br SiLo	30	YBr SiLo Grv
16	1	26	Br SiLo	36	YBr SiLo Grv
16	2	14	Br SiLo	24	YBr SiLo Grv
16	3	18	Br SiLo	28	YBr SiLo Grv
16	4	16	Br SiLo roots	26	YBr SiLo Grv
16	5	15	Br SiLo	25	YBr SiLo Grv
16	6	20	Br SiLo	30	YBr SiLo Grv
16	7	15	Br SiLo	25	YBr SiLo Grv
16	8	17	Br SiLo	27	YBr SiLo Grv
16	9	20	Br SiLo	30	YBr SiLo Grv
16	10	22	Br SiLo	32	YBr SiLo Grv
16	11	24	Br SiLo	34	YBr SiLo Grv
16	12	17	Br SiLo	27	YBr SiLo Grv
16	13	18	Br SiLo roots	28	YBr SiLo Grv
16	14	20	Br SiLo	30	YBr SiLo Grv
16	15	25	Br SiLo	35	YBr SiLo Grv
16	16	22	Br SiLo	32	YBr SiLo Grv
16	17	20	Br SiLo	30	YBr SiLo Grv
16	18	18	Br SiLo	28	YBr SiLo Grv
16	19	20	Br SiLo recent	30	YBr SiLo Grv
16	20	25	Br SiLo	35	YBr SiLo Grv
16	21	24	Br SiLo Grv	34	YBr SiLo Grv
16	22	25	Br SiLo	35	YBr SiLo Grv
16	23	14	Br SiLo	24	YBr SiLo Grv
16	1	15	Br SiLo S	25	YBr SiLo Grv
16	2	22	Br SiLo	32	YBr SiLo Grv
16	3	19	Br SiLo	29	YBr SiLo Grv
16	4	18	Br SiLo	28	YBr SiLo Grv
16	5	22	Br SiLo	32	YBr SiLo Grv
16	9	17	Br SiLo	27	YBr SiLo Grv
16	10	18	Br SiLo	28	YBr SiLo Grv
16	11	16	Br SiLo	26	YBr SiLo Grv
16	12	20	Br SiLo W	30	YBr SiLo Grv
16	13	15	Br SiLo	25	YBr SiLo Grv
16	14	16	Br SiLo roots	26	YBr SiLo Grv
16	15	19	Br SiLo	29	YBr SiLo Grv
16	16	12	Br SiLo	22	YBr SiLo Grv
17	17	16	Br SiLo	26	YBr SiLo Grv
17	18	20	Br SiLo roots	30	YBr SiLo Grv
17	19	18	Br SiLo	28	YBr SiLo Grv
17	20	19	Br SiLo	29	YBr SiLo Grv

Appendix C - Table 4: Subsurface Test Inventory.

Transect	ST	Horizon A depth (cmbs)	Horizon A soil/artifacts	Horizon B depth (cmbs)	Horizon B soil
17	21	22	Br SiLo roots	32	YBr SiLo Grv
17	22	20	Br SiLo roots	30	YBr SiLo Grv
17	23	24	Br SiLo roots	34	YBr SiLo Grv
17	1	20	Br SiLo S	30	YBr SiLo Grv
17	2	18	Br SiLo	28	YBr SiLo Grv
17	3	20	Br SiLo	30	YBr SiLo Grv
17	4	23	Br SiLo	33	YBr SiLo Grv
17	5	25	Br SiLo roots	35	YBr SiLo Grv
17	9	19	Br SiLo	29	YBr SiLo Grv
17	10	20	Br SiLo	30	YBr SiLo Grv
17	11	16	Br SiLo	26	YBr SiLo Grv
17	12	19	Br SiLo	29	YBr SiLo Grv
17	13	14	Br SiLo	24	YBr SiLo Grv
17	14	20	Br SiLo	30	YBr SiLo Grv
17	15	18	Br SiLo	28	YBr SiLo Grv
17	16	24	Br SiLo	34	YBr SiLo Grv
17	17	14	Br SiLo	24	YBr SiLo Grv
17	18	18	Br SiLo	28	YBr SiLo Grv
17	19	21	Br SiLo	31	YBr SiLo Grv
17	20	18	Br SiLo	28	YBr SiLo Grv
18	1	20	Br SiLo S	30	YBr SiLo Grv
18	2	18	Br SiLo	28	YBr SiLo Grv
18	3	20	Br SiLo	30	YBr SiLo Grv
18	4	23	Br SiLo	33	YBr SiLo Grv
18	5	25	Br SiLo roots	35	YBr SiLo Grv
19	1	20	Br SiLo	30	YBr SiLo Grv
19	2	22	Br SiLo	32	YBr SiLo Grv

Key: Br brown, Y yellow, SiLo silty loam, SnLo sandy loam, CiLo clay loam

Grv gravel / Rk rock / Urd disturbance, W- inundated, **BOLD** positive for pre-contact, historic & recent artifact.

Appendix D: Official Correspondence.

State Historic Preservation Office

New York State Office of Parks, Recreation and Historic

Preservation Human Remains Discovery Protocol

If human remains are encountered during construction or archaeological investigations, the New York State Historic Preservation Office (SHPO) recommends that the following protocol is implemented.

Human remains shall be treated with dignity and respect. Should human remains or suspected human remains be encountered, work in the general area of the discovery shall stop immediately and the location shall be secured and protected from damage and disturbance.

If skeletal remains are identified and the archaeologist is not able to conclusively determine if they are human, the remains and any associated materials shall be left in place. A qualified forensic anthropologist, bioarchaeologist, or physical anthropologist shall assess the remains in situ to help determine if they are human.

If the remains are determined to be human, law enforcement, the SHPO, the appropriate Indian Nations, and the involved state and federal agencies shall be notified immediately. If law enforcement determines that the burial site is not a criminal matter, no skeletal remains or associated materials shall be removed until appropriate consultation takes place.

If human remains are determined to be Native American, they shall be left in place and protected from further disturbance until a plan for their avoidance or removal is developed. Please note that avoidance is the preferred option of the SHPO and the Indian Nations. The involved agency shall consult SHPO and the appropriate Indian Nations to develop a plan of action. Photographs of Native American human remains and associated materials should not be taken without consulting with the involved Indian Nations.

If human remains are determined to be non-Native American, the remains shall be left in place and protected from further disturbance until a plan for their avoidance or removal is developed. Please note that avoidance is the preferred option of the SHPO. The involved agency shall consult SHPO and other appropriate parties to develop a plan of action.

The SHPO recommends that burial information is not released to the public to protect burial sites from possible looting.

Appendix I

Traffic Report



BERGMANN

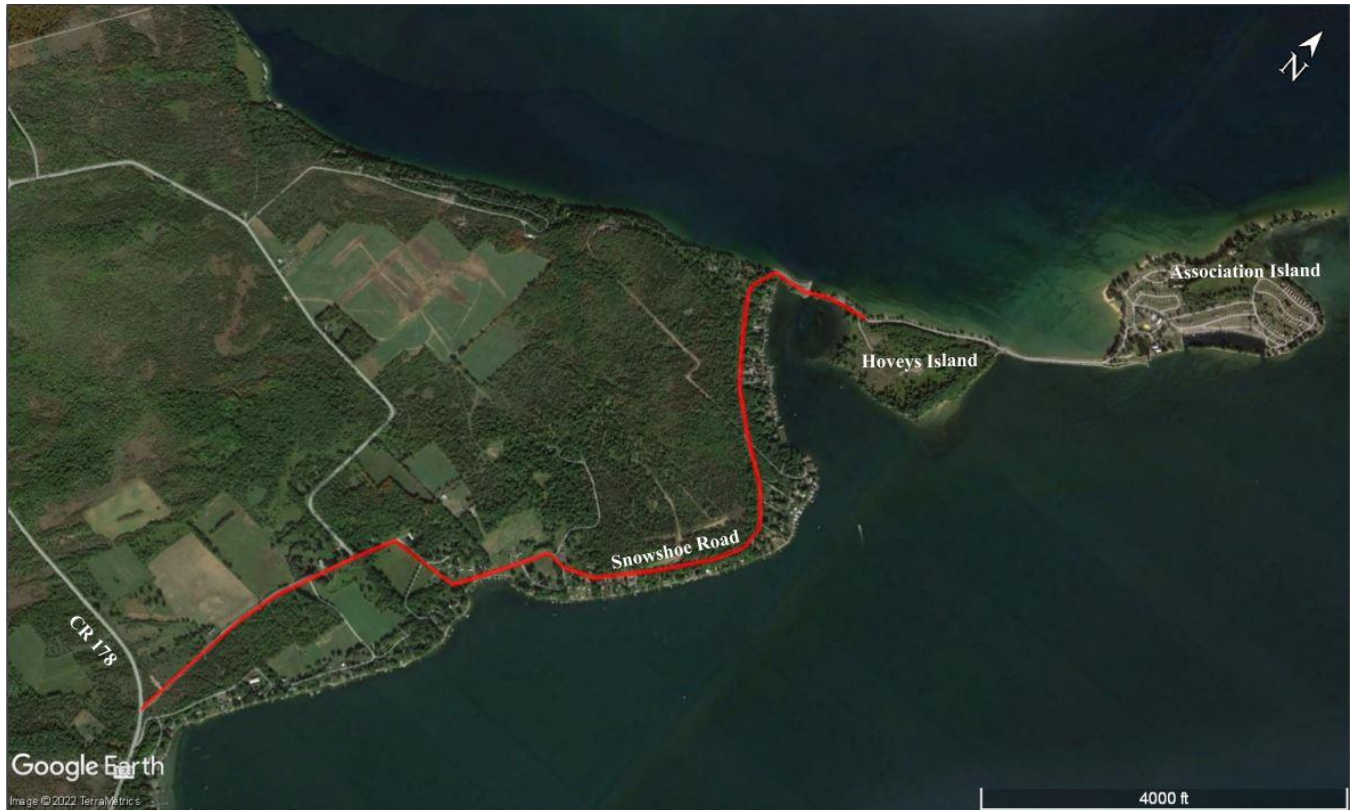
ARCHITECTS ENGINEERS PLANNERS

BERGMANN HAS JOINED COLLIERS ENGINEERING & DESIGN

Sun Communities Inc. Hovey's Island Traffic Study

SNOWSHOE ROAD, TOWN OF HENDERSON, NEW YORK

December 4, 2023



Bergmann

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Buffalo, NY 14202

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B Trip Generation

C Capacity Analysis



1.0 Introduction

Sun Communities Inc. Association Island, located in the Town of Henderson, New York, has plans for expanding its current 300 site campground with 117 new seasonal cabin sites on the adjacent Hoveys Island. Bergmann was retained to assess the existing traffic conditions along Snowshoe Road. Our sub consultant, Pittsford Traffic and Radar, conducted radar traffic data collection from August 25, 2022 through August 28, 2022. The radar unit was calibrated on site and verified to be accurate. The data collected includes traffic counts, classification studies, and speed studies on Snowshoe Road, which is the road used to access Association Island and Hoveys Island. Additional traffic data was collected from September 1, 2023 through September 4, 2023 by our sub consultant, The Traffic Group. This data includes traffic counts and classification studies on Snowshoe Road at the entrance to Hoveys Island and at the southern end of the roadway near CR 178. The detector location for each traffic data collection period can be seen in Appendix A.

Snowshoe Road begins at Jefferson County CR 178 (Military Road) and runs approximately 3 miles northeast to Association Island with a speed limit of 30 mph which begins 0.5 miles northeast of CR 178. The pavement width varies from 20 feet to 18 feet with approximately 2-foot gravel shoulders and is unstriped with numerous curves throughout the length. Snowshoe Road is primarily residential and serves waterfront properties on Lake Ontario and Henderson Harbor.

2.0 Snowshoe Road Existing Data

Based on the data received from Pittsford Traffic and Radar for August 2022, the Average Daily Traffic (ADT) for Snowshoe Road during the count period was 452 vehicles per day and the percentage of large vehicles was 18%. The count data collected in September 2023 showed that the ADT was 901 vehicles per day and the percentage of large vehicles was 16%. The traffic volume was presumably higher than the previous count period because it was collected during a peak season holiday around Labor Day weekend, as well as in the southern section of Snowshoe Road near CR 178 before any access to residential or recreational destinations.

Along with vehicle volumes, the vehicle classifications were also analyzed. Vehicles were classified using the Federal Highway Administration Classification Scheme F Report and categorized the data into four groups based on these classifications. This data was compiled into two categories: "cars" and "larger vehicles". "Cars" refer to motorcycles and other vehicles that are less than 30' in length. "Larger vehicles" include vehicles greater than 30' in length such as trucks and RVs. Figures 1a and 1b show the general daily totals counted throughout the study periods in August 2022 and September 2023, respectively, showing the difference between car travel and larger vehicle travel. This graph shows that car travel peaked on Saturday (Aug. 27th and Sept. 2nd) which is also the day that total vehicle volumes were highest. The volume of larger vehicles was higher on Thursday and Sunday in the typical summer weekend (Aug. 25th and 28th), and on Friday and Monday of the holiday Labor Day weekend (Sept. 1st and 4th).

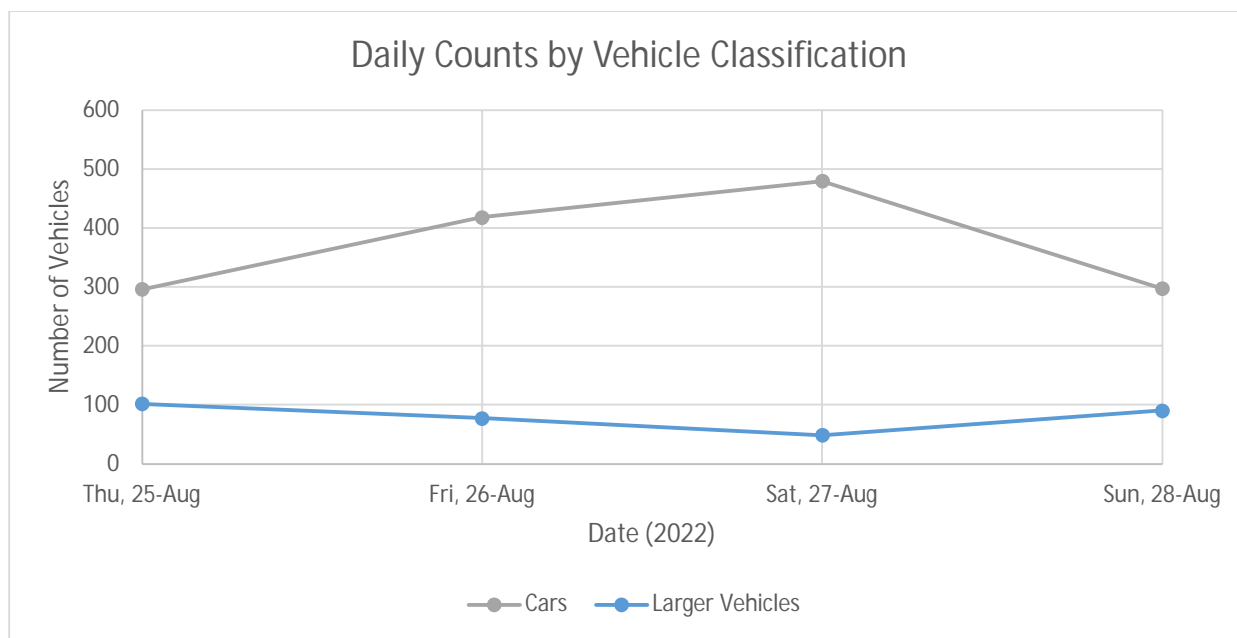


Figure 1a: Daily Traffic Counts by Vehicle Classification on Snowshoe Road from 8/25/22-8/28/22

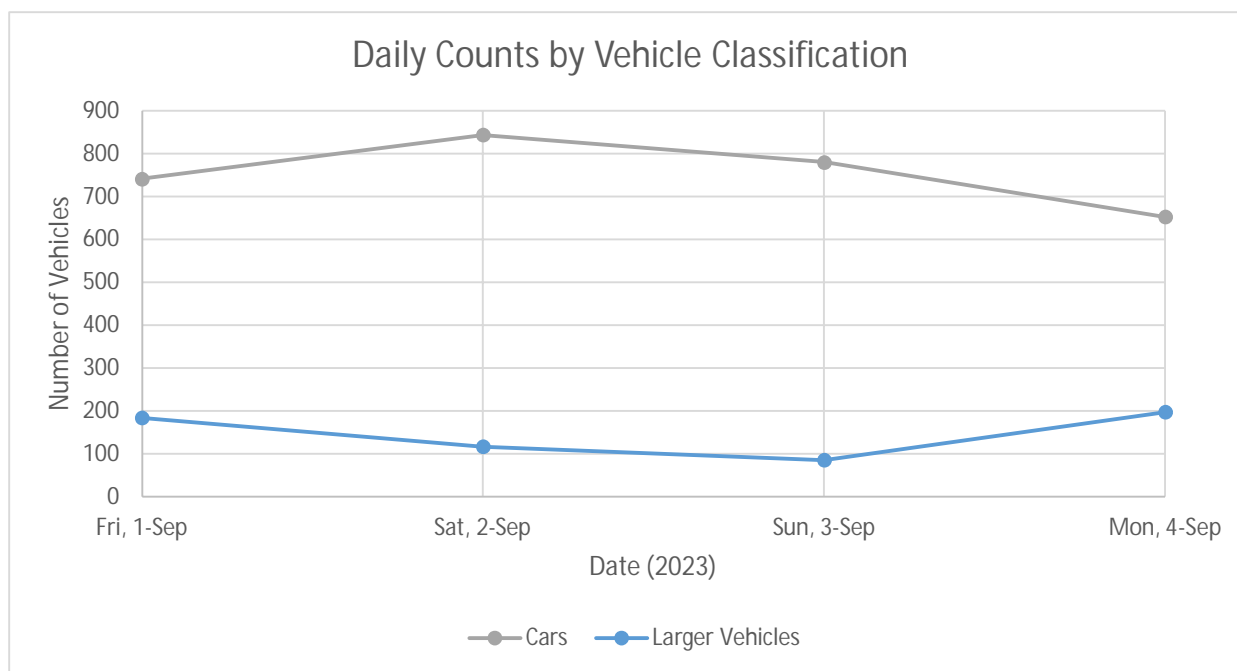


Figure 1b: Daily Traffic Counts by Vehicle Classification on Snowshoe Road from 9/1/23-9/4/23

Figure 2a below shows the average hourly traffic counts by vehicle classification for the August 2022 study period. This graph generally shows that the overall peak traffic for all vehicle types is spread throughout the middle of the day, but the peak hour for cars occurred between 12:00 pm and 1:00 pm. The average peak hour for all vehicles occurred from 10:30 am to 11:30 am, and this is also the peak hour for larger vehicles. Larger vehicle volumes were lower during the car peak but spread out mostly between 9:00 am to 12:00 pm and 2:00 pm to 4:00 pm.



Figure 2b below shows the average hourly traffic counts by vehicle classification for the September 2023 study period around the Labor Day holiday weekend. Similar to the August 2022 study period, this graph generally shows that the overall peak traffic for all vehicle types is spread throughout the middle of the day and the peak hour for cars occurred between 12:00 pm and 1:00 pm. The average peak hour for all vehicles occurred from 12:00 pm to 1:00 pm, and the peak hour for larger vehicles was between 10:00 am and 11:00 am. Larger vehicle volumes were spread out mostly between 9:00 am to 5:00 pm.

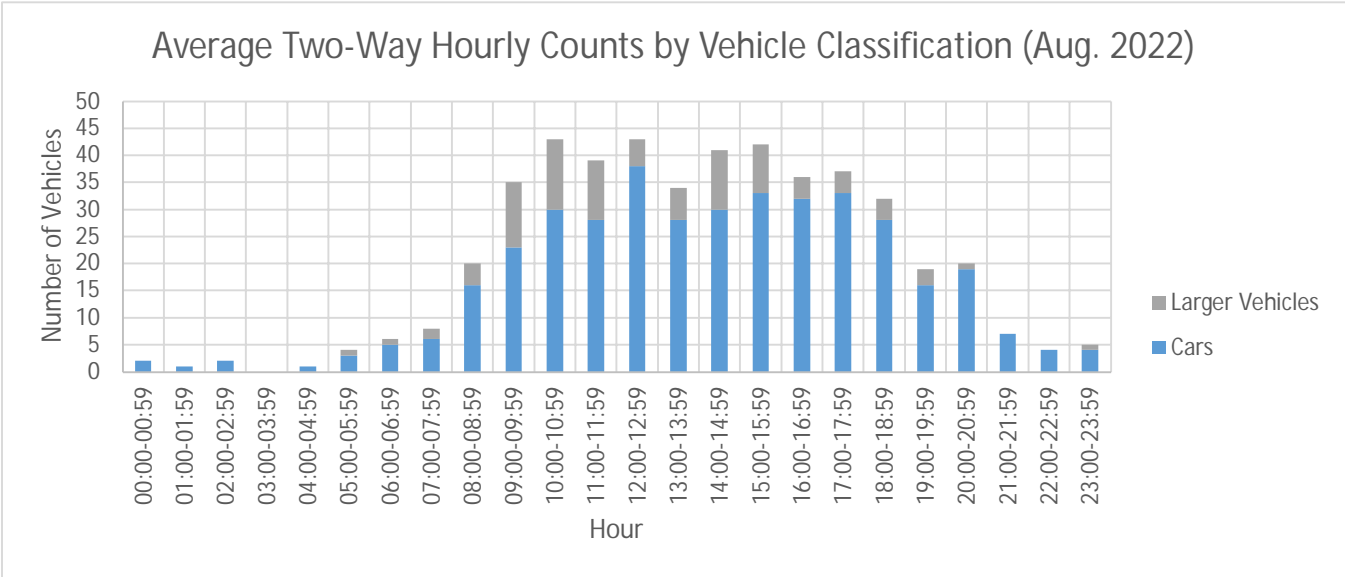


Figure 2a: Average Hourly Counts by Vehicle Classification on Snowshoe Road from 8/25/22-8/28/22

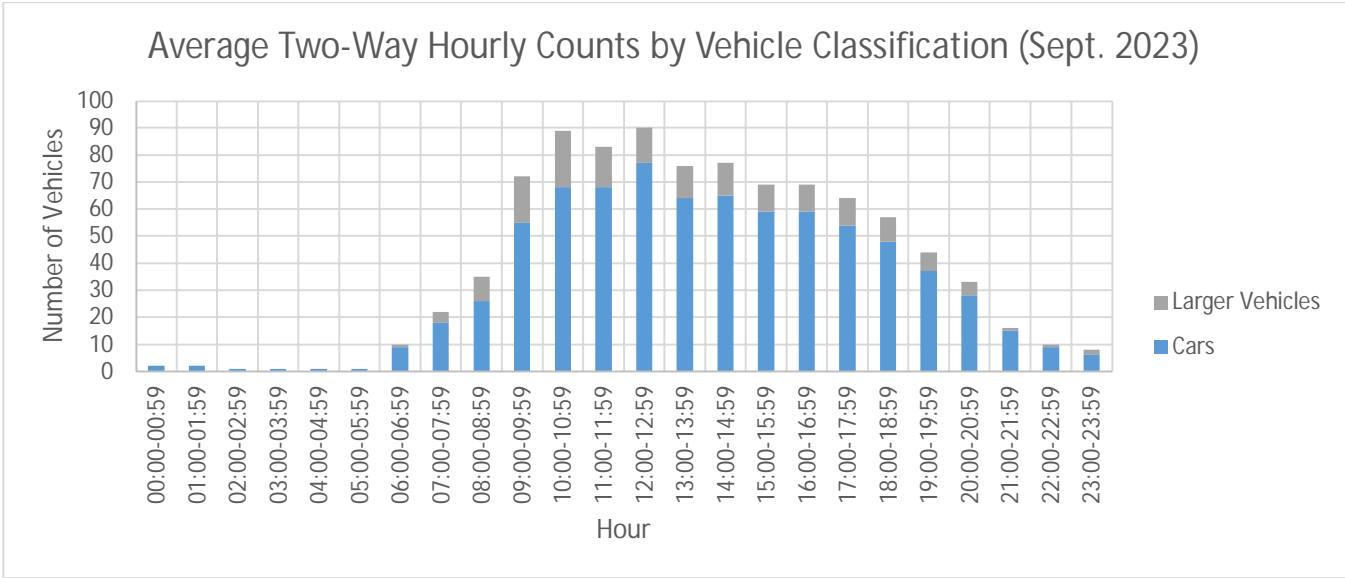


Figure 2b: Average Hourly Counts by Vehicle Classification on Snowshoe Road from 9/1/23-9/4/23

On Saturday, which was the day during both study periods with the highest daily traffic volume, the peak hour during the August 2022 count period was 12:15 pm to 1:15 pm with 67 vehicles per hour. This is equivalent to



approximately 1 vehicle per minute or 54 seconds between vehicles traveling on Snowshoe Road. During the September 2023 Labor Day count period, the Saturday peak hour was 11:30 am to 12:30 pm with 117 vehicles per hour which is about 2 vehicles per minute or 31 seconds between vehicles on Snowshoe Road.

Along with vehicle counts and classifications, vehicle speed data was also collected during the August 2022 study period. Based on the data received, the overall daily average speed on Snowshoe Road is 27.4 miles per hour while the average daily 85th percentile speed (i.e., the speed that 85% of the vehicles measured were travelling at or below) is 30.3 miles per hour. Figure 3 shows the average hourly speeds for each hour of the day. There are periods when traffic speeds are higher but there was a small number of vehicles that were above the speed limit. In addition, the average and 85th percentile speeds are close to or below the posted speed limit throughout most of the day.

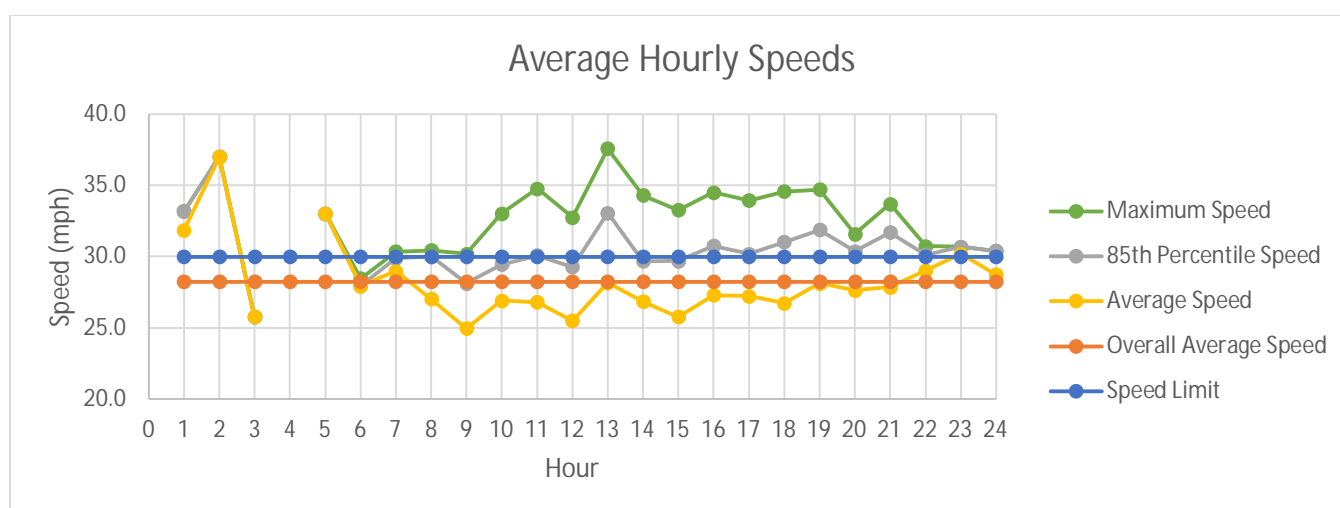


Figure 3: Average Hourly Speeds on Snowshoe Road from 8/25/22-8/28/22

To determine what proportion of the existing traffic on Snowshoe Road is traveling to and from the current 300 site campground on Association Island, traffic volume data was collected at the northern end of Snowshoe Road during the September 1st through September 4th, 2023 study period. The Average Daily Traffic (ADT) was 419 vehicles per day at the entrance to Hoveys Island and Association Island, which was 47% of the total ADT on Snowshoe Road (901 vehicles per day). Larger vehicles accounted for 26% of the ADT at this count location, and 73% of the larger vehicles on Snowshoe Road traveled to or from Hoveys Island and Association Island.

Figure 4 below shows the average hourly traffic counts by vehicle classification for the September 2023 study period at the entrance to Hoveys Island. Similar to the August 2022 and September 2023 study period counts located further south on Snowshoe Road, this graph generally shows that the overall peak traffic for all vehicle types is spread throughout the middle of the day. However, the volumes were lower around 12:00 pm and 1:00 pm, which was during the peak hour for other locations on Snowshoe Road. The average peak hour for all vehicles occurred from 10:00 am to 11:00 am, and this is also the peak hour for larger vehicles. Car volumes were spread out mostly between 9:00 am and 8:00 pm, with an average peak hour of 2:00 pm to 3:00 pm.

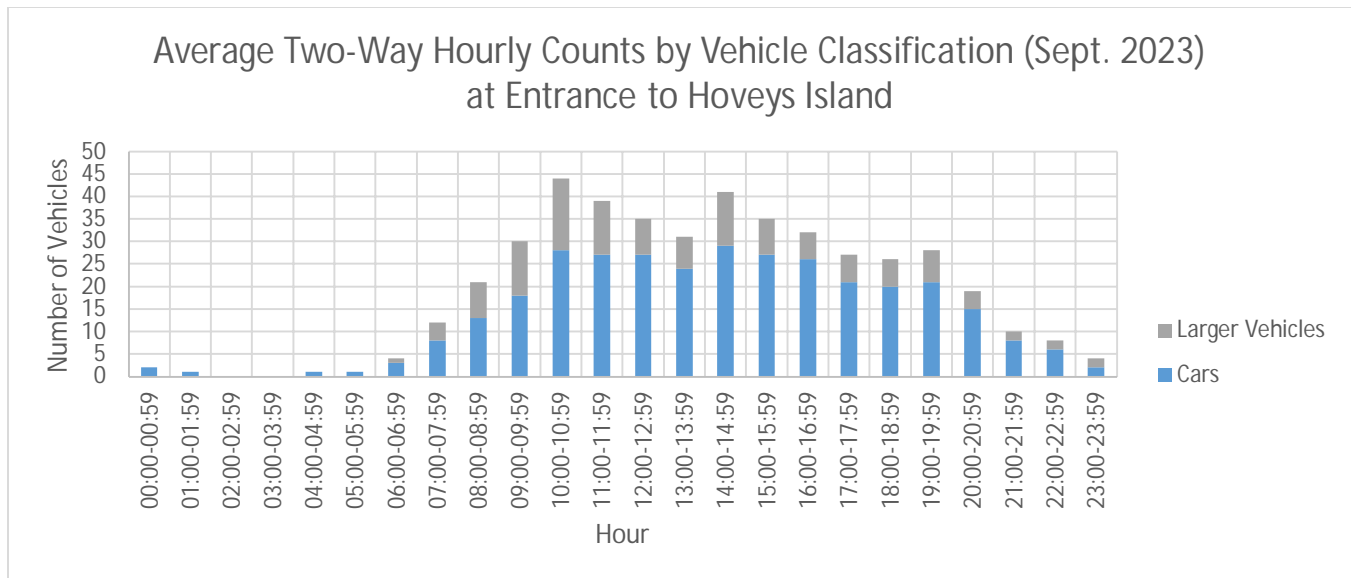


Figure 4: Average Hourly Counts by Vehicle Classification on Snowshoe Road at Hoveys Island from 9/1/23-9/4/23

For the study period from September 1st – 4th, 2023, the average count volumes at the entrance to Hoveys Island and Association Island were compared to the total counts on Snowshoe Road collected near CR 178 (Military Road). Vehicles traveling to and from Hoveys Island and Association Island accounted for 47% of the average daily traffic (47% southbound, 46% northbound). Figure 5 below shows the average hourly counts at Hoveys Island and the remaining volume that had an origin or destination at other locations along Snowshoe Road. The graph generally shows that about half of the traffic was traveling to Hoveys Island and Association Island throughout most of the day, with larger proportions of the total traffic in the morning (8:00 am to 9:00 am) and evening (7:00 pm to 11:00 pm). During the average Snowshoe Road peak hour from 12:00 pm to 1:00 pm, 61% of the vehicles traveled to or from another destination along Snowshoe Road.

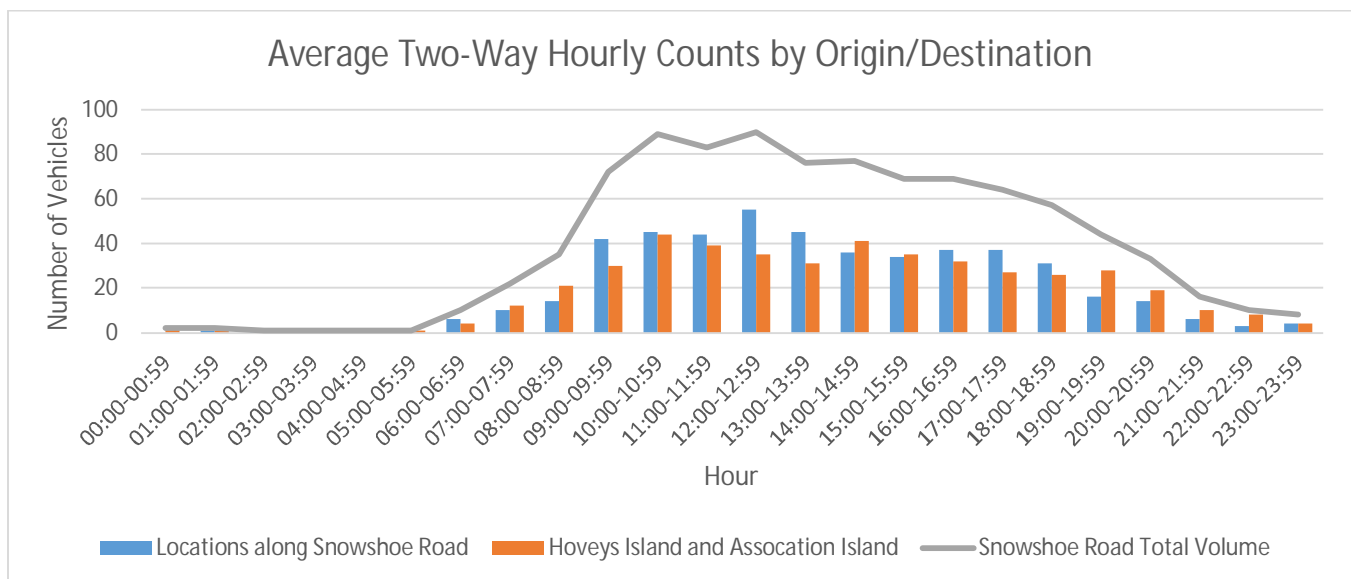


Figure 5: Average Hourly Counts by Origin/Destination from 9/1/23-9/4/23



3.0 Future Traffic Projections

Based on the data collected from the study period, as well as information provided by Sun Communities, the existing average, existing peak, and future peak traffic volumes were approximated for Snowshoe Road. The 11th edition of the ITE Trip Generation Manual (latest edition – 2021) was used to determine the trip generation entering and exiting trips estimate for the proposed seasonal use cabins on Hoveys Island (ITE Land Use Code 260 – Recreational Homes). A summary of trip generation for the site is shown in Table 1. While the expected trips to be generated by the proposed cabins is highest on Sunday, the Saturday mid-day peak hour was analyzed because the existing volumes on Snowshoe Road are higher on Saturday than Sunday. Based on the trip generation rates, there is expected to be an average of 72 additional vehicles traveling on Snowshoe Road during the Saturday mid-day peak hour, which is a 62% increase from the existing peak hour volume of 117 vehicles during the peak holiday weekend.

Table 1: Trip Generation

TRIPS GENERATED DURING THE:		WEEKDAY PM PEAK HOUR	SATURDAY MID-DAY PEAK HOUR	SUNDAY MID-DAY PEAK HOUR
LAND USE	SIZE	TOTAL VEHICLE TRIPS		
Recreational Homes (ITE Land Use Code 260)	117 Units	39 (453 weekday daily trips)	72 (550 Saturday daily trips)	88 (434 Sunday daily trips)

Data received from Sun Communities Inc. for the study period during August 2022 showed that occupancy at the existing Association Island RV park was 48.37% (about 145 sites) with 24 sites being long term occupancy and about 121 being daily or weekly sites. This was assumed to be representative of a typical summer weekend based on average weekend occupancy between June and September. [Data received by Sun Communities Inc. during the September 2023 count period showed that the peak occupancy was 65.85% \(about 209 sites\). This is typical of the holiday weekend occupancy observed in recent years for Association Island, as well as throughout the campground and RV park industry. The ITE Trip Generation Manual 11th Edition has limited data for RV parks of a similar size and none in New York; however, the projected trips generated based on full occupancy of the existing Association Island RV park was evaluated and determined to be comparable to the actual counts in the Labor Day weekend. Therefore, the local data for the existing RV Park is considered more accurate and the traffic count data collected around the Labor Day holiday weekend in September 2023 was assumed to represent peak season volumes on Snowshoe Road. The estimated trip generation that would result from the Hoveys Island cabins was added to the average and peak season traffic, as shown in Figure 6 below.](#)

Based on the additional trips projected to be generated by the Hovey's Island cabins, there would be approximately 72 more vehicles traveling on Snowshoe Road during the Saturday peak hour, which is about 189 vehicles per hour on the peak weekends of the season such as Labor Day. [This is equivalent to approximately 3 vehicles per minute or about 19 seconds between vehicles traveling on Snowshoe Road.](#) When the expected trips generated are added to the average typical weekend volumes, there are expected to be about 139 vehicles per hour during the Saturday peak hour. There is not anticipated to be an increase to large vehicles on Snowshoe Road due to the addition of seasonal use cabins on Hovey's Island, as there are no RV spaces.



When evaluating average daily traffic (ADT), the ITE Trip Generation results show that there are expected to be approximately 479 daily trips generated by the proposed Hovey's Island cabins (average of weekday, Saturday, and Sunday trips in Table 1). During the peak holiday weekends, there would be 1,380 vehicles per day on Snowshoe Road, which is a 53% percent increase above the existing 901 vehicles per day ADT on the holiday weekend.

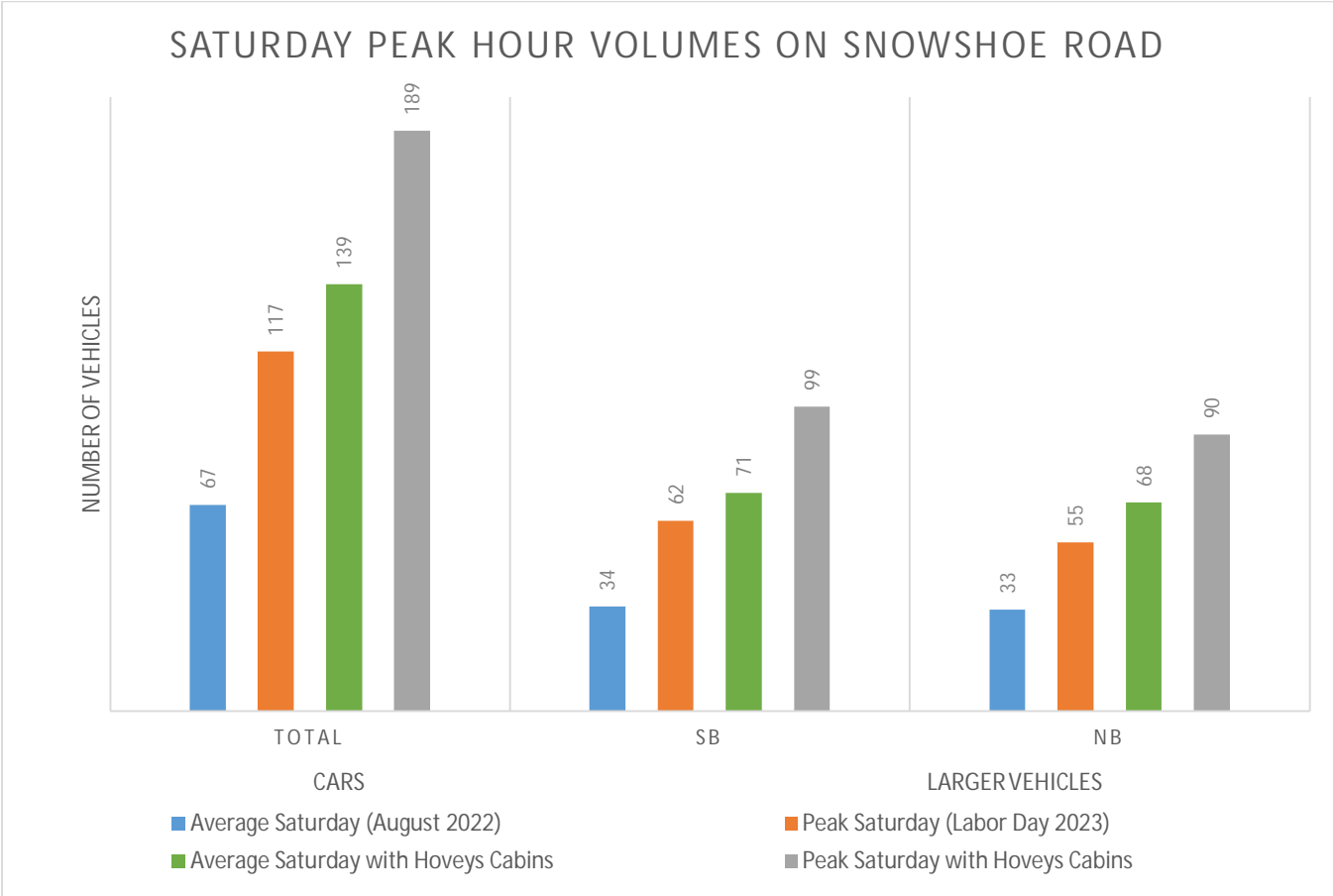


Figure 6: Saturday Peak Hour Traffic on Snowshoe Road

4.0 Recommendations

The increased traffic on Snowshoe Road generated by the Hoveys Island cabin development does not exceed the standard threshold for capacity. Based on guidelines in the Highway Capacity Manual (HCM) and NCHRP Report 825, Planning and Preliminary Engineering Applications Guide to the Highway Capacity Manual, the daily capacity for a two-lane roadway is approximately 24,900 vehicles per day and 7,100 vehicles per day for a Level of Service of C or better. The peak weekend average daily traffic on Snowshoe Road with the future traffic from the Hoveys Island cabins is approximately 1,380 vehicles per day in both directions, which is about 5.5% of the standard roadway capacity. These capacity thresholds assume ideal roadway conditions; however, Snowshoe Road is narrow



with 18-20 feet pavement width and about 2-foot shoulders and no striping. If Snowshoe Road is conservatively assumed to have half the capacity of rural two-lane road with ideal conditions, the anticipated future peak volumes based on our data is still well under the capacity threshold.

Per the HCM 7th Edition, the hourly capacity of a two-lane highway segment is 1,700 vehicles per hour per lane, under base/ideal conditions including 12-foot lanes, level terrain, and a straight alignment. The Level of Service (LOS) for an uninterrupted two-lane highway facility (i.e., no signals or stop control within the segment) is not solely based on capacity and the HCM methodology does not produce a capacity adjusted for actual roadway conditions. However, based on engineering judgement and an iterative analysis in the Highway Capacity Software 7th Edition (HCS7) (i.e., increasing volume until the volume to capacity ratio equals 1.0), the adjusted capacity is assumed as about 1,490 vehicles per hour per lane. The projected peak hour volume on Snowshoe Road on a peak season Saturday with the addition of Hovey's Island cabins is 189 vehicles per hour total and 99 vehicles per hour in the peak direction. This is significantly less than the expected capacity of Snowshoe Road at about 6.6% of the adjusted capacity.

Preliminary capacity analysis for Snowshoe Road completed in HCS7 is included in Appendix C. This analysis was conducted for the Saturday peak hour volumes collected during the holiday peak season weekend, as well as the projected peak Saturday with Hovey's Island Cabins. This preliminary analysis for Snowshoe Road shows a projected Level of Service (LOS) of B for the Saturday peak hour during the peak holiday weekend. [Synchro](#) software was used to conduct a preliminary intersection capacity analysis. Along Snowshoe Road, an intersection with a driveway was modeled to evaluate the impact of a resident turning left out of their driveway across both lanes of traffic. On the holiday peak season Saturday with the addition of Hovey's Island Cabins, the driveway LOS is expected to be A with a delay of 9.6 seconds per vehicle, compared to 9.2 seconds per vehicle without the development traffic. The unsignalized intersection of Snowshoe Road at Military Road was also analyzed, which shows an expected LOS of A for the intersection. The average delay per vehicle at the intersection is anticipated to increase from 4.2 seconds to 4.9 seconds per vehicle. The full Synchro reports are included in Appendix C.

While the existing two-way two-lane roadway is expected to have sufficient capacity for the existing and future traffic volumes, the pavement width does not meet NYSDOT standard criteria. Based on NYSDOT Highway Design Manual (HDM) Chapter 2, a local rural road with a design speed of 40 mph or less and average daily traffic (ADT) between 400 and 2,000 vehicles per day should have travel lane widths of 10 feet and shoulder widths of 4 feet. The existing pavement width varies from 20 feet to 18 feet with 2-foot gravel shoulders and does not meet this criteria. To meet NYSDOT design criteria, Snowshoe Road would need to be widened to a total width of 28 feet. [However, widening the roadway could have impacts on existing features such as driveways, trees, and parking, as well as the financial costs of road reconstruction and potential right-of-way acquisitions. In addition, according to the Highway Capacity Manual and Federal Highway Administration, wider lanes and shoulders can also lead to increased vehicle speeds.](#)

During our review of the area, we noted and would recommend the following improvements to Snowshoe Road.

1. There are two speed limit signs per direction on the entirety of Snowshoe Road. Per the New York State Supplement to the Manual on Uniform Traffic Control Devices (MUTCD), the first intermediate speed limit sign should be placed a maximum of 1100 feet from the initial speed limit sign. The spacing between subsequent intermediate signs should not exceed the distance produced by multiplying the speed limit



(in miles per hour) by 100, which would be 3000 feet in this case. The current spacing between the signs does not meet these standards.

2. To address the issue of vehicle speed and pedestrians along Snowshoe Road, we recommend increasing the number of speed limit signs to be in accordance with the NYS Supplement to the MUTCD. Figure 5 below shows the recommended location of speed limit signs.
3. Also, it is recommended that additional Pedestrian warning signs be added along Snowshoe Road to bring awareness to motorists of pedestrians along the road.



Figure 5: Recommended Speed Limit Signs on Snowshoe Road

Sun Communities Inc. Hovey's Island Traffic Study
SNOWSHOE ROAD, TOWN OF HENDERSON, NEW YORK

APPENDIX A

Traffic Count Locations

Hovey's Island

Snowshoe Road Traffic Count Locations



Association Island

Traffic Count: 09/2023
Hovey's Island

Traffic Count: 08/2022

Traffic Count: 09-2023

Snowshoe Rd @ Military Rd

178

Google Earth

Image © 2023 TerraMetrics
Image NOAA



5000 ft

Sun Communities Inc. Hovey's Island Traffic Study
SNOWSHOE ROAD, TOWN OF HENDERSON, NEW YORK

APPENDIX B

Trip Generation

Hoveys Island Cabins

Trip Generation (using ITE Trip Generation 11th Edition)

Weekday AM peak hour

LU Code	Description	Rate/Unit	Size	Trips	% In	In	Out
260	Recreational Homes	equation	117 Units	25	55	14	11
Total Trips				25		14	11

Weekday PM peak hour

LU Code	Description	Rate/Unit	Size	Trips	% In	In	Out
260	Recreational Homes	equation	117 Units	39	46	18	21
Total Trips				39		18	21

Saturday Mid-Day peak hour

LU Code	Description	Rate/Unit	Size	Trips	% In	In	Out
260	Recreational Homes	equation	117 Units	72	48	35	37
Total Trips				72		35	37

Sunday Mid-Day peak hour

LU Code	Description	Rate/Unit	Size	Trips	% In	In	Out
260	Recreational Homes	equation	117 Units	88	42	37	51
Total Trips				88		37	51

Weekday (full day)

LU Code	Description	Rate/Unit	Size	Trips	% In	In	Out
260	Recreational Homes	equation	117 Units	453	50	227	226
Total Trips				453		227	226

Saturday (full day)

LU Code	Description	Rate/Unit	Size	Trips	% In	In	Out
260	Recreational Homes	equation	117 Units	550	50	275	275
Total Trips				550		275	275

Sunday (full day)

LU Code	Description	Rate/Unit	Size	Trips	% In	In	Out
260	Recreational Homes	equation	117 Units	434	50	217	217
Total Trips				434		217	217

1. The calculations are based on the number of dwelling units as the independent variable, based on rates and equations in the ITE Trip Generation 11th Edition manual.

Sun Communities Inc. Hovey's Island Traffic Study
SNOWSHOE ROAD, TOWN OF HENDERSON, NEW YORK

APPENDIX C

Capacity Analysis

Phone: Fax:
E-Mail:

-----Directional Two-Lane Highway Segment Analysis-----

Analyst C Bentley
Agency/Co. Colliers Engineering & Design
Date Performed 10/11/2023
Analysis Time Period Saturday Midday Peak Existing (Peak Holiday Weekend)
Highway Snowshoe Rd
From/To CR 178 to Hoveys Island
Jurisdiction Henderson, NY
Analysis Year 2023
Description Hoveys Island Traffic Study

-----Input Data-----

Highway class	Class 2	Peak hour factor, PHF	0.88
Shoulder width	0.0 ft	% Trucks and buses	0 %
Lane width	9.0 ft	% Trucks crawling	0.0 %
Segment length	2.2 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Rolling	% Recreational vehicles	17 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 62 veh/h
Opposing direction volume, Vo 55 veh/h

-----Average Travel Speed-----

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	2.7	2.7
PCE for RVs, ER	1.1	1.1
Heavy-vehicle adj. factor, (note-5) fHV	0.983	0.983
Grade adj. factor, (note-1) fg	0.67	0.67
Directional flow rate, (note-2) vi	107 pc/h	95 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed, (note-3) S FM	-	mi/h
Observed total demand, (note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed, (note-3) BFFS	45.0	mi/h (Min. for HCS Two-Lane Hwy)
Adj. for lane and shoulder width, (note-3) fLS	6.4	mi/h
Adj. for access point density, (note-3) fA	2.0*	mi/h
Free-flow speed, FFSd	36.6	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSD	33.3	mi/h
Percent Free Flow Speed, PFFS	91.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.9	1.9
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor, (note-1) fg	0.73	0.73
Directional flow rate, (note-2) vi	97 pc/h	86 pc/h
Base percent time-spent-following, (note-4) BPTSFd	11.3 %	
Adjustment for no-passing zones, fnp	49.9	
Percent time-spent-following, PTSFd	37.7 %	

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.04	
Peak 15-min vehicle-miles of travel, VMT15	39	veh-mi
Peak-hour vehicle-miles of travel, VMT60	136	veh-mi
Peak 15-min total travel time, TT15	1.2	veh-h
Capacity from ATS, CdATS	1671	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.3	mi/h
Percent time-spent-following, PTSFd (from above)	37.7	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	30
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	70.5
Effective width of outside lane, We	15.21
Effective speed factor, St	3.39
Bicycle LOS Score, BLOS	3.22
Bicycle LOS	C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

-----Directional Two-Lane Highway Segment Analysis-----

Analyst C Bentley
Agency/Co. Colliers Engineering & Design
Date Performed 10/11/2023
Analysis Time Period Saturday Midday Peak (Peak Holiday Weekend w/Hovey's Cabins)
Highway Snowshoe Rd
From/To CR 178 to Hoveys Island
Jurisdiction Henderson, NY
Analysis Year 2023
Description Hoveys Island Traffic Study

-----Input Data-----

Highway class	Class 2	Peak hour factor, PHF	0.88
Shoulder width	0.0 ft	% Trucks and buses	0 %
Lane width	9.0 ft	% Trucks crawling	0.0 %
Segment length	2.2 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Rolling	% Recreational vehicles	17 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 99 veh/h
Opposing direction volume, Vo 90 veh/h

-----Average Travel Speed-----

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	2.6	2.7
PCE for RVs, ER	1.1	1.1
Heavy-vehicle adj. factor, (note-5) fHV	0.983	0.983
Grade adj. factor, (note-1) fg	0.68	0.67
Directional flow rate, (note-2) vi	168 pc/h	155 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed, (note-3) S FM	-	mi/h
Observed total demand, (note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed, (note-3) BFFS	45.0	mi/h (Min. for HCS Two-Lane Hwy)
Adj. for lane and shoulder width, (note-3) fLS	6.4	mi/h
Adj. for access point density, (note-3) fA	2.0*	mi/h
Free-flow speed, FFSd	36.6	mi/h
Adjustment for no-passing zones, fnp	2.5	mi/h
Average travel speed, ATSD	31.6	mi/h
Percent Free Flow Speed, PFFS	86.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.8	1.8
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor, (note-1) fg	0.74	0.73
Directional flow rate, (note-2) vi	152 pc/h	140 pc/h
Base percent time-spent-following, (note-4) BPTSFd	17.0 %	
Adjustment for no-passing zones, fnp	54.3	
Percent time-spent-following, PTSFd	45.3 %	

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.07	
Peak 15-min vehicle-miles of travel, VMT15	62	veh-mi
Peak-hour vehicle-miles of travel, VMT60	218	veh-mi
Peak 15-min total travel time, TT15	2.0	veh-h
Capacity from ATS, CdATS	1671	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.6	mi/h
Percent time-spent-following, PTSFd (from above)	45.3	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	30
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	112.5
Effective width of outside lane, We	13.55
Effective speed factor, St	3.39
Bicycle LOS Score, BLOS	3.70
Bicycle LOS	D

Notes:




1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCM 6th TWSC

2: Military Rd (CR 178) & Snowshoe Rd

11/18/2023

Intersection						
Int Delay, s/veh	4.2					
Movement	SBL	SBR	SEL	SET	NWT	NWR
Lane Configurations						
* Traffic Vol, veh/h	43	19	16	26	26	39
Future Vol, veh/h	43	19	16	26	26	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	17	17	17	13	13	17
Mvmt Flow	47	21	17	28	28	42

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	111	49	70
Stage 1	49	-	-
Stage 2	62	-	-
Critical Hdwy	6.57	6.37	4.27
Critical Hdwy Stg 1	5.57	-	-
Critical Hdwy Stg 2	5.57	-	-
Follow-up Hdwy	3.653	3.453	2.353
Pot Cap-1 Maneuver	851	979	1441
Stage 1	936	-	-
Stage 2	924	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	841	979	1441
Mov Cap-2 Maneuver	841	-	-
Stage 1	925	-	-
Stage 2	924	-	-

Approach	SB	SE	NW
HCM Control Delay, s	9.4	2.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SBLn1
Capacity (veh/h)	-	-	1441	-	879
HCM Lane V/C Ratio	-	-	0.012	-	0.077
HCM Control Delay (s)	-	-	7.5	0	9.4
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	-	0.2




*Note: Turning movement counts were not available for this intersection. Existing peak volumes counted on Snowshoe Road and nearby peak hour volumes from NYSDOT Traffic Data Viewer on Military Road were used. Assume 70% of traffic on Snowshoe Road traveling to/from the east (Military Road toward Henderson, NY) and 30% to/from the west on Military Road. Added counted Snowshoe Road volumes to Military Road data for a conservative analysis (i.e., some of the volume on Military Road was double counted as it was also captured in Snowshoe Road count volumes).

HCM 6th TWSC
8: Snowshoe Rd & Driveway

11/18/2023

Intersection

Int Delay, s/veh 0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	55	0	0	62
Future Vol, veh/h	1	0	55	0	0	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	17	2	2	17
Mvmt Flow	1	0	60	0	0	67

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	127	60	0
Stage 1	60	-	-
Stage 2	67	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	868	1005	1544
Stage 1	963	-	-
Stage 2	956	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	868	1005	1544
Mov Cap-2 Maneuver	868	-	-
Stage 1	963	-	-
Stage 2	956	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	868	1544
HCM Lane V/C Ratio	-	-	0.001	-
HCM Control Delay (s)	-	-	9.2	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

HCM 6th TWSC

2: Military Rd (CR 178) & Snowshoe Rd

11/18/2023

Intersection

Int Delay, s/veh 4.9

Movement

SBL SBR SEL SET NWT NWR

Lane Configurations 

* Traffic Vol, veh/h 69 30 27 26 26 63

Future Vol, veh/h 69 30 27 26 26 63

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Stop Stop Free Free Free Free

RT Channelized - None - None - None

Storage Length - - - - -

Veh in Median Storage, # 0 - - 0 0 -

Grade, % 0 - - 0 0 -

Peak Hour Factor 92 92 92 92 92 92

Heavy Vehicles, % 17 17 17 13 13 17

Mvmt Flow 75 33 29 28 28 68

Major/Minor

Minor2 Major1 Major2

Conflicting Flow All 148 62 96 0 - 0

Stage 1 62 - - - - -

Stage 2 86 - - - - -

Critical Hdwy 6.57 6.37 4.27 - - -

Critical Hdwy Stg 1 5.57 - - - - -

Critical Hdwy Stg 2 5.57 - - - - -

Follow-up Hdwy 3.653 3.453 2.353 - - -

Pot Cap-1 Maneuver 810 962 1409 - - -

Stage 1 924 - - - - -

Stage 2 901 - - - - -

Platoon blocked, % - - -

Mov Cap-1 Maneuver 793 962 1409 - - -

Mov Cap-2 Maneuver 793 - - - - -

Stage 1 905 - - - - -

Stage 2 901 - - - - -

Approach

SB SE NW

HCM Control Delay, s 9.9 3.9 0

HCM LOS A

Minor Lane/Major Mvmt

NWT NWR SEL SET SBLn1

Capacity (veh/h) - - 1409 - 838

HCM Lane V/C Ratio - - 0.021 - 0.128

HCM Control Delay (s) - - 7.6 0 9.9

HCM Lane LOS - - A A A

HCM 95th %tile Q(veh) - - 0.1 - 0.4




*Note: Turning movement counts were not available for this intersection. Existing peak volumes counted on Snowshoe Road and nearby peak hour volumes from NYSDOT Traffic Data Viewer on Military Road were used. Assume 70% of traffic on Snowshoe Road traveling to/from the east (Military Road toward Henderson, NY) and 30% to/from the west on Military Road. Added counted Snowshoe Road volumes to Military Road data for a conservative analysis (i.e., some of the volume on Military Road was double counted as it was also captured in Snowshoe Road count volumes).

HCM 6th TWSC
8: Snowshoe Rd & Driveway

11/18/2023

Intersection

Int Delay, s/veh 0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	90	0	0	99
Future Vol, veh/h	1	0	90	0	0	99
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	17	2	2	17
Mvmt Flow	1	0	98	0	0	108

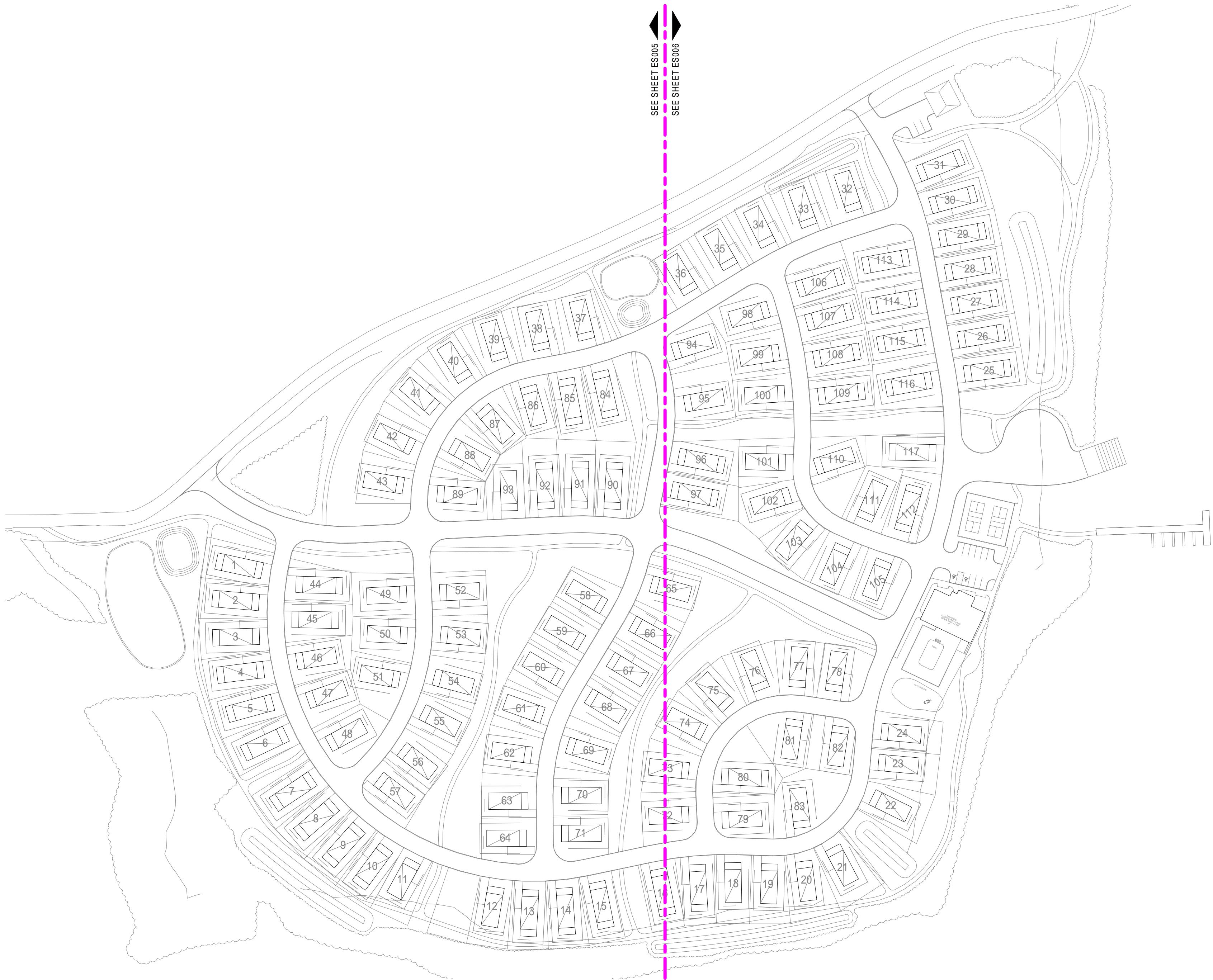
Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	206	98	0
Stage 1	98	-	-
Stage 2	108	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	782	958	-
Stage 1	926	-	-
Stage 2	916	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	782	958	-
Mov Cap-2 Maneuver	782	-	-
Stage 1	926	-	-
Stage 2	916	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	782	1495
HCM Lane V/C Ratio	-	-	0.001	-
HCM Control Delay (s)	-	-	9.6	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Appendix J

Photometric Lighting Levels Plans



1 OVERALL PHOTOMETRIC SITE PLAN
SCALE : 1" = 100'-0"

SUN COMMUNITIES

HOVEYS ISLAND

TOWN OF HENDERSON
JEFFERSON COUNTY
NEW YORK

Date Revised	Description
--------------	-------------

NOT FOR
CONSTRUCTION
60% SUBMISSION

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Landscape Architects & Surveyors, D.P.C.

Project Manager R. DARLING, PE	Discipline Lead A. ROBINSON, PE
Designer G. ANSCHUTZ-CEJA	Reviewer R. DARLING, PE
Date Issued 7/6/2023	Project Number 15347.00

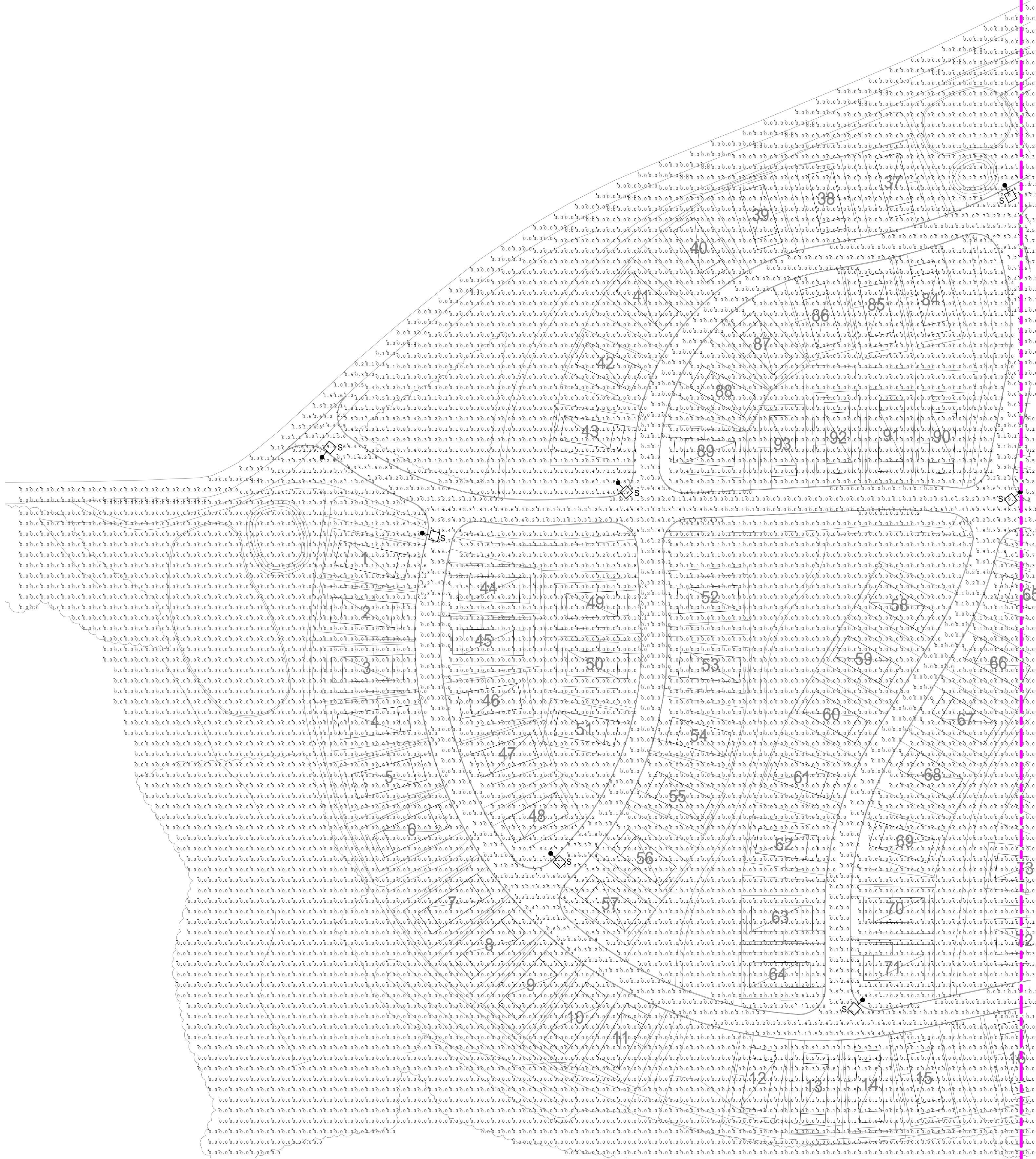
Sheet Name

PHOTOMETRIC SITE
PLAN

Drawing Number

ES004

SEE SHEET ES006



1 PHOTOMETRIC SITE PLAN I
SCALE: 1" = 60'-0"

CALCULATION SUMMARY						
AREA	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
GENERAL SITE	Fc	0.13	13.6	0.0	N.A.	N.A.
PUBLIC ROAD	Fc	0.10	4.3	0.0	N.A.	N.A.
ROADS	Fc	1.35	13.1	0.0	N.A.	N.A.

B

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SUN
COMMUNITIES

HOVEYS ISLAND

TOWN OF HENDERSON
JEFFERSON COUNTY
NEW YORK

Date Revised	Description
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NOT FOR
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60% SUBMISSION

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Project Manager R. DARLING, PE	Discipline Lead A. ROBINSON, PE
Designer G. ANSCHUTZ-CEJA	Reviewer R. DARLING, PE
Date Issued 7/6/2023	Project Number 15347.00

Sheet Name

PHOTOMETRIC SITE
PLAN I

Drawing Number

ES005

SEE SHEET ES006



1 PHOTOMETRIC SITE PLAN II
SCALE: 1" = 60'-0"

CALCULATION SUMMARY						
AREA	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
GENERAL SITE	Fc	0.13	13.6	0.0	N.A.	N.A.
PUBLIC ROAD	Fc	0.10	4.3	0.0	N.A.	N.A.
ROADS	Fc	1.35	13.1	0.0	N.A.	N.A.

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SUN COMMUNITIES

HOVEYS ISLAND

TOWN OF HENDERSON
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Date Revised	Description
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Project Manager	Discipline Lead
R. DARLING, PE	A. ROBINSON, PE
Designer	Reviewer
G. ANSCHUTZ-CEJA	R. DARLING, PE
Date Issued	Project Number
7/6/2023	15347.00

Sheet Name

PHOTOMETRIC SITE PLAN II

Drawing Number

ES006

Appendix K

Permitting Summary



To: File

From: Rita Kozak - Bergmann

Date: September 22, 2023

Re: Hovey's Island Planned Development District Project
Environmental Permitting Recommendations

It is our understanding that the proposed work involves the development of Hovey's Island in the Town of Henderson, Jefferson County, New York. Proposed upgrades will include new cabin sites, new community building, recreation areas and associated water, sewer and electric services. It is our understanding that some work associated with the utility services expansion will occur on Association Island. Additionally, it is our understanding based on conceptual plans dated 5/19/2023 that indicate the proposed development of a boat ramp and docks located within Snowshoe Bay. Environmental permitting considerations for the project were evaluated using the results of the Wetland/Watercourse Delineation conducted on July 13, 2021. The final design of the project will ultimately dictate the environmental permits required for the proposed work. Below is a discussion of the permitting scenarios that may be applicable, based on our current knowledge of the project. The discussion below is specific to environmental permitting and does not include and zoning or other local entitlement approvals that the project may require, nor is it inclusive of any New York State Department of Health (NYSDOH), County Public Health or other project permits associated with utility service to the project site or utilizing waters surrounding the project site for bathing beaches as may be regulated by NYSDOH.

Threatened and Endangered Species Consultations

According to the USFWS information reviewed, there is one (1) federally listed bat species that may occur within the project area; the federally endangered Northern Long-eared Bat (*Myotis septentrionalis*). This species is also included on the New York State (NYS) Endangered Species List as a state endangered species. Any part of the project area containing trees greater than three-inch (3") diameter breast height (dbh) is generally considered suitable summer habitat for these bat species and is subject to time of year tree clearing restrictions. The window where tree clearing can occur begins November 1 and ends March 31. If these time of year restrictions cannot be adhered to, presence/absence surveys and/or additional USFWS coordination may be required. If federal permits are required, a Section 7 Consultation with USFWS will be required to determine the project's effects on the species. The Section 7 Consultation would be initiated and carried out by the federal agency issuing a permit.

The project is not within the "Rare Plants and Animals", or "Significant Natural Communities" layers as mapped by the NYSDER Environmental Resource Mapper (ERM) indicating that there are no records of listed species at the site. No Natural Heritage screening is required.

Timeframe: 35-45 days (if further coordination is required)

State Historic Preservation Office Consultations

As the project is anticipated to have federal agency involvement (i.e. Corps permit described below) a Section 106 of the National Historic Preservation Act consultation with the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) will be required. If only state agency involvement was to be required, such as a SPDES permit, a consultation under Section 14.09 of the New York State Historic Preservation Act would still be required. Both consultation types are usually conducted via their online CRIS project review process. During this review, the OPRHP would assess the project's potential impacts on cultural resources including archeological and



architectural resources. The project is located in a mapped archeological sensitive area, and as such, a Phase 1A/1B Archeological Survey was conducted by H.A.Z.Ex in October of 2021 and September of 2023. H.A.Z.Ex coordinated with OPRHP through the CRIS website.

Timeframe: 10 to 45 days

U.S. Army Corps of Engineers – Section 404 / Section 10

Wetland 1 is a palustrine emergent (PEM) wetland under the federal jurisdiction of the U.S. Army Corps of Engineers (USACE) as a Water of the United States (WOTUS). Lake Ontario is also a federally regulated WOTUS. Impacts to these features would require authorization under Section 404 of the Clean Water Act. Lake Ontario is also a Navigable Water and impacts to this feature would require approval under Section 10 of the Rivers and Harbors Act. The USACE Nationwide Permit (NWP) program issues general permits based on activity type for projects that impact up to 0.5 acres of permanent WOTUS impact. If the project can be designed to impact less than 0.5 acres of WOTUS, coverage under the 2021 NWP 36 for Boat Ramps/ NWP 39 for Commercial Development would be likely. A Pre-Construction Notification (PCN) would have to be submitted to the USACE New York District and written authorization from the USACE is required. Coverage under NWP 36/39 would satisfy the requirements for a Section 10 Permit, if necessary. As described in General Condition 23 of the NWP program, compensatory mitigation is required for WOTUS impacts exceeding 0.1 acre. Generally, this is done by purchasing mitigation credits through a mitigation bank or in-lieu fee (ILF) program. If impacts to WOTUS can be kept under 0.1 acres, mitigation would not be required.

Timeframe: Six (6) to Nine (9) months for permit.

New York State Department of State – Federal Coastal Zone Consistency Determination

The proposed project is located within the New York State Coastal Zone. If the project requires federal action (i.e. Corps permit) the project will require a Coastal Zone Consistency Review in accordance with the Coastal Zone Management Act. The New York State Department of State (NYSDOS) objected to the Corps coastal consistency determination issued for 2021 NWP 36, and as such, any project within the New York State Coastal Zone that requires authorization under NWP 36 is required to obtain an individual consistency concurrence determination from NYSDOS if impacts to federally-jurisdictional waters are proposed, which they currently are for this project.

Timeframe: One (1) to Five (5) months for permit.

New York State Department of Environmental Conservation – SPDES GP-0-20

If the proposed work requires greater than one (>1) acre of earth disturbance, a State Pollutant Discharge Elimination System (SPDES) GP-0-20-001 may be required. This includes the preparation of a Stormwater Pollution Prevention Plan (SWPPP) and weekly inspections. A Notice of Intent (NOI) must be submitted to the NYSDEC prior to the start of construction. This permit is anticipated to be required for this project.

Timeframe: 20 to 40 days for permit.

New York State Department of Environmental Conservation – Section 401 Water Quality Certification

For any project that has federal action (i.e. requires a Section 404 or Section 10 Permit) a Section 401 Water Quality Certification (WQC) from the NYSDEC is also required. NYSDEC has issued a "blanket" 401 WQC for Nationwide Permit 36 meaning that if the project is authorized under NWP 36 and meets all the WQC conditions, the certification is automatically issued.



The blanket 401 WQC is not applicable for impacts to Significant Coastal Fish and Wildlife Habitats. The Stony Point – Lyme Barrel Shoals Significant Coastal Fish & Wildlife Habitat is mapped on the project site. As impacts to this feature are proposed, an Individual Section 401 WQC will be required. Please note that 30 days prior to application for a Section 401 Water Quality Certification, a pre-filing meeting request must be submitted to the NYSDEC. The NYSDEC is not obligated to grant or respond to a pre-filing meeting, but the form must be submitted.

Timeframe: - Six (6) to Nine (9) months for permit.

New York State Department of Environmental Conservation – Article 15 Protection of Waters Permit

Lake Ontario and Henderson Bay are classified by the NYSDEC as Class A waters and navigable. As such, impacts to these features will require an Article 15 Protection of Waters Permit from the NYSDEC Region 6. The project would likely be classified as a “Major Project” pursuant to NYS Uniform Procedures Act. A public notice in the local newspaper and associated fee will be required.

Timeframe: Six (6) to Nine (9) months for permit.

New York State Department of Environmental Conservation – Article 24 Freshwater Wetlands Permit

As described in the Wetland/Watercourse Delineation Report, the project is in close proximity to NYSDEC Freshwater Wetland (FWW) HB-5. This wetland has a 100-foot regulated adjacent area (refer to Figure 7). Impacts to the FWW or its regulated 100-foot adjacent area would require an Article 24 Permit. As currently designed, the project may require an Article 24 Permit from the NYSDEC due to encroachment of the 100-foot regulated adjacent area. This will have to be confirmed with an updated wetland delineation to include the area of potential impact.

Timeframe: Six (6) to Nine (9) months for permit.

New York State Department of Environmental Conservation – Coastal Erosion Management Permit

There is a NYSDEC mapped CEHA within the project area. Any disturbance within the CEHA would require a Coastal Erosion Management Permit from NYSDEC. A Coastal Erosion Management Permit is anticipated to be required for this project based on the proposed design.

Timeframe: Three (3) to Six (9) months for permit.

New York State Office of General Services – State Owned Lands Under

Lake Ontario may be considered a state-owned waterbody, and as such, the NYS Office of General Services (OGS) would have jurisdiction of lands below the ordinary high water mark of Lake Ontario. As impacts below the ordinary high water mark are proposed, an OGS State Owned Lands Under Water Permit is anticipated to be required.

Timeframe: Three (3) to Six (9) months for permit.

If you have any questions or require additional information, please feel free to contact me by phone at 567-318-1547 or email at rkozak@bergmannpc.com.

Rita Kozak
Regional Manager, Northeast Natural Resources



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