STORMWATER POLLUTION CONTROL PLAN

Quinebaug Solar Project

Revised February 2021

PROJECT NAME AND LOCATION:

Name:	Quinebaug Solar Project Brooklyn and Canterbury, Connecticut
Latitude:	41° 44' 56"
Longitude:	-71° 56' 2"

OPERATOR:

Owner:	Quinebaug Solar, LLC
General Contractor:	TBD

Tighe&Bond

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SECTION 1

Section 1
Certification Statements

1.1 Permittee

Certification Statement

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the General Statutes, pursuant to Section 53a-157b of the General Statutes, and in accordance with any other applicable statute.

Signature: _____ Date: _____

Name: _____Title:_____

Company name: _____

Address: _____

Telephone:_____ Fax: _____

Project Site: Quinebaug Solar Project, Brooklyn and Canterbury, CT

1.2 Contractors and Subcontractors

Each Contractor and Subcontractor that will perform actions on the site which may reasonably be expected to cause or have the potential to cause pollution of the waters of the State shall sign the certification statement included in this plan.

Certification Statement

"I certify under penalty of the law that I have read and understand the terms and conditions of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. I understand that as a contractor or subcontractor at the site, I am authorized by this General Permit, and must comply with the terms and conditions of this General Permit, including but not limited to the requirements of the Stormwater Pollution Control Plan prepared for the site."

CONTRACTOR CERTIFICATION

Signature: _____ Date: _____

Name: _____Title:_____

Company name: _____

Address: _____

Telephone:_____ Fax: _____

Project Site: Quinebaug Solar Project, Brooklyn and Canterbury, CT

SUBCONTRACTOR CERTIFICATION

Signature: _____ Date: _____

Name: _____Title:_____

Company name: _____

Address: _____

Telephone:_____ Fax: _____

Project Site: Quinebaug Solar Project, Brooklyn and Canterbury, CT

SUBCONTRACTOR CERTIFICATION

Signature: ______________________________ **Date:** ______________

Name: ______________________________**Title:**__________________

Company name: ____

Address: ____

Telephone:_________________________ **Fax:** ____________________

Project Site: Quinebaug Solar Project, Brooklyn and Canterbury, CT

SUBCONTRACTOR CERTIFICATION

Signature: ______________________________ **Date:** ______________

Name: ______________________________**Title:**__________________

Company name: ____

Address: ____

Telephone:_________________________ **Fax:** ____________________

Project Site: Quinebaug Solar Project, Brooklyn and Canterbury, CT

SUBCONTRACTOR CERTIFICATION

Signature: ______________________________ **Date:** ______________

Name: ______________________________**Title:**__________________

Company name: ____

Address: ____

Telephone:_________________________ **Fax:** ____________________

Project Site: Quinebaug Solar Project, Brooklyn and Canterbury, CT

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SECTION 2

Section 2
Stormwater Pollution Control Plan

2.1 Responsible Parties

The following Parties are identified in this Plan:

- Permittee: Quinebaug Solar, LLC. The Permittee is the party that initiates, creates or maintains a discharge in accordance with Section 3 of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (General Permit).
- Owner: Quinebaug Solar, LLC. Owner of the proposed solar facility and associated stormwater management measures.
- Contractor: Engineering, Procurement, and Construction (EPC) Contractor hired by Quinebaug Solar, LLC to perform installation of the solar facility and appurtenances.
- Sub-Contractor: Specialty sub-contractor hired by Contractor or Quinebaug Solar, LLC to perform installation of the solar facility and appurtenances.
- Site Superintendent: Representative of Contractor tasked with overseeing daily operations at the site.
- Qualified Inspector: As defined in the GP, means an individual possessing either (1) a professional license or certification by a professional organization recognized by the commissioner (as defined in section 22a-2(b) of the Connecticut General Statutes) related to agronomy, civil engineering, landscape architecture, soil science, and two years of demonstrable and focused experience in erosion and sediment control plan reading, installation, inspection and/or report writing for residential and commercial construction projects in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, established pursuant to section 22a-328 of the Connecticut General Statutes (Guidelines); or (2) five years of demonstrable and focused experience in erosion and sediment control plan reading, installation, inspection and/or report writing for residential and commercial construction projects in accordance with the Guidelines; or (3) certification by the Connecticut Department of Transportation(DOT).
- Environmental Monitor: Representative of Quinebaug Solar, LLC on-site full time to provide construction and permit compliance oversight.
- Design Engineer: Professional Engineer licensed in the state of CT who stamped the construction-period stormwater design.

2.2 Project Description

Quinebaug Solar, LLC (the Permittee or Owner) is proposing to install a 49.36 megawatt (AC) ground-mounted solar photovoltaic (PV) facility in the Towns of Brooklyn and Canterbury, Connecticut (Project).

The Project Site consists of 30 privately-owned parcels located in the southeast portion of the Town of Brooklyn the northeast portion of the Town of Canterbury, in Windham

County, Connecticut. The Project Site is generally bounded by Wauregan Road to the south (Canterbury), Blackwell Brook and Cold Spring Brook to the west, Rukstela Road, Allen Hill Road and forested areas to the north (Brooklyn) and the Quinebaug River to the east.

The Project Site consists of gently sloping hills, large level areas, and a few moderately to steeply sloping areas that currently contain a combination of previously developed areas, overgrown former pasture lands, mixed second-growth woodlands, active gravel mines, and agricultural fields. The Permittee intends to utilize existing roadways that traverse the entire Project Area wherever possible. Land uses in the vicinity of the Project Area include gravel mining, residential development, open space, and agriculture.

The topography of the existing conditions site conveys stormwater towards numerous design points. Blackwell Brook, located to the west of the Project Area, is the receiving water for the majority of the Project Area. Smaller sub-watersheds collect stormwater runoff internally in existing depressed areas. The Project has been designed to avoid construction within areas of steeper slopes where possible.

No floodplain exists within the limits of the subject parcels. The Site contains inland wetlands and watercourses and the Project has been designed to limit impacts to these areas. A description of wetland and watercourse impacts can be found in the Wetland and Watercourse Delineation Report prepared by Tetra Tech Inc. in Exhibit D of the Connecticut Siting Council (CSC) Petition # 1310A (Petition). Additional erosion controls are proposed in steep areas and upstream to sensitive areas.

In the post-construction or proposed condition, stormwater management will be accomplished through the conversion of agricultural areas to a grassy meadow condition and the construction of infiltration basins and berms. The conversion of agricultural areas to a grassy meadow offsets the impacts of the proposed gravel access roads, concrete equipment pads and solar panels. The construction of infiltration basins and berms adds additional infiltration and storage to attenuate the runoff rate and volume caused by a decrease in the time of concentration with the conversion of woods to meadow while providing water quality improvements to treat the required Water Quality Volume (WQV).

In the proposed condition, within the solar array, stormwater will fall onto the PV modules and will flow off the edge into the grassy ground cover. Stormwater runoff will continue to flow across the ground surface as under existing conditions generally along existing flow paths. Infiltration basins and berms to mitigate peak discharge rates, to encourage infiltration and to allow for suspended solids to settle were incorporated within the project area.

The Project is proposed to be constructed in phases to minimize disturbance. Within each Phase, sub-phases will be designed to be less than 10 acres and each sub-phase will have a temporary sediment basin or trap as required. A phased Soil Erosion and Sediment Control Plan for construction activities can be found in Appendix C. Significant grading is not anticipated in most of the proposed array areas. Grading is required in certain areas to flatten steep slopes and to accommodate internal access roads, stormwater features, equipment pads, and the substation.

In the area of the agricultural fields, the site will be planted with a low growing seed mix to stabilize the site. Micro-grading to smooth existing undulations will be performed as necessary.

The proposed scope of work is shown on the drawings in Appendix C.

2.3 Estimated Total Site Area and Total Disturbed Area

Combined, the Project Area/Site parcels encompass approximately 599 acres. As proposed, the Development Area/ limit of work of the proposed Project will occupy approximately 220 acres of the 599-acre Project Area/ Site.

2.4 Soils & Geology

Bedrock geology within the Project Area is primarily granite, schist, and gneiss. Glacial till is the dominant surface material, with some stratified deposits in valleys. Open hills with low elevations form in irregular plains (Griffith et al. 2009). Typical soil orders include coarse-loamy and sandy, mesic Inceptisols and some Entisols. Soils are generally well drained silt-loam and sandy-loam and depth to bedrock is greater than 60 inches throughout a majority of the Project Area (USDA NRCS 2008). Approximately 40 percent of the Project Area soils have been regularly tilled for agricultural use or otherwise disturbed from gravel extraction. The soils found on-site included in the table below.

Within the limit of work, the proposed condition runoff curve numbers associated with the Hydrologic Soil Group present on-site has been increased by one half the difference between the Hydrologic Soil Group present on-site and the next higher Hydrologic Soil Group to account for compaction of soils that results from extensive machinery traffic over the course of the construction of the array. Curve numbers for areas which will require 2 feet or more of grading have been increased by one full Hydrologic Soil Group,

Table 1
NRCS Soil Summary

Map Unit Designation	Soil Association	Additional Description	Hydrologic Soil Group (HSG)
2	Ridgebury association	Fine sandy loam	D
3	Ridgebury, Leicester, and Whitman association	Extremely stony	D
13	Walpole association	Sandy loam	B/D
15	Scarboro association	Muck	A/D
17	Timakwa and Natchaug association	N/A	B/D
23A	Sudbury association	Sandy loam	B
29A, 29B	Agawam association	Fine sandy loam	B
34A, 34B	Merrimac association	Fine sandy loam	A
36A, 36B	Windsor association	Loamy sand	A
38A, 38C, 38E	Hinckley association	Loamy sand	A
45A, 45B, 46B	Woodbridge association	Fine sandy loam	C/D
50B, 51B, 52C	Sutton association	Fine sandy loam	B/D
58C, 59D	Gloucester association	Gravelly sandy loam	A
60B, 61B, 61C, 62D	Canton and Charlton association	Stony	B
73C	Charlton-Chatfield association	Rocky	B
84B, 85B, 86C	Paxton and Montauk association	Fine sandy loam	C
100	Suncook association	Loamy fine sand	A
102	Pootatuck association	Fine sandy loam	B
103	Rippowam association	Fine sandy loam	B/D
108	Saco association	Silt loam	B/D
302	Dumps	N/A	-
305	Udorthents-Pits complex	Gravelly	C
306	Udorthents-Urban land complex	N/A	B
701A, 701B	Ninigret association	Fine sandy loam	C
W	Water	N/A	-

2.4.1 Wetland Soils

General soils observations were made as part of the wetland and watercourse delineation survey effort, and to determine if unique soil conditions occur on site. Soils observed as

part of this survey are described in the Wetland and Watercourse Delineation Report provided in the Petition.

2.4.2 Non-Wetland Soils

Areas mapped by the United States Department of Agriculture Natural Resources Conservation Service (USDA NRCS) as Prime Farmland, Soils of Statewide Importance and Locally Important Farmland soils are located within the Project Site. A Farmland Soil Mitigation Plan has been prepared to minimize and mitigate impacts to agricultural soils. As defined by the USDA NRCS, farmland soils are based on soil type and include Prime Farmland, Soils of Statewide Importance, and Locally Important Farmland. USDA NRCS defines Prime Farmland Soils as those having the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oil seed crops, and that also are available for these uses.

Additionally, in 2016 Tetra Tech performed a site visit, including test pit investigations, to confirm that the soil series mapped for the site were present and matched with those areas designated as Prime, Statewide, and Local Farmland. Test pits were excavated and evaluated in soil areas mapped as Paxton and Montauk soils, as well as in Windsor soils. The results from evaluation of the soil test pits indicated that the Farmland soil series designations shown in the NRCS mapping were generally accurate. Detailed results of this investigation are provided in the Petition.

Portions of the Project Area have been affected by current and historic gravel extraction activities. These areas have modified soil characteristics as a result of the disturbance of and removal of surface soils. These areas exhibit characteristics of undeveloped parent material and would not currently be expected to possess soil quality associated with Prime Farmland. The Farmland Soil Mitigation Plan further quantifies the amount of mapped farmland soils that have been affected by this disturbance

2.4.3 Measured Infiltration Rate

An infiltration test was not performed to determine the infiltration capacity of the existing soils. Infiltration rates assumed in stormwater management calculations were determined in accordance with the National Resource Conservation Service (NRCS) Minimum Infiltration Rates of Hydrologic Soil Groups, as provided in the 2004 Connecticut Stormwater Quality Manual.

2.5 Runoff Curve Number

The weighted runoff curve number "CN" for the existing Project is 62. The weighted runoff curve number "CN" for the completed Project will be 65.

2.6 Site Map

See Appendix A, Figure 1 for site location mapping and see Appendix C for detailed site maps.

2.7 Name of Receiving Water

The Quinebaug River is located to the south and east of the Project. Stormwater runoff from the post-construction Project will ultimately discharge to the Quinebaug River.

According to the Thames River Basin Partnership, the Quinebaug River watershed is approximately 255,070 acres and extends into south central Massachusetts and ending where it discharges to Shetucket River in Norwich, Connecticut. According to the State of Connecticut Department of Energy and Environmental Protection (CT DEEP) 2016 Integrated Water Quality Report, the impairments observed in the Quinebaug River include Escherichia coli with potential sources including stormwater, remediation sites, spills, groundwater impacts, industrial discharges, landfills, municipal discharges, illicit discharges, insufficient on-site treatment/septic systems, agricultural activities, and salt storage facilities. The 2016 Report recommended delisting of the Quinebaug River, noting applicable water quality standards had been attained. The proposed Project will not result in an increase in the identified pollutants.

2.8 Sequence of Major Activities

The construction period stormwater design for the Quinebaug Solar Project has been designed in accordance with the CT General Permit including Appendix I and the Soil Erosion and Sediment Control Manual (SESC Manual), with the intention of protecting natural resources and adjacent watercourses from adverse impacts during the construction period. The SESC Manual indicates that construction phases should occur in 5-acre areas, with sediment traps designed to hold a volume of water. Particulates then settle out of suspension, with a secondary volume to retain runoff during larger storm events. The trap includes a spillway through which water is allowed to flow onto stable ground. Runoff from the construction area is diverted through use of earthen berms and swales equipped with check dams to reduce the velocity of stormwater flow. The berms and swales direct stormwater to the sediment trap. Perimeter erosion control barriers will be installed along the downgradient edges of the phase prior to conducting any earth-disturbing activities, with other phase demarcation to be determined by the Contractor installed along the limit of work for each phase. Once earth disturbing activities are complete, the ground surface is considered stabilized once it has reached 80% vegetative coverage per the SESC Manual. Seeded areas will be monitored daily and augmented with additional seeding as needed. Temporary stormwater controls may be removed once the contributing area can be considered stable. Larger development areas are allowed up to 10-acres; however, temporary sediment basins will be required.

Permanent stormwater basins which overlap locations of temporary stormwater features used during construction to manage stormwater shall be excavated to a suitable depth to remove accumulated sediment and restore infiltration characteristics of the native soil at the end of construction, once site stabilization has been achieved. Permanent stormwater basins shall be protected from sediment laden runoff and shall not be disturbed by vehicle traffic or other construction activities.

For the purpose of this Stormwater Pollution Control Plan, the following activities are considered earth disturbing activities: solar infrastructure installation (i.e., driving piles for solar panel racking); tree clearing if ground is not frozen; vegetation grubbing; grading; roadway installation; concrete equipment pad installation; and subsurface utility infrastructure construction. The Project is proposed to be constructed in phases to minimize disturbance: 4 major phases with 58 sub-phases, as shown in Appendix C. Within each major phase, sub-phases will be designed to be less than 10 acres and each will have a temporary sediment basin or trap as required. The major phases include the following:

- Pre-Construction
- Phase 1: Access Road Construction and Staging
- Phase 2: Stump Removal for Previously Wooded Areas
- Phase 3: Grassed Area Array Construction
- Phase 4: Wooded Area Array Construction

Note that Phase 1 must occur before all other phases. Subsequent subphases can occur simultaneously provided that each active subphase has all temporary measures installed and each trap/basin is discharging to stable ground. Phase 2 and Phase 4 occur in the same location, with differing construction activities. Phase 4 is the installation of solar infrastructure in the area that was grubbed and temporarily stabilized in Phase 2.

Stabilization and removal of temporary features will be considered individually for each sub-phase. For example, if sub-phase D is determined stable by the Engineer and sub-phase A is not, the temporary features in sub-phase D may be decommissioned prior to achieving stabilization in sub-phase A as long as it will not impact the stability of another sub-phase. Some temporary features may be removed prior to full stabilization of the sub-phase with approval from the Engineer, provided that the engineer determines that temporary measures that remain in place will provide a level of protection against off site impacts due to rain events. Notification will be made to the Department prior to removal of portions of the temporary measures in a sub phase, and the decision by the engineer will be based on the level of vegetative growth contributing to the measures to be removed as well as the anticipated potential for further ground disturbance by the contractors on site, their equipment being used and their track record on the site previously.

Once stabilization is achieved in any sub-phase, some features may be determined to be beneficial to post-construction site conditions and the Engineer will determine which features will remain. CT DEEP will be notified of these changes.

Construction of the Project is expected to begin in the first quarter of 2021 with mobilization of equipment and land clearing efforts. Further site work and land preparation is expected to be complete by the end of the second quarter of 2021. Final site stabilization, testing, and commissioning is expected to be complete in the third quarter of 2021. The following describes the sequence of construction activities:

2.8.1 Pre-Construction

1. Demarcation of clearing limits, selective cutting zones, and buffer areas.
2. Cut trees above ground (retain stumps) in frozen conditions. If reliably frozen conditions do not exist, manual methods for tree felling will be implemented. If reliably frozen conditions do not exist and manual methods for tree felling are not used, or if the tree cutting operation results in ground disturbance or rutting, stormwater controls must be installed in accordance with the Soil Erosion and Sediment Control Plans in Appendix C for each area to be cleared prior to the tree clearing.
3. Conduct environmental restriction and safety training for all site personnel.
4. Hold preconstruction meeting.

2.8.2 Phase 1: Access Road Construction and Staging

1. Flag the limits of construction necessary to facilitate the preconstruction meeting.
2. Conduct environmental restriction and safety training for all site personnel.
3. Hold preconstruction meeting.
4. Install construction entrance.
5. Install perimeter controls to establish phase work area in accordance with site plan and Stormwater Pollution Control Plan (SWPCP) prior to conducting any earth-disturbing activities.
6. Prior to installing stormwater controls, such as temporary diversions and stone check dams, inspect existing conditions to ensure discharge locations are stable. If not stable, review discharge conditions with the design engineer and implement additional stabilization measures prior to installing surface water controls.
7. Construct temporary sediment traps and/or basins, diversion swales and earthen berms with check dams.
8. Once temporary stormwater controls are established, clear and remove existing stumps.
9. Where applicable, strip, re-distribute, and stabilize all topsoil that is within the footprint of the site roads, site road appurtenances and the collector substation (pursuant to 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, Chapter 4, Part ii and the Farmland Soils Mitigation Plan in Exhibit E in the CSC Petition).
10. Construct site roads and appurtenances. Install conduits for crossings simultaneous to construction of the road.
11. Stabilize site with seed and mulch in all disturbed areas. If a minimum 4" of topsoil is not present, amend with loam borrow for a minimum 4" of vegetative support material to promote grass growth. Stabilize areas with a slope of 7% or steeper with hydroseed with bonded fiber matrix or hydroseed and install erosion control blankets. Monitor disturbed areas weekly or following rain events and amend with additional seeding as needed until stabilization is achieved.
12. Upon stabilization, temporary controls may be removed or relocated as necessary and construction may advance on subsequent sub-phases.

2.8.3 Phase 2: Stump Removal for Previously Wooded Areas

1. Flag the limits of construction.
2. Install perimeter controls to establish phase work area in accordance with site plan and SWPCP plans prior to conducting any earth-disturbing activities.
3. Prior to installing surface water controls, such as temporary diversions and stone check dams, inspect existing conditions to ensure discharge locations are stable. If not stable, review discharge conditions with the design engineer and implement additional stabilization measures prior to installing surface water controls.
4. Construct temporary sediment traps and/or basins, diversion swales and earthen berms with check dams.

5. Once temporary stormwater controls are established, grub existing stumps from previously cleared trees.
6. Stabilize site with seed and mulch in all disturbed areas. If a minimum 4" of topsoil is not present, amend with loam borrow for a minimum 4" of vegetative support material to promote grass growth. Stabilize areas with a slope of 7% or steeper with hydroseed with bonded fiber matrix or hydroseed and install erosion control blankets. Monitor disturbed areas weekly or following rain events and amend with additional seeding as needed until stabilization is achieved.
7. Check and repair temporary controls as needed. Temporary controls to remain in place through Phase 4 construction.

2.8.4 Phase 3: Grassed Area Array Construction

1. Flag the limits of construction.
2. Install perimeter controls to establish phase work area in accordance with site plan and SWPCP plans prior to conducting any earth-disturbing activities.
3. Prior to installing surface water controls, such as temporary diversions and stone check dams, inspect existing conditions to ensure discharge locations are stable. If not stable, review discharge conditions with the design engineer and implement additional stabilization measures prior to installing surface water controls.
4. Construct temporary sediment traps and/or basins, diversion swales and earthen berms with check dams.
5. Clear and remove existing stumps as needed.
6. Install solar infrastructure, including racking, solar modules, utility connections, and equipment pads. Solar array construction will begin with posts or ground screws being driven into the ground; racking will then be affixed to the posts; and modules will be mounted and installed on the racks.
7. Stabilize site with seed and mulch in all disturbed areas. If a minimum 4" of topsoil is not present, amend with loam borrow for a minimum 4" of vegetative support material to promote grass growth. Stabilize areas with a slope of 7% or steeper with hydroseed with bonded fiber matrix or hydroseed and install erosion control blankets. Monitor disturbed areas weekly or following rain events and amend with additional seeding as needed until stabilization is achieved.
8. After phase is fully stabilized, remove temporary stormwater controls.
9. Once the temporary measures are removed, install the remaining racking and components that are located where the temporary measures were removed.

2.8.5 Phase 4: Wooded Area Array Construction

1. Inspect and install perimeter controls established in Phase 2 to ensure phase work area is in accordance with site plan and SWPCP plans prior to conducting any earth-disturbing activities.
2. Inspect and construct temporary sediment traps and/or basins, diversion swales and earthen berms with check dams installed in Phase 2.
3. Install solar infrastructure, including racking, solar modules, utility connections, and equipment pads. Solar array construction will begin with posts or ground

screws being driven into the ground; racking will then be affixed to the posts; and modules will be mounted and installed on the racks.

4. Stabilize site with seed and mulch in all disturbed areas. If a minimum 4" of topsoil is not present, amend with loam borrow for a minimum 4" of vegetative support material to promote grass growth. Stabilize areas with a slope of 7% or steeper with hydroseed with bonded fiber matrix or hydroseed and install erosion control blankets. Monitor disturbed areas weekly or following rain events and amend with additional seeding as needed until stabilization is achieved.

5. After phase is fully stabilized, remove temporary stormwater controls. The ground surface is considered stabilized once it has reached 80% vegetative coverage per the SESC Manual.
6. Once the temporary measures are removed, install the remaining racking and components that are located where the temporary measures were removed.

2.9 Post-Construction Stormwater Management

2.9.1 Site Hydrology and Hydraulic Analysis

Under proposed conditions, large portions of the agricultural uses will be converted to solar array where panels will be installed using driven posts; in some areas, screws or piles may be used in lieu of or in addition to the posts. Existing woodland within the limits of the Project will be cleared and grubbed and allowed to stabilize prior to construction of solar infrastructure.

Following construction, stormwater will fall onto solar panels and will flow off the edge into the vegetated surface and flow along existing flow paths as under existing conditions. Therefore, for purposed of peak rate reduction calculations, the only solar panels that are considered impervious will be the most up-gradient panels in each subcatchment.[1] The remainder of the solar facility within the limit of work will be considered meadow, non-grazed. Concrete equipment pads or skids, existing and proposed gravel access roads, woodland, remaining agricultural fields and basins also were included in the post-development analysis.

The topography of the site will be altered in select areas to accommodate the solar array, stormwater berms and basins, and proposed access roads. The delineation of drainage areas will not substantially change as a result of the proposed development. The Proposed Conditions Drainage Area Map, provided as Figure 4 in Appendix A, indicates that the four existing conditions design points will be maintained under proposed conditions. The contributing drainage areas will convey stormwater runoff generally as under existing conditions.

The proposed Project will not substantially alter stormwater flow paths and will result in decreased peak discharge rates as a result of stormwater management features designed to reduce peak discharge rates. The existing Site is primarily woodland and grass with existing gravel areas and gravel roads. The CN value for the existing site is 62 and the

[1] Cook, L.M. & McCuen, R. H., (2013). Hydrologic Response of Solar Farms. *Journal of Hydrologic Engineering*, 18(5). pp.536-541

proposed CN value is 65 for the entire site. Additionally, infiltration to attenuate runoff rate and volume was achieved through the construction of earthen berms.

Table 2.5 presents the results of the pre-development stormwater runoff analysis versus the post-development stormwater runoff analysis for each design point.

Table 2.5

Peak Discharge Rate Comparison

		2-year Storm Event (cfs)	25-year Storm Event (cfs)	50-year Storm Event (cfs)	100-year Storm Event (cfs)
Design Point 1 (West)	Existing	9.15	51.55	71.19	104.08
	Proposed	7.66	46.37	69.88	118.77
Design Point 2 (South)	Existing	7.00	25.75	33.33	39.25
	Proposed	7.00	25.72	33.33	39.25
Design Point 3 (East)	Existing	21.20	60.03	83.50	96.96
	Proposed	20.86	58.89	78.44	94.51
Design Point 4 (Southeast)	Existing	23.85	87.86	115.12	136.92
	Proposed	23.29	82.92	107.74	127.25
Overall Project	Existing	61.20	225.19	303.14	377.21
	Proposed	58.81	213.90	289.39	379.78

Table 2.5 indicates that existing peak discharge rates are reduced for the 2-, 25-, 50-year storm events, and for the 100-year storm event for all Design Points except Design Point 1. The analysis for the 100-year storm event for Design Point 1 includes numerous stormwater management basins which have been designed to attenuate peak discharge rates. Each of those basins' discharges to an overland conveyance, for which no additional travel time can be included in our analysis to reflect anticipated conditions. The model, as presented, assumes that discharges from each basin, regardless of location on-site, will reach the Design Point at the same time. This limitation of HydroCAD is a common experience with the software. While the increase in peak discharge rates during the 100-year storm event are presented as approximately 14 cubic feet per second, we do not anticipate adverse impacts on natural resources.

2.9.2 Best Management Practices and Water Quality

The proposed conditions stormwater management plan for the proposed site has been designed to remove a high percentage of sediments in accordance with the Connecticut Department of Energy and Environmental Protection "Stormwater General Permit Criteria".

The Project has been designed to utilize a "country drainage" scheme which allows stormwater runoff from impervious surfaces to flow into adjacent grassed areas and allowed to recharge to groundwater as under existing conditions. The Project does not include large, uninterrupted spans of impervious ground coverage. Concrete equipment

pads are relatively small in comparison to the overall watershed, will not adversely impact groundwater recharge capabilities of the proposed conditions site.

The post-construction stormwater management plan for this site uses "Best Management Practices ("BMPs")" to meet or exceed the Connecticut DEEP's goal of 80% removal of total suspended solids and Water Quality requirements. The BMPs include:
Infiltration Basins: Infiltration basins, created through vegetated berms and excavated depressions, are stormwater features that capture and infiltrate runoff to reduce runoff volume and remove fine sediment, improving water quality.

All slopes within the proposed project area for solar installation will be graded to a maximum of 15%. The provided spacing between panels further requires that panels are to be considered effective impervious for purposes of calculating the required Water Quality Volume. The proposed long-term stormwater management basins have been designed to provide treatment volumes to accommodate the entire Water Quality Volume under the assumption the entire array is effective impervious. The proposed grading is depicted on the Proposed Conditions sheets of the Construction Drawings. Calculations documenting the required Water Quality Volume and the long-term stormwater management design's compliance with this requirement are provided in Appendix D.

The required WQV for the proposed conditions is based on the acreage of impervious surfaces including gravel access roads, solar panels and impervious concrete pads.

All other impervious surfaces, specifically gravel roads, will not be curbed in order to promote a "country drainage" scenario. The lack of curb and gutter will allow stormwater runoff from the roadways to flow through the adjacent grasses. This will remove any sediment from the runoff prior to discharge off-site or to a resource area. The Site Plans indicate that impervious surfaces will be located over 100-feet from any receiving water, providing suitable residence time within the grass to remove sediment from runoff.

2.9.3 Post-Construction Storm Water Management Measures

2.9.3.1 General Permit Coverage Termination

Upon the completion of any and all construction activities on site, the Registrant shall submit a Notice of Termination Form, to the CT DEEP to ensure the proper handling of the permit termination. See Appendix M for a blank form.

Upon completion of the construction activities the Owner (or their delegate) shall conduct monthly inspections of the BMPs which include all areas covered by the SWPCP and all stormwater structures and outfalls on the site for surface or floating debris, oil and sediment for the first 90 days. Following the initial 90-day inspection period, stormwater BMPs shall be inspected in accordance with the recommended schedule outlined in 2002 Connecticut Stormwater Quality Manual, or as further detailed in Section 2.8.3.2 below. The site shall be inspected bi-annually for trash accumulation and surface debris. Routine inspection forms can be found in Appendix I.

2.9.3.2 Operations and Maintenance

The application of no disturbance buffers and establishing meadow habitat are two ways water quality will be protected throughout the life of the Project. Compared to current site uses, the final site stabilization design will result in a net improvement in comparison to current conditions for several areas close to Blackwell Brook and Cold Spring Brook. The

post-construction stormwater plan was developed with the intention of protecting natural resources and adjacent watercourses from adverse impacts throughout the operational phase of the Project.

The Owner (or their delegate) will be responsible for implementing the Operations and Maintenance Plan on the entire property that shall cover the following:

Roadway Surface

Regular road maintenance will be employed during operation of the Project. Gravel roadway surfaces shall be observed periodically by the Owner to clean trash and other debris, and to identify areas where concentrated runoff may cause erosion of the roadway surface.

Perform a visual inspection of roadway areas four times per year with one inspection after the last snowfall, but no later than April 1. Repair roadway areas as necessary when erosion is found during the remainder of the year.

Landscape

Meadow vegetation surrounding and underneath the solar PV array will be inspected and mowed twice per year to allow for healthy meadow cover, while preventing woody vegetation growth. The number of mows will be adjusted based on field conditions and actual vegetation growth.

Existing vegetation around the perimeter of the Project Site will be maintained in its native condition. No clearing, grading, stockpiling, storage or development will occur in these areas.

Spill Containment

Any oil or gasoline spills should be cleaned from the site immediately, and the stormwater management system components cleaned. The Owner should not wait until the next inspection to clean the components. A record of spills should be kept in a logbook, and reported as required to Connecticut DEEP. See Appendices F and G for reporting forms. See Section 2.16.3 of this document for Spill Control and Response Practices.

2.10 Pollution Controls

2.10.1 Stabilization Practices

Major erosion and sediment controls are shown on the plans in Appendix C. Stabilization practices include:

1. **Vehicle areas:** Stabilization of construction road access, staging, and parking areas using coarse aggregate.

2. **Temporary Stabilization:** Hydroseed with bonded fiber matrix or install erosion control blankets and broadcast seed areas.

3. **Permanent Vegetation:** Sodding and/or seeding of all disturbed areas.

2.10.2 Erosion and Sediment Controls

Construction phase erosion and sediment controls will include structural controls such as conveyance swales and berms, temporary sediment basins and temporary sediment traps in addition to perimeter controls, check dams, and other measures as required during construction to manage stormwater. Structural controls have been designed in accordance with the 2002 Guidelines for Soil Erosion and Sediment Control manual. Additional details regarding temporary basin and trap location and sizing are provided in Appendix D.

Redundant erosion and sediment controls are proposed to provide additional protection in "Erosion Prone Areas" as identified in Appendix A, Figure 5. These include measures to prevent erosion and sedimentation to adjacent watercourses during construction and protection of water quality for protection of eastern pearlshell (*Margaritifera margaritifera*), a freshwater mussel species that has the potential to occur in the freshwater streams in and adjacent to the Project Area as well as other sensitive aquatic species. These include:

- Establishing a no-disturbance buffer around all wetlands and watercourses that will be fortified by using the best erosion control devices available, to maintain high water quality of the stormwater runoff during heavy rainfall events. Buffers will be a minimum of 100 feet, except in limited circumstances in the vicinity of existing gravel roads (less than 100 feet) that are to be used for site access during construction;
- Redundant erosion control devices will be installed along the gravel access roads to ensure a failsafe system is in place to protect the resources. Regular road maintenance will be employed during construction;
- Redundant erosion control devices installed in erosion prone areas (see Appendix A, Figure 5), and others identified prior to construction, will be regularly monitored during construction to ensure proper stormwater control function is maintained throughout the construction period, and if necessary additional controls will be implemented in these areas as needed to control the volume and quality of water running off the site;
- The forested buffer located established for the herpetofauna avoidance area (located around the cluster of wetlands and vernal pools in the relic stream channel immediately up slope from Cold Spring Brook and Blackwell Brook, see Appendix A, Figure 6) will be left intact between the adjacent watercourses and potential sources of erosion and sedimentation created during Project construction; and
- Maintaining temporary stormwater controls until site is considered stabilized.

Areas where additional erosion control is proposed are indicated in the Appendix C.

2.10.3 Sequence of Major Erosion and Sediment Control Activities

The construction will proceed in sequences as previously described in Section 2.7. The stabilized construction access, staging, and parking areas will be constructed first. The following pollution prevention controls and measures will be implemented throughout the Project:

1. Perimeter erosion controls will be installed prior to conducting any earth-disturbing activities; and construction entrances, and silt fence will be constructed in predetermined locations.
2. Prior to installing surface water controls such as temporary diversions and stone check dams, inspect existing conditions to ensure discharge locations are stable. If

not stable, review discharge conditions with the design engineer and implement additional stabilized measures prior to installing surface water controls.

3. Construct temporary sediment traps and/ or basins, diversion swales and earthen berms with check dams.
4. Complete work designated to sequence sub-phase.
5. Stabilize site by hydroseeding with bonded fiber matrix or installing erosion control blanket in all disturbed areas. Monitor hydroseeded areas and erosion control blanketed areas daily and amend with additional seeding as needed.
6. Upon stabilization, temporary controls may be removed in order to construct subsequent sub-phases.

2.10.4 Waste Materials

All trash and construction debris from the site will be hauled to an approved landfill or other legal means of disposal. No construction waste material will be buried on the site. Employee waste and other loose materials will be collected so as to prevent the release of floatables during runoff events.

All personnel will receive instructions regarding the correct procedure for waste disposal. Notices describing these practices shall be posted in the construction office. The site superintendent will be responsible for seeing that these procedures are followed.

2.10.5 Hazardous Waste

No hazardous waste is expected to be generated or encountered during this Project. In the event that hazardous waste is encountered, all hazardous waste materials will be disposed of in the manner specified by local, state or federal regulation or by the manufacturer.

The site superintendent will be responsible for seeing that these practices are followed.

2.10.6 Sanitary Waste

Portable sanitary units will be provided for use by all workers throughout the life of the Project. All sanitary waste will be regularly collected from the portable units by a licensed sanitary waste management contractor.

2.11 Maintenance

To maintain the erosion and sediment controls, the following procedures will be performed.

1. **Sediment Capture Devices:** Sediment will be removed from the upstream or upslope side of the perimeter erosion controls when the depth of accumulated sediment reaches about one-third the height of the structure. Sediment accumulations in temporary traps and basins shall be removed when sediment depth exceeds one half of the wet storage capacity of the basin or trap, or when the depth of the available pool in the basin is reduced to 18 inches.

2. **Temporary Controls:** All temporary controls will be removed after the disturbed areas have been stabilized. The ground surface is considered stabilized once it has reached 80% vegetative coverage per the SESC Manual.

The contractor shall haul off-site and properly dispose of, or use as backfill, sediment that is removed from structural barriers. Sediment temporarily stockpiled on site will be placed in such areas and in such manner as to minimize wash-off into the local drainage system. Berms, perimeter erosion controls, and polyethylene or polypropylene covers are measures which may be utilized in minimizing washoff.

2.11.1 Inspection Procedures

All construction activities submitting a registration for the General Permit shall be inspected initially for Plan implementation and then weekly for routine inspections. Weekly inspection forms can be found in Appendix J. Inspections will be conducted by a Qualified Inspector (defined below at Section 2.10.1.3). The Permittee also will have a full-time, on-site Environmental Monitor to oversee construction and permit compliance throughout the construction process, which will allow for real-time adjustments to be made to protect adjacent natural resources. The Design Engineer will be on-site during the establishment of each major Phase to oversee compliance with the proposed design.

2.11.1.1 Plan Implementation Inspection

Within the first 30 days following commencement of the construction activity on the Site, the Permittee shall contact a qualified soil erosion and sediment control professional or a qualified professional engineer (a Qualified Inspector) to inspect the site. The site shall be inspected at least once and no more than three times during the first 90 days to confirm compliance with the General Permit and proper initial implementation of all controls measures designated in the Plan for the site for the initial phase of construction. The inspection forms can be found in Appendix H, I, and J.

2.11.1.2 Routine Inspections

The Permittee shall routinely inspect the site for compliance with the General Permit and the Plan for the site until a Notice of Termination has been submitted. Inspection procedures for these routine inspections shall be addressed and implemented in the following manner:

a. The Permittee shall maintain a rain gauge on-site to document rainfall amounts. At least once a week and within 24 hours of the end of a storm that generates a discharge, a qualified inspector (provided by the Permittee), as defined in the "Definitions" section (Section 2) of the General Permit, shall inspect, at a minimum, the following: disturbed areas of the construction activity that have not been finally stabilized; all erosion and sedimentation control measures; all structural control measures; soil stockpile areas; washout areas and locations where vehicles enter or exit the site. These areas shall be inspected for evidence of, or the potential for, pollutants entering the drainage system and impacts to the receiving waters. Locations where vehicles enter or exit the site shall also be inspected for evidence of off-site sediment tracking. For storms that end on a weekend, holiday or other time after which normal working hours will not commence within 24 hours, an inspection is required within 24 hours only for storms that equal or exceed 0.5 inches. For storms of less than 0.5 inches, an inspection shall occur immediately upon the start of the subsequent normal working hours. Where sites have been temporarily or finally stabilized, such inspection shall be conducted at least once every month for three months.

b. The Qualified Inspector(s) shall evaluate the effectiveness of erosion and sediment controls, structural controls, stabilization practices, and any other controls

implemented to prevent pollution and determine if it is necessary to install, maintain, or repair such controls and/or practices to improve the quality of stormwater discharge(s).

c. A report shall be prepared and retained as part of the Plan. This report shall summarize: the scope of the inspection; name(s) and qualifications of personnel making the inspection; the date(s) of the inspection; weather conditions including precipitation information; major observations relating to erosion and sediment controls and the implementation of the Plan; a description of the stormwater discharge(s) from the site; and any water quality monitoring performed during the inspection. The report shall be signed by the Permittee or his/her authorized representative in accordance with the "Certification of Documents" section (subsection 5(i)) of the General Permit. The report shall include a statement that, in the judgment of the qualified inspector(s) conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the Plan and permit. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance. Non-engineered corrective actions (as identified in the Guidelines) shall be implemented on site within 24 hours and incorporated into a revised Plan within three (3) calendar days of the date of inspection unless another schedule is specified in the Guidelines. Engineered corrective actions (as identified in the Guidelines) shall be implemented on site within seven (7) days and incorporated into a revised Plan within ten (10) days of the date of inspection, unless another schedule is specified in the Guidelines or is approved by the commissioner. During the period in which any corrective actions are being developed and have not yet been fully implemented, interim measures shall be implemented to minimize the potential for the discharge of pollutants from the site.

d. Inspectors from the CT DEEP may inspect the site for compliance with the General Permit at any time construction activities are ongoing and upon completion of construction activities to verify the final stabilization of the site and/or the installation of post-construction stormwater management measures pursuant to Section 6(a).

e. Additional inspections, reports and documentation may also be required to comply with the "Monitoring Requirements" section (Section 5(c)) of the General Permit.

2.11.1.3 Inspection Personnel Qualifications

The site shall be inspected by a qualified soil erosion and sediment control professional or a qualified professional engineer (Qualified Inspector). The inspector shall be someone who:

a. is not an employee, as defined by the Internal Revenue Service in the Internal Revenue Code of 1986, of the registrant, and

b. has no ownership interest of any kind in the Project for which the registration is being submitted.

2.12 Letter of Credit

The Permittee will establish a Letter of Credit in the amount of $3,300,000 with the CT DEEP prior to initiating construction. The value of the Letter of Credit is based on the total disturbance of 220 acres and the $15,000.00 per acre requirement.

2.13 Non-Stormwater Discharges

It is not expected that non-stormwater discharges will occur at the Site during the construction period, however if groundwater is apparent then the following discharge may occur:

1. **Dewatering discharges:** Water pumped from the construction area during dewatering operations.

2.14 Significant-Materials Inventory

Significant materials expected to be found at the construction site include:

- Concrete mix (trucked to the site for proposed site improvements)
- Steel reinforcing bars and related materials
- Photovoltaic panels and related materials
- Diesel fuel and lubricating oils
- Paints
- Fertilizers

This list of significant materials may be reduced or expanded once a contractor has been selected and the materials to be used have been specified. If fewer, or additional, materials are required, the SWPCP will be amended to reflect these changes.

2.15 Spill Prevention and Response Procedures

Spill prevention and response include good housekeeping as well as specific practices for certain products and established procedures for responding to spills.

2.15.1 Good Housekeeping

The following good housekeeping practices will be followed on site during construction of the Project.

1. **Minimize materials:** An effort will be made to store only enough material required to complete the job.

2. **Storage:** All materials stored on site will be stored in a neat, orderly manner in their appropriate containers in a covered area. If storage in a covered area is not possible, the materials shall be covered with polyethylene or polypropylene sheeting to protect them from the elements.

3. **Labeling:** Products will be stored in their original containers with the original manufacturer's label affixed to each container.

4. **Mixing:** Substances will not be mixed with one another unless this is recommended by the manufacturer.

5. **Disposal:** Whenever possible, all of a product will be used prior to disposal of the container. Manufacturers' recommendations for proper use and disposal will be followed.

6. **Inspections:** The site superintendent will inspect the site daily to ensure proper use and disposal of materials on site.

7. **Spoil materials:** Any excavated material that will not be used for fill material and all demolished pavement will be hauled off site and will be disposed of properly.

2.15.2 Product-Specific Practices

Petroleum products: All on-site vehicles will be monitored for leaks and will receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled. Any asphalt substances used on site will be applied according to the manufacturer's recommendations.

Concrete trucks: Concrete trucks will not be allowed to wash out or discharge surplus concrete or drum wash water at the site.

Paints: All containers will be tightly sealed and stored when not required for use. Excess paint will be properly disposed of according to manufacturers' instructions and state and local regulations.

Fertilizers: Fertilizers will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. Fertilizer will be stored in a covered area, and any partially used bags will be transferred to a sealable plastic bin to avoid spills.

2.15.3 Spill Control and Response Practices

A spill prevention and response team will be designated by the Owner or the site superintendent. In addition, the following practices will be followed for spill cleanup:

1. **Information:** Manufacturers' recommended methods for spill cleanup will be clearly posted, and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
2. **Equipment:** Materials and equipment necessary for spill cleanup will be present on the site at all times. Equipment and materials will include but not limited to brooms, shovels, rags, gloves, goggles, absorbent materials (sand, sawdust, etc.), and plastic or metal trash containers specifically designed for this purpose. The materials and equipment necessary for spill cleanup will be dependent upon the nature and quantity of the material stored on site.
3. **Response:** All spills will be cleaned up immediately upon discovery.
4. **Safety**: The spill area will be kept well ventilated, and personnel will wear appropriate protective clothing to prevent injury from contact with hazardous substances.

5. **Reporting**: Spills of toxic or hazardous material will be reported to the appropriate state or local government agency, regardless of the spill's size, immediately upon discovery.
6. **Record keeping:** The spill prevention plan will be modified to include measures to prevent a spill from recurring as well as improved methods for cleaning up any future spills. A description of each spill, what caused it, and the cleanup measures used will be kept with the plan.

2.16 Plan Location and Public Access

This SWPCP must be available at the construction site from the date of Project initiation to the date of final stabilization. The SWPCP and all reports required by the General Permit for permit must be retained by the Owner for at least three years from the date on which the site is finally stabilized.

2.17 Reporting and Record Keeping

The Permittee is responsible for keeping the Plan in compliance with the General Permit at all times. For a period of at least five years from the date that construction is complete, the Permittee shall retain copies of the Plan and all reports required by this General Permit, and records of all data used to complete the registration for this General Permit, unless the commissioner specifies another time period in writing. Inspection records must be retained as part of the Plan for a period of five (5) years after the date of inspection.

The Permittee shall retain an updated copy of the Plan required by the General Permit at the construction site from the date construction is initiated at the site until the date construction at the site is completed.

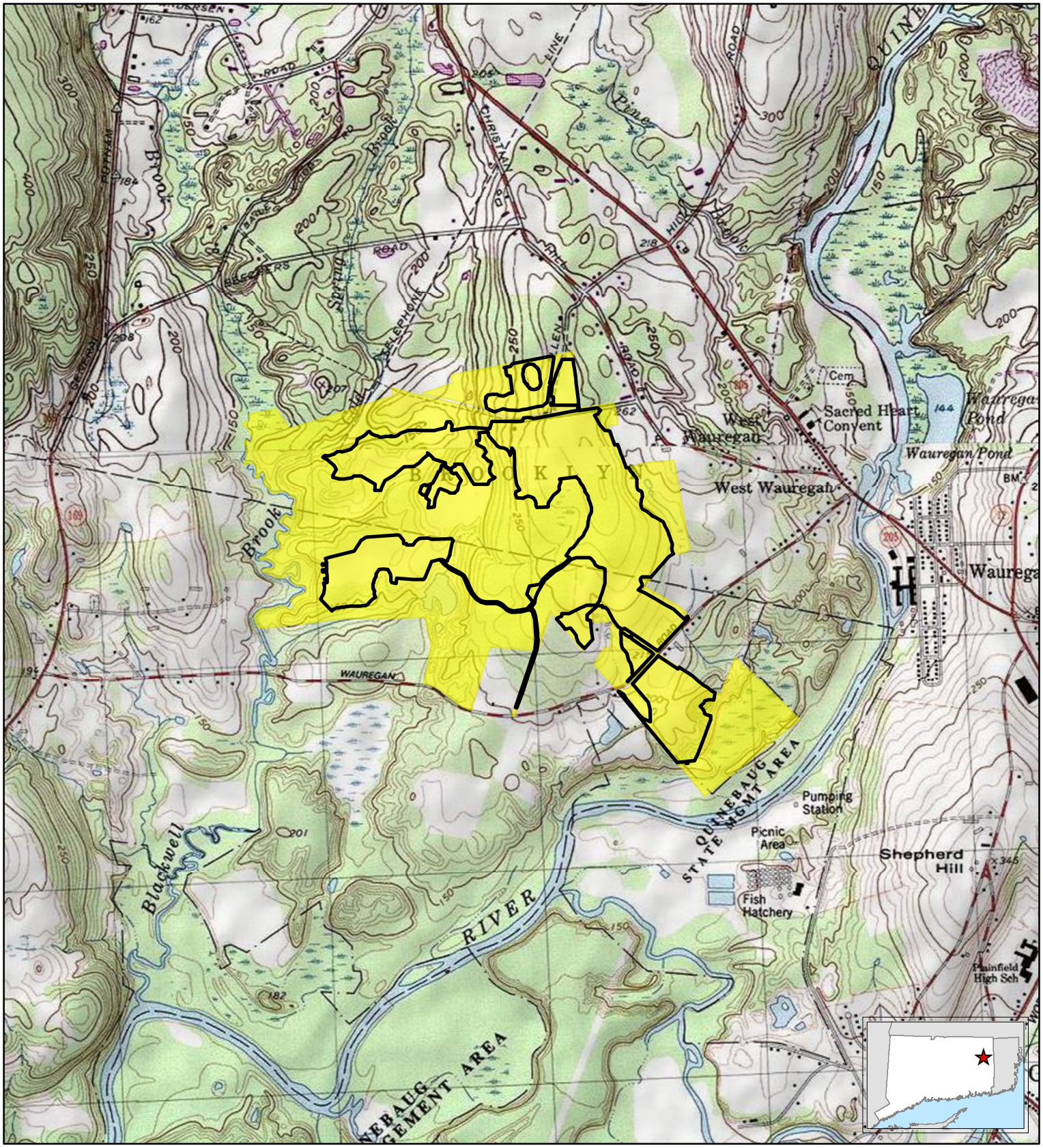
Revisions to the plan may involve the following actions:

- The Permittee shall amend the Plan if the actions required by the Plan fail to prevent pollution or fail to otherwise comply with any other provision of the General Permit. The Plan shall also be amended whenever there is a change in contractors or subcontractors at the site, or a change in design, construction, operation, or maintenance at the site which has the potential for the discharge of pollutants to the waters of the state and which has not otherwise been addressed in the Plan.
- The commissioner may notify the Permittee at any time that the Plan and/or the site do not meet one or more of the minimum requirements of the General Permit. Within 7 days of such notice, or such other time as the commissioner may allow, the Permittee shall make the required changes to the Plan and perform all actions required by such revised Plan. Within 15 days of such notice, or such other time as the commissioner may allow, the Permittee shall submit to the commissioner a written certification that the requested changes have been made and implemented and such other information as the commissioner requires, in accordance with the "Duty to Provide Information" and "Certification of Documents" sections (subsections 5(h) and 5(i)) of the General Permit.

In no event shall failure to complete, maintain or update a Plan, in accordance with the "Development of Contents of the Plan" and "Keeping Plans Current" sections (subsections 5(b)(1) and 5(b)(5)) of the General Permit, relieve a Permittee of responsibility to

implement any actions required to protect the waters of the state and to comply with all conditions of the permit.

APPENDIX A



Limit of Work/Development Area

Project Site

Tighe&Bond

Based on USGS Topographic Map for Danielson, CT and Plainfield, CT

1:24,000

0 1,000 2,000

Feet

N

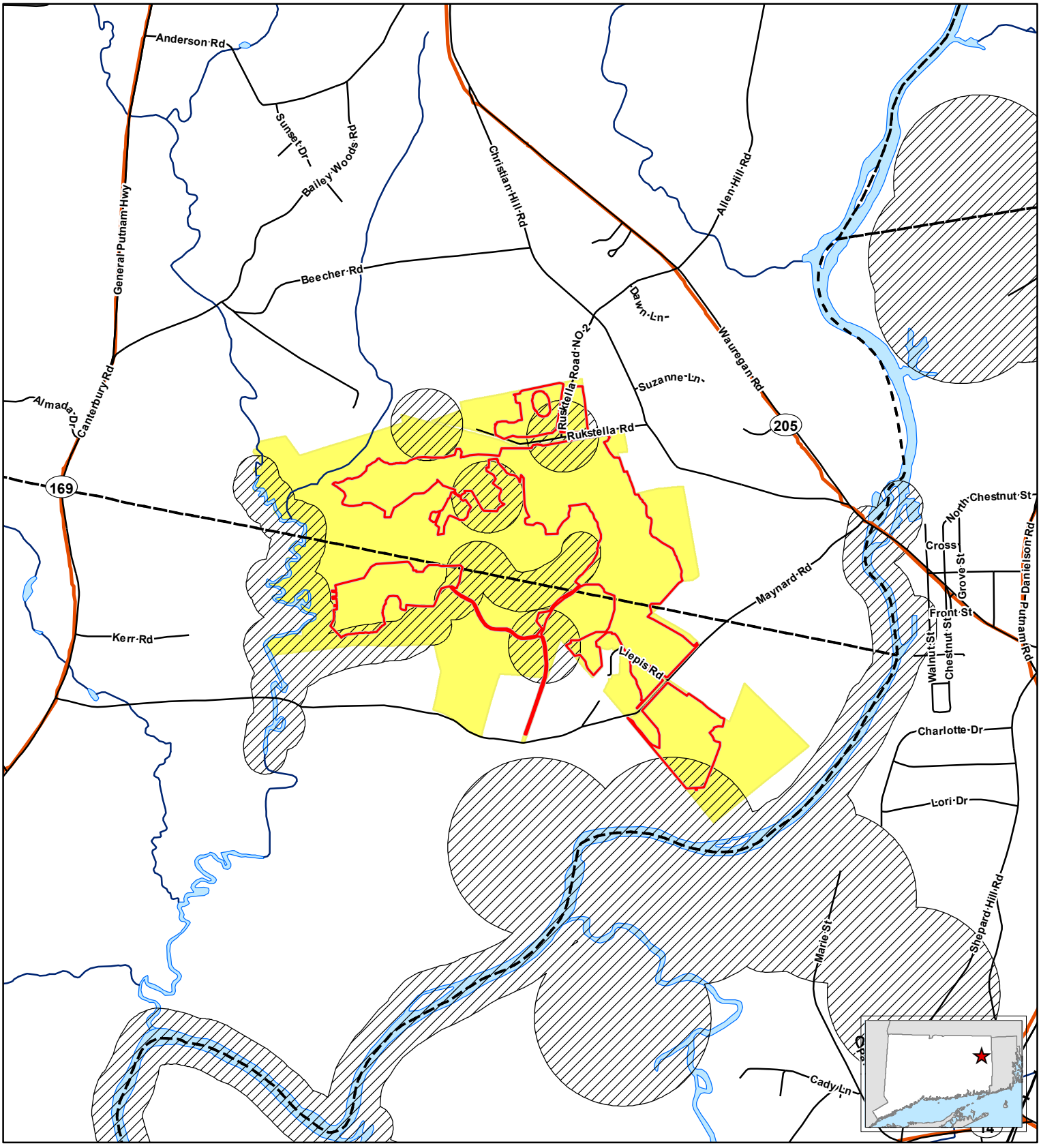
FIGURE 1
SITE LOCATION

Quinebaug Solar
Brooklyn & Canterbury,
Connecticut

December 2020

V:\Projects\R\R0317\QuinebaugCT_Solar\Maps\FilingFigures_Updated\SiteLocation_QuinebaugCT.mxd [Exported By: kjw, 12/23/2020, 9:23:10 AM]

R-0317



Limit of Work/Development Area
Minor Street or Road
State Route
Railroad
CT Municipal Boundary
Watercourse
Natural Diversity Database Area
Waterbody
Project Site

Tighe&Bond

Data source: Connecticut Department of Energy and Environmental Protection (CTDEEP).
Data valid as of December 2020.

1:24,000
0 1,000 2,000
Feet

N

FIGURE 2
CT DEEP ENDANGERED SPECIES MAP

Quinebaug Solar
Brooklyn & Canterbury, Connecticut

December 2020

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R-0317

N

1S
2S
3S
4S
5S
6S
7S
8S
9S
10S
11S
12S
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DP-1
DP-2
DP-3
DP-4

LEGEND

SUBCATCHMENT BOUNDARY

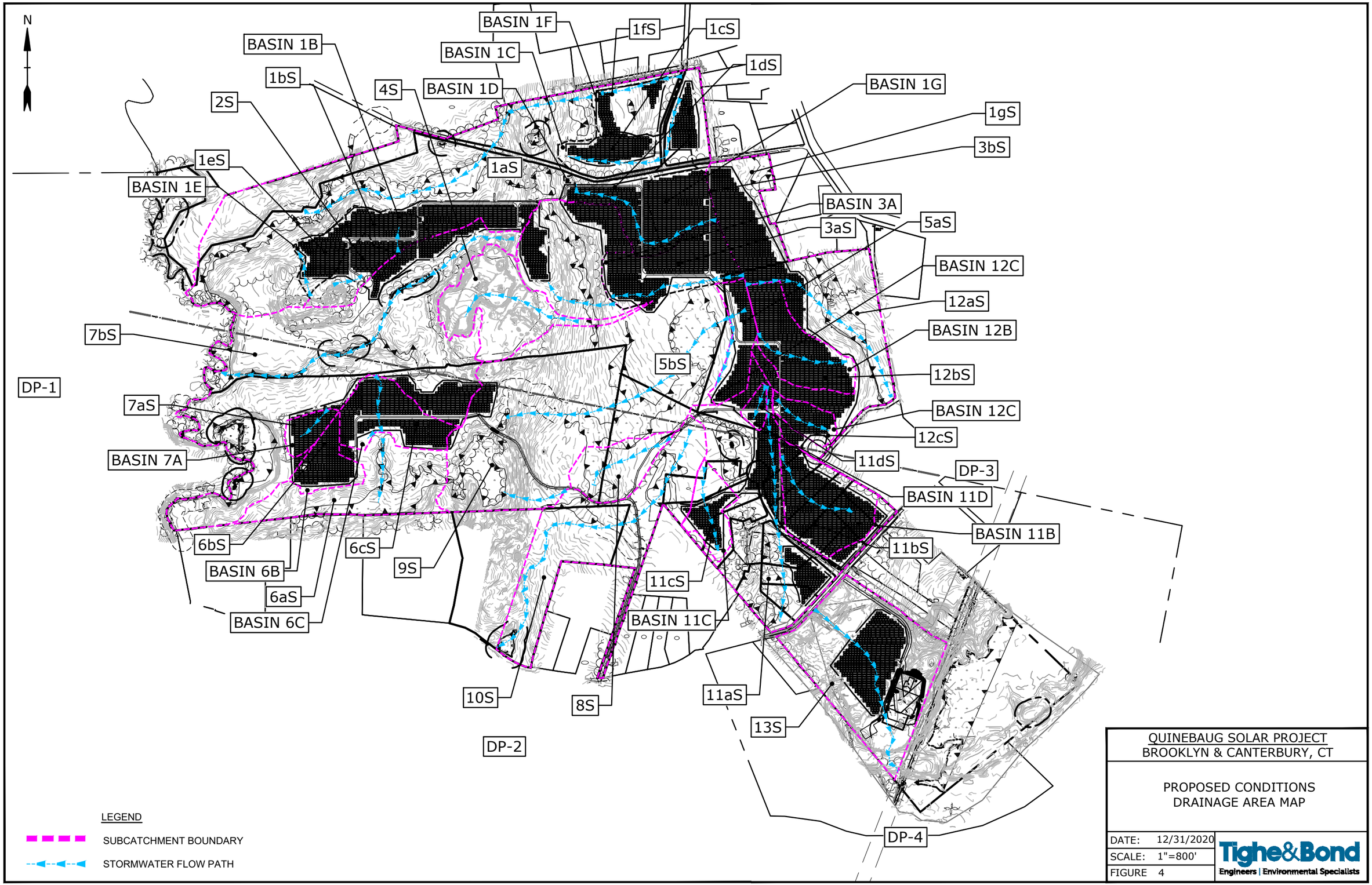
STORMWATER FLOW PATH

QUINEBAUG SOLAR PROJECT
BROOKLYN & CANTERBURY, CT

EXISTING CONDITIONS
DRAINAGE AREA MAP

DATE: 12/31/2020
SCALE: 1"=800'
FIGURE 3

Tighe&Bond
Engineers | Environmental Specialists


N
BASIN 1F
1fS
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BASIN 1B
BASIN 1C
1dS
1bS
4S
BASIN 1D
BASIN 1G
2S
1gS
3bS
1eS
1aS
BASIN 1E
BASIN 3A
5aS
3aS
BASIN 12C
12aS
7bS
BASIN 12B
5bS
12bS
DP-1
7aS
BASIN 12C
12cS
BASIN 7A
11dS
DP-3
BASIN 11D
BASIN 11B
6bS
6cS
11bS
9S
BASIN 6B
11cS
6aS
BASIN 11C
BASIN 6C
10S
8S
11aS
13S
DP-2
DP-4
LEGEND
SUBCATCHMENT BOUNDARY
STORMWATER FLOW PATH
QUINEBAUG SOLAR PROJECT
BROOKLYN & CANTERBURY, CT
PROPOSED CONDITIONS
DRAINAGE AREA MAP
DATE: 12/31/2020
SCALE: 1"=800'
FIGURE 4
Tighe&Bond
Engineers | Environmental Specialists

APPENDIX B

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

March 5, 2020

Katelin Nickerson
Senior Environmental Consultant
Tetra Tech, Inc.
451 Presumpscot Street
Portland, ME 04103
Katelin.nickerson@tetratch.com

Re: Quinebaug Solar Project, Wauregan Road and Rukstella Road, Canterbury and Brooklyn, CT
NDDB Final Determination: 201904603

Current data maintained by the Natural Diversity Database (NDDB) indicates that the following species have been documented within the vicinity of the proposed project area:

- American kestrel (*Falco sparverius*) – State Special Concern
- Eastern pearlshell (*Margaritifera margaritifera)* – State Special Concern
- Eastern spadefoot (*Scaphiopus holbrookii)* – State Endangered

Wildlife Division staff have reviewed following material submitted by TetraTech, including but not limited to:

- Environmental Site Conditions Report, April 2019
- Vernal Pool Survey and General Herpetological Inventory of the Quinebaug Solar Project. Prepared by FB Environmental (March 2019)
- Eastern Spadefoot Toad Survey, Quinebaug Solar Project, Brooklyn and Canterbury, Connecticut. Prepared by FB Environmental (March 2019)
- Northern Long-eared Bat (NLEB) Presence/Absence Survey Prepared by Tetra Tech, Inc. for Ranger Solar (September 20, 2016)
- Herpetofauna Avoidance and Mitigation Plan, Quinebaug Solar Project, April 2019
- Quinebaug Solar Project, Additional Wildlife and Resource Evaluation (correspondence), August 28, 2019
- Quinebaug Solar 2019 Spadefoot Surveys (October 7, 2019)
- Quinebaug Solar Project, Eastern Spadefoot Toad Protection, January 17, 2020
- Eastern Spadefoot Toad (*Scaphiopus holbrookii*) Three-Year Monitoring Plan, submitted February 28, 2020, which includes current array layout map and updated conservation area map

<u>American kestrel (*Falco sparverius*)</u>
Habitat for this bird consists of open grassy or shrubby areas with short vegetation and natural tree cavities or nest boxes for nesting; they are limited by habitat in Connecticut. This bird returns to breed in March – July and can benefit from active nest box monitoring and management to decrease competition by starlings. Availability of early successional habitat benefits this species during the post fledgling period and during migration.

Land disturbance activities including digging, ground clearing, heavy machinery driving, staging, or trampling that will occur more than 100 feet into or cut across in a way that fragments large parcels of grassland or shrubland habitat should be done when birds are not breeding. Breeding primarily takes place between March 1 and July 30. Conducting land disturbance activities outside of this breeding season will avoid impact to the individuals. Additionally, do not introduce new traffic or construction noise within a 200m buffer of an active nest or nest box.

Thank you for your August 28, 2019 memo detailing additional protection measures that will be undertaken for this species, which included seasonal clearing restrictions (winter clearing) as well as the following:

- Construction-phase environmental monitoring,
- On-site environmental training for contractors, and
- Minimizing soil disturbance and establishing meadow habitat following construction.

We concur that these additional measures will be protective of this species.

Eastern pearlshell (*Margaritifera margaritifera)*

This freshwater mussel species lives buried in clean, stable, mixed substrate in fast-flowing unpolluted streams and rivers. Its host fish include Atlantic salmon (*Salmo salar*), brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), and rainbow trout (*Onchorhynchus mykiss*). Best habitats are good trout streams that are heavily shaded by a riparian canopy, possess clean cold water with high dissolved oxygen, and have stable channels with substrates of coarse sand, gravel, and cobble. Factors that limit the eastern pearlshell are changes to water quality, including eutrophication, acidification, sedimentation, and increases in water temperature.

DEEP accepts the following measures, outlined in your August 28, 2019 correspondence, intended to prevent erosion and sedimentation to adjacent watercourses during project construction:

- Establish a no-disturbance buffer around all wetlands and watercourses that will be fortified by using the best erosion control devices available to maintain high water quality of the stormwater runoff during heavy rainfall events. Buffers will be a minimum of 100 feet, except in limited circumstances in the vicinity of existing gravel roads (less than 100 feet) that will be used for site access during construction
- Redundant erosion control devices will be installed along the gravel access roads to ensure a failsafe system to protect the resources. Regular road maintenance will be employed during construction and will be maintained during the operation of the Project.
- The herpetofauna avoidance area established around the cluster of wetlands and vernal pools in a relic stream channel immediately up slope from Cold Spring Brook and Blackwell Brook will leave a forested buffer intact between the adjacent watercourses and potential sources of erosion and sedimentation created during Project construction.
- Additional measures are found in the August 28, 2019 memo, sections Stormwater Control and Site Stabilization, Stormwater Pollution Control Plan and Construction Sequence, and Additional Control Measures.

Eastern spadefoot (*Scaphiopus holbrookii)*

Pursuant to the December 18, 2019 meeting, ongoing discussions between Agency Staff and project proponents have resulted in an agreement by all parties to implement Spadefoot toad mitigation measures as outlined in the Quinebaug Solar Hepetofauna Avoidance and Mitigation Plan (April 2019), the Quinebaug Solar Project, Eastern Spadefoot Toad Protection (January 17, 2020), and the Eastern Spadefoot Toad (*Scaphiopus holbrookii*) Three-Year Monitoring Plan (submitted February 28, 2020).

These plans provide details regarding the components of spadefoot toad protection, as highlighted below. Refer to these plans for specific details.

Conservation Areas

- Wetlands and watercourses are outside the limit of work, and include 100-foot buffers, with some exceptions. See Figure 2, Eastern Spadefoot Toad (*Scaphiopus holbrookii*) Three-Year Monitoring Plan (submitted February 28, 2020).
- Conservation area (designated as 'herpetofauna protection area'); ~ 40 acres, which has been updated to include conserved areas around Pool C (~1 acre) and the edge of the gravel extraction area (~7 acres). See Figure 2, Eastern Spadefoot Toad (*Scaphiopus holbrookii*) Three-Year Monitoring Plan (submitted February 28, 2020).
- Conserved areas are to be designated as such for the life of the project, as agreed to in the letter dated January 10, 2020, signed by River Junction Estates LLC, O & G Industries, Inc. and Strategic Commercial Realty DBA Rawson Materials, and provided to DEEP (Attachment 1).

Protection Measures - Construction Activities

- Construction Timing as described in the Quinebaug Solar Herpetofauna Avoidance and Mitigation Plan, including but not limited to restricting tree clearing in vernal pool critical terrestrial habitats to winter (November to March)
- Monitoring during construction as described in the Quinebaug Solar Herpetofauna Avoidance and Mitigation Plan
- Exclusion fencing and relocation as needed as described in the Quinebaug Solar Herpetofauna Avoidance and Mitigation Plan.
- Contractor training – as described in the Quinebaug Solar Herpetofauna Avoidance and Mitigation Plan, including but not limited to hiring an Environmental Monitor, who will create a training curriculum prior to commencement of construction activities.

Post-Construction

- Permanent signage around Pool C (prevent entry of mechanized maintenance equipment)
- Post-construction monitoring – 3 years of monitoring, beginning in 2022 and extending to 2024, will be implemented utilizing survey methods deployed during summer 2019. Monitoring focus will be limited to surveying for breeding evidence at Pool C. Refer to the Eastern Spadefoot Toad (*Scaphiopus holbrookii*) Three-Year Monitoring Plan (submitted February 28, 2020) for details. Annual monitoring reports must be submitted to the Wildlife Division by December 31st each year.
- Note that DEEP would like to clarify the declaration found in the Eastern Spadefoot Toad (*Scaphiopus holbrookii*) Three-Year Monitoring Plan statement; "*Therefore, if breeding of eastern spadefoot toad is not observed during the proposed three-year monitoring effort, it will not be indicative of negative impact or disturbance to the species resulting from Project development. Rather, it will be a continuation of what has been previously observed.*" A parsing of this sentence indicates that Quinebaug Solar is stating that a lack of breeding should not be utilized to conclude there have been negative impacts to the species from project development. DEEP notes that if breeding is not observed, there are no conclusions to be drawn regarding potential impacts to spadefoot toad breeding from project activities.

As the project moves forward, it will be important for your project leaders and herpetologists to work closely with DEEP spadefoot toad biologist, Michael Ravesi (michael.ravesi@ct.gov; 860-424-3104) to ensure that protection measures proposed during construction are properly implemented and that

study design for the post-construction monitoring is appropriate for the species and for acquisition of the appropriate data to assess impact associated with and site use of the Quinebaug Solar Project.

Finally, DEEP notes that impact avoidance and mitigation measures agreed to for this project are applicable to this project only and may not be appropriate or deemed acceptable for similar species and conditions at other sites.

The NDDB Determination for Quinebaug Solar Project, Wauregan Road and Rukstella Road, Canterbury and Brooklyn, as described in the submitted information is valid for two years. This determination applies only to the project as described in the submission. Please re-submit an updated Request for Review if there are additional scope of work and/or timeframe changes, including if work has not begun by March 05, 2022.

Natural Diversity Database information includes all information regarding listed species available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, land owners, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as enhance existing data. Such new information is incorporated into the Database and as it becomes available. New information may result in additional review, and new or modified restrictions or conditions may be necessary to remain in compliance with certain state permits.

- During your work listed species may be encountered on site. A report must be submitted by the observer to the Natural Diversity Database promptly and additional review and restrictions or conditions may be necessary to remain in compliance with certain state permits.
- Your project involves the state permit application process or other state involvement, including state funding or state agency actions; please note that consultations with your permit analyst or the agency may result in additional requirements. In this situation, additional evaluation of the proposal by the DEEP Wildlife Division may be necessary and additional information, including but not limited to species-specific site surveys, may be required. Any additional review may result in specific restrictions or conditions relating to listed species that may be found at or in the vicinity of the site.

Jenny Dickson

Director
CT DEEP Wildlife Division
Jenny.dickson@ct.gov

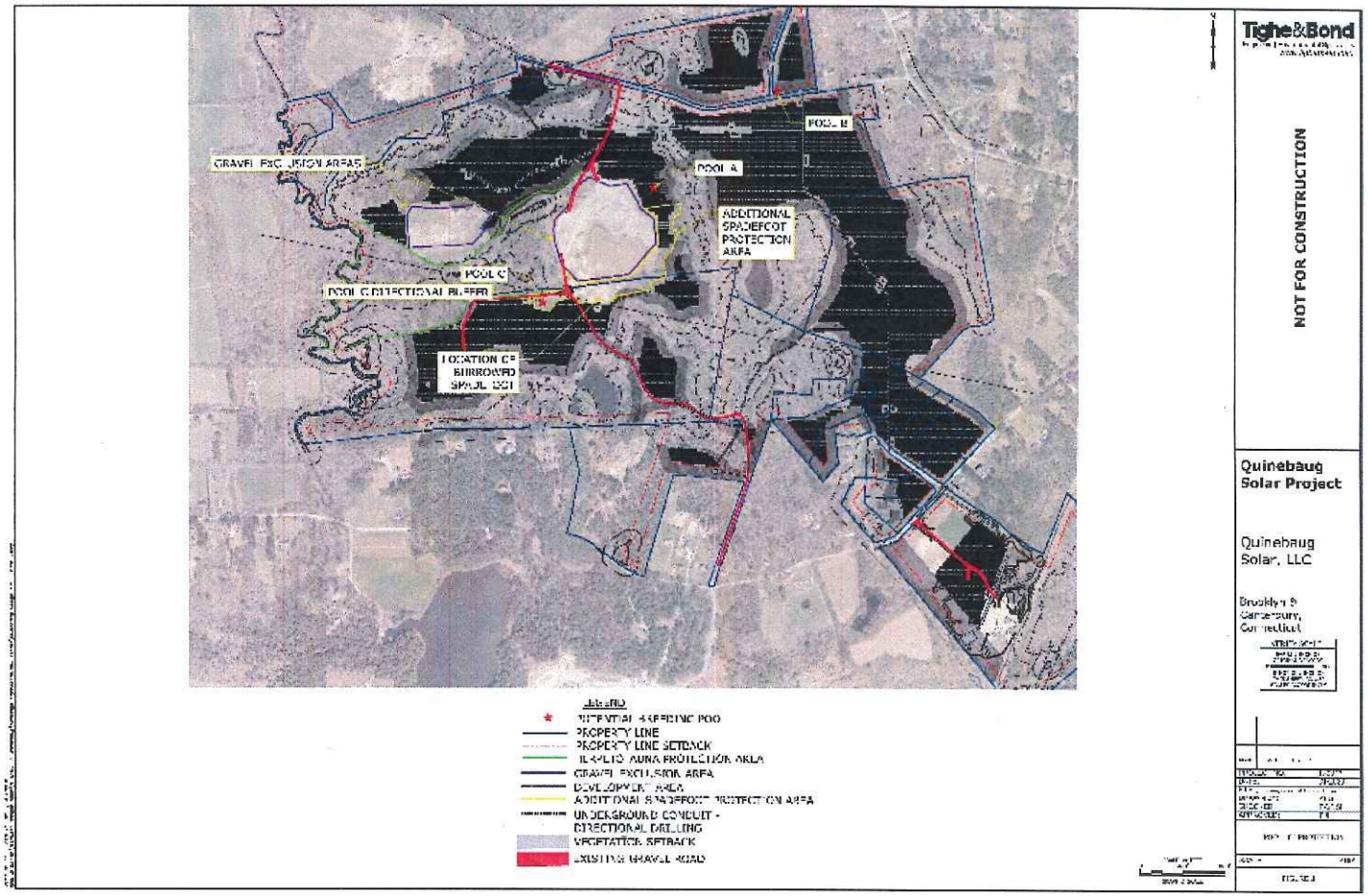


Figure 1: Conceptual layout and maximum Project extent, Quinebaug Solar Project Brooklyn and Canterbury, Connecticut

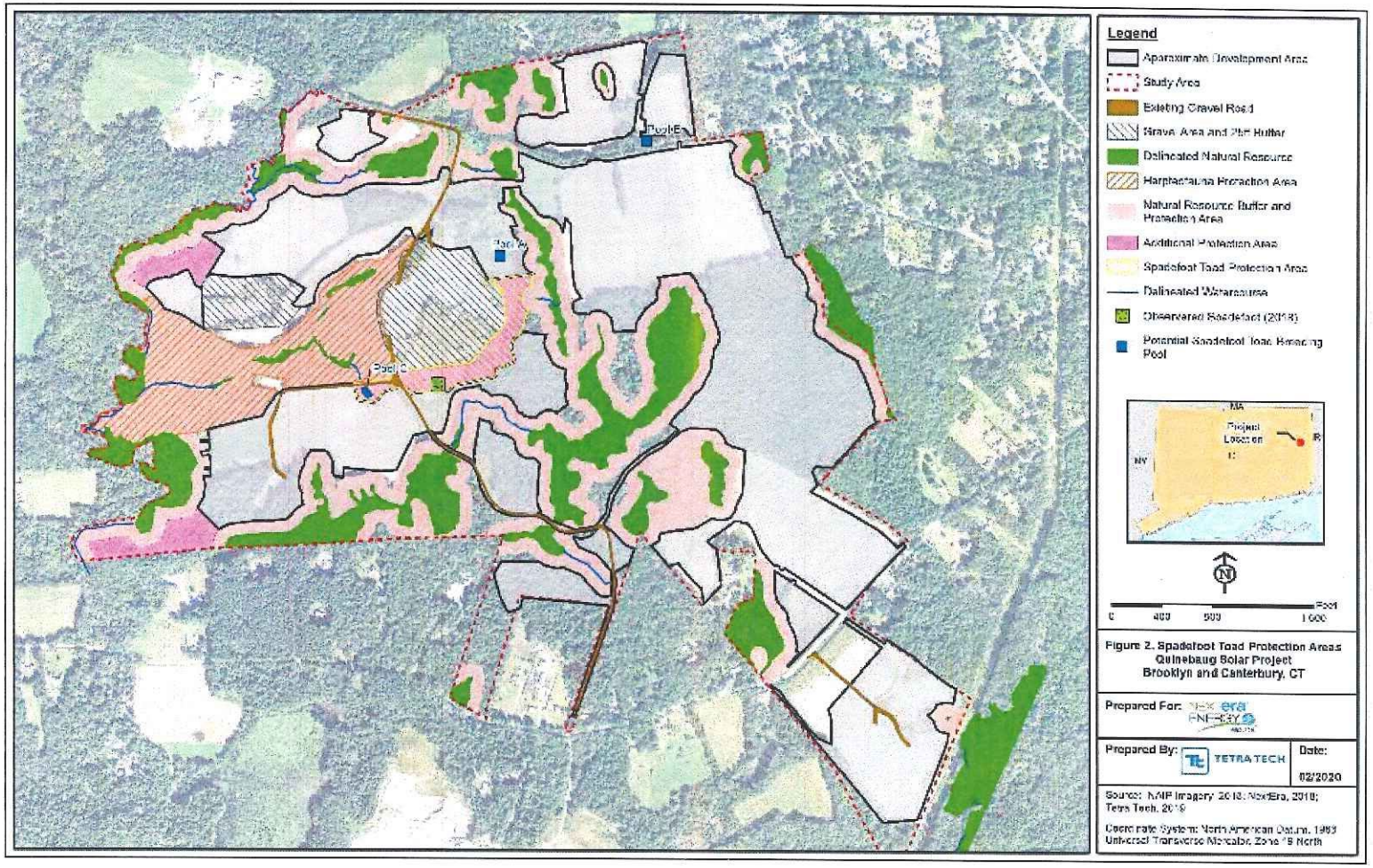


Figure 2: Spadefoot toad protection areas, Quinebaug Solar Project Brooklyn and Canterbury, Connecticut

Attachment 1. Conservation Area Protection Letter

January 10, 2023

Connecticut Department of Energy
and Environmental Protection
79 Elm Street
Hartford, Connecticut 06106

Re: Quinebaug Solar Project – Conservation Areas on the River Junction Estates Land

To Whom This May Concern:

Quinebaug Solar, LLC ("Quinebaug Solar") is currently proposing to construct a solar project (the "Project") on several parcels of land in the towns of Canterbury and Brooklyn, Connecticut. Quinebaug Solar understands the value of placing certain areas of the solar project in conservation for the duration of the solar project and therefore agrees that it will not develop solar on the areas shown in pink as further denoted on **Exhibit A**, the Conservation Areas Map, attached hereto and hereinafter incorporated by reference (the "**Conservation Areas**").

Further, the landowner, River Junction Estates, LLC and the mineral rights owners O&G Industries, Inc. and Strategic Commercial Realty, Inc. DBA Rawson Materials (collectively, referred to as the "**Land Parties**"), represent and warrant that for the duration of the solar project, the Land Parties will not develop or grant others the right to develop, the Conservation Areas.

Quinebaug Solar and the Land Parties agree that a short form of this letter in a format acceptable to all parties, may be recorded at the request of the Connecticut Department of Energy and Environmental Protection in the land records of the town where such Conservation Areas lie.

Quinebaug Solar and the Land Parties further agree that the above referenced Conservation Areas shall be effective no earlier than the start of construction of the Project and will not go into effect unless and until all applicable state and local permits have been duly issued.

QUINEBAUG SOLAR
Quinebaug Solar, LLC

By: Kathy Beilhart
Title: VP of Finance, Accounting, and Tax

LAND PARTIES
Strategic Commercial Realty, Inc.
dba Rawson Materials

By: Jeffrey Rawson
Title: President

O&G Industries, Inc.

By: Matt Onofrio
Title: AVP

River Junction Estates, LLC

By: Allan Rawson
Title: Manager

APPENDIX C

SOIL EROSION AND SEDIMENT CONTROL
PLAN UNDER SEPARATE COVER

APPENDIX D

Temporary Sediment Basin and Trap Sizing Calculations

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 1D/2B/4B

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 6.1 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

Source: USDA-SCS

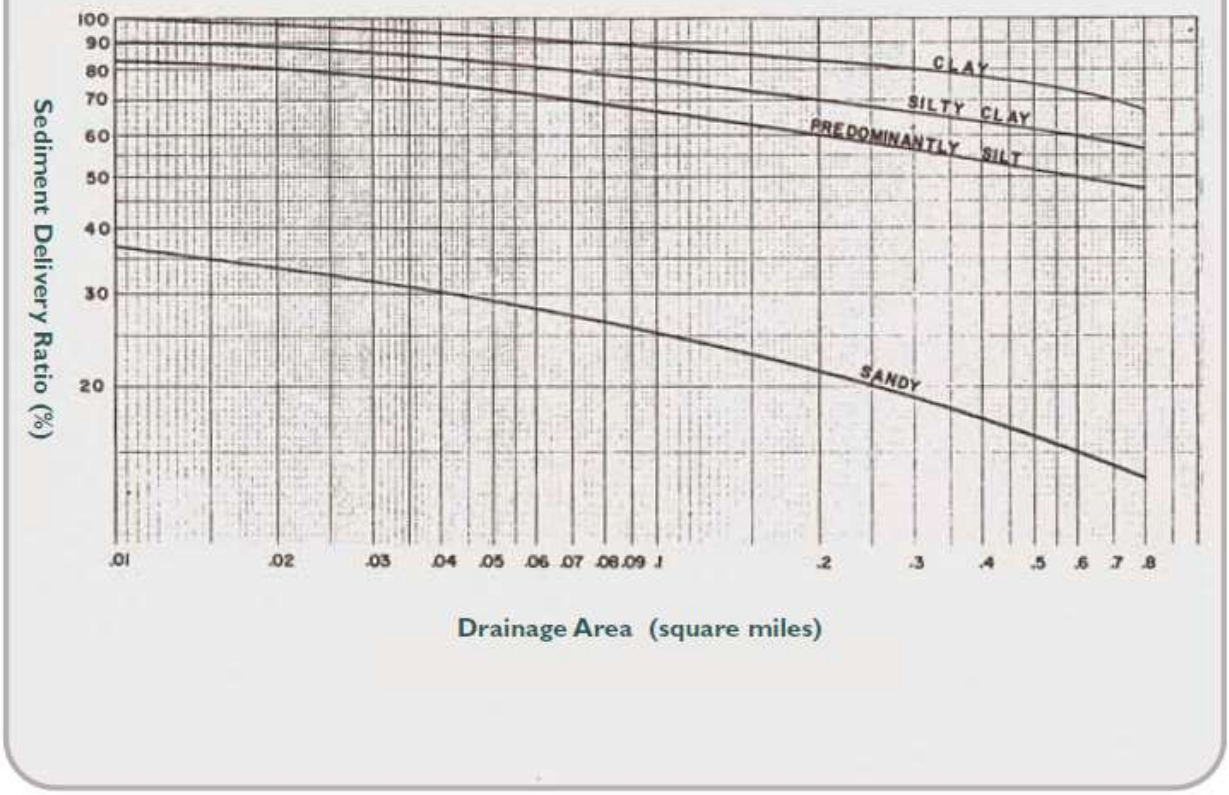
Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed

DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.070 Acre Ft
V_S = 3042.82 Cu. Ft
112.70 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 6086 Cu. Ft
225.39 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 11741 Cu. Ft.
435 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 1F/3L

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 10 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

Source: USDA-SCS

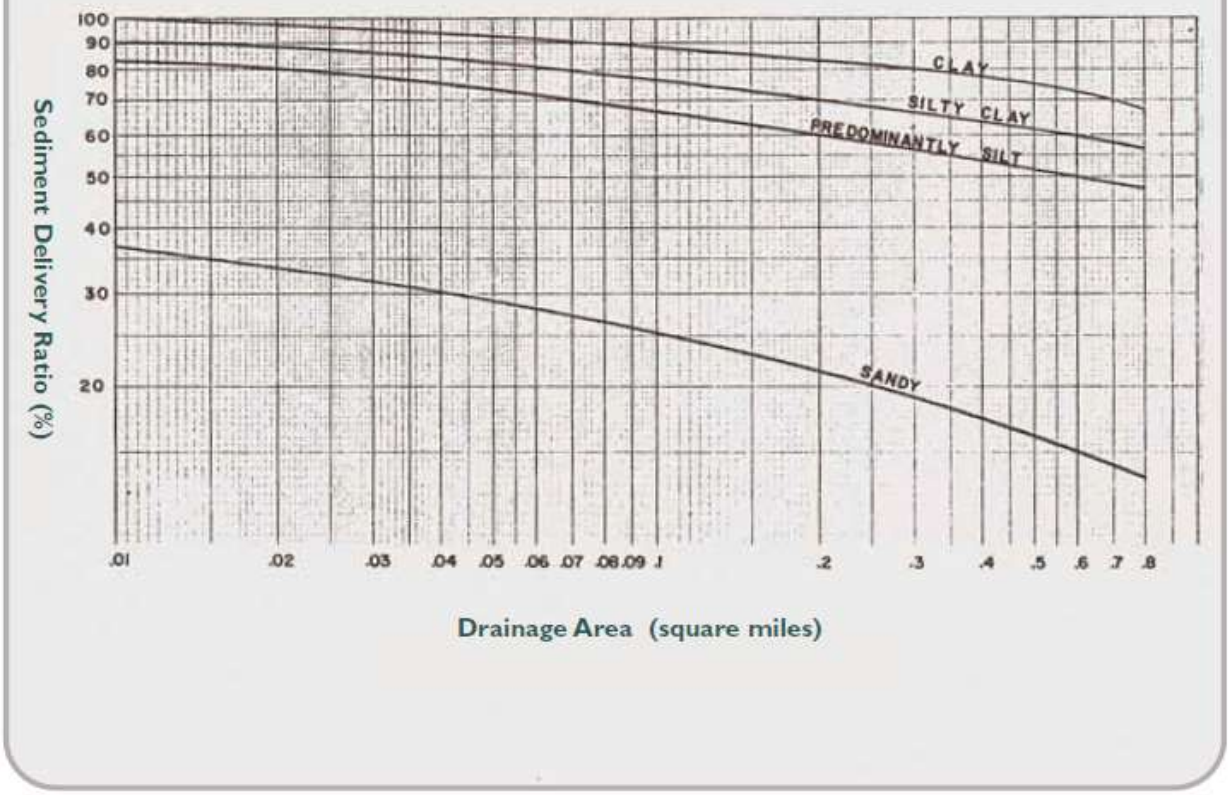
Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed

DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.115 Acre Ft
V_S = 4988.24 Cu. Ft
184.75 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 9976 Cu. Ft
369.50 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 17578 Cu. Ft.
651 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 1L/3S/3T

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 8.3 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

Source: USDA-SCS

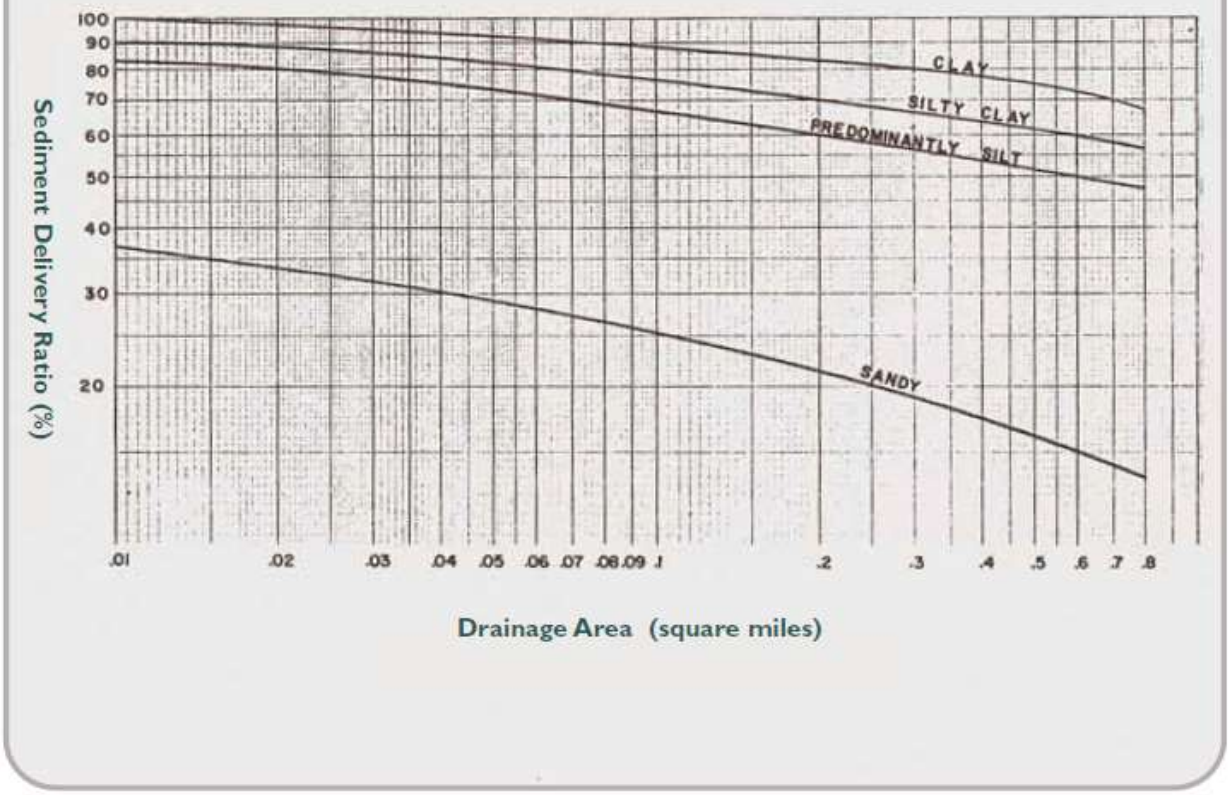
Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed

DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.095 Acre Ft
V_S = 4140.24 Cu. Ft
153.34 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 8280 Cu. Ft
306.68 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 15034 Cu. Ft.
557 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 2A/4A

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 5.2 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

Source: USDA-SCS

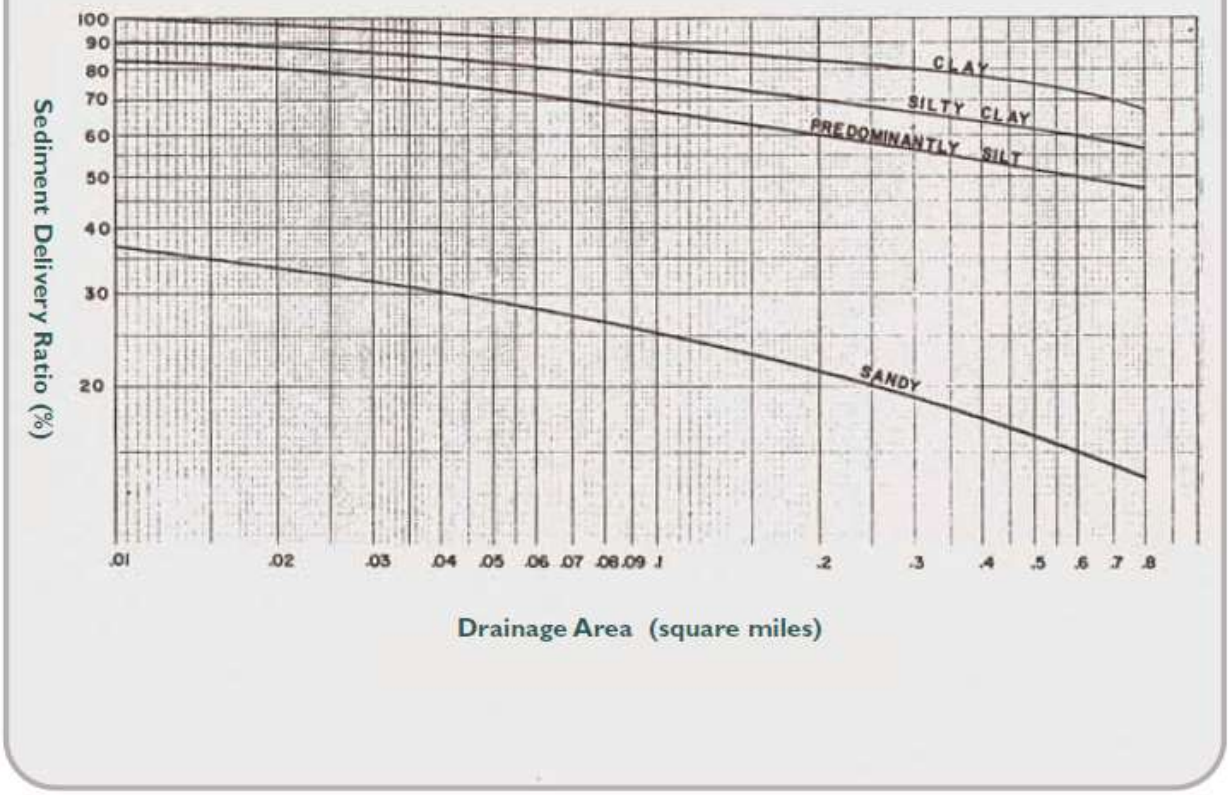
Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed

DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.060 Acre Ft
V_S = 2593.88 Cu. Ft
96.07 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 5188 Cu. Ft
192.14 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 10395 Cu. Ft.

385 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Cantebury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 2F/4F

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 8.8 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

Source: USDA-SCS

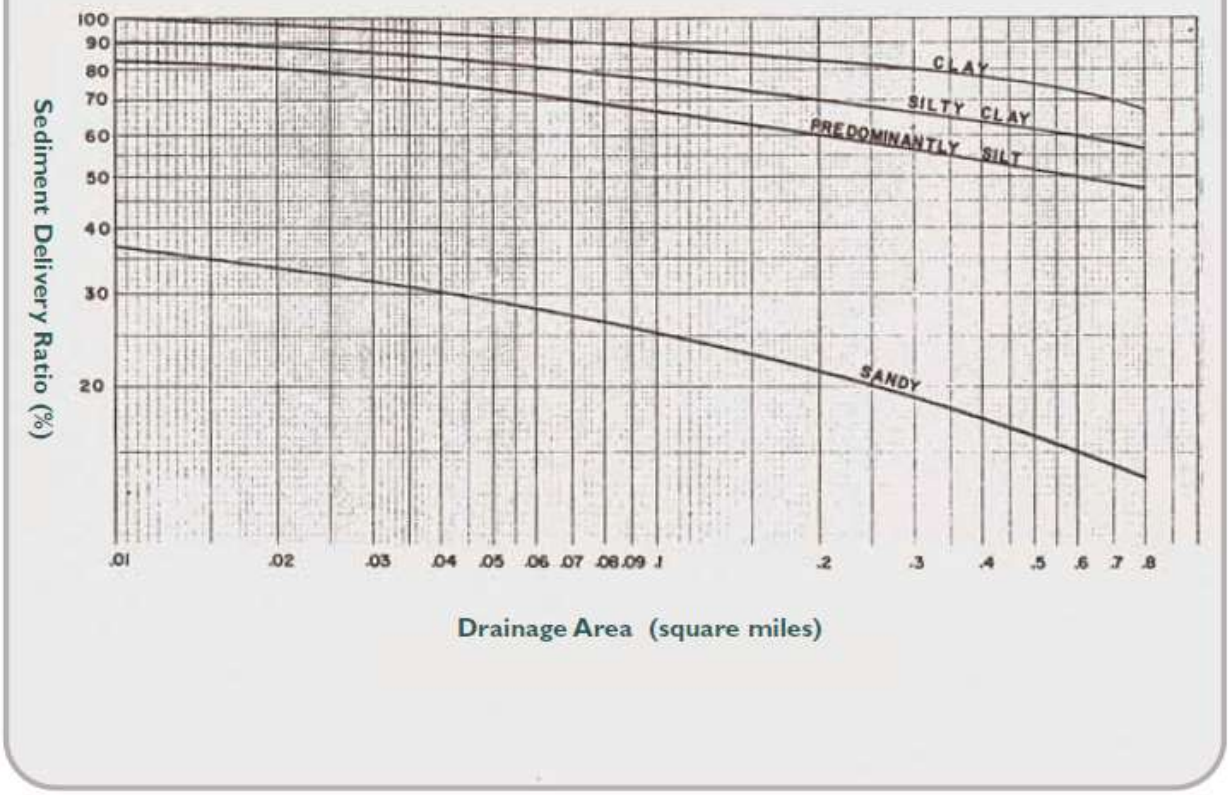
Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Cantebury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed

DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Cantebury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.101 Acre Ft
V_S = 4389.65 Cu. Ft
162.58 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 8779 Cu. Ft
325.16 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 15782 Cu. Ft.
585 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 2G/4G

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 10 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

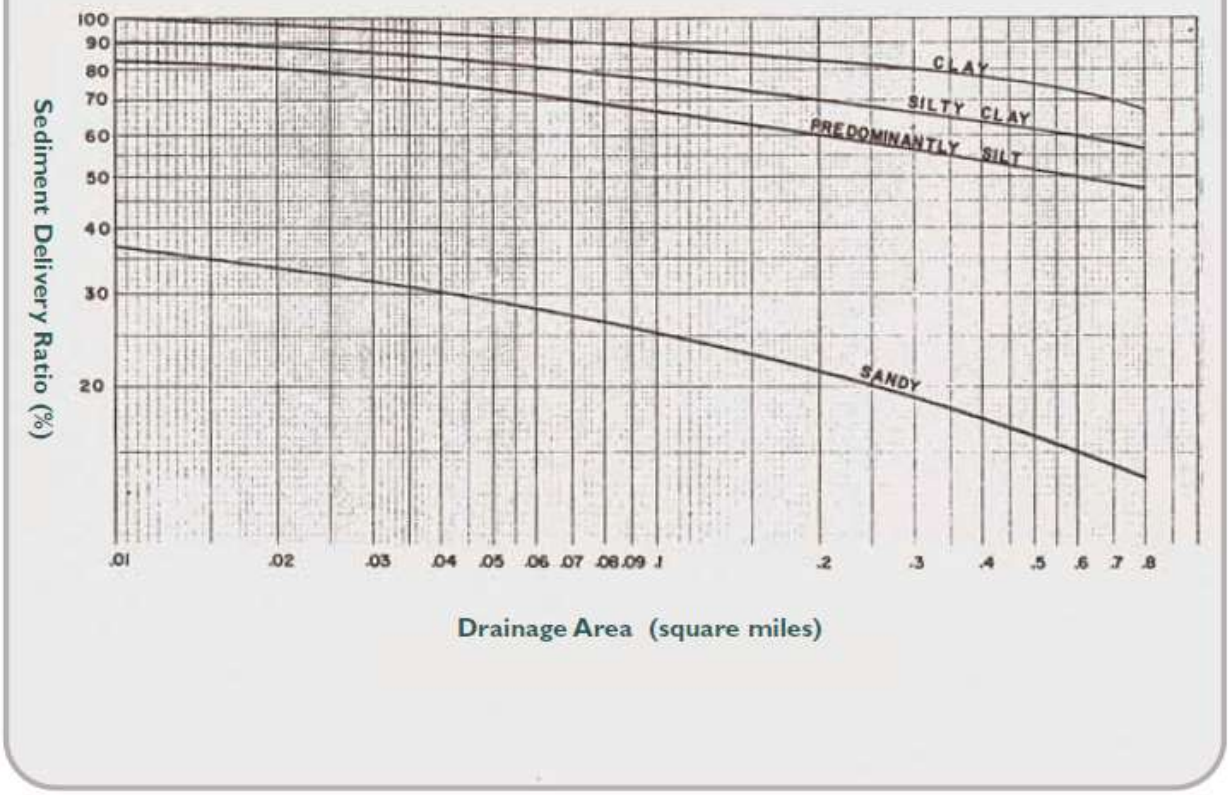
Source: USDA-SCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed
DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.115 Acre Ft
V_S = 4988.24 Cu. Ft
184.75 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 9976 Cu. Ft
369.50 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 17578 Cu. Ft.
651 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 2H/4H

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 8.9 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

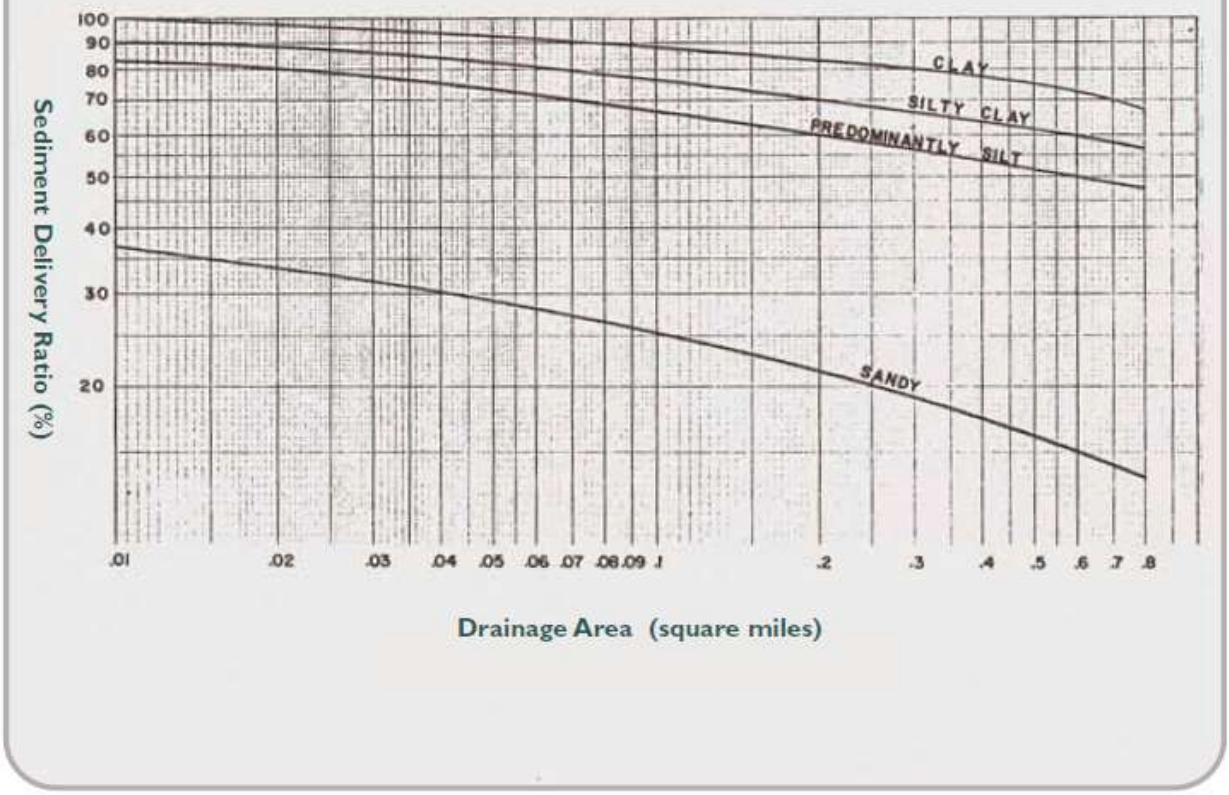
Source: USDA-SCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed
DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
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Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.102 Acre Ft
V_S = 4439.53 Cu. Ft
164.43 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 8879 Cu. Ft
328.85 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 15932 Cu. Ft.
590 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 2I/4I

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 7.4 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

Source: USDA-SCS

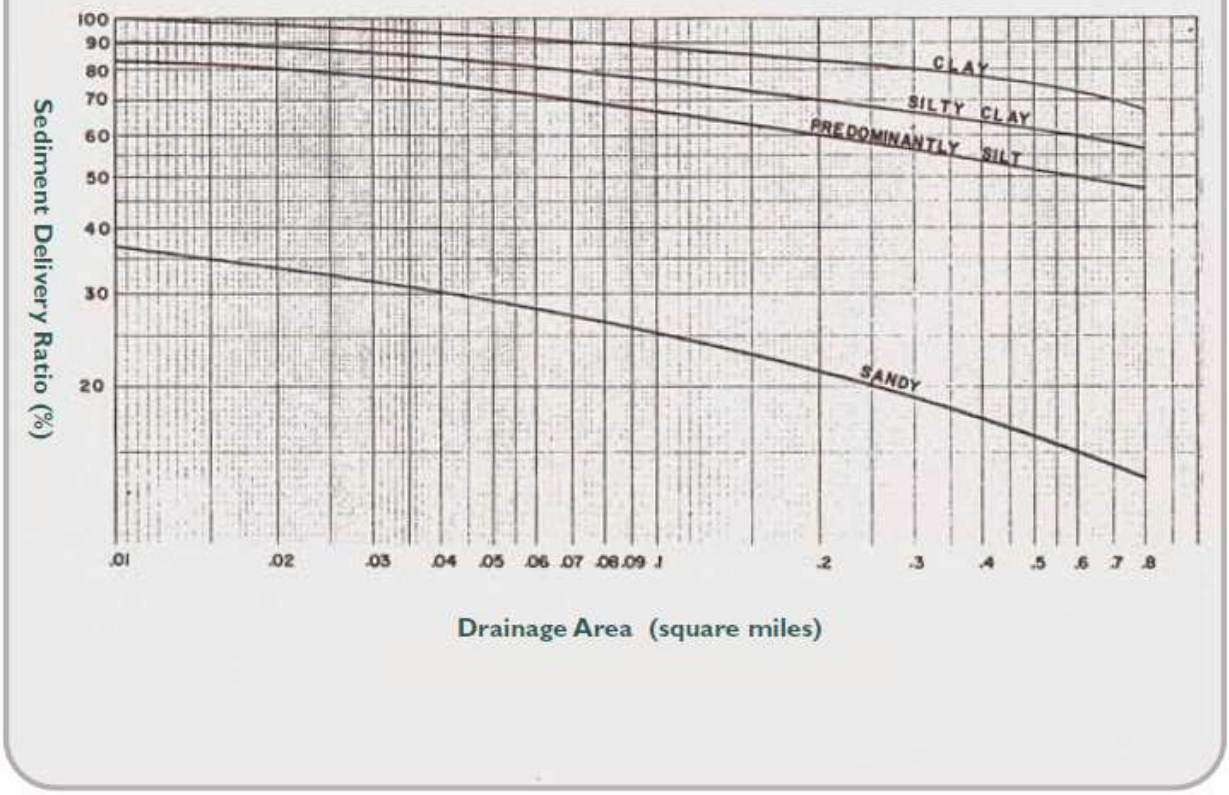
Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed

DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.085 Acre Ft
V_S = 3691.29 Cu. Ft
136.71 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 7383 Cu. Ft
273.43 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 13687 Cu. Ft.
507 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 2J/4J

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 5.8 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

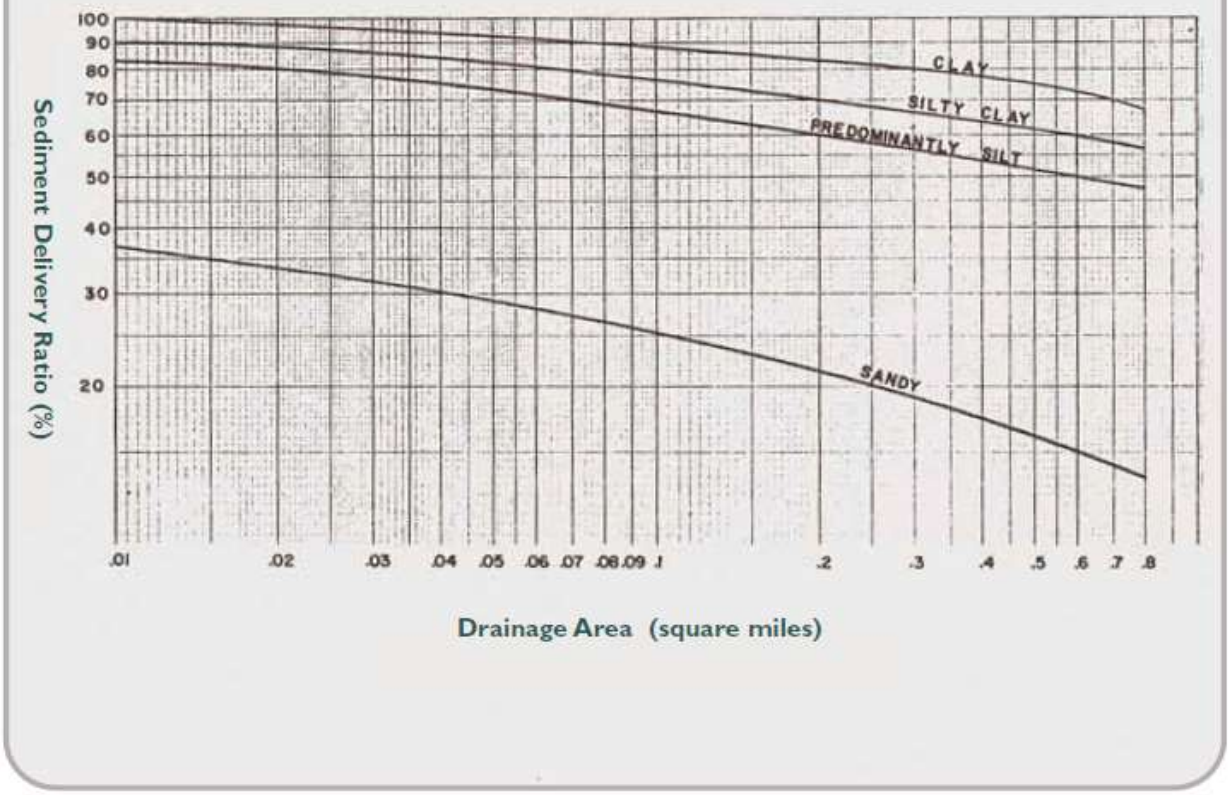
Source: USDA-SCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed
DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.066 Acre Ft
V_S = 2893.18 Cu. Ft
107.15 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 5786 Cu. Ft
214.31 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 11293 Cu. Ft.
418 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 2L/4L

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 9.3 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

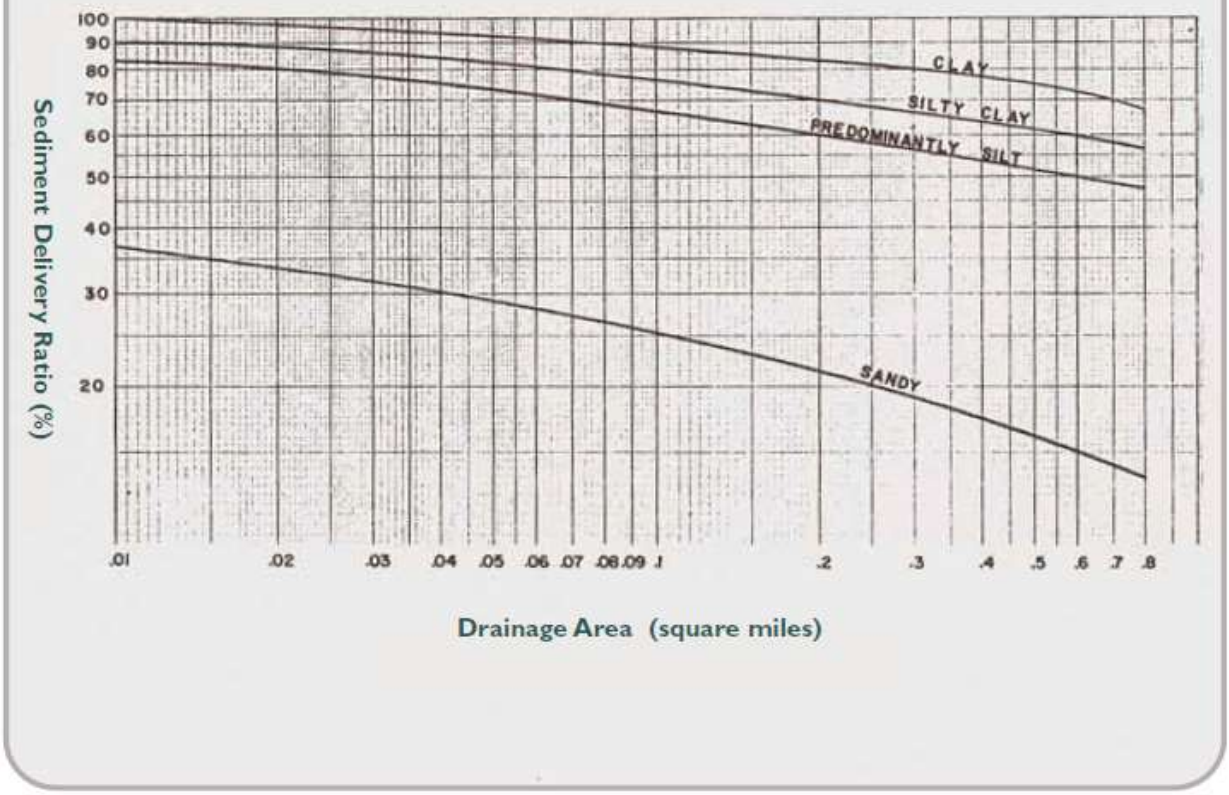
Source: USDA-SCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed
DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.106 Acre Ft
V_S = 4639.06 Cu. Ft
171.82 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 9278 Cu. Ft
343.63 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 16530 Cu. Ft.
612 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 3B

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 7.8 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

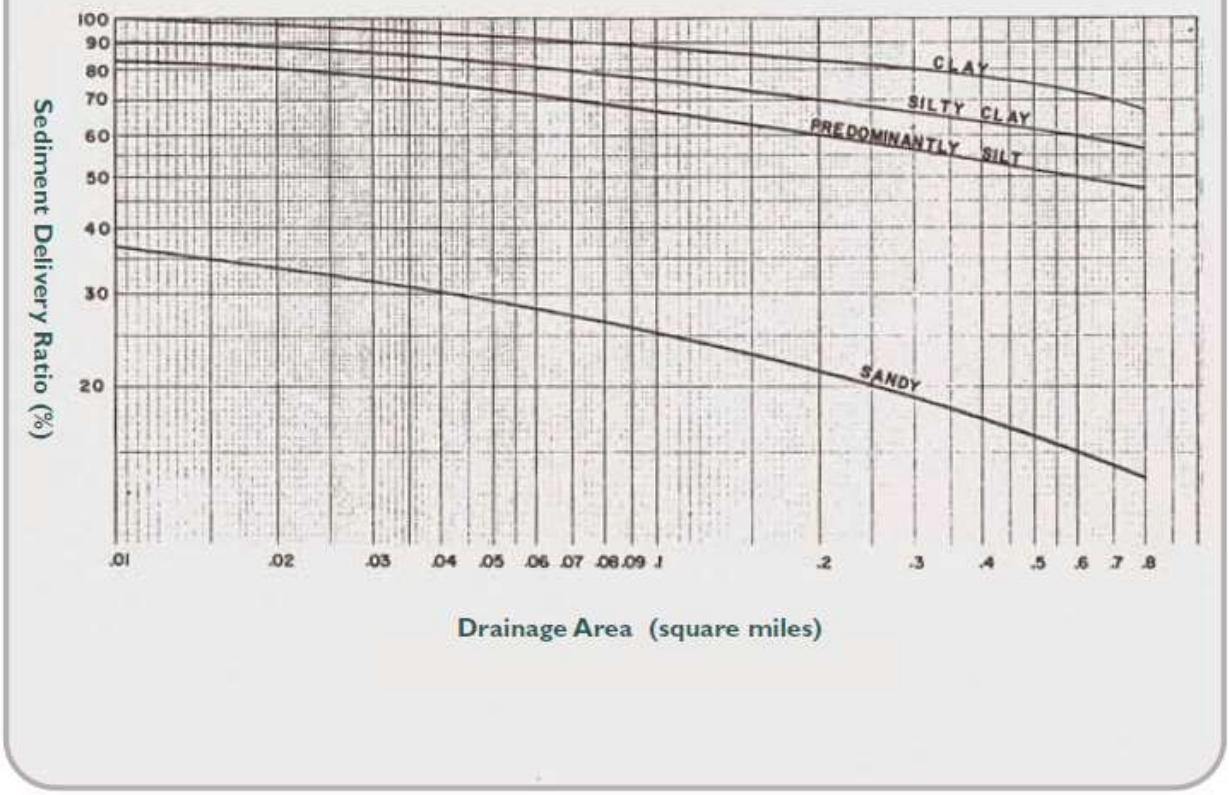
Source: USDA-SCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed
DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.089 Acre Ft
V_S = 3890.82 Cu. Ft
144.10 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 7782 Cu. Ft
288.21 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 14285 Cu. Ft.
529 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 3C

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 8.9 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

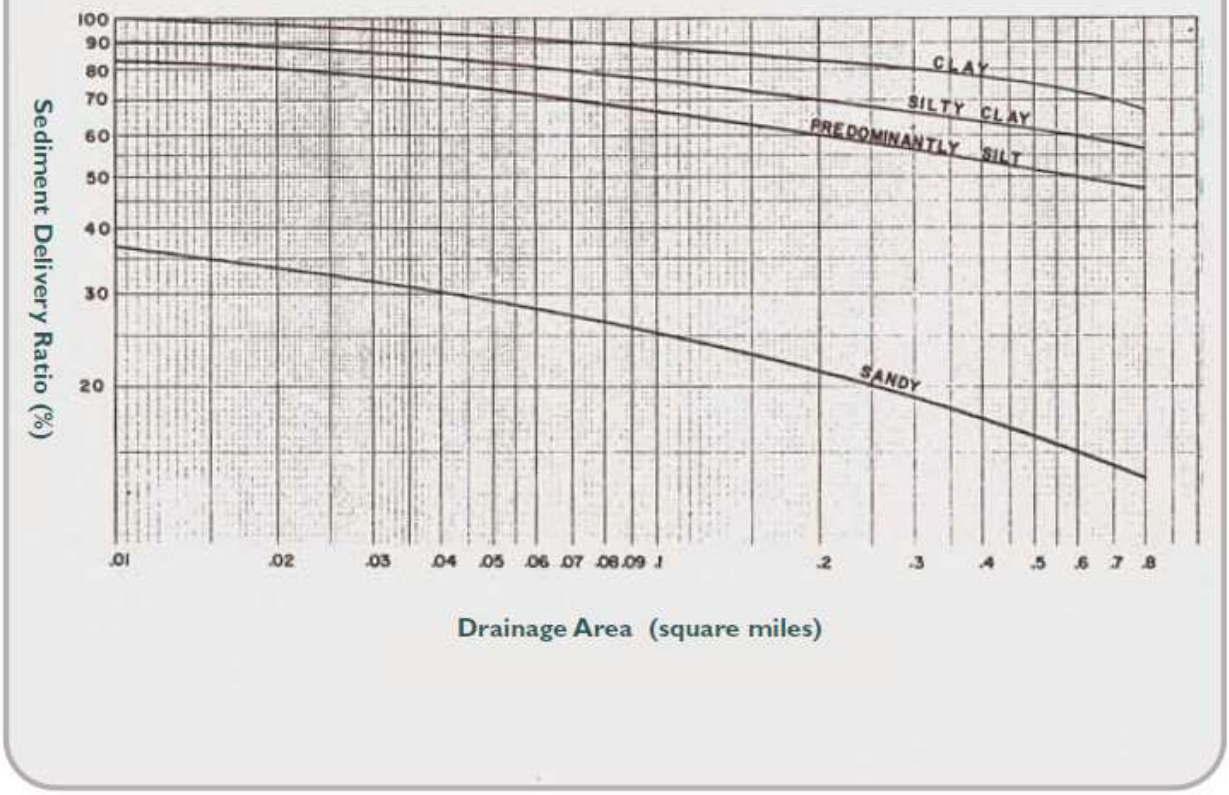
Source: USDA-SCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed
DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

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Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.102 Acre Ft
V_S = 4439.53 Cu. Ft
164.43 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 8879 Cu. Ft
328.85 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 15932 Cu. Ft.
590 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 3E

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 6.8 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

Source: USDA-SCS

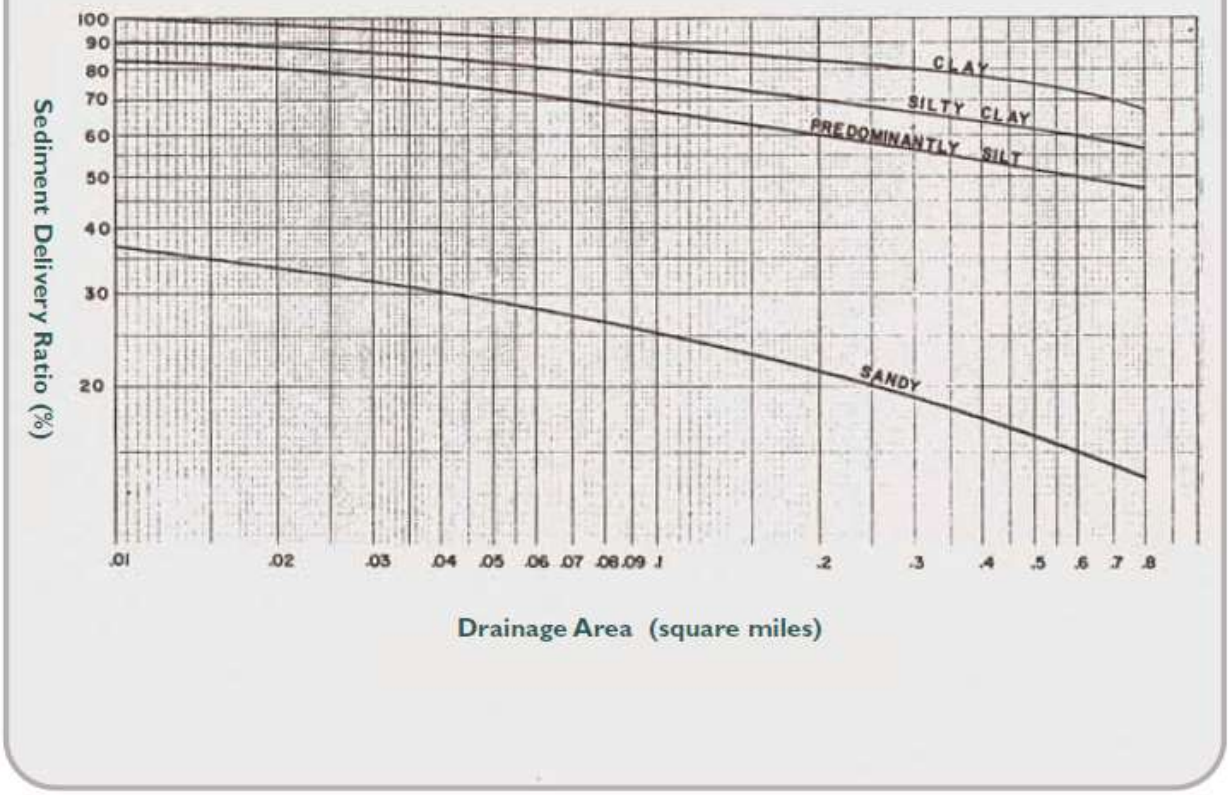
Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed

DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.078 Acre Ft
V_S = 3392.00 Cu. Ft
125.63 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 6784 Cu. Ft
251.26 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 12789 Cu. Ft.
474 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 3F

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 5.7 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

Source: USDA-SCS

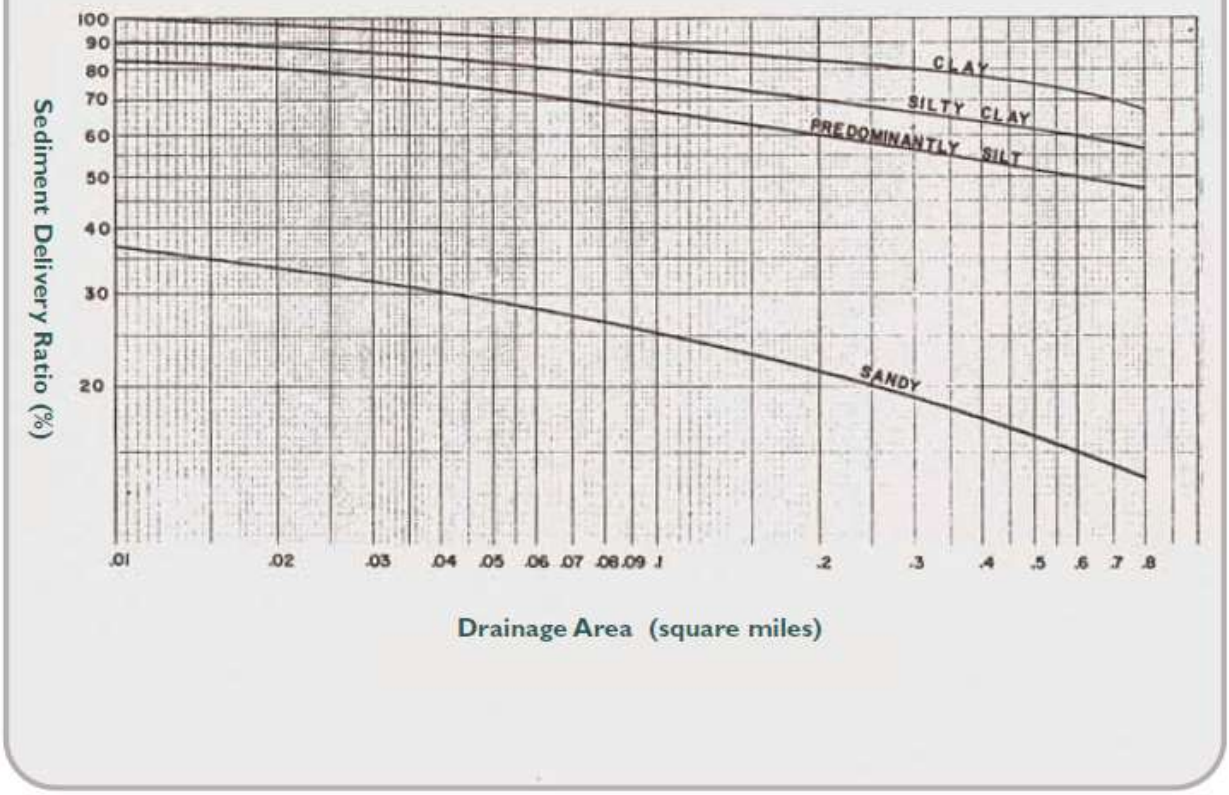
Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed

DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.065 Acre Ft
V_S = 2843.29 Cu. Ft
105.31 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 5687 Cu. Ft
210.61 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 11143 Cu. Ft.
413 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 3G

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 6.5 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

Source: USDA-SCS

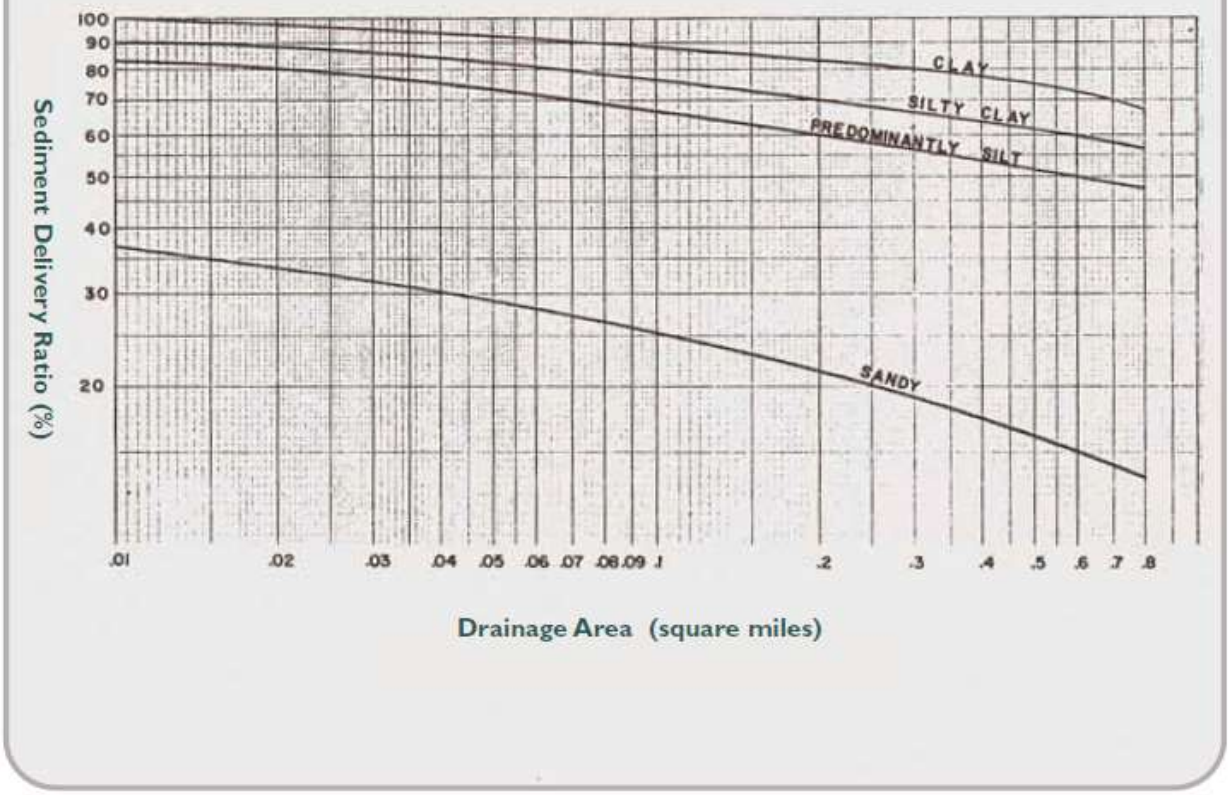
Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed

DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.074 Acre Ft
V_S = 3242.35 Cu. Ft
120.09 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 6485 Cu. Ft
240.17 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 12340 Cu. Ft.
457 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Temporary Sediment Basin 3I

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

where:

V = the volume of sediment trapped in ac. ft./yr.
DA = the total drainage area in acres
A = the average annual erosion in tons per acre per year using either values from the Universal Soil Loss Equation, the Revised Universal Soil Loss Equation or the values in **Figure SB-1** for the listed land use.
DR = the delivery ratio determined from **Figure SB-12**.
TE = the trap efficiency as given above. (Use 0.8)
γ = the estimated sediment density in the sediment basin in lbs/cu. ft. (from **Figure SB-2**).

DA = 6.4 Acres

A = Site will be considered a construction area

A = 50.0 ton/acre/yr

Figure SB-1 Determining Erosion Rates

Land Use	Ave. Annual Erosion
Wooded area	0.2 ton/ac/yr
Developed urban areas, grassed areas, pastures, hay fields, abandoned fields with good cover	1.0 ton/ac/yr
Clean tilled cropland (corn, vegetables, etc.)	10 ton/ac/yr
Construction Areas	50 ton/ac/yr

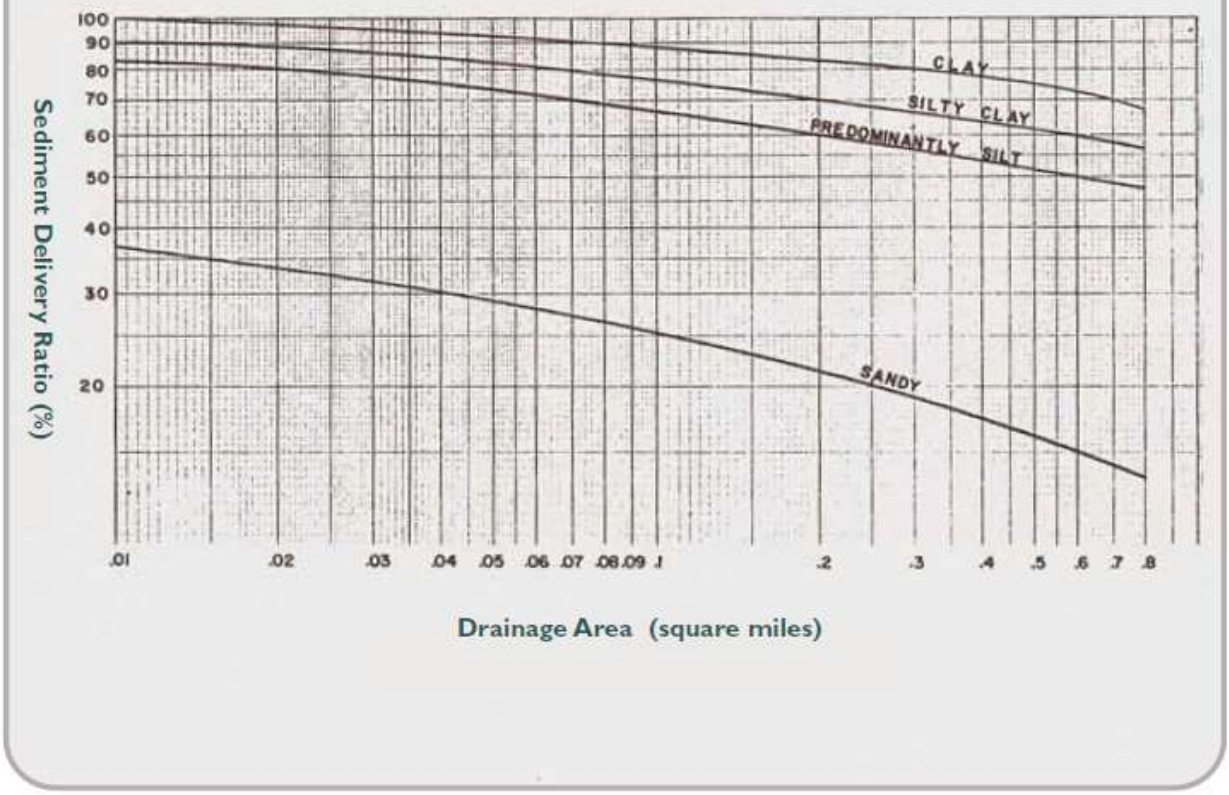
Source: USDA-SCS

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

DR = From figure SB-12 below
Sandy-silt Soil with 0.015625 square miles disturbed
DR = 0.53

Figure SB-12 Sediment Delivery Ratio Vs. Drainage Area Graph



Source: USDA-NRCS

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Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R-0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Basin Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

γ = Soil Texture is Sand-silt mixtur

γ = 85

Figure SB-2 Estimated Sediment Density

Soil Texture *	γ_s Submerged (lbs/cu. ft.)
Clay	40-60
Silt	55-75
Clay-silt mixtures (equal parts)	40-65
Sand-silt mixtures (equal parts)	75-95
Clay-silt-sand mixtures (equal parts)	50-80
Sand	85-100
Gravel	85-125
Poorly sorted sand and gravel	95-130

* Use USDA soil data from county soil surveys or sieve analysis to determine soil texture.

Source: USDA-NRCS.

Sediment Storage Volume

$$V_S = \frac{(DA)(A)(DR)(TE)(2{,}000\text{lbs./ton})}{(\gamma)(43{,}560\text{sq.ft./ac})}$$

V_S = 0.073 Acre Ft
V_S = 3192.47 Cu. Ft
118.24 Cu. Yd.

Wet Storage Volume

$V_W = 2 * V$
V_W = 6385 Cu. Ft
236.48 Cu Yd

Total Required Basin Capacity

Total Volume = $V_S + V_W$ + Residence Storage

Residence Storage = volume to provide 10 hours residence time for a 10 year frequency 24 hour duration, type III distribution storm

Residence Storage = 2,613 Cu. Ft. as determined by HydroCAD

Total Volume = 12190 Cu. Ft.
451 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 1A - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 0.5 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **67** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 1,279 Sq. Ft.
D_W= 1 feet

V_W= 1,087 Cu. Ft.
V_W= 41 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 1,279 Sq. Ft.
A_d= 1,711 Sq. Ft.
D_d= 1 feet

V_d= 1,495 Cu. Ft.
V_d= 56 Cu. Yd.

Provided Storage - Total Storage is provided in two sediment traps

Wet Storage 1,087 Cu. Ft.
40 Cu. Yd.

Dry Storage 1,495 Cu. Ft.
55 Cu. Yd.

Total Storage 2,582 Cu. Ft.
97 Cu. Yd.

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 1B - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 2.1 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **281** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_W \times D_W$$

where,

V_W = the wet storage volume in cubic feet
A_W = the surface area of the flooded area at the base of the stone outlet in square feet
D_W = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 2,540 Sq. Ft.
D_W= 2 feet

V_W= 4,318 Cu. Ft.
V_W= 160 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_W + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_W = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 2,540 Sq. Ft.
A_d= 3,822 Sq. Ft.
D_d= 2 feet

V_d= 6,362 Cu. Ft.
V_d= 236 Cu. Yd.

Provided Storage

Wet Storage	4,318	Cu. Ft.
	159.93	Cu. Yd.
Dry Storage	6,362	Cu. Ft.
	236	Cu. Yd.
Total Storage	**10,680**	**Cu. Ft.**
	396	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 1C - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 3.5 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **469** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \text{ x } A_W \text{ x } D_W$$

where,

V_W = the wet storage volume in cubic feet
A_W = the surface area of the flooded area at the base of the stone outlet in square feet
D_W = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 3,772 Sq. Ft.
D_W= 2 feet

V_W= 6,412 Cu. Ft.
V_W= 237 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_W + A_d)}{2} \text{ x } D_d$$

where,

V_d = the dry storage volume
A_W = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 3,772 Sq. Ft.
A_d= 5,437 Sq. Ft.
D_d= 2 feet

V_d= 9,209 Cu. Ft.
V_d= 341 Cu. Yd.

Provided Storage

Wet Storage	6,412	Cu. Ft.
	237.50	Cu. Yd.
Dry Storage	9,209	Cu. Ft.
	341	Cu. Yd.
Total Storage	**15,621**	**Cu. Ft.**
	578	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 1E - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 0.4 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **54** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 995 Sq. Ft.
D_W= 1 feet

V_W= 846 Cu. Ft.
V_W= 31 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 995 Sq. Ft.
A_d= 1,366 Sq. Ft.
D_d= 1 feet

V_d= 1,181 Cu. Ft.
V_d= 44 Cu. Yd.

Provided Storage - Total Storage is provided in two sediment traps

Wet Storage	846	Cu. Ft.
	31	Cu. Yd.
Dry Storage	1,181	Cu. Ft.
	44	Cu. Yd.
Total Storage	**2,026**	**Cu. Ft.**
	75	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 1G - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 4.1 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **549** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 4,666 Sq. Ft.
D_W= 2 feet

V_W= 7932.2 Cu. Ft.
V_W= 294 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 4,666 Sq. Ft.
A_d= 6,667 Sq. Ft.
D_d= 2 feet

V_d= 11,333 Cu. Ft.
V_d= 420 Cu. Yd.

Provided Storage

Wet Storage	7,932	Cu. Ft.
	293.79	Cu. Yd.
Dry Storage	11,333	Cu. Ft.
	420	Cu. Yd.
Total Storage	**19,265**	**Cu. Ft.**
	714	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 1H - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 1.1 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **147** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 2,811 Sq. Ft.
D_W= 1 feet

V_W= 2389.35 Cu. Ft.
V_W= 88 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 2,811 Sq. Ft.
A_d= 2,811 Sq. Ft.
D_d= 1 feet

V_d= 2,811 Cu. Ft.
V_d= 104 Cu. Yd.

Provided Storage

Wet Storage	2,389	Cu. Ft.
	88.49	Cu. Yd.
Dry Storage	2,811	Cu. Ft.
	104	Cu. Yd.
Total Storage	**5,200**	**Cu. Ft.**
	192	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 1I - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 1.7 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **228** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 4,557 Sq. Ft.
D_W= 1 feet

V_W= 3,873 Cu. Ft.
V_W= 143 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 4,557 Sq. Ft.
A_d= 5,410 Sq. Ft.
D_d= 1 feet

V_d= 4,984 Cu. Ft.
V_d= 185 Cu. Yd.

Provided Storage

Wet Storage	3,873	Cu. Ft.
	143.46	Cu. Yd.
Dry Storage	4,984	Cu. Ft.
	185	Cu. Yd.
Total Storage	**8,857**	**Cu. Ft.**
	328	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 1J - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area =	1	Acres
Required Storage=	134	Cu. Yds / Acre
Total Required Storage=	**134**	Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W=	1,120	Sq. Ft.
D_W=	2	feet

V_W=	**1,904**	**Cu. Ft.**
V_W=	**71**	**Cu. Yd.**

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W=	1,120	Sq. Ft.
A_d=	2,104	Sq. Ft.
D_d=	2	feet

V_d=	**3,224**	**Cu. Ft.**
V_d=	**119**	**Cu. Yd.**

Provided Storage

Wet Storage	1,904	Cu. Ft.
	71	Cu. Yd.
Dry Storage	3,224	Cu. Ft.
	119	Cu. Yd.
Total Storage	**5,128**	**Cu. Ft.**
	190	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 1K - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 5 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **670** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 5,788 Sq. Ft.
D_W= 2 feet

V_W=	**9,840**	**Cu. Ft.**
V_W=	**364**	**Cu. Yd.**

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 5,788 Sq. Ft.
A_d= 7,723 Sq. Ft.
D_d= 2 feet

V_d=	**13,511**	**Cu. Ft.**
V_d=	**500**	**Cu. Yd.**

Provided Storage

Wet Storage	9,840	Cu. Ft.
	364.43	Cu. Yd.
Dry Storage	13,511	Cu. Ft.
	500	Cu. Yd.
Total Storage	**23,351**	**Cu. Ft.**
	864	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 2C - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 2.80 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **375** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_W \times D_W$$

where,

V_W = the wet storage volume in cubic feet
A_W = the surface area of the flooded area at the base of the stone outlet in square feet
D_W = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 3,492 Sq. Ft.
D_W= 2 feet

V_W= 5,936 Cu. Ft.
V_W= 220 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_W + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_W = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 3,492 Sq. Ft.
A_d= 5,128 Sq. Ft.
D_d= 2 feet

V_d= 8,620 Cu. Ft.
V_d= 319 Cu. Yd.

Provided Storage

Wet Storage	5,936	Cu. Ft.
	220	Cu. Yd.
Dry Storage	8,620	Cu. Ft.
	319	Cu. Yd.
Total Storage	**14,556**	**Cu. Ft.**
	539	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 2D - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 2.80 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **375** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 3,932 Sq. Ft.
D_W= 2 feet

V_W= 6,684 Cu. Ft.
V_W= 248 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 3,932 Sq. Ft.
A_d= 5,972 Sq. Ft.
D_d= 2 feet

V_d= 9,904 Cu. Ft.
V_d= 367 Cu. Yd.

Provided Storage

Wet Storage	6,684	Cu. Ft.
	248	Cu. Yd.
Dry Storage	9,904	Cu. Ft.
	367	Cu. Yd.
Total Storage	**16,588**	**Cu. Ft.**
	615	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 2E - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 3.00 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **402** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 3,412 Sq. Ft.
D_W= 2 feet

V_W= 5,800 Cu. Ft.
V_W= 215 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 3,412 Sq. Ft.
A_d= 4,973 Sq. Ft.
D_d= 2 feet

V_d= 8,385 Cu. Ft.
V_d= 311 Cu. Yd.

Provided Storage

Wet Storage	5,800	Cu. Ft.
	215	Cu. Yd.
Dry Storage	8,385	Cu. Ft.
	311	Cu. Yd.
Total Storage	**14,185**	**Cu. Ft.**
	526	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 2K - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 4.50 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **603** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 5,533 Sq. Ft.
D_W= 2 feet

V_W=	**9,406**	**Cu. Ft.**
V_W=	**348**	**Cu. Yd.**

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 5,533 Sq. Ft.
A_d= 7,712 Sq. Ft.
D_d= 2 feet

V_d=	**13,245**	**Cu. Ft.**
V_d=	**491**	**Cu. Yd.**

Provided Storage

Wet Storage	9,406	Cu. Ft.
	348	Cu. Yd.
Dry Storage	13,245	Cu. Ft.
	491	Cu. Yd.
Total Storage	**22,651**	**Cu. Ft.**
	839	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 2M - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 4.80 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **643** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_W \times D_W$$

where,

V_W = the wet storage volume in cubic feet
A_W = the surface area of the flooded area at the base of the stone outlet in square feet
D_W = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 5,533 Sq. Ft.

D_W= 2 feet

V_W=	**9,406**	**Cu. Ft.**
V_W=	**348**	**Cu. Yd.**

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_W + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_W = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 5,533 Sq. Ft.
A_d= 7,712 Sq. Ft.
D_d= 2 feet

V_d=	**13,245**	**Cu. Ft.**
V_d=	**491**	**Cu. Yd.**

Provided Storage

Wet Storage	9,406	Cu. Ft.
	348	Cu. Yd.
Dry Storage	13,245	Cu. Ft.
	491	Cu. Yd.
Total Storage	**22,651**	**Cu. Ft.**
	839	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 3A - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 4.50 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **603** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 4,872 Sq. Ft.
D_W= 2 feet

V_W= 8,282 Cu. Ft.
V_W= 307 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 6,583 Sq. Ft.
A_d= 6,583 Sq. Ft.
D_d= 2 feet

V_d= 13,166 Cu. Ft.
V_d= 488 Cu. Yd.

Provided Storage

Wet Storage	8,282	Cu. Ft.
	307	Cu. Yd.
Dry Storage	13,166	Cu. Ft.
	488	Cu. Yd.
Total Storage	**21,448**	**Cu. Ft.**
	794	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 3D - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 2.10 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **281** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 2,540 Sq. Ft.
D_W= 2 feet

V_W= 4,318 Cu. Ft.
V_W= 160 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 2,540 Sq. Ft.
A_d= 3,822 Sq. Ft.
D_d= 2 feet

V_d= 6,362 Cu. Ft.
V_d= 236 Cu. Yd.

Provided Storage

Wet Storage	4,318	Cu. Ft.
	160	Cu. Yd.
Dry Storage	6,362	Cu. Ft.
	236	Cu. Yd.
Total Storage	**10,680**	**Cu. Ft.**
	396	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 3H - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 3.70 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **496** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 4,452 Sq. Ft.
D_W= 2 feet

V_W=	**7,568**	**Cu. Ft.**
V_W=	**280**	**Cu. Yd.**

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 4,452 Sq. Ft.
A_d= 6,304 Sq. Ft.
D_d= 2 feet

V_d=	**10,756**	**Cu. Ft.**
V_d=	**398**	**Cu. Yd.**

Provided Storage

Wet Storage	7,568	Cu. Ft.
	280	Cu. Yd.
Dry Storage	10,756	Cu. Ft.
	398	Cu. Yd.
Total Storage	**18,324**	**Cu. Ft.**
	679	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 3J - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 4.60 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **616** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 5,171 Sq. Ft.
D_W= 2 feet

V_W=	**8,791**	**Cu. Ft.**
V_W=	**326**	**Cu. Yd.**

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 5,171 Sq. Ft.
A_d= 7,036 Sq. Ft.
D_d= 2 feet

V_d=	**12,207**	**Cu. Ft.**
V_d=	**452**	**Cu. Yd.**

Provided Storage

Wet Storage	8,791	Cu. Ft.
	326	Cu. Yd.
Dry Storage	12,207	Cu. Ft.
	452	Cu. Yd.
Total Storage	**20,998**	**Cu. Ft.**
	778	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
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Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 3K - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 2.90 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **389** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 3,110 Sq. Ft.
D_W= 2 feet

V_W=	**5,287**	**Cu. Ft.**
V_W=	**196**	**Cu. Yd.**

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 3,110 Sq. Ft.
A_d= 5,013 Sq. Ft.
D_d= 2 feet

V_d=	**8,123**	**Cu. Ft.**
V_d=	**301**	**Cu. Yd.**

Provided Storage

Wet Storage	5,287	Cu. Ft.
	196	Cu. Yd.
Dry Storage	8,123	Cu. Ft.
	301	Cu. Yd.
Total Storage	**13,410**	**Cu. Ft.**
	497	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 3M - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 1.50 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **201** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 1,630 Sq. Ft.
D_W= 2 feet

V_W= 2,771 Cu. Ft.
V_W= 103 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 1,630 Sq. Ft.
A_d= 2,789 Sq. Ft.
D_d= 2 feet

V_d= 4,419 Cu. Ft.
V_d= 164 Cu. Yd.

Provided Storage

Wet Storage	2,771	Cu. Ft.
	103	Cu. Yd.
Dry Storage	4,419	Cu. Ft.
	164	Cu. Yd.
Total Storage	**7,190**	**Cu. Ft.**
	266	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 3N - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 4.60 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **616** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 4,913 Sq. Ft.
D_W= 2 feet

V_W= 8,352 Cu. Ft.
V_W= 309 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 4,913 Sq. Ft.
A_d= 6,762 Sq. Ft.
D_d= 2 feet

V_d= 11,675 Cu. Ft.
V_d= 432 Cu. Yd.

Provided Storage

Wet Storage	8,352	Cu. Ft.
	309	Cu. Yd.
Dry Storage	11,675	Cu. Ft.
	432	Cu. Yd.
Total Storage	**20,027**	**Cu. Ft.**
	742	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 3O - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 4.30 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **576** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 5,196 Sq. Ft.
D_W= 2 feet

V_W= 8,833 Cu. Ft.
V_W= 327 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 5,196 Sq. Ft.
A_d= 7,490 Sq. Ft.
D_d= 2 feet

V_d= 12,686 Cu. Ft.
V_d= 470 Cu. Yd.

Provided Storage

Wet Storage	8,833	Cu. Ft.
	327	Cu. Yd.
Dry Storage	12,686	Cu. Ft.
	470	Cu. Yd.
Total Storage	**21,519**	**Cu. Ft.**
	797	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 3P - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 5.00 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **670** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 5,788 Sq. Ft.
D_W= 2 feet

V_W=	**9,840**	**Cu. Ft.**
V_W=	**364**	**Cu. Yd.**

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 5,788 Sq. Ft.
A_d= 7,723 Sq. Ft.
D_d= 2 feet

V_d=	**13,511**	**Cu. Ft.**
V_d=	**500**	**Cu. Yd.**

Provided Storage

Wet Storage	9,840	Cu. Ft.
	364	Cu. Yd.
Dry Storage	13,511	Cu. Ft.
	500	Cu. Yd.
Total Storage	**23,351**	**Cu. Ft.**
	865	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 3Q - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 2.40 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **322** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 2,595 Sq. Ft.
D_W= 2 feet

V_W=	**4,412**	**Cu. Ft.**
V_W=	**163**	**Cu. Yd.**

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 2,595 Sq. Ft.
A_d= 2,595 Sq. Ft.
D_d= 2 feet

V_d=	**5,190**	**Cu. Ft.**
V_d=	**192**	**Cu. Yd.**

Provided Storage

Wet Storage	4,412	Cu. Ft.
	163	Cu. Yd.
Dry Storage	5,190	Cu. Ft.
	192	Cu. Yd.
Total Storage	**9,602**	**Cu. Ft.**
	356	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 3R - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 3.40 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **456** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_W \times D_W$$

where,

V_W = the wet storage volume in cubic feet
A_W = the surface area of the flooded area at the base of the stone outlet in square feet
D_W = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 3,615 Sq. Ft.
D_W= 2 feet

V_W=	**6,146**	**Cu. Ft.**
V_W=	**228**	**Cu. Yd.**

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_W + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_W = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 3,615 Sq. Ft.
A_d= 5,328 Sq. Ft.
D_d= 2 feet

V_d=	**8,943**	**Cu. Ft.**
V_d=	**331**	**Cu. Yd.**

Provided Storage

Wet Storage	6,146	Cu. Ft.
	228	Cu. Yd.
Dry Storage	8,943	Cu. Ft.
	331	Cu. Yd.
Total Storage	**15,089**	**Cu. Ft.**
	559	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

Tighe&Bond
Consulting Engineers
Environmental Specialists

Project Name: **Quinebaug Solar Project**
Project Number: **R0317**
Project Location: **Brooklyn and Canterbury, Connecticut**
Description: **Temporary Sediment Trap Sizing Calculation**
Prepared By: **ALG** Date: **December 2020**

Phase 3U - Sediment Trap Sizing Calculations

Sediment Storage Volume

Drainage Area = 3.00 Acres

Required Storage= 134 Cu. Yds / Acre

Total Required Storage= **402** Cu. Yds

Provided Wet Storage

Wet storage volume may be approximated as follows:

$$Vw = 0.85 \times A_w \times D_w$$

where,

V_w = the wet storage volume in cubic feet
A_w = the surface area of the flooded area at the base of the stone outlet in square feet
D_w = the maximum depth in feet, measured from the low point in the trap to the base of the stone outlet.

A_W= 3,239 Sq. Ft.
D_W= 2 feet

V_W= 5,506 Cu. Ft.
V_W= 204 Cu. Yd.

Provided Dry Storage

Dry storage volume may be approximated as follows:

$$V_d = \frac{(A_w + A_d)}{2} \times D_d$$

where,

V_d = the dry storage volume
A_w = the surface area of the flooded area at the base of the stone outlet in square feet.
A_d = the surface area of the flooded area at the top of the stone outlet (over flow mechanism), in square feet
D_d = the depth in feet, measured from the base of the stone outlet to the top of the stone outlet

A_W= 3,239 Sq. Ft.
A_d= 5,061 Sq. Ft.
D_d= 2 feet

V_d= 8,300 Cu. Ft.
V_d= 307 Cu. Yd.

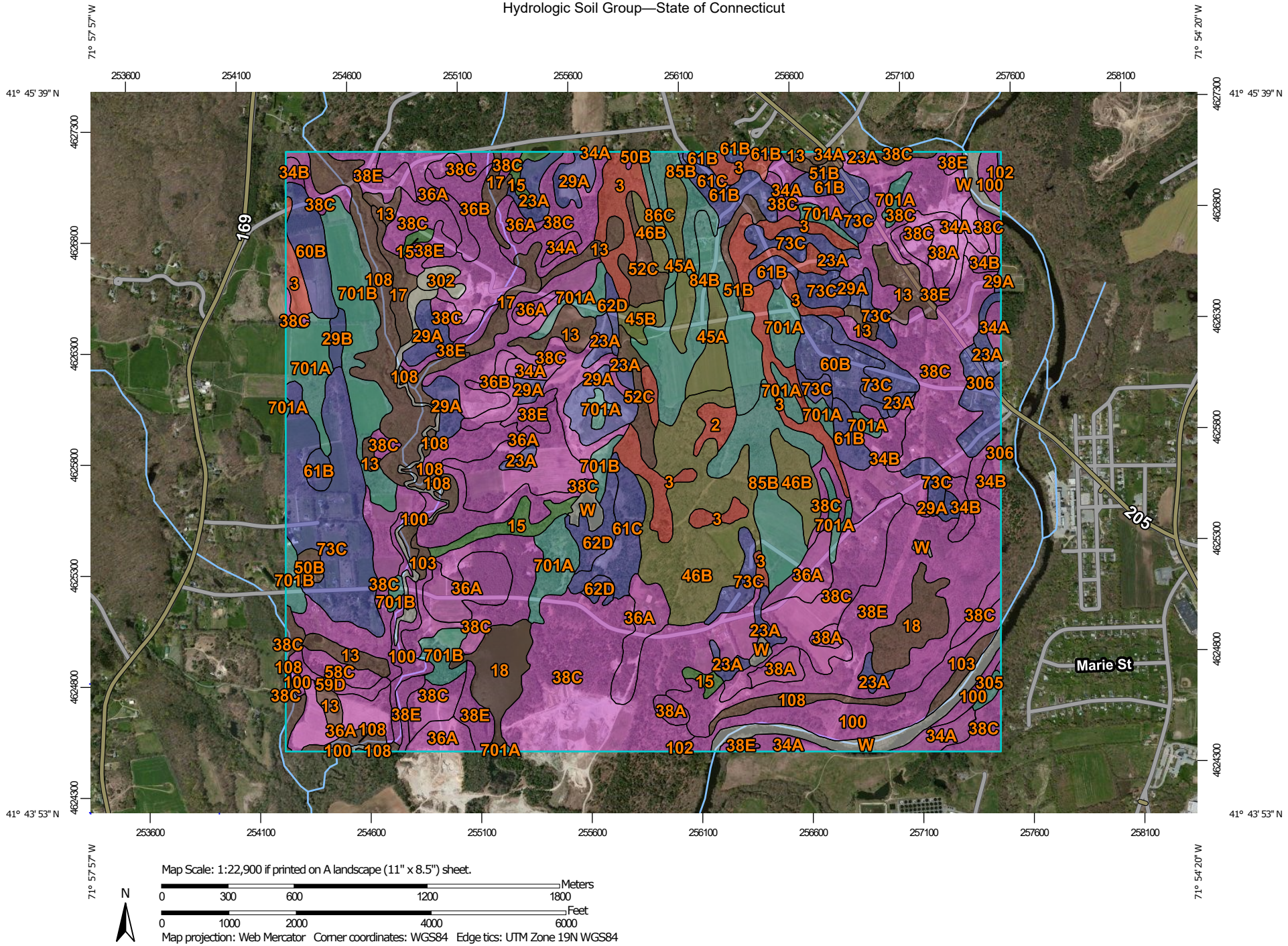
Provided Storage

Wet Storage	5,506	Cu. Ft.
	204	Cu. Yd.
Dry Storage	8,300	Cu. Ft.
	307	Cu. Yd.
Total Storage	**13,806**	**Cu. Ft.**
	511	**Cu. Yd.**

Calculated in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control Section 5-11

NRCS Soils Report

Hydrologic Soil Group—State of Connecticut



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

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 1:12,000.

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: State of Connecticut
Survey Area Data: Version 18, Dec 6, 2018

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

Date(s) aerial images were photographed: Mar 30, 2011—May 1, 2011

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2	Ridgebury fine sandy loam, 0 to 3 percent slopes	D	6.6	0.3%
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	D	91.7	4.2%
13	Walpole sandy loam, 0 to 3 percent slopes	B/D	48.7	2.2%
15	Scarboro muck, 0 to 3 percent slopes	A/D	18.9	0.9%
17	Timakwa and Natchaug soils, 0 to 2 percent slopes	B/D	25.1	1.2%
18	Catden and Freetown soils, 0 to 2 percent slopes	B/D	44.9	2.1%
23A	Sudbury sandy loam, 0 to 5 percent slopes	B	37.0	1.7%
29A	Agawam fine sandy loam, 0 to 3 percent slopes	B	46.6	2.1%
29B	Agawam fine sandy loam, 3 to 8 percent slopes	B	3.8	0.2%
34A	Merrimac fine sandy loam, 0 to 3 percent slopes	A	35.4	1.6%
34B	Merrimac fine sandy loam, 3 to 8 percent slopes	A	41.1	1.9%
36A	Windsor loamy sand, 0 to 3 percent slopes	A	130.8	6.0%
36B	Windsor loamy sand, 3 to 8 percent slopes	A	38.5	1.8%
38A	Hinckley loamy sand, 0 to 3 percent slopes	A	21.0	1.0%
38C	Hinckley loamy sand, 3 to 15 percent slopes	A	510.1	23.5%
38E	Hinckley loamy sand, 15 to 45 percent slopes	A	152.7	7.0%
45A	Woodbridge fine sandy loam, 0 to 3 percent slopes	C/D	27.1	1.3%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	C/D	6.7	0.3%
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	C/D	98.7	4.6%
50B	Sutton fine sandy loam, 3 to 8 percent slopes	B/D	4.4	0.2%
51B	Sutton fine sandy loam, 0 to 8 percent slopes, very stony	B/D	8.5	0.4%
52C	Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	B/D	20.6	1.0%
58C	Gloucester gravelly sandy loam, 8 to 15 percent slopes, very stony	A	7.7	0.4%
59D	Gloucester gravelly sandy loam, 15 to 35 percent slopes, extremely stony	A	5.8	0.3%
60B	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	B	40.9	1.9%
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	B	42.2	1.9%
61C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony	B	23.8	1.1%
62D	Canton and Charlton fine sandy loams, 15 to 35 percent slopes, extremely stony	B	17.6	0.8%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	133.2	6.1%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	C	50.3	2.3%
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	C	55.7	2.6%
86C	Paxton and Montauk fine sandy loams, 3 to 15 percent slopes, extremely stony	C	5.9	0.3%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
100	Suncook loamy fine sand	A	64.4	3.0%
102	Pootatuck fine sandy loam	B	1.0	0.0%
103	Rippowam fine sandy loam	B/D	7.8	0.4%
108	Saco silt loam	B/D	82.9	3.8%
302	Dumps		5.0	0.2%
305	Udorthents-Pits complex, gravelly	C	2.3	0.1%
306	Udorthents-Urban land complex	B	15.9	0.7%
701A	Ninigret fine sandy loam, 0 to 3 percent slopes	C	75.8	3.5%
701B	Ninigret fine sandy loam, 3 to 8 percent slopes	C	63.9	2.9%
W	Water		46.2	2.1%
Totals for Area of Interest			**2,167.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

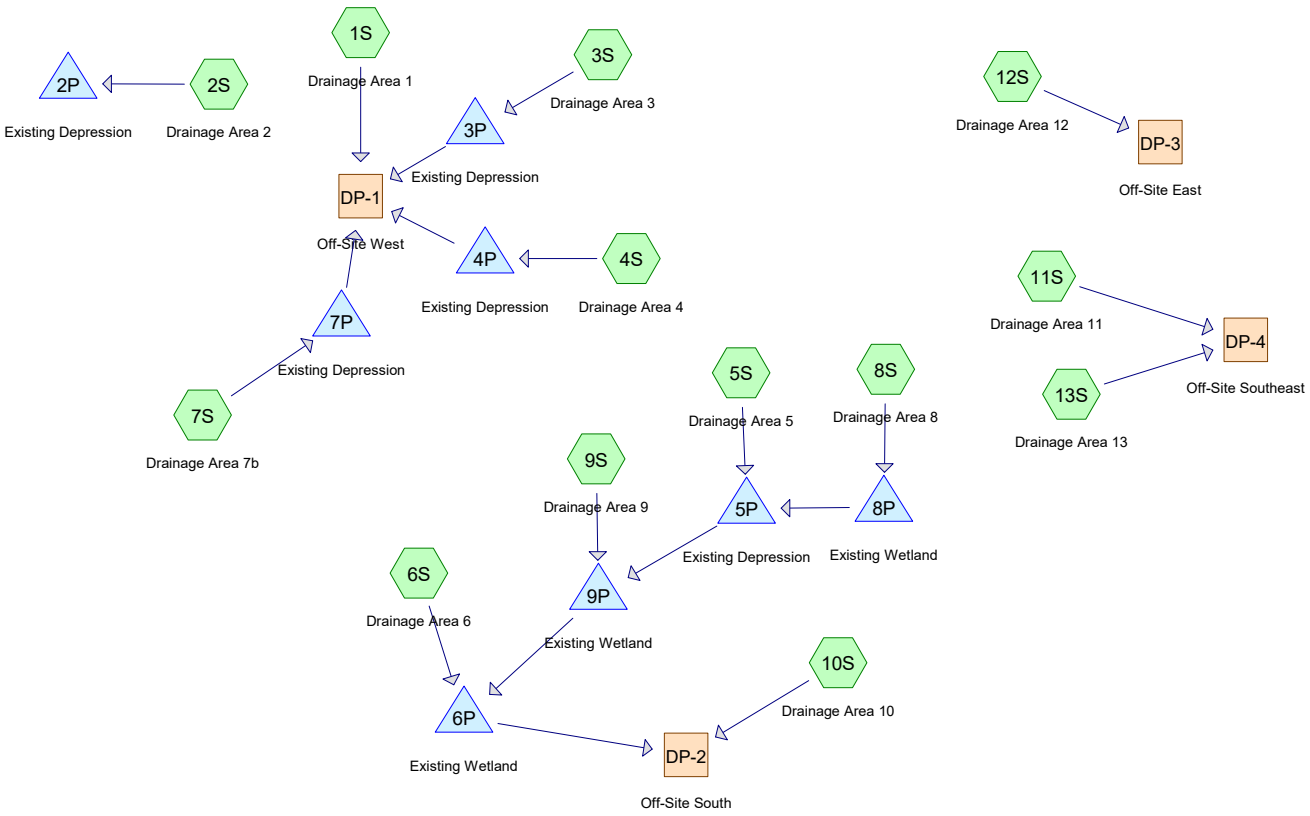
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Long-Term Existing Conditions Hydrology



Subcat Reach Pond Link

Routing Diagram for Quinebaug Existing Hydrology
Prepared by Tighe & Bond, Printed 12/31/2020

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
36.636	70	Gravel pit, HSG A (1S, 2S, 3S, 4S, 7S, 13S)
14.294	81	Gravel pit, HSG B (3S, 4S, 7S, 13S)
3.095	88	Gravel pit, HSG C (4S)
3.249	96	Gravel road (1S, 5S, 6S, 7S, 8S, 9S, 10S, 11S)
66.581	30	Meadow, non-grazed, HSG A (1S, 2S, 4S, 5S, 6S, 7S, 9S, 10S, 11S, 13S)
27.675	58	Meadow, non-grazed, HSG B (1S, 2S, 3S, 4S, 5S, 6S, 7S, 9S, 11S, 12S)
96.018	71	Meadow, non-grazed, HSG C (1S, 3S, 5S, 9S, 10S, 11S, 12S)
0.335	75	Meadow, non-grazed, HSG C (8S)
1.710	78	Meadow, non-grazed, HSG D (5S, 8S, 10S, 11S, 12S)
0.184	98	Structure (11S)
56.702	98	Water body (1S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S)
66.744	30	Woods, Good, HSG A (1S, 2S, 3S, 6S, 7S, 9S, 10S, 11S, 12S)
55.145	55	Woods, Good, HSG B (1S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 11S, 12S)
0.177	63	Woods, Good, HSG B (8S)
88.094	70	Woods, Good, HSG C (1S, 3S, 4S, 5S, 9S, 10S, 11S, 12S)
4.313	74	Woods, Good, HSG C (8S)
17.899	77	Woods, Good, HSG D (1S, 3S, 4S, 5S, 8S, 10S, 11S, 12S)
538.851	**62**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
169.961	HSG A	1S, 2S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 11S, 12S, 13S
97.291	HSG B	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S
191.855	HSG C	1S, 3S, 4S, 5S, 8S, 9S, 10S, 11S, 12S
19.609	HSG D	1S, 3S, 4S, 5S, 8S, 10S, 11S, 12S
60.135	Other	1S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S
538.851		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
36.636	14.294	3.095	0.000	0.000	54.025	Gravel pit	1S, 2S, 3S, 4S, 7S, 13S
0.000	0.000	0.000	0.000	3.249	3.249	Gravel road	1S, 5S, 6S, 7S, 8S, 9S, 10S, 11S
66.581	27.675	96.353	1.710	0.000	192.319	Meadow, non-grazed	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S
0.000	0.000	0.000	0.000	0.184	0.184	Structure	11S
0.000	0.000	0.000	0.000	56.702	56.702	Water body	1S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S
66.744	55.322	92.407	17.899	0.000	232.371	Woods, Good	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S
169.961	**97.291**	**191.855**	**19.609**	**60.135**	**538.851**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1 Runoff Area=5,105,798 sf 8.17% Impervious Runoff Depth=0.37"
Flow Length=4,424' Tc=105.4 min CN=59 Runoff=9.15 cfs 3.654 af

Subcatchment 2S: Drainage Area 2 Runoff Area=233,003 sf 0.00% Impervious Runoff Depth=0.03"
Flow Length=289' Tc=12.1 min CN=44 Runoff=0.02 cfs 0.014 af

Subcatchment 3S: Drainage Area 3 Runoff Area=1,385,288 sf 3.69% Impervious Runoff Depth=0.83"
Flow Length=2,001' Tc=51.4 min CN=70 Runoff=11.82 cfs 2.195 af

Subcatchment 4S: Drainage Area 4 Runoff Area=717,184 sf 0.66% Impervious Runoff Depth=1.27"
Flow Length=1,189' Tc=24.4 min CN=78 Runoff=14.84 cfs 1.747 af

Subcatchment 5S: Drainage Area 5 Runoff Area=2,622,449 sf 22.24% Impervious Runoff Depth=0.98"
Flow Length=2,516' Tc=58.5 min CN=73 Runoff=25.70 cfs 4.931 af

Subcatchment 6S: Drainage Area 6 Runoff Area=1,440,923 sf 14.99% Impervious Runoff Depth=0.02"
Flow Length=1,186' Tc=28.5 min CN=43 Runoff=0.08 cfs 0.060 af

Subcatchment 7S: Drainage Area 7b Runoff Area=3,422,419 sf 10.61% Impervious Runoff Depth=0.03"
Flow Length=3,224' Tc=88.9 min CN=44 Runoff=0.29 cfs 0.210 af

Subcatchment 8S: Drainage Area 8 Runoff Area=354,456 sf 26.48% Impervious Runoff Depth=1.47"
Flow Length=859' Tc=25.0 min CN=81 Runoff=8.50 cfs 0.996 af

Subcatchment 9S: Drainage Area 9 Runoff Area=635,835 sf 31.61% Impervious Runoff Depth=0.64"
Flow Length=608' Tc=13.8 min CN=66 Runoff=6.79 cfs 0.782 af

Subcatchment 10S: Drainage Area 10 Runoff Area=1,328,463 sf 10.48% Impervious Runoff Depth=0.69"
Flow Length=3,118' Tc=74.8 min CN=67 Runoff=7.00 cfs 1.746 af

Subcatchment 11S: Drainage Area 11 Runoff Area=2,488,023 sf 8.41% Impervious Runoff Depth=0.69"
Flow Length=1,904' Tc=43.3 min CN=67 Runoff=18.25 cfs 3.270 af

Subcatchment 12S: Drainage Area 12 Runoff Area=2,329,724 sf 8.52% Impervious Runoff Depth=0.88"
Flow Length=1,596' Tc=52.4 min CN=71 Runoff=21.20 cfs 3.914 af

Subcatchment 13S: Drainage Area 13 Runoff Area=1,408,782 sf 0.05% Impervious Runoff Depth=0.64"
Flow Length=1,813' Tc=9.8 min CN=66 Runoff=17.07 cfs 1.733 af

Reach DP-1: Off-Site West Inflow=9.15 cfs 3.654 af
Outflow=9.15 cfs 3.654 af

Reach DP-2: Off-Site South Inflow=7.00 cfs 1.746 af
Outflow=7.00 cfs 1.746 af

Reach DP-3: Off-Site East Inflow=21.20 cfs 3.914 af
Outflow=21.20 cfs 3.914 af

Reach DP-4: Off-Site Southeast Inflow=23.85 cfs 5.003 af
Outflow=23.85 cfs 5.003 af

Pond 2P: Existing Depression Peak Elev=168.00' Storage=17 cf Inflow=0.02 cfs 0.014 af
Outflow=0.02 cfs 0.014 af

Pond 3P: Existing Depression Peak Elev=188.37' Storage=60,258 cf Inflow=11.82 cfs 2.195 af
Discarded=0.95 cfs 2.195 af Primary=0.00 cfs 0.000 af Outflow=0.95 cfs 2.195 af

Pond 4P: Existing Depression Peak Elev=165.10' Storage=52,540 cf Inflow=14.84 cfs 1.747 af
Discarded=0.61 cfs 1.747 af Primary=0.00 cfs 0.000 af Outflow=0.61 cfs 1.747 af

Pond 5P: Existing Depression Peak Elev=167.37' Storage=108,945 cf Inflow=25.70 cfs 4.931 af
Discarded=0.24 cfs 1.067 af Primary=7.83 cfs 2.277 af Outflow=8.06 cfs 3.344 af

Pond 6P: Existing Wetland Peak Elev=138.03' Storage=755 cf Inflow=0.08 cfs 0.060 af
Discarded=0.08 cfs 0.060 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.060 af

Pond 7P: Existing Depression Peak Elev=146.01' Storage=101 cf Inflow=0.29 cfs 0.210 af
Discarded=0.29 cfs 0.210 af Primary=0.00 cfs 0.000 af Outflow=0.29 cfs 0.210 af

Pond 8P: Existing Wetland Peak Elev=230.30' Storage=38,155 cf Inflow=8.50 cfs 0.996 af
Discarded=0.13 cfs 0.522 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.522 af

Pond 9P: Existing Wetland Peak Elev=151.89' Storage=116,394 cf Inflow=8.80 cfs 3.059 af
Discarded=0.49 cfs 1.843 af Primary=0.00 cfs 0.000 af Outflow=0.49 cfs 1.843 af

Total Runoff Area = 538.851 ac Runoff Volume = 25.252 af Average Runoff Depth = 0.56"
89.44% Pervious = 481.965 ac 10.56% Impervious = 56.886 ac

Summary for Subcatchment 1S: Drainage Area 1

Runoff = 9.15 cfs @ 13.81 hrs, Volume= 3.654 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

	Area (sf)	CN	Description
	684,720	30	Meadow, non-grazed, HSG A
	599,168	58	Meadow, non-grazed, HSG B
	1,561,408	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	636,978	30	Woods, Good, HSG A
	754,982	55	Woods, Good, HSG B
	382,108	70	Woods, Good, HSG C
	10,846	77	Woods, Good, HSG D
*	33,106	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	417,348	98	Water body
*	25,134	96	Gravel road
*	0	98	Structure
	5,105,798	59	Weighted Average
	4,688,450		91.83% Pervious Area
	417,348		8.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
11.3	356	0.0110	0.52		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	433	0.0020	0.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.3	222	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	766	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
46.9	2,597	0.0340	0.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
105.4	4,424	Total			

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 0.02 cfs @ 15.79 hrs, Volume= 0.014 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

	Area (sf)	CN	Description
	125,845	30	Meadow, non-grazed, HSG A
	32,409	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	16,117	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	58,632	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	0	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	233,003	44	Weighted Average
	233,003		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0900	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
5.3	239	0.0230	0.76		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.1	289	Total			

Summary for Subcatchment 3S: Drainage Area 3

Runoff = 11.82 cfs @ 12.78 hrs, Volume= 2.195 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

	Area (sf)	CN	Description
	0	30	Meadow, non-grazed, HSG A
	99,790	58	Meadow, non-grazed, HSG B
	811,823	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	1,798	30	Woods, Good, HSG A
	107,172	55	Woods, Good, HSG B
	142,868	70	Woods, Good, HSG C
	14,571	77	Woods, Good, HSG D
*	59,918	70	Gravel pit, HSG A
*	96,280	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	51,068	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	1,385,288	70	Weighted Average
	1,334,220		96.31% Pervious Area
	51,068		3.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	50	0.0080	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	166	0.0211	0.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.7	1,110	0.0135	0.81		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.1	675	0.0993	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
51.4	2,001	Total			

Summary for Subcatchment 4S: Drainage Area 4

Runoff = 14.84 cfs @ 12.36 hrs, Volume= 1.747 af, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

	Area (sf)	CN	Description
	15,441	30	Meadow, non-grazed, HSG A
	77,630	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	0	30	Woods, Good, HSG A
	17,967	55	Woods, Good, HSG B
	16,548	70	Woods, Good, HSG C
	4,984	77	Woods, Good, HSG D
*	18,400	70	Gravel pit, HSG A
*	426,656	81	Gravel pit, HSG B
*	134,831	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	4,727	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	717,184	78	Weighted Average
	712,457		99.34% Pervious Area
	4,727		0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	150	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.5	147	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.7	309	0.0032	0.91		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	40	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.6	284	0.0020	0.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	209	0.0358	3.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
24.4	1,189	Total			

Summary for Subcatchment 5S: Drainage Area 5

Runoff = 25.70 cfs @ 12.85 hrs, Volume= 4.931 af, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

	Area (sf)	CN	Description
	84,917	30	Meadow, non-grazed, HSG A
	51,069	58	Meadow, non-grazed, HSG B
	93,653	71	Meadow, non-grazed, HSG C
	461	78	Meadow, non-grazed, HSG D
	0	30	Woods, Good, HSG A
	447,068	55	Woods, Good, HSG B
	1,028,032	70	Woods, Good, HSG C
	324,761	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	583,192	98	Water body
*	9,296	96	Gravel road
*	0	98	Structure
	2,622,449	73	Weighted Average
	2,039,257		77.76% Pervious Area
	583,192		22.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.4	237	0.0527	1.15		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.7	1,244	0.0241	0.78		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.4	499	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.7	486	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
58.5	2,516	Total			

Summary for Subcatchment 6S: Drainage Area 6

Runoff = 0.08 cfs @ 17.50 hrs, Volume= 0.060 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

	Area (sf)	CN	Description
	499,374	30	Meadow, non-grazed, HSG A
	96,264	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	567,239	30	Woods, Good, HSG A
	50,036	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	215,930	98	Water body
*	12,080	96	Gravel road
*	0	98	Structure
	1,440,923	43	Weighted Average
	1,224,993		85.01% Pervious Area
	215,930		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
11.9	499	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	637	0.0376	0.97		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
28.5	1,186	Total			

Summary for Subcatchment 7S: Drainage Area 7b

Runoff = 0.29 cfs @ 17.87 hrs, Volume= 0.210 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

	Area (sf)	CN	Description
*	940,491	30	Meadow, non-grazed, HSG A
*	144,855	58	Meadow, non-grazed, HSG B
*	0	75	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	1,468,258	30	Woods, Good, HSG A
*	230,359	55	Woods, Good, HSG B
*	0	74	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	159,622	70	Gravel pit, HSG A
*	95,253	81	Gravel pit, HSG B
*	0	90	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	363,113	98	Water body
*	20,468	96	Gravel road
*	0	98	Structure
*	0	98	Panels
*	0	98	Equipment pad
	3,422,419	44	Weighted Average
	3,059,306		89.39% Pervious Area
	363,113		10.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.3200	0.31		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
6.9	460	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	2,714	0.0130	0.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
88.9	3,224	Total			

Summary for Subcatchment 8S: Drainage Area 8

Runoff = 8.50 cfs @ 12.36 hrs, Volume= 0.996 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

	Area (sf)	CN	Description
*	0	44	Meadow, non-grazed, HSG A
*	0	65	Meadow, non-grazed, HSG B
*	14,593	75	Meadow, non-grazed, HSG C
	6,627	78	Meadow, non-grazed, HSG D
*	0	43	Woods, Good, HSG A
*	7,700	63	Woods, Good, HSG B
*	187,866	74	Woods, Good, HSG C
	40,001	77	Woods, Good, HSG D
*	0	76	Gravel pit, HSG A
*	0	85	Gravel pit, HSG B
*	0	90	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	93,852	98	Water body
*	3,817	96	Gravel road
*	0	98	Structure
	354,456	81	Weighted Average
	260,604		73.52% Pervious Area
	93,852		26.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
8.6	391	0.0230	0.76		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.2	303	0.0590	1.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
25.0	859	Total			

Summary for Subcatchment 9S: Drainage Area 9

Runoff = 6.79 cfs @ 12.23 hrs, Volume= 0.782 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

	Area (sf)	CN	Description
	74,237	30	Meadow, non-grazed, HSG A
	20,235	58	Meadow, non-grazed, HSG B
	5,099	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	38,735	30	Woods, Good, HSG A
	258,244	55	Woods, Good, HSG B
	19,916	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	200,974	98	Water body
*	18,395	96	Gravel road
*	0	98	Structure
	635,835	66	Weighted Average
	434,861		68.39% Pervious Area
	200,974		31.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	119	0.0504	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.9	155	0.0323	0.90		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	284	0.2280	2.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.8	608	Total			

Summary for Subcatchment 10S: Drainage Area 10

Runoff = 7.00 cfs @ 13.15 hrs, Volume= 1.746 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

	Area (sf)	CN	Description
	13,076	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
	108,724	71	Meadow, non-grazed, HSG C
	7,142	78	Meadow, non-grazed, HSG D
	110,901	30	Woods, Good, HSG A
	314,648	55	Woods, Good, HSG B
	514,847	70	Woods, Good, HSG C
	87,476	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	139,264	98	Water body
*	32,385	96	Gravel road
*	0	98	Structure
	1,328,463	67	Weighted Average
	1,189,199		89.52% Pervious Area
	139,264		10.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
23.0	873	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	74	0.0135	1.16		**Shallow Concentrated Flow,** Nearly Bare & Untilled Kv= 10.0 fps
11.7	626	0.0319	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.4	817	0.0416	1.02		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	678	0.0290	0.85		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
74.8	3,118	Total			

Summary for Subcatchment 11S: Drainage Area 11

Runoff = 18.25 cfs @ 12.69 hrs, Volume= 3.270 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

	Area (sf)	CN	Description
	324,786	30	Meadow, non-grazed, HSG A
	74,662	58	Meadow, non-grazed, HSG B
	1,249,959	71	Meadow, non-grazed, HSG C
	22,189	78	Meadow, non-grazed, HSG D
	5,299	30	Woods, Good, HSG A
	38,194	55	Woods, Good, HSG B
	471,495	70	Woods, Good, HSG C
	72,253	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	201,207	98	Water body
*	19,973	96	Gravel road
*	8,006	98	Structure
	2,488,023	67	Weighted Average
	2,278,810		91.59% Pervious Area
	209,213		8.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
34.0	1,854	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
43.3	1,904	Total			

Summary for Subcatchment 12S: Drainage Area 12

Runoff = 21.20 cfs @ 12.79 hrs, Volume= 3.914 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

	Area (sf)	CN	Description
	0	30	Meadow, non-grazed, HSG A
	9,439	58	Meadow, non-grazed, HSG B
	351,871	71	Meadow, non-grazed, HSG C
	38,083	78	Meadow, non-grazed, HSG D
	62,057	30	Woods, Good, HSG A
	183,438	55	Woods, Good, HSG B
	1,261,559	70	Woods, Good, HSG C
	224,776	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	198,501	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	2,329,724	71	Weighted Average
	2,131,223		91.48% Pervious Area
	198,501		8.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	50	0.0140	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
7.5	626	0.0780	1.40		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
30.7	920	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
52.4	1,596	Total			

Summary for Subcatchment 13S: Drainage Area 13

Runoff = 17.07 cfs @ 12.17 hrs, Volume= 1.733 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

	Area (sf)	CN	Description
	137,390	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	1,266,167	70	Gravel pit, HSG A
*	4,469	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	756	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	1,408,782	66	Weighted Average
	1,408,026		99.95% Pervious Area
	756		0.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
9.1	1,763	0.0403	3.23		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
9.8	1,813	Total			

Summary for Reach DP-1: Off-Site West

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 244.047 ac, 7.87% Impervious, Inflow Depth = 0.18" for 2-year event
Inflow = 9.15 cfs @ 13.81 hrs, Volume= 3.654 af
Outflow = 9.15 cfs @ 13.81 hrs, Volume= 3.654 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-2: Off-Site South

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 146.513 ac, 19.32% Impervious, Inflow Depth = 0.14" for 2-year event
Inflow = 7.00 cfs @ 13.15 hrs, Volume= 1.746 af
Outflow = 7.00 cfs @ 13.15 hrs, Volume= 1.746 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-3: Off-Site East

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 53.483 ac, 8.52% Impervious, Inflow Depth = 0.88" for 2-year event
Inflow = 21.20 cfs @ 12.79 hrs, Volume= 3.914 af
Outflow = 21.20 cfs @ 12.79 hrs, Volume= 3.914 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-4: Off-Site Southeast

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 89.458 ac, 5.39% Impervious, Inflow Depth = 0.67" for 2-year event
Inflow = 23.85 cfs @ 12.53 hrs, Volume= 5.003 af
Outflow = 23.85 cfs @ 12.53 hrs, Volume= 5.003 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Existing Depression

Inflow Area = 5.349 ac, 0.00% Impervious, Inflow Depth = 0.03" for 2-year event
Inflow = 0.02 cfs @ 15.79 hrs, Volume= 0.014 af
Outflow = 0.02 cfs @ 16.91 hrs, Volume= 0.014 af, Atten= 1%, Lag= 67.4 min
Discarded = 0.02 cfs @ 16.91 hrs, Volume= 0.014 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 168.00' @ 16.91 hrs Surf.Area= 7,599 sf Storage= 17 cf

Plug-Flow detention time= 13.8 min calculated for 0.014 af (100% of inflow)
Center-of-Mass det. time= 13.9 min (1,155.5 - 1,141.6)

Volume	Invert	Avail.Storage	Storage Description
#1	168.00'	58,289 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
168.00	7,570	407.0	0	0	7,570
170.00	58,771	1,048.0	58,289	58,289	81,803

Device	Routing	Invert	Outlet Devices
#1	Discarded	168.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.18 cfs @ 16.91 hrs HW=168.00' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Summary for Pond 3P: Existing Depression

Inflow Area = 31.802 ac, 3.69% Impervious, Inflow Depth = 0.83" for 2-year event
Inflow = 11.82 cfs @ 12.78 hrs, Volume= 2.195 af
Outflow = 0.95 cfs @ 18.68 hrs, Volume= 2.195 af, Atten= 92%, Lag= 354.0 min
Discarded = 0.95 cfs @ 18.68 hrs, Volume= 2.195 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 188.37' @ 18.68 hrs Surf.Area= 40,348 sf Storage= 60,258 cf

Plug-Flow detention time= 784.7 min calculated for 2.195 af (100% of inflow)
Center-of-Mass det. time= 784.4 min (1,702.2 - 917.8)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	277,396 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
186.00	11,737	422.0	0	0	11,737
188.00	36,683	753.0	46,113	46,113	42,709
190.00	58,742	1,001.0	94,563	140,677	77,369
192.00	78,452	1,254.0	136,720	277,396	122,825

Device	Routing	Invert	Outlet Devices
#1	Discarded	186.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	191.00'	**64.0' long x 16.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.95 cfs @ 18.68 hrs HW=188.37' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.95 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=186.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 4P: Existing Depression

Inflow Area = 16.464 ac, 0.66% Impervious, Inflow Depth = 1.27" for 2-year event
Inflow = 14.84 cfs @ 12.36 hrs, Volume= 1.747 af
Outflow = 0.61 cfs @ 18.36 hrs, Volume= 1.747 af, Atten= 96%, Lag= 359.9 min
Discarded = 0.61 cfs @ 18.36 hrs, Volume= 1.747 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 165.10' @ 18.36 hrs Surf.Area= 26,000 sf Storage= 52,540 cf

Plug-Flow detention time= 1,025.6 min calculated for 1.746 af (100% of inflow)
Center-of-Mass det. time= 1,026.6 min (1,892.8 - 866.2)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	1,773,203 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
162.00	8,040	387.0	0	0	8,040
164.00	20,064	890.0	27,203	27,203	59,171
166.00	31,393	894.0	51,036	78,239	61,043
168.00	59,552	1,582.0	89,455	167,695	196,625
170.00	106,611	3,162.0	163,895	331,590	793,118
172.00	142,449	3,012.0	248,196	579,786	867,073
174.00	182,259	2,708.0	323,891	903,678	1,005,567
176.00	222,778	3,083.0	404,360	1,308,037	1,178,477
178.00	242,528	3,031.0	465,166	1,773,203	1,204,505

Device	Routing	Invert	Outlet Devices
#1	Discarded	162.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	177.00'	**23.0' long x 99.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.61 cfs @ 18.36 hrs HW=165.10' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.61 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=162.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 5P: Existing Depression

Inflow Area = 68.340 ac, 22.74% Impervious, Inflow Depth = 0.87" for 2-year event
Inflow = 25.70 cfs @ 12.85 hrs, Volume= 4.931 af
Outflow = 8.06 cfs @ 14.17 hrs, Volume= 3.344 af, Atten= 69%, Lag= 79.2 min
Discarded = 0.24 cfs @ 14.17 hrs, Volume= 1.067 af
Primary = 7.83 cfs @ 14.17 hrs, Volume= 2.277 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 167.37' @ 14.17 hrs Surf.Area= 38,057 sf Storage= 108,945 cf

Plug-Flow detention time= 694.0 min calculated for 3.341 af (68% of inflow)
Center-of-Mass det. time= 586.1 min (1,500.2 - 914.1)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	134,374 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
162.00	1,686	164.0	0	0	1,686
164.00	17,454	653.0	16,376	16,376	33,489
166.00	29,548	840.0	46,474	62,851	55,756
168.00	42,358	938.0	71,523	134,374	69,736

Device	Routing	Invert	Outlet Devices
#1	Discarded	162.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	167.25'	**71.0' long x 38.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.24 cfs @ 14.17 hrs HW=167.37' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=7.62 cfs @ 14.17 hrs HW=167.37' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 7.62 cfs @ 0.92 fps)

Summary for Pond 6P: Existing Wetland

Inflow Area = 116.016 ac, 21.65% Impervious, Inflow Depth = 0.01" for 2-year event
Inflow = 0.08 cfs @ 17.50 hrs, Volume= 0.060 af
Outflow = 0.08 cfs @ 23.44 hrs, Volume= 0.060 af, Atten= 10%, Lag= 355.9 min
Discarded = 0.08 cfs @ 23.44 hrs, Volume= 0.060 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 138.03' @ 23.44 hrs Surf.Area= 24,187 sf Storage= 755 cf

Plug-Flow detention time= 165.5 min calculated for 0.060 af (100% of inflow)
Center-of-Mass det. time= 166.2 min (1,357.1 - 1,190.9)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	330,471 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
138.00	23,460	686.0	0	0	23,460
140.00	91,023	1,816.0	107,129	107,129	248,460
142.00	133,681	2,277.0	223,342	330,471	398,668

Device	Routing	Invert	Outlet Devices
#1	Discarded	138.00'	**0.170 in/hr Exfiltration over Surface area**
#2	Primary	141.00'	**121.0' long x 19.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.10 cfs @ 23.44 hrs HW=138.03' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 7P: Existing Depression

Inflow Area = 78.568 ac, 10.61% Impervious, Inflow Depth = 0.03" for 2-year event
Inflow = 0.29 cfs @ 17.87 hrs, Volume= 0.210 af
Outflow = 0.29 cfs @ 17.93 hrs, Volume= 0.210 af, Atten= 0%, Lag= 3.5 min
Discarded = 0.29 cfs @ 17.93 hrs, Volume= 0.210 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 146.01' @ 17.93 hrs Surf.Area= 9,255 sf Storage= 101 cf

Plug-Flow detention time= 5.9 min calculated for 0.209 af (100% of inflow)
Center-of-Mass det. time= 5.9 min (1,218.7 - 1,212.8)

Volume	Invert	Avail.Storage	Storage Description
#1	146.00'	80,115 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
146.00	9,050	771.0	0	0	9,050
148.00	83,614	3,079.0	80,115	80,115	716,170

Device	Routing	Invert	Outlet Devices
#1	Primary	147.50'	**14.0' long x 90.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	146.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.52 cfs @ 17.93 hrs HW=146.01' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.52 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=146.00' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 8P: Existing Wetland

Inflow Area = 8.137 ac, 26.48% Impervious, Inflow Depth = 1.47" for 2-year event
Inflow = 8.50 cfs @ 12.36 hrs, Volume= 0.996 af
Outflow = 0.13 cfs @ 24.28 hrs, Volume= 0.522 af, Atten= 99%, Lag= 715.0 min
Discarded = 0.13 cfs @ 24.28 hrs, Volume= 0.522 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 230.30' @ 24.28 hrs Surf.Area= 32,202 sf Storage= 38,155 cf

Plug-Flow detention time= 1,667.2 min calculated for 0.522 af (52% of inflow)
Center-of-Mass det. time= 1,549.1 min (2,406.2 - 857.1)

Volume	Invert	Avail.Storage	Storage Description
#1	228.00'	130,034 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.00	5,806	459.0	0	0	5,806
230.00	25,974	862.0	29,374	29,374	48,191
232.00	79,559	1,189.0	100,661	130,034	101,601

Device	Routing	Invert	Outlet Devices
#1	Discarded	228.00'	**0.170 in/hr Exfiltration over Surface area**
#2	Primary	231.50'	**119.0' long x 196.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.13 cfs @ 24.28 hrs HW=230.30' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=228.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 9P: Existing Wetland

Inflow Area = 82.937 ac, 24.30% Impervious, Inflow Depth = 0.44" for 2-year event
Inflow = 8.80 cfs @ 14.17 hrs, Volume= 3.059 af
Outflow = 0.49 cfs @ 24.96 hrs, Volume= 1.843 af, Atten= 94%, Lag= 647.4 min
Discarded = 0.49 cfs @ 24.96 hrs, Volume= 1.843 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 151.89' @ 24.96 hrs Surf.Area= 125,016 sf Storage= 116,394 cf

Plug-Flow detention time= 1,577.2 min calculated for 1.843 af (60% of inflow)
Center-of-Mass det. time= 1,445.3 min (2,452.1 - 1,006.8)

Volume	Invert	Avail.Storage	Storage Description
#1	148.00'	834,530 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.00	2,138	180.0	0	0	2,138
150.00	9,156	387.0	10,479	10,479	11,495
152.00	135,719	2,199.0	120,084	130,563	384,391
154.00	178,250	2,327.0	313,004	443,567	430,714
156.00	213,235	2,588.0	390,963	834,530	532,915

Device	Routing	Invert	Outlet Devices
#1	Discarded	148.00'	**0.170 in/hr Exfiltration over Surface area**
#2	Primary	154.00'	**31.0' long x 49.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.49 cfs @ 24.96 hrs HW=151.89' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.49 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=148.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1 Runoff Area=5,105,798 sf 8.17% Impervious Runoff Depth=1.53"
Flow Length=4,424' Tc=105.4 min CN=59 Runoff=51.55 cfs 14.921 af

Subcatchment 2S: Drainage Area 2 Runoff Area=233,003 sf 0.00% Impervious Runoff Depth=0.56"
Flow Length=289' Tc=12.1 min CN=44 Runoff=1.38 cfs 0.248 af

Subcatchment 3S: Drainage Area 3 Runoff Area=1,385,288 sf 3.69% Impervious Runoff Depth=2.41"
Flow Length=2,001' Tc=51.4 min CN=70 Runoff=38.17 cfs 6.398 af

Subcatchment 4S: Drainage Area 4 Runoff Area=717,184 sf 0.66% Impervious Runoff Depth=3.14"
Flow Length=1,189' Tc=24.4 min CN=78 Runoff=37.51 cfs 4.310 af

Subcatchment 5S: Drainage Area 5 Runoff Area=2,622,449 sf 22.24% Impervious Runoff Depth=2.68"
Flow Length=2,516' Tc=58.5 min CN=73 Runoff=75.15 cfs 13.440 af

Subcatchment 6S: Drainage Area 6 Runoff Area=1,440,923 sf 14.99% Impervious Runoff Depth=0.50"
Flow Length=1,186' Tc=28.5 min CN=43 Runoff=5.80 cfs 1.389 af

Subcatchment 7S: Drainage Area 7b Runoff Area=3,422,419 sf 10.61% Impervious Runoff Depth=0.56"
Flow Length=3,224' Tc=88.9 min CN=44 Runoff=9.26 cfs 3.645 af

Subcatchment 8S: Drainage Area 8 Runoff Area=354,456 sf 26.48% Impervious Runoff Depth=3.43"
Flow Length=859' Tc=25.0 min CN=81 Runoff=19.99 cfs 2.327 af

Subcatchment 9S: Drainage Area 9 Runoff Area=635,835 sf 31.61% Impervious Runoff Depth=2.08"
Flow Length=608' Tc=13.8 min CN=66 Runoff=26.70 cfs 2.526 af

Subcatchment 10S: Drainage Area 10 Runoff Area=1,328,463 sf 10.48% Impervious Runoff Depth=2.16"
Flow Length=3,118' Tc=74.8 min CN=67 Runoff=25.72 cfs 5.488 af

Subcatchment 11S: Drainage Area 11 Runoff Area=2,488,023 sf 8.41% Impervious Runoff Depth=2.16"
Flow Length=1,904' Tc=43.3 min CN=67 Runoff=66.48 cfs 10.278 af

Subcatchment 12S: Drainage Area 12 Runoff Area=2,329,724 sf 8.52% Impervious Runoff Depth=2.50"
Flow Length=1,596' Tc=52.4 min CN=71 Runoff=66.03 cfs 11.149 af

Subcatchment 13S: Drainage Area 13 Runoff Area=1,408,782 sf 0.05% Impervious Runoff Depth=2.08"
Flow Length=1,813' Tc=9.8 min CN=66 Runoff=66.38 cfs 5.596 af

Reach DP-1: Off-Site West Inflow=51.55 cfs 15.219 af
Outflow=51.55 cfs 15.219 af

Reach DP-2: Off-Site South Inflow=25.72 cfs 5.488 af
Outflow=25.72 cfs 5.488 af

Reach DP-3: Off-Site East Inflow=66.03 cfs 11.149 af
Outflow=66.03 cfs 11.149 af

Reach DP-4: Off-Site Southeast Inflow=87.68 cfs 15.874 af
Outflow=87.68 cfs 15.874 af

Pond 2P: Existing Depression Peak Elev=168.31' Storage=3,076 cf Inflow=1.38 cfs 0.248 af
Outflow=0.29 cfs 0.248 af

Pond 3P: Existing Depression Peak Elev=191.02' Storage=205,423 cf Inflow=38.17 cfs 6.398 af
Discarded=1.62 cfs 5.908 af Primary=0.66 cfs 0.130 af Outflow=2.28 cfs 6.037 af

Pond 4P: Existing Depression Peak Elev=167.50' Storage=139,816 cf Inflow=37.51 cfs 4.310 af
Discarded=1.22 cfs 3.955 af Primary=0.00 cfs 0.000 af Outflow=1.22 cfs 3.955 af

Pond 5P: Existing Depression Peak Elev=167.78' Storage=125,091 cf Inflow=75.15 cfs 13.440 af
Discarded=0.26 cfs 1.092 af Primary=73.36 cfs 10.756 af Outflow=73.62 cfs 11.848 af

Pond 6P: Existing Wetland Peak Elev=140.37' Storage=142,236 cf Inflow=5.80 cfs 3.615 af
Discarded=0.39 cfs 1.668 af Primary=0.00 cfs 0.000 af Outflow=0.39 cfs 1.668 af

Pond 7P: Existing Depression Peak Elev=147.59' Storage=50,153 cf Inflow=9.26 cfs 3.645 af
Discarded=3.46 cfs 3.476 af Primary=0.97 cfs 0.169 af Outflow=4.43 cfs 3.645 af

Pond 8P: Existing Wetland Peak Elev=231.45' Storage=90,956 cf Inflow=19.99 cfs 2.327 af
Discarded=0.24 cfs 1.046 af Primary=0.00 cfs 0.000 af Outflow=0.24 cfs 1.046 af

Pond 9P: Existing Wetland Peak Elev=154.13' Storage=466,989 cf Inflow=78.46 cfs 13.282 af
Discarded=0.71 cfs 3.333 af Primary=4.05 cfs 2.226 af Outflow=4.76 cfs 5.559 af

Total Runoff Area = 538.851 ac Runoff Volume = 81.713 af Average Runoff Depth = 1.82"
89.44% Pervious = 481.965 ac 10.56% Impervious = 56.886 ac

Summary for Subcatchment 1S: Drainage Area 1

Runoff = 51.55 cfs @ 13.52 hrs, Volume= 14.921 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

	Area (sf)	CN	Description
	684,720	30	Meadow, non-grazed, HSG A
	599,168	58	Meadow, non-grazed, HSG B
	1,561,408	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	636,978	30	Woods, Good, HSG A
	754,982	55	Woods, Good, HSG B
	382,108	70	Woods, Good, HSG C
	10,846	77	Woods, Good, HSG D
*	33,106	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	417,348	98	Water body
*	25,134	96	Gravel road
*	0	98	Structure
	5,105,798	59	Weighted Average
	4,688,450		91.83% Pervious Area
	417,348		8.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
11.3	356	0.0110	0.52		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	433	0.0020	0.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.3	222	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	766	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
46.9	2,597	0.0340	0.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
105.4	4,424	Total			

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 1.38 cfs @ 12.37 hrs, Volume= 0.248 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

	Area (sf)	CN	Description
	125,845	30	Meadow, non-grazed, HSG A
	32,409	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	16,117	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	58,632	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	0	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	233,003	44	Weighted Average
	233,003		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0900	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
5.3	239	0.0230	0.76		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.1	289	Total			

Summary for Subcatchment 3S: Drainage Area 3

Runoff = 38.17 cfs @ 12.73 hrs, Volume= 6.398 af, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

	Area (sf)	CN	Description
	0	30	Meadow, non-grazed, HSG A
	99,790	58	Meadow, non-grazed, HSG B
	811,823	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	1,798	30	Woods, Good, HSG A
	107,172	55	Woods, Good, HSG B
	142,868	70	Woods, Good, HSG C
	14,571	77	Woods, Good, HSG D
*	59,918	70	Gravel pit, HSG A
*	96,280	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	51,068	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	1,385,288	70	Weighted Average
	1,334,220		96.31% Pervious Area
	51,068		3.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	50	0.0080	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	166	0.0211	0.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.7	1,110	0.0135	0.81		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.1	675	0.0993	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
51.4	2,001	Total			

Summary for Subcatchment 4S: Drainage Area 4

Runoff = 37.51 cfs @ 12.34 hrs, Volume= 4.310 af, Depth= 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

	Area (sf)	CN	Description
	15,441	30	Meadow, non-grazed, HSG A
	77,630	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	0	30	Woods, Good, HSG A
	17,967	55	Woods, Good, HSG B
	16,548	70	Woods, Good, HSG C
	4,984	77	Woods, Good, HSG D
*	18,400	70	Gravel pit, HSG A
*	426,656	81	Gravel pit, HSG B
*	134,831	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	4,727	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	717,184	78	Weighted Average
	712,457		99.34% Pervious Area
	4,727		0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	150	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.5	147	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.7	309	0.0032	0.91		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	40	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.6	284	0.0020	0.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	209	0.0358	3.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
24.4	1,189	Total			

Summary for Subcatchment 5S: Drainage Area 5

Runoff = 75.15 cfs @ 12.81 hrs, Volume= 13.440 af, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

	Area (sf)	CN	Description
	84,917	30	Meadow, non-grazed, HSG A
	51,069	58	Meadow, non-grazed, HSG B
	93,653	71	Meadow, non-grazed, HSG C
	461	78	Meadow, non-grazed, HSG D
	0	30	Woods, Good, HSG A
	447,068	55	Woods, Good, HSG B
	1,028,032	70	Woods, Good, HSG C
	324,761	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	583,192	98	Water body
*	9,296	96	Gravel road
*	0	98	Structure
	2,622,449	73	Weighted Average
	2,039,257		77.76% Pervious Area
	583,192		22.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.4	237	0.0527	1.15		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.7	1,244	0.0241	0.78		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.4	499	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.7	486	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
58.5	2,516	Total			

Summary for Subcatchment 6S: Drainage Area 6

Runoff = 5.80 cfs @ 12.63 hrs, Volume= 1.389 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

	Area (sf)	CN	Description
	499,374	30	Meadow, non-grazed, HSG A
	96,264	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	567,239	30	Woods, Good, HSG A
	50,036	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	215,930	98	Water body
*	12,080	96	Gravel road
*	0	98	Structure
	1,440,923	43	Weighted Average
	1,224,993		85.01% Pervious Area
	215,930		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
11.9	499	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	637	0.0376	0.97		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
28.5	1,186	Total			

Summary for Subcatchment 7S: Drainage Area 7b

Runoff = 9.26 cfs @ 13.57 hrs, Volume= 3.645 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

	Area (sf)	CN	Description
*	940,491	30	Meadow, non-grazed, HSG A
*	144,855	58	Meadow, non-grazed, HSG B
*	0	75	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	1,468,258	30	Woods, Good, HSG A
*	230,359	55	Woods, Good, HSG B
*	0	74	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	159,622	70	Gravel pit, HSG A
*	95,253	81	Gravel pit, HSG B
*	0	90	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	363,113	98	Water body
*	20,468	96	Gravel road
*	0	98	Structure
*	0	98	Panels
*	0	98	Equipment pad
	3,422,419	44	Weighted Average
	3,059,306		89.39% Pervious Area
	363,113		10.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.3200	0.31		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
6.9	460	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	2,714	0.0130	0.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
88.9	3,224	Total			

Summary for Subcatchment 8S: Drainage Area 8

Runoff = 19.99 cfs @ 12.34 hrs, Volume= 2.327 af, Depth= 3.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

	Area (sf)	CN	Description
*	0	44	Meadow, non-grazed, HSG A
*	0	65	Meadow, non-grazed, HSG B
*	14,593	75	Meadow, non-grazed, HSG C
	6,627	78	Meadow, non-grazed, HSG D
*	0	43	Woods, Good, HSG A
*	7,700	63	Woods, Good, HSG B
*	187,866	74	Woods, Good, HSG C
	40,001	77	Woods, Good, HSG D
*	0	76	Gravel pit, HSG A
*	0	85	Gravel pit, HSG B
*	0	90	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	93,852	98	Water body
*	3,817	96	Gravel road
*	0	98	Structure
	354,456	81	Weighted Average
	260,604		73.52% Pervious Area
	93,852		26.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
8.6	391	0.0230	0.76		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.2	303	0.0590	1.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
25.0	859	Total			

Summary for Subcatchment 9S: Drainage Area 9

Runoff = 26.70 cfs @ 12.20 hrs, Volume= 2.526 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

	Area (sf)	CN	Description
	74,237	30	Meadow, non-grazed, HSG A
	20,235	58	Meadow, non-grazed, HSG B
	5,099	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	38,735	30	Woods, Good, HSG A
	258,244	55	Woods, Good, HSG B
	19,916	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	200,974	98	Water body
*	18,395	96	Gravel road
*	0	98	Structure
	635,835	66	Weighted Average
	434,861		68.39% Pervious Area
	200,974		31.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	119	0.0504	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.9	155	0.0323	0.90		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	284	0.2280	2.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.8	608	Total			

Summary for Subcatchment 10S: Drainage Area 10

Runoff = 25.72 cfs @ 13.05 hrs, Volume= 5.488 af, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

	Area (sf)	CN	Description
	13,076	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
	108,724	71	Meadow, non-grazed, HSG C
	7,142	78	Meadow, non-grazed, HSG D
	110,901	30	Woods, Good, HSG A
	314,648	55	Woods, Good, HSG B
	514,847	70	Woods, Good, HSG C
	87,476	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	139,264	98	Water body
*	32,385	96	Gravel road
*	0	98	Structure
	1,328,463	67	Weighted Average
	1,189,199		89.52% Pervious Area
	139,264		10.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
23.0	873	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	74	0.0135	1.16		**Shallow Concentrated Flow,** Nearly Bare & Untilled Kv= 10.0 fps
11.7	626	0.0319	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.4	817	0.0416	1.02		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	678	0.0290	0.85		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
74.8	3,118	Total			

Summary for Subcatchment 11S: Drainage Area 11

Runoff = 66.48 cfs @ 12.63 hrs, Volume= 10.278 af, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

	Area (sf)	CN	Description
	324,786	30	Meadow, non-grazed, HSG A
	74,662	58	Meadow, non-grazed, HSG B
	1,249,959	71	Meadow, non-grazed, HSG C
	22,189	78	Meadow, non-grazed, HSG D
	5,299	30	Woods, Good, HSG A
	38,194	55	Woods, Good, HSG B
	471,495	70	Woods, Good, HSG C
	72,253	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	201,207	98	Water body
*	19,973	96	Gravel road
*	8,006	98	Structure
	2,488,023	67	Weighted Average
	2,278,810		91.59% Pervious Area
	209,213		8.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
34.0	1,854	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
43.3	1,904	Total			

Summary for Subcatchment 12S: Drainage Area 12

Runoff = 66.03 cfs @ 12.74 hrs, Volume= 11.149 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

	Area (sf)	CN	Description
	0	30	Meadow, non-grazed, HSG A
	9,439	58	Meadow, non-grazed, HSG B
	351,871	71	Meadow, non-grazed, HSG C
	38,083	78	Meadow, non-grazed, HSG D
	62,057	30	Woods, Good, HSG A
	183,438	55	Woods, Good, HSG B
	1,261,559	70	Woods, Good, HSG C
	224,776	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	198,501	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	2,329,724	71	Weighted Average
	2,131,223		91.48% Pervious Area
	198,501		8.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	50	0.0140	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
7.5	626	0.0780	1.40		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
30.7	920	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
52.4	1,596	Total			

Summary for Subcatchment 13S: Drainage Area 13

Runoff = 66.38 cfs @ 12.15 hrs, Volume= 5.596 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

	Area (sf)	CN	Description
	137,390	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	1,266,167	70	Gravel pit, HSG A
*	4,469	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	756	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	1,408,782	66	Weighted Average
	1,408,026		99.95% Pervious Area
	756		0.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
9.1	1,763	0.0403	3.23		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
9.8	1,813	Total			

Summary for Reach DP-1: Off-Site West

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 244.047 ac, 7.87% Impervious, Inflow Depth = 0.75" for 25-year event
Inflow = 51.55 cfs @ 13.52 hrs, Volume= 15.219 af
Outflow = 51.55 cfs @ 13.52 hrs, Volume= 15.219 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-2: Off-Site South

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 146.513 ac, 19.32% Impervious, Inflow Depth = 0.45" for 25-year event
Inflow = 25.72 cfs @ 13.05 hrs, Volume= 5.488 af
Outflow = 25.72 cfs @ 13.05 hrs, Volume= 5.488 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-3: Off-Site East

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 53.483 ac, 8.52% Impervious, Inflow Depth = 2.50" for 25-year event
Inflow = 66.03 cfs @ 12.74 hrs, Volume= 11.149 af
Outflow = 66.03 cfs @ 12.74 hrs, Volume= 11.149 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-4: Off-Site Southeast

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 89.458 ac, 5.39% Impervious, Inflow Depth = 2.13" for 25-year event
Inflow = 87.68 cfs @ 12.48 hrs, Volume= 15.874 af
Outflow = 87.68 cfs @ 12.48 hrs, Volume= 15.874 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Existing Depression

Inflow Area = 5.349 ac, 0.00% Impervious, Inflow Depth = 0.56" for 25-year event
Inflow = 1.38 cfs @ 12.37 hrs, Volume= 0.248 af
Outflow = 0.29 cfs @ 15.28 hrs, Volume= 0.248 af, Atten= 79%, Lag= 174.8 min
Discarded = 0.29 cfs @ 15.28 hrs, Volume= 0.248 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 168.31' @ 15.28 hrs Surf.Area= 12,370 sf Storage= 3,076 cf

Plug-Flow detention time= 124.6 min calculated for 0.248 af (100% of inflow)
Center-of-Mass det. time= 124.5 min (1,066.7 - 942.2)

Volume	Invert	Avail.Storage	Storage Description
#1	168.00'	58,289 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
168.00	7,570	407.0	0	0	7,570
170.00	58,771	1,048.0	58,289	58,289	81,803

Device	Routing	Invert	Outlet Devices
#1	Discarded	168.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.29 cfs @ 15.28 hrs HW=168.31' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.29 cfs)

Summary for Pond 3P: Existing Depression

Inflow Area = 31.802 ac, 3.69% Impervious, Inflow Depth = 2.41" for 25-year event
Inflow = 38.17 cfs @ 12.73 hrs, Volume= 6.398 af
Outflow = 2.28 cfs @ 18.57 hrs, Volume= 6.037 af, Atten= 94%, Lag= 350.3 min
Discarded = 1.62 cfs @ 18.57 hrs, Volume= 5.908 af
Primary = 0.66 cfs @ 18.57 hrs, Volume= 0.130 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 191.02' @ 18.57 hrs Surf.Area= 68,431 sf Storage= 205,423 cf

Plug-Flow detention time= 1,361.8 min calculated for 6.037 af (94% of inflow)
Center-of-Mass det. time= 1,331.6 min (2,216.4 - 884.7)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	277,396 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
186.00	11,737	422.0	0	0	11,737
188.00	36,683	753.0	46,113	46,113	42,709
190.00	58,742	1,001.0	94,563	140,677	77,369
192.00	78,452	1,254.0	136,720	277,396	122,825

Device	Routing	Invert	Outlet Devices
#1	Discarded	186.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	191.00'	**64.0' long x 16.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=1.62 cfs @ 18.57 hrs HW=191.02' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.62 cfs)

Primary OutFlow Max=0.46 cfs @ 18.57 hrs HW=191.02' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.46 cfs @ 0.37 fps)

Summary for Pond 4P: Existing Depression

Inflow Area = 16.464 ac, 0.66% Impervious, Inflow Depth = 3.14" for 25-year event
Inflow = 37.51 cfs @ 12.34 hrs, Volume= 4.310 af
Outflow = 1.22 cfs @ 18.65 hrs, Volume= 3.955 af, Atten= 97%, Lag= 378.5 min
Discarded = 1.22 cfs @ 18.65 hrs, Volume= 3.955 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 167.50' @ 18.65 hrs Surf.Area= 51,646 sf Storage= 139,816 cf

Plug-Flow detention time= 1,356.0 min calculated for 3.955 af (92% of inflow)
Center-of-Mass det. time= 1,314.2 min (2,154.1 - 840.0)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	1,773,203 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
162.00	8,040	387.0	0	0	8,040
164.00	20,064	890.0	27,203	27,203	59,171
166.00	31,393	894.0	51,036	78,239	61,043
168.00	59,552	1,582.0	89,455	167,695	196,625
170.00	106,611	3,162.0	163,895	331,590	793,118
172.00	142,449	3,012.0	248,196	579,786	867,073
174.00	182,259	2,708.0	323,891	903,678	1,005,567
176.00	222,778	3,083.0	404,360	1,308,037	1,178,477
178.00	242,528	3,031.0	465,166	1,773,203	1,204,505

Device	Routing	Invert	Outlet Devices
#1	Discarded	162.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	177.00'	**23.0' long x 99.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=1.22 cfs @ 18.65 hrs HW=167.50' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.22 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=162.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 5P: Existing Depression

Inflow Area = 68.340 ac, 22.74% Impervious, Inflow Depth = 2.36" for 25-year event
Inflow = 75.15 cfs @ 12.81 hrs, Volume= 13.440 af
Outflow = 73.62 cfs @ 12.90 hrs, Volume= 11.848 af, Atten= 2%, Lag= 5.6 min
Discarded = 0.26 cfs @ 12.90 hrs, Volume= 1.092 af
Primary = 73.36 cfs @ 12.90 hrs, Volume= 10.756 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 167.78' @ 12.90 hrs Surf.Area= 40,814 sf Storage= 125,091 cf

Plug-Flow detention time= 231.3 min calculated for 11.848 af (88% of inflow)
Center-of-Mass det. time= 175.7 min (1,059.7 - 884.0)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	134,374 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
162.00	1,686	164.0	0	0	1,686
164.00	17,454	653.0	16,376	16,376	33,489
166.00	29,548	840.0	46,474	62,851	55,756
168.00	42,358	938.0	71,523	134,374	69,736

Device	Routing	Invert	Outlet Devices
#1	Discarded	162.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	167.25'	**71.0' long x 38.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.26 cfs @ 12.90 hrs HW=167.78' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=73.27 cfs @ 12.90 hrs HW=167.78' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 73.27 cfs @ 1.96 fps)

Summary for Pond 6P: Existing Wetland

Inflow Area = 116.016 ac, 21.65% Impervious, Inflow Depth = 0.37" for 25-year event
Inflow = 5.80 cfs @ 12.63 hrs, Volume= 3.615 af
Outflow = 0.39 cfs @ 26.93 hrs, Volume= 1.668 af, Atten= 93%, Lag= 858.1 min
Discarded = 0.39 cfs @ 26.93 hrs, Volume= 1.668 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 140.37' @ 26.93 hrs Surf.Area= 98,317 sf Storage= 142,236 cf

Plug-Flow detention time= 1,631.9 min calculated for 1.668 af (46% of inflow)
Center-of-Mass det. time= 1,429.1 min (2,588.1 - 1,159.1)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	330,471 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
138.00	23,460	686.0	0	0	23,460
140.00	91,023	1,816.0	107,129	107,129	248,460
142.00	133,681	2,277.0	223,342	330,471	398,668

Device	Routing	Invert	Outlet Devices
#1	Discarded	138.00'	**0.170 in/hr Exfiltration over Surface area**
#2	Primary	141.00'	**121.0' long x 19.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.39 cfs @ 26.93 hrs HW=140.37' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.39 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 7P: Existing Depression

Inflow Area = 78.568 ac, 10.61% Impervious, Inflow Depth = 0.56" for 25-year event
Inflow = 9.26 cfs @ 13.57 hrs, Volume= 3.645 af
Outflow = 4.43 cfs @ 16.35 hrs, Volume= 3.645 af, Atten= 52%, Lag= 166.5 min
Discarded = 3.46 cfs @ 16.35 hrs, Volume= 3.476 af
Primary = 0.97 cfs @ 16.35 hrs, Volume= 0.169 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 147.59' @ 16.35 hrs Surf.Area= 62,053 sf Storage= 50,153 cf

Plug-Flow detention time= 191.8 min calculated for 3.645 af (100% of inflow)
Center-of-Mass det. time= 191.8 min (1,205.2 - 1,013.4)

Volume	Invert	Avail.Storage	Storage Description
#1	146.00'	80,115 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
146.00	9,050	771.0	0	0	9,050
148.00	83,614	3,079.0	80,115	80,115	716,170

Device	Routing	Invert	Outlet Devices
#1	Primary	147.50'	**14.0' long x 90.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	146.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=3.46 cfs @ 16.35 hrs HW=147.59' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 3.46 cfs)

Primary OutFlow Max=0.96 cfs @ 16.35 hrs HW=147.59' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.96 cfs @ 0.79 fps)

Summary for Pond 8P: Existing Wetland

Inflow Area = 8.137 ac, 26.48% Impervious, Inflow Depth = 3.43" for 25-year event
Inflow = 19.99 cfs @ 12.34 hrs, Volume= 2.327 af
Outflow = 0.24 cfs @ 24.28 hrs, Volume= 1.046 af, Atten= 99%, Lag= 716.3 min
Discarded = 0.24 cfs @ 24.28 hrs, Volume= 1.046 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 231.45' @ 24.28 hrs Surf.Area= 61,775 sf Storage= 90,956 cf

Plug-Flow detention time= 1,705.0 min calculated for 1.046 af (45% of inflow)
Center-of-Mass det. time= 1,586.0 min (2,418.8 - 832.7)

Volume	Invert	Avail.Storage	Storage Description
#1	228.00'	130,034 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.00	5,806	459.0	0	0	5,806
230.00	25,974	862.0	29,374	29,374	48,191
232.00	79,559	1,189.0	100,661	130,034	101,601

Device	Routing	Invert	Outlet Devices
#1	Discarded	228.00'	**0.170 in/hr Exfiltration over Surface area**
#2	Primary	231.50'	**119.0' long x 196.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.24 cfs @ 24.28 hrs HW=231.45' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=228.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 9P: Existing Wetland

Inflow Area = 82.937 ac, 24.30% Impervious, Inflow Depth = 1.92" for 25-year event
Inflow = 78.46 cfs @ 12.89 hrs, Volume= 13.282 af
Outflow = 4.76 cfs @ 19.33 hrs, Volume= 5.559 af, Atten= 94%, Lag= 386.5 min
Discarded = 0.71 cfs @ 19.33 hrs, Volume= 3.333 af
Primary = 4.05 cfs @ 19.33 hrs, Volume= 2.226 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 154.13' @ 19.33 hrs Surf.Area= 180,439 sf Storage= 466,989 cf

Plug-Flow detention time= 1,250.5 min calculated for 5.559 af (42% of inflow)
Center-of-Mass det. time= 1,113.9 min (2,022.5 - 908.5)

Volume	Invert	Avail.Storage	Storage Description
#1	148.00'	834,530 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.00	2,138	180.0	0	0	2,138
150.00	9,156	387.0	10,479	10,479	11,495
152.00	135,719	2,199.0	120,084	130,563	384,391
154.00	178,250	2,327.0	313,004	443,567	430,714
156.00	213,235	2,588.0	390,963	834,530	532,915

Device	Routing	Invert	Outlet Devices
#1	Discarded	148.00'	**0.170 in/hr Exfiltration over Surface area**
#2	Primary	154.00'	**31.0' long x 49.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.71 cfs @ 19.33 hrs HW=154.13' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.71 cfs)

Primary OutFlow Max=3.92 cfs @ 19.33 hrs HW=154.13' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 3.92 cfs @ 0.97 fps)

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1 Runoff Area=5,105,798 sf 8.17% Impervious Runoff Depth=2.03"
Flow Length=4,424' Tc=105.4 min CN=59 Runoff=71.19 cfs 19.858 af

Subcatchment 2S: Drainage Area 2 Runoff Area=233,003 sf 0.00% Impervious Runoff Depth=0.86"
Flow Length=289' Tc=12.1 min CN=44 Runoff=2.66 cfs 0.381 af

Subcatchment 3S: Drainage Area 3 Runoff Area=1,385,288 sf 3.69% Impervious Runoff Depth=3.05"
Flow Length=2,001' Tc=51.4 min CN=70 Runoff=48.51 cfs 8.070 af

Subcatchment 4S: Drainage Area 4 Runoff Area=717,184 sf 0.66% Impervious Runoff Depth=3.85"
Flow Length=1,189' Tc=24.4 min CN=78 Runoff=45.87 cfs 5.276 af

Subcatchment 5S: Drainage Area 5 Runoff Area=2,622,449 sf 22.24% Impervious Runoff Depth=3.34"
Flow Length=2,516' Tc=58.5 min CN=73 Runoff=94.13 cfs 16.752 af

Subcatchment 6S: Drainage Area 6 Runoff Area=1,440,923 sf 14.99% Impervious Runoff Depth=0.79"
Flow Length=1,186' Tc=28.5 min CN=43 Runoff=11.25 cfs 2.171 af

Subcatchment 7S: Drainage Area 7b Runoff Area=3,422,419 sf 10.61% Impervious Runoff Depth=0.86"
Flow Length=3,224' Tc=88.9 min CN=44 Runoff=16.47 cfs 5.600 af

Subcatchment 8S: Drainage Area 8 Runoff Area=354,456 sf 26.48% Impervious Runoff Depth=4.16"
Flow Length=859' Tc=25.0 min CN=81 Runoff=24.14 cfs 2.820 af

Subcatchment 9S: Drainage Area 9 Runoff Area=635,835 sf 31.61% Impervious Runoff Depth=2.66"
Flow Length=608' Tc=13.8 min CN=66 Runoff=34.78 cfs 3.241 af

Subcatchment 10S: Drainage Area 10 Runoff Area=1,328,463 sf 10.48% Impervious Runoff Depth=2.76"
Flow Length=3,118' Tc=74.8 min CN=67 Runoff=33.33 cfs 7.011 af

Subcatchment 11S: Drainage Area 11 Runoff Area=2,488,023 sf 8.41% Impervious Runoff Depth=2.76"
Flow Length=1,904' Tc=43.3 min CN=67 Runoff=85.95 cfs 13.130 af

Subcatchment 12S: Drainage Area 12 Runoff Area=2,329,724 sf 8.52% Impervious Runoff Depth=3.14"
Flow Length=1,596' Tc=52.4 min CN=71 Runoff=83.50 cfs 14.005 af

Subcatchment 13S: Drainage Area 13 Runoff Area=1,408,782 sf 0.05% Impervious Runoff Depth=2.66"
Flow Length=1,813' Tc=9.8 min CN=66 Runoff=86.40 cfs 7.182 af

Reach DP-1: Off-Site West Inflow=71.19 cfs 22.974 af
Outflow=71.19 cfs 22.974 af

Reach DP-2: Off-Site South Inflow=33.33 cfs 10.498 af
Outflow=33.33 cfs 10.498 af

Reach DP-3: Off-Site East Inflow=83.50 cfs 14.005 af
Outflow=83.50 cfs 14.005 af

Reach DP-4: Off-Site Southeast Inflow=115.12 cfs 20.312 af
Outflow=115.12 cfs 20.312 af

Pond 2P: Existing Depression Peak Elev=168.53' Storage=6,160 cf Inflow=2.66 cfs 0.381 af
Outflow=0.39 cfs 0.381 af

Pond 3P: Existing Depression Peak Elev=191.12' Storage=212,164 cf Inflow=48.51 cfs 8.070 af
Discarded=1.64 cfs 6.007 af Primary=7.00 cfs 1.687 af Outflow=8.64 cfs 7.694 af

Pond 4P: Existing Depression Peak Elev=168.09' Storage=172,894 cf Inflow=45.87 cfs 5.276 af
Discarded=1.45 cfs 4.686 af Primary=0.00 cfs 0.000 af Outflow=1.45 cfs 4.686 af

Pond 5P: Existing Depression Peak Elev=167.87' Storage=128,853 cf Inflow=94.13 cfs 17.140 af
Discarded=0.26 cfs 1.100 af Primary=92.99 cfs 14.447 af Outflow=93.24 cfs 15.547 af

Pond 6P: Existing Wetland Peak Elev=141.09' Storage=218,104 cf Inflow=15.79 cfs 8.760 af
Discarded=0.45 cfs 2.003 af Primary=8.69 cfs 3.487 af Outflow=9.13 cfs 5.490 af

Pond 7P: Existing Depression Peak Elev=147.79' Storage=63,440 cf Inflow=16.47 cfs 5.600 af
Discarded=4.02 cfs 4.170 af Primary=5.74 cfs 1.430 af Outflow=9.76 cfs 5.600 af

Pond 8P: Existing Wetland Peak Elev=231.52' Storage=95,822 cf Inflow=24.14 cfs 2.820 af
Discarded=0.25 cfs 1.093 af Primary=1.17 cfs 0.388 af Outflow=1.42 cfs 1.482 af

Pond 9P: Existing Wetland Peak Elev=154.30' Storage=497,426 cf Inflow=99.73 cfs 17.689 af
Discarded=0.72 cfs 3.360 af Primary=13.64 cfs 6.589 af Outflow=14.36 cfs 9.950 af

Total Runoff Area = 538.851 ac Runoff Volume = 105.496 af Average Runoff Depth = 2.35"
89.44% Pervious = 481.965 ac 10.56% Impervious = 56.886 ac

Summary for Subcatchment 1S: Drainage Area 1

Runoff = 71.19 cfs @ 13.49 hrs, Volume= 19.858 af, Depth= 2.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.30"

	Area (sf)	CN	Description
	684,720	30	Meadow, non-grazed, HSG A
	599,168	58	Meadow, non-grazed, HSG B
	1,561,408	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	636,978	30	Woods, Good, HSG A
	754,982	55	Woods, Good, HSG B
	382,108	70	Woods, Good, HSG C
	10,846	77	Woods, Good, HSG D
*	33,106	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	417,348	98	Water body
*	25,134	96	Gravel road
*	0	98	Structure
	5,105,798	59	Weighted Average
	4,688,450		91.83% Pervious Area
	417,348		8.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
11.3	356	0.0110	0.52		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	433	0.0020	0.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.3	222	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	766	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
46.9	2,597	0.0340	0.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
105.4	4,424	Total			

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 2.66 cfs @ 12.25 hrs, Volume= 0.381 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.30"

	Area (sf)	CN	Description
	125,845	30	Meadow, non-grazed, HSG A
	32,409	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	16,117	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	58,632	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	0	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	233,003	44	Weighted Average
	233,003		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0900	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
5.3	239	0.0230	0.76		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.1	289	Total			

Summary for Subcatchment 3S: Drainage Area 3

Runoff = 48.51 cfs @ 12.72 hrs, Volume= 8.070 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.30"

	Area (sf)	CN	Description
	0	30	Meadow, non-grazed, HSG A
	99,790	58	Meadow, non-grazed, HSG B
	811,823	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	1,798	30	Woods, Good, HSG A
	107,172	55	Woods, Good, HSG B
	142,868	70	Woods, Good, HSG C
	14,571	77	Woods, Good, HSG D
*	59,918	70	Gravel pit, HSG A
*	96,280	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	51,068	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	1,385,288	70	Weighted Average
	1,334,220		96.31% Pervious Area
	51,068		3.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	50	0.0080	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	166	0.0211	0.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.7	1,110	0.0135	0.81		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.1	675	0.0993	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
51.4	2,001	Total			

Summary for Subcatchment 4S: Drainage Area 4

Runoff = 45.87 cfs @ 12.34 hrs, Volume= 5.276 af, Depth= 3.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.30"

	Area (sf)	CN	Description
	15,441	30	Meadow, non-grazed, HSG A
	77,630	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	0	30	Woods, Good, HSG A
	17,967	55	Woods, Good, HSG B
	16,548	70	Woods, Good, HSG C
	4,984	77	Woods, Good, HSG D
*	18,400	70	Gravel pit, HSG A
*	426,656	81	Gravel pit, HSG B
*	134,831	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	4,727	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	717,184	78	Weighted Average
	712,457		99.34% Pervious Area
	4,727		0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	150	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.5	147	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.7	309	0.0032	0.91		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	40	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.6	284	0.0020	0.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	209	0.0358	3.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
24.4	1,189	Total			

Summary for Subcatchment 5S: Drainage Area 5

Runoff = 94.13 cfs @ 12.80 hrs, Volume= 16.752 af, Depth= 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.30"

	Area (sf)	CN	Description
	84,917	30	Meadow, non-grazed, HSG A
	51,069	58	Meadow, non-grazed, HSG B
	93,653	71	Meadow, non-grazed, HSG C
	461	78	Meadow, non-grazed, HSG D
	0	30	Woods, Good, HSG A
	447,068	55	Woods, Good, HSG B
	1,028,032	70	Woods, Good, HSG C
	324,761	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	583,192	98	Water body
*	9,296	96	Gravel road
*	0	98	Structure
	2,622,449	73	Weighted Average
	2,039,257		77.76% Pervious Area
	583,192		22.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.4	237	0.0527	1.15		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.7	1,244	0.0241	0.78		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.4	499	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.7	486	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
58.5	2,516	Total			

Summary for Subcatchment 6S: Drainage Area 6

Runoff = 11.25 cfs @ 12.56 hrs, Volume= 2.171 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.30"

	Area (sf)	CN	Description
	499,374	30	Meadow, non-grazed, HSG A
	96,264	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	567,239	30	Woods, Good, HSG A
	50,036	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	215,930	98	Water body
*	12,080	96	Gravel road
*	0	98	Structure
	1,440,923	43	Weighted Average
	1,224,993		85.01% Pervious Area
	215,930		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
11.9	499	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	637	0.0376	0.97		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
28.5	1,186	Total			

Summary for Subcatchment 7S: Drainage Area 7b

Runoff = 16.47 cfs @ 13.48 hrs, Volume= 5.600 af, Depth= 0.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.30"

	Area (sf)	CN	Description
*	940,491	30	Meadow, non-grazed, HSG A
*	144,855	58	Meadow, non-grazed, HSG B
*	0	75	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	1,468,258	30	Woods, Good, HSG A
*	230,359	55	Woods, Good, HSG B
*	0	74	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	159,622	70	Gravel pit, HSG A
*	95,253	81	Gravel pit, HSG B
*	0	90	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	363,113	98	Water body
*	20,468	96	Gravel road
*	0	98	Structure
*	0	98	Panels
*	0	98	Equipment pad
	3,422,419	44	Weighted Average
	3,059,306		89.39% Pervious Area
	363,113		10.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.3200	0.31		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
6.9	460	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	2,714	0.0130	0.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
88.9	3,224	Total			

Summary for Subcatchment 8S: Drainage Area 8

Runoff = 24.14 cfs @ 12.34 hrs, Volume= 2.820 af, Depth= 4.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.30"

	Area (sf)	CN	Description
*	0	44	Meadow, non-grazed, HSG A
*	0	65	Meadow, non-grazed, HSG B
*	14,593	75	Meadow, non-grazed, HSG C
	6,627	78	Meadow, non-grazed, HSG D
*	0	43	Woods, Good, HSG A
*	7,700	63	Woods, Good, HSG B
*	187,866	74	Woods, Good, HSG C
	40,001	77	Woods, Good, HSG D
*	0	76	Gravel pit, HSG A
*	0	85	Gravel pit, HSG B
*	0	90	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	93,852	98	Water body
*	3,817	96	Gravel road
*	0	98	Structure
	354,456	81	Weighted Average
	260,604		73.52% Pervious Area
	93,852		26.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
8.6	391	0.0230	0.76		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.2	303	0.0590	1.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
25.0	859	Total			

Summary for Subcatchment 9S: Drainage Area 9

Runoff = 34.78 cfs @ 12.20 hrs, Volume= 3.241 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.30"

	Area (sf)	CN	Description
	74,237	30	Meadow, non-grazed, HSG A
	20,235	58	Meadow, non-grazed, HSG B
	5,099	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	38,735	30	Woods, Good, HSG A
	258,244	55	Woods, Good, HSG B
	19,916	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	200,974	98	Water body
*	18,395	96	Gravel road
*	0	98	Structure
	635,835	66	Weighted Average
	434,861		68.39% Pervious Area
	200,974		31.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	119	0.0504	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.9	155	0.0323	0.90		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	284	0.2280	2.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.8	608	Total			

Summary for Subcatchment 10S: Drainage Area 10

Runoff = 33.33 cfs @ 13.04 hrs, Volume= 7.011 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.30"

	Area (sf)	CN	Description
	13,076	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
	108,724	71	Meadow, non-grazed, HSG C
	7,142	78	Meadow, non-grazed, HSG D
	110,901	30	Woods, Good, HSG A
	314,648	55	Woods, Good, HSG B
	514,847	70	Woods, Good, HSG C
	87,476	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	139,264	98	Water body
*	32,385	96	Gravel road
*	0	98	Structure
	1,328,463	67	Weighted Average
	1,189,199		89.52% Pervious Area
	139,264		10.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
23.0	873	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	74	0.0135	1.16		**Shallow Concentrated Flow,** Nearly Bare & Untilled Kv= 10.0 fps
11.7	626	0.0319	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.4	817	0.0416	1.02		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	678	0.0290	0.85		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
74.8	3,118	Total			

Summary for Subcatchment 11S: Drainage Area 11

Runoff = 85.95 cfs @ 12.62 hrs, Volume= 13.130 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.30"

	Area (sf)	CN	Description
	324,786	30	Meadow, non-grazed, HSG A
	74,662	58	Meadow, non-grazed, HSG B
	1,249,959	71	Meadow, non-grazed, HSG C
	22,189	78	Meadow, non-grazed, HSG D
	5,299	30	Woods, Good, HSG A
	38,194	55	Woods, Good, HSG B
	471,495	70	Woods, Good, HSG C
	72,253	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	201,207	98	Water body
*	19,973	96	Gravel road
*	8,006	98	Structure
	2,488,023	67	Weighted Average
	2,278,810		91.59% Pervious Area
	209,213		8.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
34.0	1,854	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
43.3	1,904	Total			

Summary for Subcatchment 12S: Drainage Area 12

Runoff = 83.50 cfs @ 12.73 hrs, Volume= 14.005 af, Depth= 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.30"

	Area (sf)	CN	Description
	0	30	Meadow, non-grazed, HSG A
	9,439	58	Meadow, non-grazed, HSG B
	351,871	71	Meadow, non-grazed, HSG C
	38,083	78	Meadow, non-grazed, HSG D
	62,057	30	Woods, Good, HSG A
	183,438	55	Woods, Good, HSG B
	1,261,559	70	Woods, Good, HSG C
	224,776	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	198,501	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	2,329,724	71	Weighted Average
	2,131,223		91.48% Pervious Area
	198,501		8.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	50	0.0140	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
7.5	626	0.0780	1.40		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
30.7	920	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
52.4	1,596	Total			

Summary for Subcatchment 13S: Drainage Area 13

Runoff = 86.40 cfs @ 12.15 hrs, Volume= 7.182 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-year Rainfall=6.30"

	Area (sf)	CN	Description
	137,390	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	1,266,167	70	Gravel pit, HSG A
*	4,469	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	756	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	1,408,782	66	Weighted Average
	1,408,026		99.95% Pervious Area
	756		0.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
9.1	1,763	0.0403	3.23		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
9.8	1,813	Total			

Summary for Reach DP-1: Off-Site West

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 244.047 ac, 7.87% Impervious, Inflow Depth = 1.13" for 50-year event
Inflow = 71.19 cfs @ 13.49 hrs, Volume= 22.974 af
Outflow = 71.19 cfs @ 13.49 hrs, Volume= 22.974 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-2: Off-Site South

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 146.513 ac, 19.32% Impervious, Inflow Depth = 0.86" for 50-year event
Inflow = 33.33 cfs @ 13.04 hrs, Volume= 10.498 af
Outflow = 33.33 cfs @ 13.04 hrs, Volume= 10.498 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-3: Off-Site East

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 53.483 ac, 8.52% Impervious, Inflow Depth = 3.14" for 50-year event
Inflow = 83.50 cfs @ 12.73 hrs, Volume= 14.005 af
Outflow = 83.50 cfs @ 12.73 hrs, Volume= 14.005 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-4: Off-Site Southeast

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 89.458 ac, 5.39% Impervious, Inflow Depth = 2.72" for 50-year event
Inflow = 115.12 cfs @ 12.17 hrs, Volume= 20.312 af
Outflow = 115.12 cfs @ 12.17 hrs, Volume= 20.312 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Existing Depression

Inflow Area = 5.349 ac, 0.00% Impervious, Inflow Depth = 0.86" for 50-year event
Inflow = 2.66 cfs @ 12.25 hrs, Volume= 0.381 af
Outflow = 0.39 cfs @ 15.52 hrs, Volume= 0.381 af, Atten= 85%, Lag= 195.9 min
Discarded = 0.39 cfs @ 15.52 hrs, Volume= 0.381 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 168.53' @ 15.52 hrs Surf.Area= 16,371 sf Storage= 6,160 cf

Plug-Flow detention time= 204.3 min calculated for 0.381 af (100% of inflow)
Center-of-Mass det. time= 204.2 min (1,126.1 - 921.9)

Volume	Invert	Avail.Storage	Storage Description
#1	168.00'	58,289 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
168.00	7,570	407.0	0	0	7,570
170.00	58,771	1,048.0	58,289	58,289	81,803

Device	Routing	Invert	Outlet Devices
#1	Discarded	168.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.39 cfs @ 15.52 hrs HW=168.53' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.39 cfs)

Summary for Pond 3P: Existing Depression

Inflow Area = 31.802 ac, 3.69% Impervious, Inflow Depth = 3.05" for 50-year event
Inflow = 48.51 cfs @ 12.72 hrs, Volume= 8.070 af
Outflow = 8.64 cfs @ 14.57 hrs, Volume= 7.694 af, Atten= 82%, Lag= 110.7 min
Discarded = 1.64 cfs @ 14.57 hrs, Volume= 6.007 af
Primary = 7.00 cfs @ 14.57 hrs, Volume= 1.687 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 191.12' @ 14.57 hrs Surf.Area= 69,400 sf Storage= 212,164 cf

Plug-Flow detention time= 1,102.7 min calculated for 7.694 af (95% of inflow)
Center-of-Mass det. time= 1,077.2 min (1,955.1 - 878.0)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	277,396 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
186.00	11,737	422.0	0	0	11,737
188.00	36,683	753.0	46,113	46,113	42,709
190.00	58,742	1,001.0	94,563	140,677	77,369
192.00	78,452	1,254.0	136,720	277,396	122,825

Device	Routing	Invert	Outlet Devices
#1	Discarded	186.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	191.00'	**64.0' long x 16.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=1.64 cfs @ 14.57 hrs HW=191.12' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.64 cfs)

Primary OutFlow Max=6.86 cfs @ 14.57 hrs HW=191.12' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 6.86 cfs @ 0.92 fps)

Summary for Pond 4P: Existing Depression

Inflow Area = 16.464 ac, 0.66% Impervious, Inflow Depth = 3.85" for 50-year event
Inflow = 45.87 cfs @ 12.34 hrs, Volume= 5.276 af
Outflow = 1.45 cfs @ 18.60 hrs, Volume= 4.686 af, Atten= 97%, Lag= 375.5 min
Discarded = 1.45 cfs @ 18.60 hrs, Volume= 4.686 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 168.09' @ 18.60 hrs Surf.Area= 61,297 sf Storage= 172,894 cf

Plug-Flow detention time= 1,363.7 min calculated for 4.686 af (89% of inflow)
Center-of-Mass det. time= 1,310.9 min (2,145.1 - 834.2)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	1,773,203 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
162.00	8,040	387.0	0	0	8,040
164.00	20,064	890.0	27,203	27,203	59,171
166.00	31,393	894.0	51,036	78,239	61,043
168.00	59,552	1,582.0	89,455	167,695	196,625
170.00	106,611	3,162.0	163,895	331,590	793,118
172.00	142,449	3,012.0	248,196	579,786	867,073
174.00	182,259	2,708.0	323,891	903,678	1,005,567
176.00	222,778	3,083.0	404,360	1,308,037	1,178,477
178.00	242,528	3,031.0	465,166	1,773,203	1,204,505

Device	Routing	Invert	Outlet Devices
#1	Discarded	162.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	177.00'	**23.0' long x 99.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=1.45 cfs @ 18.60 hrs HW=168.09' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.45 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=162.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 5P: Existing Depression

Inflow Area = 68.340 ac, 22.74% Impervious, Inflow Depth = 3.01" for 50-year event
Inflow = 94.13 cfs @ 12.80 hrs, Volume= 17.140 af
Outflow = 93.24 cfs @ 12.86 hrs, Volume= 15.547 af, Atten= 1%, Lag= 3.4 min
Discarded = 0.26 cfs @ 12.86 hrs, Volume= 1.100 af
Primary = 92.99 cfs @ 12.86 hrs, Volume= 14.447 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 167.87' @ 12.86 hrs Surf.Area= 41,443 sf Storage= 128,853 cf

Plug-Flow detention time= 181.5 min calculated for 15.537 af (91% of inflow)
Center-of-Mass det. time= 137.4 min (1,020.4 - 883.0)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	134,374 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
162.00	1,686	164.0	0	0	1,686
164.00	17,454	653.0	16,376	16,376	33,489
166.00	29,548	840.0	46,474	62,851	55,756
168.00	42,358	938.0	71,523	134,374	69,736

Device	Routing	Invert	Outlet Devices
#1	Discarded	162.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	167.25'	**71.0' long x 38.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.26 cfs @ 12.86 hrs HW=167.87' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=92.90 cfs @ 12.86 hrs HW=167.87' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 92.90 cfs @ 2.12 fps)

Summary for Pond 6P: Existing Wetland

Inflow Area = 116.016 ac, 21.65% Impervious, Inflow Depth = 0.91" for 50-year event
Inflow = 15.79 cfs @ 15.86 hrs, Volume= 8.760 af
Outflow = 9.13 cfs @ 18.70 hrs, Volume= 5.490 af, Atten= 42%, Lag= 170.5 min
Discarded = 0.45 cfs @ 18.70 hrs, Volume= 2.003 af
Primary = 8.69 cfs @ 18.70 hrs, Volume= 3.487 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 141.09' @ 18.70 hrs Surf.Area= 113,232 sf Storage= 218,104 cf

Plug-Flow detention time= 790.1 min calculated for 5.487 af (63% of inflow)
Center-of-Mass det. time= 661.3 min (1,740.1 - 1,078.7)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	330,471 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
138.00	23,460	686.0	0	0	23,460
140.00	91,023	1,816.0	107,129	107,129	248,460
142.00	133,681	2,277.0	223,342	330,471	398,668

Device	Routing	Invert	Outlet Devices
#1	Discarded	138.00'	**0.170 in/hr Exfiltration over Surface area**
#2	Primary	141.00'	**121.0' long x 19.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.45 cfs @ 18.70 hrs HW=141.09' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.45 cfs)

Primary OutFlow Max=8.58 cfs @ 18.70 hrs HW=141.09' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 8.58 cfs @ 0.80 fps)

Summary for Pond 7P: Existing Depression

Inflow Area = 78.568 ac, 10.61% Impervious, Inflow Depth = 0.86" for 50-year event
Inflow = 16.47 cfs @ 13.48 hrs, Volume= 5.600 af
Outflow = 9.76 cfs @ 14.81 hrs, Volume= 5.600 af, Atten= 41%, Lag= 79.4 min
Discarded = 4.02 cfs @ 14.81 hrs, Volume= 4.170 af
Primary = 5.74 cfs @ 14.81 hrs, Volume= 1.430 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 147.79' @ 14.81 hrs Surf.Area= 72,013 sf Storage= 63,440 cf

Plug-Flow detention time= 162.1 min calculated for 5.596 af (100% of inflow)
Center-of-Mass det. time= 162.2 min (1,155.2 - 993.0)

Volume	Invert	Avail.Storage	Storage Description
#1	146.00'	80,115 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
146.00	9,050	771.0	0	0	9,050
148.00	83,614	3,079.0	80,115	80,115	716,170

Device	Routing	Invert	Outlet Devices
#1	Primary	147.50'	**14.0' long x 90.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	146.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=4.02 cfs @ 14.81 hrs HW=147.79' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 4.02 cfs)

Primary OutFlow Max=5.74 cfs @ 14.81 hrs HW=147.79' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 5.74 cfs @ 1.44 fps)

Summary for Pond 8P: Existing Wetland

Inflow Area = 8.137 ac, 26.48% Impervious, Inflow Depth = 4.16" for 50-year event
Inflow = 24.14 cfs @ 12.34 hrs, Volume= 2.820 af
Outflow = 1.42 cfs @ 15.99 hrs, Volume= 1.482 af, Atten= 94%, Lag= 218.7 min
Discarded = 0.25 cfs @ 15.99 hrs, Volume= 1.093 af
Primary = 1.17 cfs @ 15.99 hrs, Volume= 0.388 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 231.52' @ 15.99 hrs Surf.Area= 64,120 sf Storage= 95,822 cf

Plug-Flow detention time= 1,345.7 min calculated for 1.482 af (53% of inflow)
Center-of-Mass det. time= 1,233.9 min (2,061.1 - 827.2)

Volume	Invert	Avail.Storage	Storage Description
#1	228.00'	130,034 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.00	5,806	459.0	0	0	5,806
230.00	25,974	862.0	29,374	29,374	48,191
232.00	79,559	1,189.0	100,661	130,034	101,601

Device	Routing	Invert	Outlet Devices
#1	Discarded	228.00'	**0.170 in/hr Exfiltration over Surface area**
#2	Primary	231.50'	**119.0' long x 196.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.25 cfs @ 15.99 hrs HW=231.52' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=1.10 cfs @ 15.99 hrs HW=231.52' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.10 cfs @ 0.40 fps)

Summary for Pond 9P: Existing Wetland

Inflow Area = 82.937 ac, 24.30% Impervious, Inflow Depth = 2.56" for 50-year event
Inflow = 99.73 cfs @ 12.84 hrs, Volume= 17.689 af
Outflow = 14.36 cfs @ 15.99 hrs, Volume= 9.950 af, Atten= 86%, Lag= 188.9 min
Discarded = 0.72 cfs @ 15.99 hrs, Volume= 3.360 af
Primary = 13.64 cfs @ 15.99 hrs, Volume= 6.589 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 154.30' @ 15.99 hrs Surf.Area= 183,264 sf Storage= 497,426 cf

Plug-Flow detention time= 809.6 min calculated for 9.950 af (56% of inflow)
Center-of-Mass det. time= 687.9 min (1,590.3 - 902.3)

Volume	Invert	Avail.Storage	Storage Description
#1	148.00'	834,530 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.00	2,138	180.0	0	0	2,138
150.00	9,156	387.0	10,479	10,479	11,495
152.00	135,719	2,199.0	120,084	130,563	384,391
154.00	178,250	2,327.0	313,004	443,567	430,714
156.00	213,235	2,588.0	390,963	834,530	532,915

Device	Routing	Invert	Outlet Devices
#1	Discarded	148.00'	**0.170 in/hr Exfiltration over Surface area**
#2	Primary	154.00'	**31.0' long x 49.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.72 cfs @ 15.99 hrs HW=154.30' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.72 cfs)

Primary OutFlow Max=13.56 cfs @ 15.99 hrs HW=154.30' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 13.56 cfs @ 1.47 fps)

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Drainage Area 1 Runoff Area=5,105,798 sf 8.17% Impervious Runoff Depth=2.44"
Flow Length=4,424' Tc=105.4 min CN=59 Runoff=86.94 cfs 23.803 af

Subcatchment 2S: Drainage Area 2 Runoff Area=233,003 sf 0.00% Impervious Runoff Depth=1.11"
Flow Length=289' Tc=12.1 min CN=44 Runoff=3.98 cfs 0.495 af

Subcatchment 3S: Drainage Area 3 Runoff Area=1,385,288 sf 3.69% Impervious Runoff Depth=3.54"
Flow Length=2,001' Tc=51.4 min CN=70 Runoff=56.51 cfs 9.369 af

Subcatchment 4S: Drainage Area 4 Runoff Area=717,184 sf 0.66% Impervious Runoff Depth=4.38"
Flow Length=1,189' Tc=24.4 min CN=78 Runoff=52.20 cfs 6.015 af

Subcatchment 5S: Drainage Area 5 Runoff Area=2,622,449 sf 22.24% Impervious Runoff Depth=3.85"
Flow Length=2,516' Tc=58.5 min CN=73 Runoff=108.68 cfs 19.311 af

Subcatchment 6S: Drainage Area 6 Runoff Area=1,440,923 sf 14.99% Impervious Runoff Depth=1.03"
Flow Length=1,186' Tc=28.5 min CN=43 Runoff=16.39 cfs 2.843 af

Subcatchment 7S: Drainage Area 7b Runoff Area=3,422,419 sf 10.61% Impervious Runoff Depth=1.11"
Flow Length=3,224' Tc=88.9 min CN=44 Runoff=23.09 cfs 7.268 af

Subcatchment 8S: Drainage Area 8 Runoff Area=354,456 sf 26.48% Impervious Runoff Depth=4.71"
Flow Length=859' Tc=25.0 min CN=81 Runoff=27.27 cfs 3.195 af

Subcatchment 9S: Drainage Area 9 Runoff Area=635,835 sf 31.61% Impervious Runoff Depth=3.13"
Flow Length=608' Tc=13.8 min CN=66 Runoff=41.08 cfs 3.803 af

Subcatchment 10S: Drainage Area 10 Runoff Area=1,328,463 sf 10.48% Impervious Runoff Depth=3.23"
Flow Length=3,118' Tc=74.8 min CN=67 Runoff=39.25 cfs 8.202 af

Subcatchment 11S: Drainage Area 11 Runoff Area=2,488,023 sf 8.41% Impervious Runoff Depth=3.23"
Flow Length=1,904' Tc=43.3 min CN=67 Runoff=101.13 cfs 15.362 af

Subcatchment 12S: Drainage Area 12 Runoff Area=2,329,724 sf 8.52% Impervious Runoff Depth=3.64"
Flow Length=1,596' Tc=52.4 min CN=71 Runoff=96.96 cfs 16.221 af

Subcatchment 13S: Drainage Area 13 Runoff Area=1,408,782 sf 0.05% Impervious Runoff Depth=3.13"
Flow Length=1,813' Tc=9.8 min CN=66 Runoff=102.00 cfs 8.425 af

Reach DP-1: Off-Site West Inflow=104.08 cfs 29.443 af
Outflow=104.08 cfs 29.443 af

Reach DP-2: Off-Site South Inflow=39.25 cfs 15.784 af
Outflow=39.25 cfs 15.784 af

Reach DP-3: Off-Site East Inflow=96.96 cfs 16.221 af
Outflow=96.96 cfs 16.221 af

Reach DP-4: Off-Site Southeast Inflow=136.92 cfs 23.787 af
Outflow=136.92 cfs 23.787 af

Pond 2P: Existing Depression Peak Elev=168.68' Storage=8,932 cf Inflow=3.98 cfs 0.495 af
Outflow=0.46 cfs 0.495 af

Pond 3P: Existing Depression Peak Elev=191.19' Storage=217,532 cf Inflow=56.51 cfs 9.369 af
Discarded=1.66 cfs 6.050 af Primary=14.79 cfs 2.939 af Outflow=16.45 cfs 8.989 af

Pond 4P: Existing Depression Peak Elev=168.47' Storage=197,947 cf Inflow=52.20 cfs 6.015 af
Discarded=1.64 cfs 5.247 af Primary=0.00 cfs 0.000 af Outflow=1.64 cfs 5.247 af

Pond 5P: Existing Depression Peak Elev=167.93' Storage=131,600 cf Inflow=108.68 cfs 20.067 af
Discarded=0.26 cfs 1.106 af Primary=107.49 cfs 17.367 af Outflow=107.75 cfs 18.474 af

Pond 6P: Existing Wetland Peak Elev=141.16' Storage=226,093 cf Inflow=28.16 cfs 12.892 af
Discarded=0.45 cfs 2.036 af Primary=20.55 cfs 7.582 af Outflow=21.00 cfs 9.617 af

Pond 7P: Existing Depression Peak Elev=147.93' Storage=74,306 cf Inflow=23.09 cfs 7.268 af
Discarded=4.44 cfs 4.567 af Primary=10.62 cfs 2.701 af Outflow=15.06 cfs 7.268 af

Pond 8P: Existing Wetland Peak Elev=231.54' Storage=96,670 cf Inflow=27.27 cfs 3.195 af
Discarded=0.25 cfs 1.101 af Primary=2.42 cfs 0.756 af Outflow=2.67 cfs 1.857 af

Pond 9P: Existing Wetland Peak Elev=154.44' Storage=523,818 cf Inflow=115.35 cfs 21.170 af
Discarded=0.73 cfs 3.374 af Primary=24.59 cfs 10.049 af Outflow=25.32 cfs 13.423 af

Total Runoff Area = 538.851 ac Runoff Volume = 124.312 af Average Runoff Depth = 2.77"
89.44% Pervious = 481.965 ac 10.56% Impervious = 56.886 ac

Summary for Subcatchment 1S: Drainage Area 1

Runoff = 86.94 cfs @ 13.48 hrs, Volume= 23.803 af, Depth= 2.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.90"

	Area (sf)	CN	Description
	684,720	30	Meadow, non-grazed, HSG A
	599,168	58	Meadow, non-grazed, HSG B
	1,561,408	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	636,978	30	Woods, Good, HSG A
	754,982	55	Woods, Good, HSG B
	382,108	70	Woods, Good, HSG C
	10,846	77	Woods, Good, HSG D
*	33,106	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	417,348	98	Water body
*	25,134	96	Gravel road
*	0	98	Structure
	5,105,798	59	Weighted Average
	4,688,450		91.83% Pervious Area
	417,348		8.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
11.3	356	0.0110	0.52		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.1	433	0.0020	0.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.3	222	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.5	766	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
46.9	2,597	0.0340	0.92		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
105.4	4,424	Total			

Summary for Subcatchment 2S: Drainage Area 2

Runoff = 3.98 cfs @ 12.22 hrs, Volume= 0.495 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.90"

	Area (sf)	CN	Description
	125,845	30	Meadow, non-grazed, HSG A
	32,409	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	16,117	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	58,632	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	0	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	233,003	44	Weighted Average
	233,003		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.8	50	0.0900	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
5.3	239	0.0230	0.76		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.1	289	Total			

Summary for Subcatchment 3S: Drainage Area 3

Runoff = 56.51 cfs @ 12.72 hrs, Volume= 9.369 af, Depth= 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.90"

	Area (sf)	CN	Description
	0	30	Meadow, non-grazed, HSG A
	99,790	58	Meadow, non-grazed, HSG B
	811,823	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	1,798	30	Woods, Good, HSG A
	107,172	55	Woods, Good, HSG B
	142,868	70	Woods, Good, HSG C
	14,571	77	Woods, Good, HSG D
*	59,918	70	Gravel pit, HSG A
*	96,280	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	51,068	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	1,385,288	70	Weighted Average
	1,334,220		96.31% Pervious Area
	51,068		3.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.8	50	0.0080	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	166	0.0211	0.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.7	1,110	0.0135	0.81		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.1	675	0.0993	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
51.4	2,001	Total			

Summary for Subcatchment 4S: Drainage Area 4

Runoff = 52.20 cfs @ 12.33 hrs, Volume= 6.015 af, Depth= 4.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.90"

	Area (sf)	CN	Description
	15,441	30	Meadow, non-grazed, HSG A
	77,630	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	0	30	Woods, Good, HSG A
	17,967	55	Woods, Good, HSG B
	16,548	70	Woods, Good, HSG C
	4,984	77	Woods, Good, HSG D
*	18,400	70	Gravel pit, HSG A
*	426,656	81	Gravel pit, HSG B
*	134,831	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	4,727	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	717,184	78	Weighted Average
	712,457		99.34% Pervious Area
	4,727		0.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	150	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.5	147	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.7	309	0.0032	0.91		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	40	0.6000	12.47		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
6.6	284	0.0020	0.72		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
1.1	209	0.0358	3.05		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
24.4	1,189	Total			

Summary for Subcatchment 5S: Drainage Area 5

Runoff = 108.68 cfs @ 12.80 hrs, Volume= 19.311 af, Depth= 3.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.90"

	Area (sf)	CN	Description
	84,917	30	Meadow, non-grazed, HSG A
	51,069	58	Meadow, non-grazed, HSG B
	93,653	71	Meadow, non-grazed, HSG C
	461	78	Meadow, non-grazed, HSG D
	0	30	Woods, Good, HSG A
	447,068	55	Woods, Good, HSG B
	1,028,032	70	Woods, Good, HSG C
	324,761	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	583,192	98	Water body
*	9,296	96	Gravel road
*	0	98	Structure
	2,622,449	73	Weighted Average
	2,039,257		77.76% Pervious Area
	583,192		22.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.4	237	0.0527	1.15		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.7	1,244	0.0241	0.78		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.4	499	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.7	486	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
58.5	2,516	Total			

Summary for Subcatchment 6S: Drainage Area 6

Runoff = 16.39 cfs @ 12.52 hrs, Volume= 2.843 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.90"

	Area (sf)	CN	Description
	499,374	30	Meadow, non-grazed, HSG A
	96,264	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	567,239	30	Woods, Good, HSG A
	50,036	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	215,930	98	Water body
*	12,080	96	Gravel road
*	0	98	Structure
	1,440,923	43	Weighted Average
	1,224,993		85.01% Pervious Area
	215,930		14.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
11.9	499	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	637	0.0376	0.97		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
28.5	1,186	Total			

Summary for Subcatchment 7S: Drainage Area 7b

Runoff = 23.09 cfs @ 13.43 hrs, Volume= 7.268 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.90"

	Area (sf)	CN	Description
*	940,491	30	Meadow, non-grazed, HSG A
*	144,855	58	Meadow, non-grazed, HSG B
*	0	75	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
*	1,468,258	30	Woods, Good, HSG A
*	230,359	55	Woods, Good, HSG B
*	0	74	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	159,622	70	Gravel pit, HSG A
*	95,253	81	Gravel pit, HSG B
*	0	90	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	363,113	98	Water body
*	20,468	96	Gravel road
*	0	98	Structure
*	0	98	Panels
*	0	98	Equipment pad
	3,422,419	44	Weighted Average
	3,059,306		89.39% Pervious Area
	363,113		10.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.3200	0.31		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.20"
6.9	460	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	2,714	0.0130	0.57		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
88.9	3,224	Total			

Summary for Subcatchment 8S: Drainage Area 8

Runoff = 27.27 cfs @ 12.34 hrs, Volume= 3.195 af, Depth= 4.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.90"

	Area (sf)	CN	Description
*	0	44	Meadow, non-grazed, HSG A
*	0	65	Meadow, non-grazed, HSG B
*	14,593	75	Meadow, non-grazed, HSG C
	6,627	78	Meadow, non-grazed, HSG D
*	0	43	Woods, Good, HSG A
*	7,700	63	Woods, Good, HSG B
*	187,866	74	Woods, Good, HSG C
	40,001	77	Woods, Good, HSG D
*	0	76	Gravel pit, HSG A
*	0	85	Gravel pit, HSG B
*	0	90	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	93,852	98	Water body
*	3,817	96	Gravel road
*	0	98	Structure
	354,456	81	Weighted Average
	260,604		73.52% Pervious Area
	93,852		26.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
8.6	391	0.0230	0.76		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.2	303	0.0590	1.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.9	115	0.0170	0.65		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
25.0	859	Total			

Summary for Subcatchment 9S: Drainage Area 9

Runoff = 41.08 cfs @ 12.20 hrs, Volume= 3.803 af, Depth= 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.90"

	Area (sf)	CN	Description
	74,237	30	Meadow, non-grazed, HSG A
	20,235	58	Meadow, non-grazed, HSG B
	5,099	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	38,735	30	Woods, Good, HSG A
	258,244	55	Woods, Good, HSG B
	19,916	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	200,974	98	Water body
*	18,395	96	Gravel road
*	0	98	Structure
	635,835	66	Weighted Average
	434,861		68.39% Pervious Area
	200,974		31.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	119	0.0504	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.9	155	0.0323	0.90		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	284	0.2280	2.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.8	608	Total			

Summary for Subcatchment 10S: Drainage Area 10

Runoff = 39.25 cfs @ 13.04 hrs, Volume= 8.202 af, Depth= 3.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.90"

	Area (sf)	CN	Description
	13,076	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
	108,724	71	Meadow, non-grazed, HSG C
	7,142	78	Meadow, non-grazed, HSG D
	110,901	30	Woods, Good, HSG A
	314,648	55	Woods, Good, HSG B
	514,847	70	Woods, Good, HSG C
	87,476	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	139,264	98	Water body
*	32,385	96	Gravel road
*	0	98	Structure
	1,328,463	67	Weighted Average
	1,189,199		89.52% Pervious Area
	139,264		10.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
23.0	873	0.0160	0.63		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	74	0.0135	1.16		**Shallow Concentrated Flow,** Nearly Bare & Untilled Kv= 10.0 fps
11.7	626	0.0319	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.4	817	0.0416	1.02		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	678	0.0290	0.85		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
74.8	3,118	Total			

Summary for Subcatchment 11S: Drainage Area 11

Runoff = 101.13 cfs @ 12.61 hrs, Volume= 15.362 af, Depth= 3.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.90"

	Area (sf)	CN	Description
	324,786	30	Meadow, non-grazed, HSG A
	74,662	58	Meadow, non-grazed, HSG B
	1,249,959	71	Meadow, non-grazed, HSG C
	22,189	78	Meadow, non-grazed, HSG D
	5,299	30	Woods, Good, HSG A
	38,194	55	Woods, Good, HSG B
	471,495	70	Woods, Good, HSG C
	72,253	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	201,207	98	Water body
*	19,973	96	Gravel road
*	8,006	98	Structure
	2,488,023	67	Weighted Average
	2,278,810		91.59% Pervious Area
	209,213		8.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
34.0	1,854	0.0330	0.91		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
43.3	1,904	Total			

Summary for Subcatchment 12S: Drainage Area 12

Runoff = 96.96 cfs @ 12.73 hrs, Volume= 16.221 af, Depth= 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.90"

	Area (sf)	CN	Description
	0	30	Meadow, non-grazed, HSG A
	9,439	58	Meadow, non-grazed, HSG B
	351,871	71	Meadow, non-grazed, HSG C
	38,083	78	Meadow, non-grazed, HSG D
	62,057	30	Woods, Good, HSG A
	183,438	55	Woods, Good, HSG B
	1,261,559	70	Woods, Good, HSG C
	224,776	77	Woods, Good, HSG D
*	0	70	Gravel pit, HSG A
*	0	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	198,501	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	2,329,724	71	Weighted Average
	2,131,223		91.48% Pervious Area
	198,501		8.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2	50	0.0140	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
7.5	626	0.0780	1.40		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
30.7	920	0.0100	0.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
52.4	1,596	Total			

Summary for Subcatchment 13S: Drainage Area 13

Runoff = 102.00 cfs @ 12.15 hrs, Volume= 8.425 af, Depth= 3.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.90"

	Area (sf)	CN	Description
	137,390	30	Meadow, non-grazed, HSG A
	0	58	Meadow, non-grazed, HSG B
	0	71	Meadow, non-grazed, HSG C
	0	78	Meadow, non-grazed, HSG D
	0	30	Woods, Good, HSG A
	0	55	Woods, Good, HSG B
	0	70	Woods, Good, HSG C
	0	77	Woods, Good, HSG D
*	1,266,167	70	Gravel pit, HSG A
*	4,469	81	Gravel pit, HSG B
*	0	88	Gravel pit, HSG C
*	0	92	Gravel pit, HSG D
*	756	98	Water body
*	0	96	Gravel road
*	0	98	Structure
	1,408,782	66	Weighted Average
	1,408,026		99.95% Pervious Area
	756		0.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.20		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
9.1	1,763	0.0403	3.23		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
9.8	1,813	Total			

Summary for Reach DP-1: Off-Site West

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 244.047 ac, 7.87% Impervious, Inflow Depth = 1.45" for 100-year event
Inflow = 104.08 cfs @ 13.71 hrs, Volume= 29.443 af
Outflow = 104.08 cfs @ 13.71 hrs, Volume= 29.443 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-2: Off-Site South

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 146.513 ac, 19.32% Impervious, Inflow Depth = 1.29" for 100-year event
Inflow = 39.25 cfs @ 13.04 hrs, Volume= 15.784 af
Outflow = 39.25 cfs @ 13.04 hrs, Volume= 15.784 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-3: Off-Site East

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 53.483 ac, 8.52% Impervious, Inflow Depth = 3.64" for 100-year event
Inflow = 96.96 cfs @ 12.73 hrs, Volume= 16.221 af
Outflow = 96.96 cfs @ 12.73 hrs, Volume= 16.221 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach DP-4: Off-Site Southeast

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 89.458 ac, 5.39% Impervious, Inflow Depth = 3.19" for 100-year event
Inflow = 136.92 cfs @ 12.17 hrs, Volume= 23.787 af
Outflow = 136.92 cfs @ 12.17 hrs, Volume= 23.787 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Existing Depression

Inflow Area = 5.349 ac, 0.00% Impervious, Inflow Depth = 1.11" for 100-year event
Inflow = 3.98 cfs @ 12.22 hrs, Volume= 0.495 af
Outflow = 0.46 cfs @ 15.61 hrs, Volume= 0.495 af, Atten= 88%, Lag= 203.6 min
Discarded = 0.46 cfs @ 15.61 hrs, Volume= 0.495 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 168.68' @ 15.61 hrs Surf.Area= 19,585 sf Storage= 8,932 cf

Plug-Flow detention time= 252.4 min calculated for 0.494 af (100% of inflow)
Center-of-Mass det. time= 252.4 min (1,163.2 - 910.8)

Volume	Invert	Avail.Storage	Storage Description
#1	168.00'	58,289 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
168.00	7,570	407.0	0	0	7,570
170.00	58,771	1,048.0	58,289	58,289	81,803

Device	Routing	Invert	Outlet Devices
#1	Discarded	168.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.46 cfs @ 15.61 hrs HW=168.68' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.46 cfs)

Summary for Pond 3P: Existing Depression

Inflow Area = 31.802 ac, 3.69% Impervious, Inflow Depth = 3.54" for 100-year event
Inflow = 56.51 cfs @ 12.72 hrs, Volume= 9.369 af
Outflow = 16.45 cfs @ 13.78 hrs, Volume= 8.989 af, Atten= 71%, Lag= 63.8 min
Discarded = 1.66 cfs @ 13.78 hrs, Volume= 6.050 af
Primary = 14.79 cfs @ 13.78 hrs, Volume= 2.939 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 191.19' @ 13.78 hrs Surf.Area= 70,166 sf Storage= 217,532 cf

Plug-Flow detention time= 954.2 min calculated for 8.989 af (96% of inflow)
Center-of-Mass det. time= 931.5 min (1,805.2 - 873.6)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	277,396 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
186.00	11,737	422.0	0	0	11,737
188.00	36,683	753.0	46,113	46,113	42,709
190.00	58,742	1,001.0	94,563	140,677	77,369
192.00	78,452	1,254.0	136,720	277,396	122,825

Device	Routing	Invert	Outlet Devices
#1	Discarded	186.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	191.00'	**64.0' long x 16.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=1.66 cfs @ 13.78 hrs HW=191.19' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 1.66 cfs)

Primary OutFlow Max=14.63 cfs @ 13.78 hrs HW=191.19' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 14.63 cfs @ 1.18 fps)

Summary for Pond 4P: Existing Depression

Inflow Area = 16.464 ac, 0.66% Impervious, Inflow Depth = 4.38" for 100-year event
Inflow = 52.20 cfs @ 12.33 hrs, Volume= 6.015 af
Outflow = 1.64 cfs @ 18.47 hrs, Volume= 5.247 af, Atten= 97%, Lag= 368.2 min
Discarded = 1.64 cfs @ 18.47 hrs, Volume= 5.247 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 168.47' @ 18.47 hrs Surf.Area= 69,382 sf Storage= 197,947 cf

Plug-Flow detention time= 1,360.9 min calculated for 5.247 af (87% of inflow)
Center-of-Mass det. time= 1,303.0 min (2,133.4 - 830.4)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	1,773,203 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
162.00	8,040	387.0	0	0	8,040
164.00	20,064	890.0	27,203	27,203	59,171
166.00	31,393	894.0	51,036	78,239	61,043
168.00	59,552	1,582.0	89,455	167,695	196,625
170.00	106,611	3,162.0	163,895	331,590	793,118
172.00	142,449	3,012.0	248,196	579,786	867,073
174.00	182,259	2,708.0	323,891	903,678	1,005,567
176.00	222,778	3,083.0	404,360	1,308,037	1,178,477
178.00	242,528	3,031.0	465,166	1,773,203	1,204,505

Device	Routing	Invert	Outlet Devices
#1	Discarded	162.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	177.00'	**23.0' long x 99.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=1.64 cfs @ 18.47 hrs HW=168.47' (Free Discharge)
1=Exfiltration (Exfiltration Controls 1.64 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=162.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 5P: Existing Depression

Inflow Area = 68.340 ac, 22.74% Impervious, Inflow Depth = 3.52" for 100-year event
Inflow = 108.68 cfs @ 12.80 hrs, Volume= 20.067 af
Outflow = 107.75 cfs @ 12.85 hrs, Volume= 18.474 af, Atten= 1%, Lag= 3.2 min
Discarded = 0.26 cfs @ 12.85 hrs, Volume= 1.106 af
Primary = 107.49 cfs @ 12.85 hrs, Volume= 17.367 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 167.93' @ 12.85 hrs Surf.Area= 41,900 sf Storage= 131,600 cf

Plug-Flow detention time= 158.1 min calculated for 18.474 af (92% of inflow)
Center-of-Mass det. time= 117.7 min (996.8 - 879.1)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	134,374 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
162.00	1,686	164.0	0	0	1,686
164.00	17,454	653.0	16,376	16,376	33,489
166.00	29,548	840.0	46,474	62,851	55,756
168.00	42,358	938.0	71,523	134,374	69,736

Device	Routing	Invert	Outlet Devices
#1	Discarded	162.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	167.25'	**71.0' long x 38.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.26 cfs @ 12.85 hrs HW=167.93' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=107.45 cfs @ 12.85 hrs HW=167.93' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 107.45 cfs @ 2.21 fps)

Summary for Pond 6P: Existing Wetland

Inflow Area = 116.016 ac, 21.65% Impervious, Inflow Depth = 1.33" for 100-year event
Inflow = 28.16 cfs @ 14.71 hrs, Volume= 12.892 af
Outflow = 21.00 cfs @ 16.13 hrs, Volume= 9.617 af, Atten= 25%, Lag= 85.3 min
Discarded = 0.45 cfs @ 16.13 hrs, Volume= 2.036 af
Primary = 20.55 cfs @ 16.13 hrs, Volume= 7.582 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 141.16' @ 16.13 hrs Surf.Area= 114,745 sf Storage= 226,093 cf

Plug-Flow detention time= 504.3 min calculated for 9.611 af (75% of inflow)
Center-of-Mass det. time= 408.0 min (1,443.2 - 1,035.1)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	330,471 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
138.00	23,460	686.0	0	0	23,460
140.00	91,023	1,816.0	107,129	107,129	248,460
142.00	133,681	2,277.0	223,342	330,471	398,668

Device	Routing	Invert	Outlet Devices
#1	Discarded	138.00'	**0.170 in/hr Exfiltration over Surface area**
#2	Primary	141.00'	**121.0' long x 19.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.45 cfs @ 16.13 hrs HW=141.16' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.45 cfs)

Primary OutFlow Max=20.52 cfs @ 16.13 hrs HW=141.16' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 20.52 cfs @ 1.07 fps)

Summary for Pond 7P: Existing Depression

Inflow Area = 78.568 ac, 10.61% Impervious, Inflow Depth = 1.11" for 100-year event
Inflow = 23.09 cfs @ 13.43 hrs, Volume= 7.268 af
Outflow = 15.06 cfs @ 14.38 hrs, Volume= 7.268 af, Atten= 35%, Lag= 56.7 min
Discarded = 4.44 cfs @ 14.38 hrs, Volume= 4.567 af
Primary = 10.62 cfs @ 14.38 hrs, Volume= 2.701 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 147.93' @ 14.38 hrs Surf.Area= 79,669 sf Storage= 74,306 cf

Plug-Flow detention time= 142.1 min calculated for 7.263 af (100% of inflow)
Center-of-Mass det. time= 142.2 min (1,124.1 - 981.9)

Volume	Invert	Avail.Storage	Storage Description
#1	146.00'	80,115 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
146.00	9,050	771.0	0	0	9,050
148.00	83,614	3,079.0	80,115	80,115	716,170

Device	Routing	Invert	Outlet Devices
#1	Primary	147.50'	**14.0' long x 90.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	146.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=4.44 cfs @ 14.38 hrs HW=147.93' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 4.44 cfs)

Primary OutFlow Max=10.61 cfs @ 14.38 hrs HW=147.93' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 10.61 cfs @ 1.77 fps)

Summary for Pond 8P: Existing Wetland

Inflow Area = 8.137 ac, 26.48% Impervious, Inflow Depth = 4.71" for 100-year event
Inflow = 27.27 cfs @ 12.34 hrs, Volume= 3.195 af
Outflow = 2.67 cfs @ 14.26 hrs, Volume= 1.857 af, Atten= 90%, Lag= 114.9 min
Discarded = 0.25 cfs @ 14.26 hrs, Volume= 1.101 af
Primary = 2.42 cfs @ 14.26 hrs, Volume= 0.756 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 231.54' @ 14.26 hrs Surf.Area= 64,524 sf Storage= 96,670 cf

Plug-Flow detention time= 1,113.9 min calculated for 1.857 af (58% of inflow)
Center-of-Mass det. time= 1,007.4 min (1,831.1 - 823.7)

Volume	Invert	Avail.Storage	Storage Description
#1	228.00'	130,034 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.00	5,806	459.0	0	0	5,806
230.00	25,974	862.0	29,374	29,374	48,191
232.00	79,559	1,189.0	100,661	130,034	101,601

Device	Routing	Invert	Outlet Devices
#1	Discarded	228.00'	**0.170 in/hr Exfiltration over Surface area**
#2	Primary	231.50'	**119.0' long x 196.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.25 cfs @ 14.26 hrs HW=231.54' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=2.18 cfs @ 14.26 hrs HW=231.54' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.18 cfs @ 0.51 fps)

Summary for Pond 9P: Existing Wetland

Inflow Area = 82.937 ac, 24.30% Impervious, Inflow Depth = 3.06" for 100-year event
Inflow = 115.35 cfs @ 12.83 hrs, Volume= 21.170 af
Outflow = 25.32 cfs @ 14.75 hrs, Volume= 13.423 af, Atten= 78%, Lag= 115.0 min
Discarded = 0.73 cfs @ 14.75 hrs, Volume= 3.374 af
Primary = 24.59 cfs @ 14.75 hrs, Volume= 10.049 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 154.44' @ 14.75 hrs Surf.Area= 185,696 sf Storage= 523,818 cf

Plug-Flow detention time= 638.9 min calculated for 13.423 af (63% of inflow)
Center-of-Mass det. time= 529.3 min (1,425.2 - 896.0)

Volume	Invert	Avail.Storage	Storage Description
#1	148.00'	834,530 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.00	2,138	180.0	0	0	2,138
150.00	9,156	387.0	10,479	10,479	11,495
152.00	135,719	2,199.0	120,084	130,563	384,391
154.00	178,250	2,327.0	313,004	443,567	430,714
156.00	213,235	2,588.0	390,963	834,530	532,915

Device	Routing	Invert	Outlet Devices
#1	Discarded	148.00'	**0.170 in/hr Exfiltration over Surface area**
#2	Primary	154.00'	**31.0' long x 49.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.73 cfs @ 14.75 hrs HW=154.44' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.73 cfs)

Primary OutFlow Max=24.51 cfs @ 14.75 hrs HW=154.44' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 24.51 cfs @ 1.79 fps)

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#2 Discarded 276.00' **0.180 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.20 cfs @ 14.81 hrs HW=277.84' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=1.60 cfs @ 14.81 hrs HW=277.84' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 1.60 cfs @ 0.72 fps)

Summary for Pond 2P: Existing Depression

Inflow Area = 5.348 ac, 1.26% Impervious, Inflow Depth = 2.44" for 100-year event
Inflow = 11.82 cfs @ 12.18 hrs, Volume= 1.086 af
Outflow = 0.57 cfs @ 16.70 hrs, Volume= 1.086 af, Atten= 95%, Lag= 271.0 min
Discarded = 0.57 cfs @ 16.70 hrs, Volume= 1.086 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 169.39' @ 16.70 hrs Surf.Area= 38,027 sf Storage= 28,983 cf

Plug-Flow detention time= 667.4 min calculated for 1.085 af (100% of inflow)
Center-of-Mass det. time= 667.9 min (1,530.4 - 862.4)

Volume	Invert	Avail.Storage	Storage Description
#1	168.00'	58,289 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
168.00	7,570	407.0	0	0	7,570
170.00	58,771	1,048.0	58,289	58,289	81,803

Device	Routing	Invert	Outlet Devices
#1	Discarded	168.00'	**0.645 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.57 cfs @ 16.70 hrs HW=169.39' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.57 cfs)

Summary for Pond 3aP: Proposed Berm

[93] Warning: Storage range exceeded by 0.47'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=4)

Inflow Area = 12.821 ac, 1.58% Impervious, Inflow Depth = 4.17" for 100-year event
Inflow = 37.78 cfs @ 12.36 hrs, Volume= 4.454 af
Outflow = 50.21 cfs @ 12.41 hrs, Volume= 3.421 af, Atten= 0%, Lag= 2.9 min
Discarded = 0.07 cfs @ 12.40 hrs, Volume= 0.326 af
Primary = 50.14 cfs @ 12.41 hrs, Volume= 3.094 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 258.47' @ 12.40 hrs Surf.Area= 16,659 sf Storage= 59,726 cf

Plug-Flow detention time= 288.5 min calculated for 3.421 af (77% of inflow)

Center-of-Mass det. time= 204.7 min (1,041.2 - 836.5)

Volume	Invert	Avail.Storage	Storage Description
#1	252.00'	59,726 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
252.00	4,100	538.0	0	0	4,100
254.00	7,745	668.0	11,653	11,653	16,634
256.00	11,975	742.0	19,567	31,220	25,056
258.00	16,659	818.0	28,505	59,726	34,619

Device	Routing	Invert	Outlet Devices
#1	Primary	257.75'	**30.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	252.00'	**0.180 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.07 cfs @ 12.40 hrs HW=258.47' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=45.75 cfs @ 12.41 hrs HW=258.43' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 45.75 cfs @ 2.23 fps)

Summary for Pond 3P: Existing Depression

Inflow Area = 18.980 ac, 11.70% Impervious, Inflow Depth = 3.74" for 100-year event
Inflow = 69.83 cfs @ 12.16 hrs, Volume= 5.922 af
Outflow = 1.57 cfs @ 19.36 hrs, Volume= 5.688 af, Atten= 98%, Lag= 432.4 min
Discarded = 1.57 cfs @ 19.36 hrs, Volume= 5.688 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 190.83' @ 19.36 hrs Surf.Area= 66,539 sf Storage= 192,394 cf

Plug-Flow detention time= 1,367.5 min calculated for 5.684 af (96% of inflow)
Center-of-Mass det. time= 1,346.6 min (2,178.4 - 831.8)

Volume	Invert	Avail.Storage	Storage Description
#1	186.00'	277,396 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
186.00	11,737	422.0	0	0	11,737
188.00	36,683	753.0	46,113	46,113	42,709
190.00	58,742	1,001.0	94,563	140,677	77,369
192.00	78,452	1,254.0	136,720	277,396	122,825

Device	Routing	Invert	Outlet Devices
#1	Discarded	186.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	191.00'	**64.0' long x 16.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=1.57 cfs @ 19.36 hrs HW=190.83' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 1.57 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=186.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 4P: Existing Depression

Inflow Area = 16.464 ac, 0.66% Impervious, Inflow Depth = 4.49" for 100-year event
Inflow = 53.42 cfs @ 12.33 hrs, Volume= 6.164 af
Outflow = 1.68 cfs @ 18.39 hrs, Volume= 5.362 af, Atten= 97%, Lag= 363.4 min
Discarded = 1.68 cfs @ 18.39 hrs, Volume= 5.362 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 168.54' @ 18.39 hrs Surf.Area= 70,986 sf Storage= 203,100 cf

Plug-Flow detention time= 1,360.2 min calculated for 5.362 af (87% of inflow)
Center-of-Mass det. time= 1,301.6 min (2,129.7 - 828.0)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	1,773,203 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
162.00	8,040	387.0	0	0	8,040
164.00	20,064	890.0	27,203	27,203	59,171
166.00	31,393	894.0	51,036	78,239	61,043
168.00	59,552	1,582.0	89,455	167,695	196,625
170.00	106,611	3,162.0	163,895	331,590	793,118
172.00	142,449	3,012.0	248,196	579,786	867,073
174.00	182,259	2,708.0	323,891	903,678	1,005,567
176.00	222,778	3,083.0	404,360	1,308,037	1,178,477
178.00	242,528	3,031.0	465,166	1,773,203	1,204,505

Device	Routing	Invert	Outlet Devices
#1	Discarded	162.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	177.00'	**23.0' long x 99.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=1.68 cfs @ 18.39 hrs HW=168.54' (Free Discharge)
1=Exfiltration (Exfiltration Controls 1.68 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=162.00' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 5aP: Proposed Berm

Inflow Area = 6.106 ac, 3.95% Impervious, Inflow Depth = 4.28" for 100-year event
Inflow = 24.52 cfs @ 12.17 hrs, Volume= 2.176 af
Outflow = 15.54 cfs @ 12.36 hrs, Volume= 1.600 af, Atten= 37%, Lag= 11.4 min
Discarded = 0.04 cfs @ 12.36 hrs, Volume= 0.176 af
Primary = 15.50 cfs @ 12.36 hrs, Volume= 1.424 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 269.94' @ 12.36 hrs Surf.Area= 14,009 sf Storage= 36,837 cf

Plug-Flow detention time= 328.9 min calculated for 1.600 af (74% of inflow)
Center-of-Mass det. time= 239.6 min (1,061.4 - 821.8)

Volume	Invert	Avail.Storage	Storage Description
#1	266.00'	37,655 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
266.00	3,071	219.0	0	0	3,071
268.00	10,655	408.0	12,964	12,964	12,522
270.00	14,117	458.0	24,691	37,655	16,075

Device	Routing	Invert	Outlet Devices
#1	Discarded	266.00'	**0.115 in/hr Exfiltration over Surface area**
#2	Primary	269.50'	**20.0' long x 12.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Discarded OutFlow Max=0.04 cfs @ 12.36 hrs HW=269.94' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=15.29 cfs @ 12.36 hrs HW=269.94' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 15.29 cfs @ 1.74 fps)

Summary for Pond 5P: Existing Depression

[93] Warning: Storage range exceeded by 0.05'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 70.674 ac, 22.33% Impervious, Inflow Depth = 3.54" for 100-year event
Inflow = 131.55 cfs @ 12.59 hrs, Volume= 20.866 af
Outflow = 134.07 cfs @ 12.56 hrs, Volume= 19.279 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.26 cfs @ 12.55 hrs, Volume= 1.110 af
Primary = 133.80 cfs @ 12.56 hrs, Volume= 18.170 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 168.05' @ 12.56 hrs Surf.Area= 42,358 sf Storage= 134,374 cf

Plug-Flow detention time= 150.7 min calculated for 19.266 af (92% of inflow)
Center-of-Mass det. time= 113.6 min (981.0 - 867.3)

Volume	Invert	Avail.Storage	Storage Description
#1	162.00'	134,374 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
162.00	1,686	164.0	0	0	1,686
164.00	17,454	653.0	16,376	16,376	33,489
166.00	29,548	840.0	46,474	62,851	55,756
168.00	42,358	938.0	71,523	134,374	69,736

Device	Routing	Invert	Outlet Devices
#1	Discarded	162.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	167.25'	**71.0' long x 38.5' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.26 cfs @ 12.55 hrs HW=168.05' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=132.04 cfs @ 12.56 hrs HW=168.04' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 132.04 cfs @ 2.35 fps)

Summary for Pond 6bP: Basin 2B

Inflow Area = 5.368 ac, 2.87% Impervious, Inflow Depth = 1.27" for 100-year event
Inflow = 3.69 cfs @ 12.48 hrs, Volume= 0.569 af
Outflow = 0.24 cfs @ 19.57 hrs, Volume= 0.104 af, Atten= 93%, Lag= 425.1 min
Primary = 0.24 cfs @ 19.57 hrs, Volume= 0.104 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 159.04' @ 19.57 hrs Surf.Area= 6,872 sf Storage= 20,535 cf

Plug-Flow detention time= 546.3 min calculated for 0.104 af (18% of inflow)
Center-of-Mass det. time= 371.0 min (1,287.7 - 916.7)

Volume	Invert	Avail.Storage	Storage Description
#1	155.00'	27,578 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
155.00	3,449	244.0	0	0	3,449
156.00	4,210	263.0	3,823	3,823	4,256
157.00	5,028	282.0	4,613	8,436	5,124
158.00	5,902	301.0	5,459	13,895	6,053
159.00	6,833	320.0	6,362	20,257	7,042
160.00	7,820	339.0	7,321	27,578	8,091

Device	Routing	Invert	Outlet Devices
#1	Primary	159.00'	**10.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.22 cfs @ 19.57 hrs HW=159.04' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.22 cfs @ 0.54 fps)

Summary for Pond 6cP: Proposed Berm

Inflow Area = 10.313 ac, 2.73% Impervious, Inflow Depth = 1.88" for 100-year event
Inflow = 12.99 cfs @ 12.36 hrs, Volume= 1.614 af
Outflow = 9.10 cfs @ 12.63 hrs, Volume= 1.614 af, Atten= 30%, Lag= 16.0 min
Discarded = 0.33 cfs @ 12.63 hrs, Volume= 0.645 af
Primary = 8.77 cfs @ 12.63 hrs, Volume= 0.969 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 165.48' @ 12.63 hrs Surf.Area= 8,339 sf Storage= 17,582 cf

Plug-Flow detention time= 229.0 min calculated for 1.614 af (100% of inflow)
Center-of-Mass det. time= 228.9 min (1,117.5 - 888.6)

Volume	Invert	Avail.Storage	Storage Description
#1	163.00'	22,032 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
163.00	5,879	306.0	0	0	5,879
164.00	6,828	336.0	6,348	6,348	7,445
165.00	7,834	345.0	7,325	13,673	8,040
166.00	8,896	364.0	8,359	22,032	9,169

Device	Routing	Invert	Outlet Devices
#1	Primary	165.00'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	163.00'	**1.715 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.33 cfs @ 12.63 hrs HW=165.48' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=8.70 cfs @ 12.63 hrs HW=165.48' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 8.70 cfs @ 1.81 fps)

Summary for Pond 6P: Existing Wetland

Inflow Area = 118.349 ac, 21.79% Impervious, Inflow Depth = 1.50" for 100-year event
Inflow = 31.05 cfs @ 14.32 hrs, Volume= 14.781 af
Outflow = 26.18 cfs @ 15.33 hrs, Volume= 11.039 af, Atten= 16%, Lag= 60.4 min
Discarded = 0.31 cfs @ 15.33 hrs, Volume= 1.411 af
Primary = 25.88 cfs @ 15.33 hrs, Volume= 9.627 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 141.18' @ 15.33 hrs Surf.Area= 115,308 sf Storage= 229,080 cf

Plug-Flow detention time= 384.2 min calculated for 11.039 af (75% of inflow)
Center-of-Mass det. time= 284.6 min (1,293.0 - 1,008.4)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	330,471 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
138.00	23,460	686.0	0	0	23,460
140.00	91,023	1,816.0	107,129	107,129	248,460
142.00	133,681	2,277.0	223,342	330,471	398,668

Device	Routing	Invert	Outlet Devices
#1	Discarded	138.00'	**0.115 in/hr Exfiltration over Surface area**
#2	Primary	141.00'	**121.0' long x 19.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.31 cfs @ 15.33 hrs HW=141.18' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.31 cfs)

Primary OutFlow Max=25.76 cfs @ 15.33 hrs HW=141.18' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 25.76 cfs @ 1.15 fps)

Summary for Pond 7aP: Proposed Berm

Inflow Area = 2.788 ac, 6.57% Impervious, Inflow Depth = 1.44" for 100-year event
Inflow = 2.83 cfs @ 12.26 hrs, Volume= 0.334 af
Outflow = 0.46 cfs @ 13.87 hrs, Volume= 0.334 af, Atten= 84%, Lag= 96.1 min
Discarded = 0.46 cfs @ 13.87 hrs, Volume= 0.334 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Peak Elev= 164.51' @ 13.87 hrs Surf.Area= 11,674 sf Storage= 4,809 cf

Plug-Flow detention time= 112.2 min calculated for 0.334 af (100% of inflow)
Center-of-Mass det. time= 112.2 min (1,010.1 - 897.9)

Volume	Invert	Avail.Storage	Storage Description
#1	164.00'	11,749 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
164.00	7,393	367.0	0	0	7,393
165.00	16,731	574.0	11,749	11,749	22,901

Device	Routing	Invert	Outlet Devices
#1	Primary	164.75'	**8.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	164.00'	**1.715 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.46 cfs @ 13.87 hrs HW=164.51' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.46 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=164.00' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: Existing Depression

[93] Warning: Storage range exceeded by 0.48'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=9)

Inflow Area = 78.568 ac, 11.57% Impervious, Inflow Depth = 1.55" for 100-year event
Inflow = 37.31 cfs @ 13.34 hrs, Volume= 10.176 af
Outflow = 40.21 cfs @ 13.50 hrs, Volume= 10.176 af, Atten= 0%, Lag= 9.5 min
Discarded = 4.66 cfs @ 13.45 hrs, Volume= 4.950 af
Primary = 35.55 cfs @ 13.50 hrs, Volume= 5.226 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 148.48' @ 13.50 hrs Surf.Area= 83,614 sf Storage= 80,115 cf

Plug-Flow detention time= 113.8 min calculated for 10.176 af (100% of inflow)
Center-of-Mass det. time= 113.8 min (1,072.5 - 958.7)

Volume	Invert	Avail.Storage	Storage Description
#1	146.00'	80,115 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
146.00	9,050	771.0	0	0	9,050
148.00	83,614	3,079.0	80,115	80,115	716,170

Device	Routing	Invert	Outlet Devices
#1	Primary	147.50'	**14.0' long x 90.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	146.00'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=4.66 cfs @ 13.45 hrs HW=148.33' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 4.66 cfs)

Primary OutFlow Max=35.24 cfs @ 13.50 hrs HW=148.47' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 35.24 cfs @ 2.59 fps)

Summary for Pond 8P: Existing Wetland

Inflow Area = 8.137 ac, 26.48% Impervious, Inflow Depth = 4.71" for 100-year event
Inflow = 27.27 cfs @ 12.34 hrs, Volume= 3.195 af
Outflow = 2.83 cfs @ 14.11 hrs, Volume= 1.619 af, Atten= 90%, Lag= 106.5 min
Discarded = 0.17 cfs @ 14.11 hrs, Volume= 0.776 af
Primary = 2.66 cfs @ 14.11 hrs, Volume= 0.843 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 231.53' @ 14.11 hrs Surf.Area= 64,389 sf Storage= 96,387 cf

Plug-Flow detention time= 987.0 min calculated for 1.619 af (51% of inflow)
Center-of-Mass det. time= 873.7 min (1,697.4 - 823.7)

Volume	Invert	Avail.Storage	Storage Description
#1	228.00'	130,034 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
228.00	5,806	459.0	0	0	5,806
230.00	25,974	862.0	29,374	29,374	48,191
232.00	79,559	1,189.0	100,661	130,034	101,601

Device	Routing	Invert	Outlet Devices
#1	Discarded	228.00'	**0.115 in/hr Exfiltration over Surface area**
#2	Primary	231.50'	**158.0' long x 196.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.17 cfs @ 14.11 hrs HW=231.53' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=2.38 cfs @ 14.11 hrs HW=231.53' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.38 cfs @ 0.48 fps)

Summary for Pond 9P: Existing Wetland

Inflow Area = 85.270 ac, 23.92% Impervious, Inflow Depth = 3.09" for 100-year event
Inflow = 150.93 cfs @ 12.55 hrs, Volume= 21.972 af
Outflow = 26.85 cfs @ 14.41 hrs, Volume= 14.233 af, Atten= 82%, Lag= 111.2 min
Discarded = 0.73 cfs @ 14.41 hrs, Volume= 3.380 af
Primary = 26.12 cfs @ 14.41 hrs, Volume= 10.853 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 154.46' @ 14.41 hrs Surf.Area= 186,008 sf Storage= 527,224 cf

Plug-Flow detention time= 611.4 min calculated for 14.223 af (65% of inflow)
Center-of-Mass det. time= 505.0 min (1,390.9 - 886.0)

Volume	Invert	Avail.Storage	Storage Description
#1	148.00'	834,530 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
148.00	2,138	180.0	0	0	2,138
150.00	9,156	387.0	10,479	10,479	11,495
152.00	135,719	2,199.0	120,084	130,563	384,391
154.00	178,250	2,327.0	313,004	443,567	430,714
156.00	213,235	2,588.0	390,963	834,530	532,915

Device	Routing	Invert	Outlet Devices
#1	Discarded	148.00'	**0.170 in/hr Exfiltration over Surface area**
#2	Primary	154.00'	**31.0' long x 49.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Discarded OutFlow Max=0.73 cfs @ 14.41 hrs HW=154.46' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.73 cfs)

Primary OutFlow Max=26.06 cfs @ 14.41 hrs HW=154.46' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 26.06 cfs @ 1.83 fps)

Summary for Pond 11bP: Proposed Berm

Inflow Area = 13.753 ac, 1.09% Impervious, Inflow Depth = 3.43" for 100-year event
Inflow = 46.25 cfs @ 12.16 hrs, Volume= 3.933 af
Outflow = 3.42 cfs @ 14.37 hrs, Volume= 3.933 af, Atten= 93%, Lag= 132.6 min
Discarded = 3.42 cfs @ 14.37 hrs, Volume= 3.933 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 220.96' @ 14.37 hrs Surf.Area= 86,109 sf Storage= 79,688 cf

Plug-Flow detention time= 236.5 min calculated for 3.931 af (100% of inflow)
Center-of-Mass det. time= 236.4 min (1,074.9 - 838.5)

Volume	Invert	Avail.Storage	Storage Description
#1	220.00'	172,842 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
220.00	79,277	1,374.0	0	0	79,277
222.00	93,768	1,524.0	172,842	172,842	113,991

Device	Routing	Invert	Outlet Devices
#1	Primary	221.50'	**4.0' long x 11.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.55 2.60 2.70 2.67 2.67 2.67 2.66 2.64
#2	Discarded	220.00'	**1.715 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=3.42 cfs @ 14.37 hrs HW=220.96' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 3.42 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=220.00' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 11cP: Proposed Berm

Inflow Area = 5.677 ac, 1.19% Impervious, Inflow Depth = 4.06" for 100-year event
Inflow = 14.55 cfs @ 12.46 hrs, Volume= 1.921 af
Outflow = 11.67 cfs @ 12.68 hrs, Volume= 1.448 af, Atten= 20%, Lag= 13.0 min
Discarded = 0.03 cfs @ 12.68 hrs, Volume= 0.150 af
Primary = 11.64 cfs @ 12.68 hrs, Volume= 1.297 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 247.57' @ 12.68 hrs Surf.Area= 7,889 sf Storage= 29,843 cf

Plug-Flow detention time= 307.9 min calculated for 1.447 af (75% of inflow)
Center-of-Mass det. time= 223.3 min (1,068.9 - 845.6)

Volume	Invert	Avail.Storage	Storage Description
#1	242.00'	33,303 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
242.00	3,125	229.0	0	0	3,125
244.00	4,628	270.0	7,704	7,704	4,828
246.00	6,365	308.0	10,947	18,651	6,669
248.00	8,331	346.0	14,652	33,303	8,752

Device	Routing	Invert	Outlet Devices
#1	Primary	247.00'	**10.0' long x 9.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69
#2	Discarded	242.00'	**0.180 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 12.68 hrs HW=247.57' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=11.56 cfs @ 12.68 hrs HW=247.57' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 11.56 cfs @ 2.02 fps)

Summary for Pond 11dP: Proposed Berm

Inflow Area = 1.393 ac, 5.44% Impervious, Inflow Depth = 4.17" for 100-year event
Inflow = 6.92 cfs @ 12.07 hrs, Volume= 0.484 af
Outflow = 0.74 cfs @ 12.86 hrs, Volume= 0.369 af, Atten= 89%, Lag= 47.5 min
Discarded = 0.04 cfs @ 12.86 hrs, Volume= 0.180 af
Primary = 0.70 cfs @ 12.86 hrs, Volume= 0.190 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 269.61' @ 12.86 hrs Surf.Area= 9,355 sf Storage= 11,752 cf

Plug-Flow detention time= 902.6 min calculated for 0.369 af (76% of inflow)
Center-of-Mass det. time= 818.0 min (1,634.8 - 816.8)

Volume	Invert	Avail.Storage	Storage Description
#1	268.00'	15,626 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
268.00	5,429	465.0	0	0	5,429
270.00	10,470	453.0	15,626	15,626	6,698

Device	Routing	Invert	Outlet Devices
#1	Primary	269.50'	**8.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	268.00'	**0.180 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 12.86 hrs HW=269.61' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.70 cfs @ 12.86 hrs HW=269.61' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.70 cfs @ 0.80 fps)

Summary for Pond 12bP: Proposed Berm

Inflow Area = 11.369 ac, 2.82% Impervious, Inflow Depth = 4.17" for 100-year event
Inflow = 42.34 cfs @ 12.20 hrs, Volume= 3.949 af
Outflow = 10.25 cfs @ 12.71 hrs, Volume= 2.876 af, Atten= 76%, Lag= 30.7 min
Discarded = 0.11 cfs @ 12.71 hrs, Volume= 0.501 af
Primary = 10.13 cfs @ 12.71 hrs, Volume= 2.375 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 253.96' @ 12.71 hrs Surf.Area= 27,399 sf Storage= 86,881 cf

Plug-Flow detention time= 466.7 min calculated for 2.874 af (73% of inflow)
Center-of-Mass det. time= 378.1 min (1,204.0 - 825.9)

Volume	Invert	Avail.Storage	Storage Description
#1	248.00'	87,909 cf	` **(Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
248.00	4,342	360.0	0	0	4,342
250.00	7,440	413.0	11,644	11,644	7,693
252.00	21,312	730.0	27,563	39,207	36,549
254.00	27,523	779.0	48,703	87,909	42,623

Device	Routing	Invert	Outlet Devices
#1	Primary	253.00'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	248.00'	**0.180 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.11 cfs @ 12.71 hrs HW=253.96' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=10.11 cfs @ 12.71 hrs HW=253.96' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 10.11 cfs @ 2.63 fps)

Summary for Pond 12cP: Proposed Berm

Inflow Area = 3.551 ac, 2.49% Impervious, Inflow Depth = 4.17" for 100-year event
Inflow = 14.12 cfs @ 12.17 hrs, Volume= 1.234 af
Outflow = 1.74 cfs @ 13.06 hrs, Volume= 0.753 af, Atten= 88%, Lag= 53.5 min
Discarded = 0.05 cfs @ 13.06 hrs, Volume= 0.230 af
Primary = 1.69 cfs @ 13.06 hrs, Volume= 0.522 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 253.99' @ 13.06 hrs Surf.Area= 11,977 sf Storage= 31,084 cf

Plug-Flow detention time= 691.9 min calculated for 0.752 af (61% of inflow)
Center-of-Mass det. time= 588.3 min (1,411.9 - 823.7)

Volume	Invert	Avail.Storage	Storage Description
#1	250.00'	31,248 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

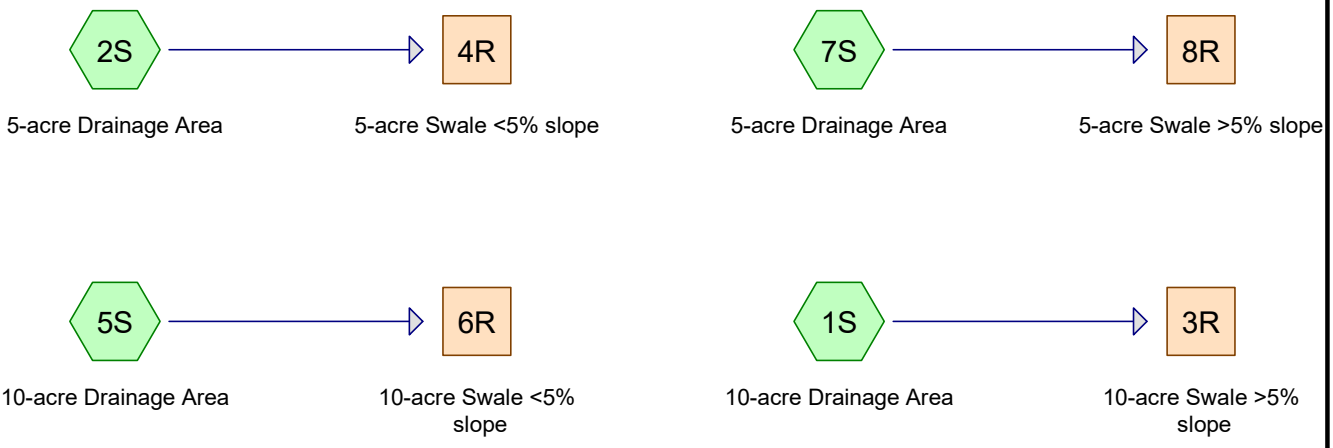
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
250.00	4,234	341.0	0	0	4,234
252.00	7,667	463.0	11,732	11,732	12,081
254.00	12,010	580.0	19,515	31,248	21,848

Device	Routing	Invert	Outlet Devices
#1	Primary	253.75'	**6.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	250.00'	**0.180 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 13.06 hrs HW=253.99' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=1.69 cfs @ 13.06 hrs HW=253.99' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.69 cfs @ 1.19 fps)

Temporary Swale
Design Hydrology



Subcat Reach Pond Link

Routing Diagram for Temp Swale Design Calcs
Prepared by Tighe & Bond, Printed 3/19/2020

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
30.000	82	Dirt roads, HSG B (1S, 2S, 5S, 7S)
30.000	**82**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
30.000	HSG B	1S, 2S, 5S, 7S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
30.000		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	30.000	0.000	0.000	0.000	30.000	Dirt roads	1S, 2S, 5S, 7S
0.000	**30.000**	**0.000**	**0.000**	**0.000**	**30.000**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: 10-acre Drainage Area Runoff Area=10.000 ac 0.00% Impervious Runoff Depth>2.63"
Tc=6.0 min CN=82 Runoff=32.26 cfs 2.192 af

Subcatchment 2S: 5-acre Drainage Area Runoff Area=5.000 ac 0.00% Impervious Runoff Depth>2.63"
Tc=6.0 min CN=82 Runoff=16.13 cfs 1.096 af

Subcatchment 5S: 10-acre Drainage Area Runoff Area=10.000 ac 0.00% Impervious Runoff Depth>2.63"
Tc=6.0 min CN=82 Runoff=32.26 cfs 2.192 af

Subcatchment 7S: 5-acre Drainage Area Runoff Area=5.000 ac 0.00% Impervious Runoff Depth>2.63"
Tc=6.0 min CN=82 Runoff=16.13 cfs 1.096 af

Reach 3R: 10-acre Swale >5% slope Avg. Flow Depth=0.81' Max Vel=7.35 fps Inflow=32.26 cfs 2.192 af
n=0.030 L=100.0' S=0.0500 '/' Capacity=49.53 cfs Outflow=32.00 cfs 2.191 af

Reach 4R: 5-acre Swale <5% slope Avg. Flow Depth=0.92' Max Vel=2.59 fps Inflow=16.13 cfs 1.096 af
n=0.030 L=100.0' S=0.0050 '/' Capacity=18.92 cfs Outflow=15.68 cfs 1.095 af

Reach 6R: 10-acre Swale <5% slope Avg. Flow Depth=1.41' Max Vel=3.16 fps Inflow=32.26 cfs 2.192 af
n=0.030 L=100.0' S=0.0050 '/' Capacity=36.76 cfs Outflow=31.55 cfs 2.190 af

Reach 8R: 5-acre Swale >5% slope Avg. Flow Depth=0.77' Max Vel=6.35 fps Inflow=16.13 cfs 1.096 af
n=0.030 L=100.0' S=0.0500 '/' Capacity=29.60 cfs Outflow=15.98 cfs 1.096 af

Total Runoff Area = 30.000 ac Runoff Volume = 6.576 af Average Runoff Depth = 2.63"
100.00% Pervious = 30.000 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: 10-acre Drainage Area

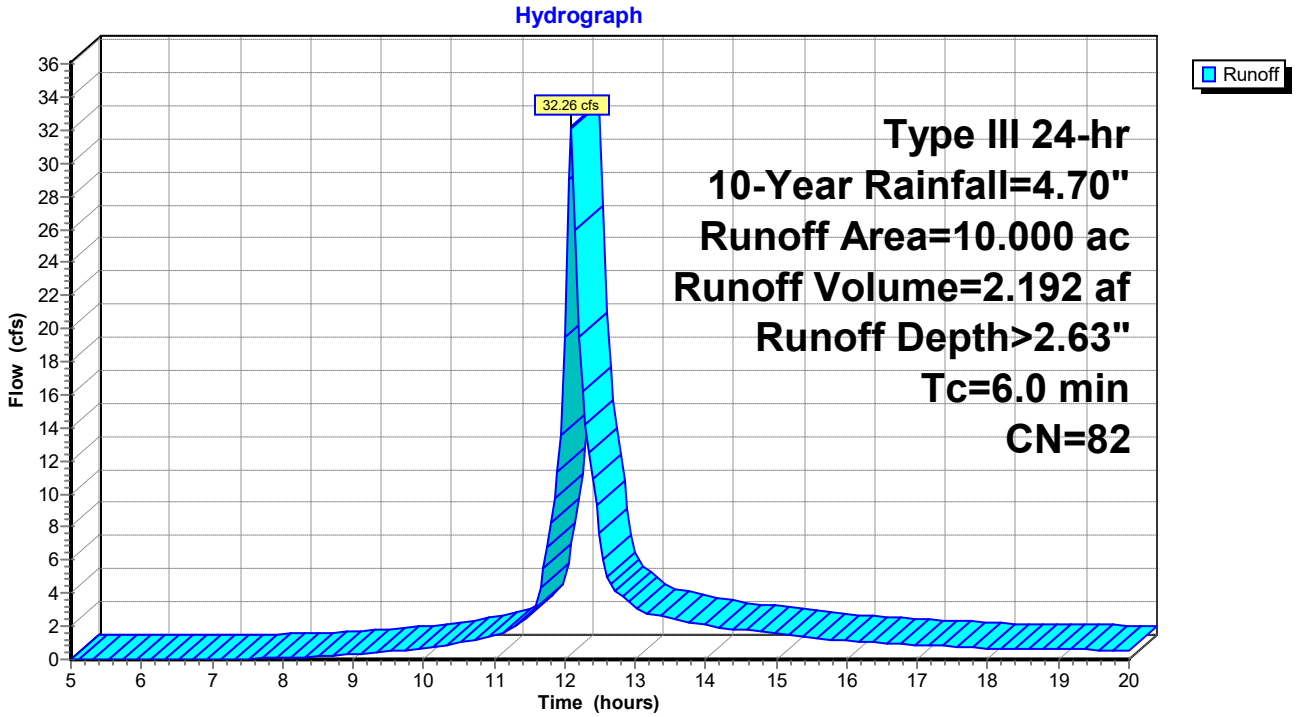
Runoff = 32.26 cfs @ 12.09 hrs, Volume= 2.192 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
10.000	82	Dirt roads, HSG B
10.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum**

Subcatchment 1S: 10-acre Drainage Area



Summary for Subcatchment 2S: 5-acre Drainage Area

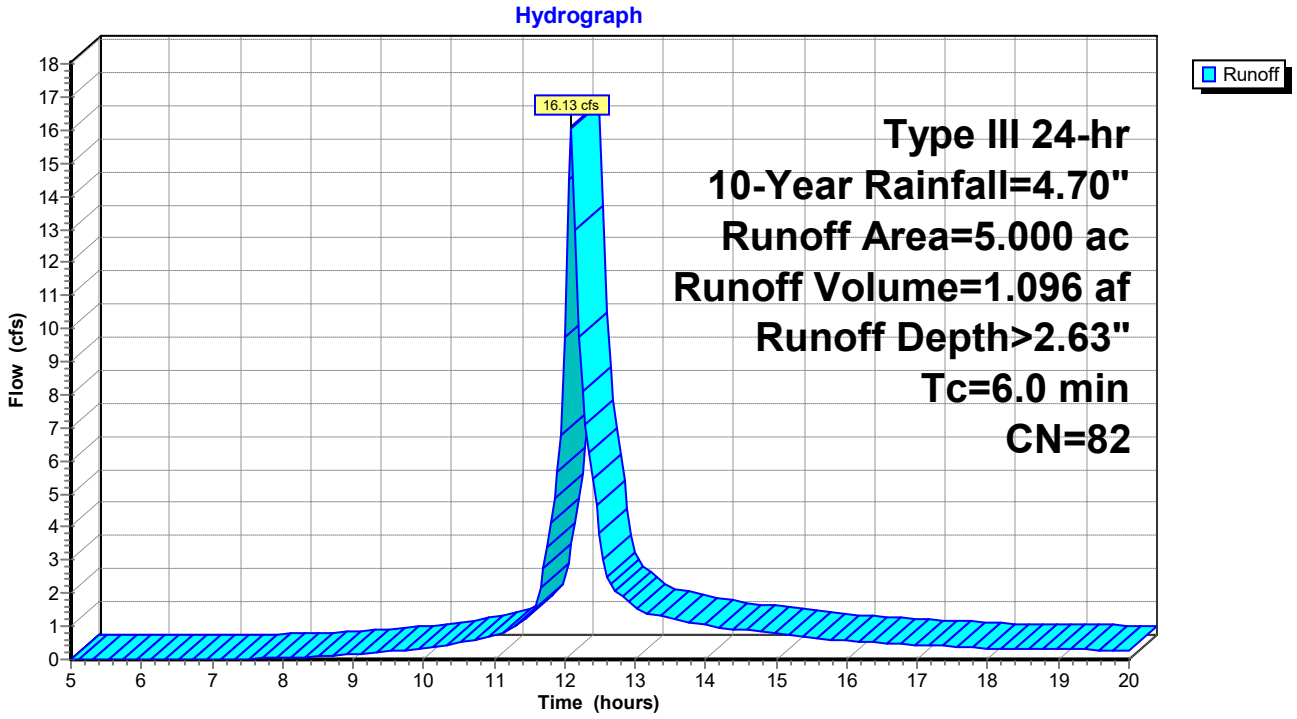
Runoff = 16.13 cfs @ 12.09 hrs, Volume= 1.096 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
5.000	82	Dirt roads, HSG B
5.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum**

Subcatchment 2S: 5-acre Drainage Area



Summary for Subcatchment 5S: 10-acre Drainage Area

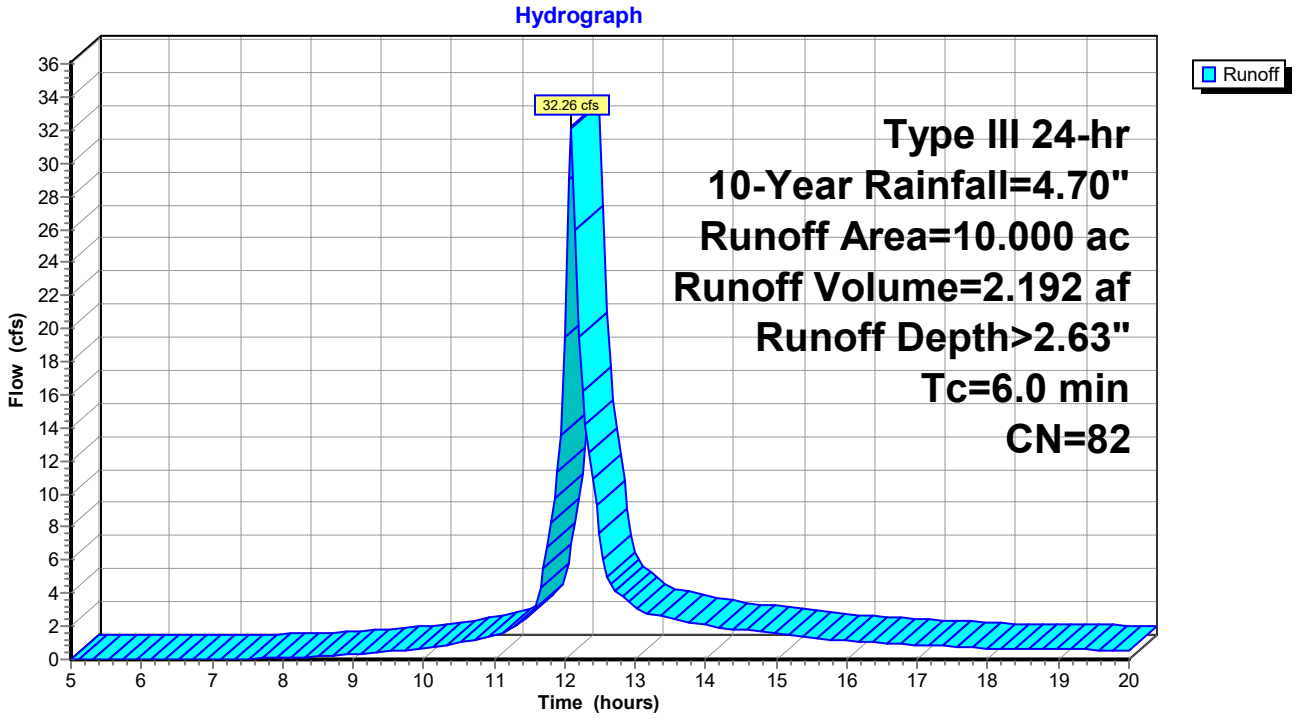
Runoff = 32.26 cfs @ 12.09 hrs, Volume= 2.192 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
10.000	82	Dirt roads, HSG B
10.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum**

Subcatchment 5S: 10-acre Drainage Area



Summary for Subcatchment 7S: 5-acre Drainage Area

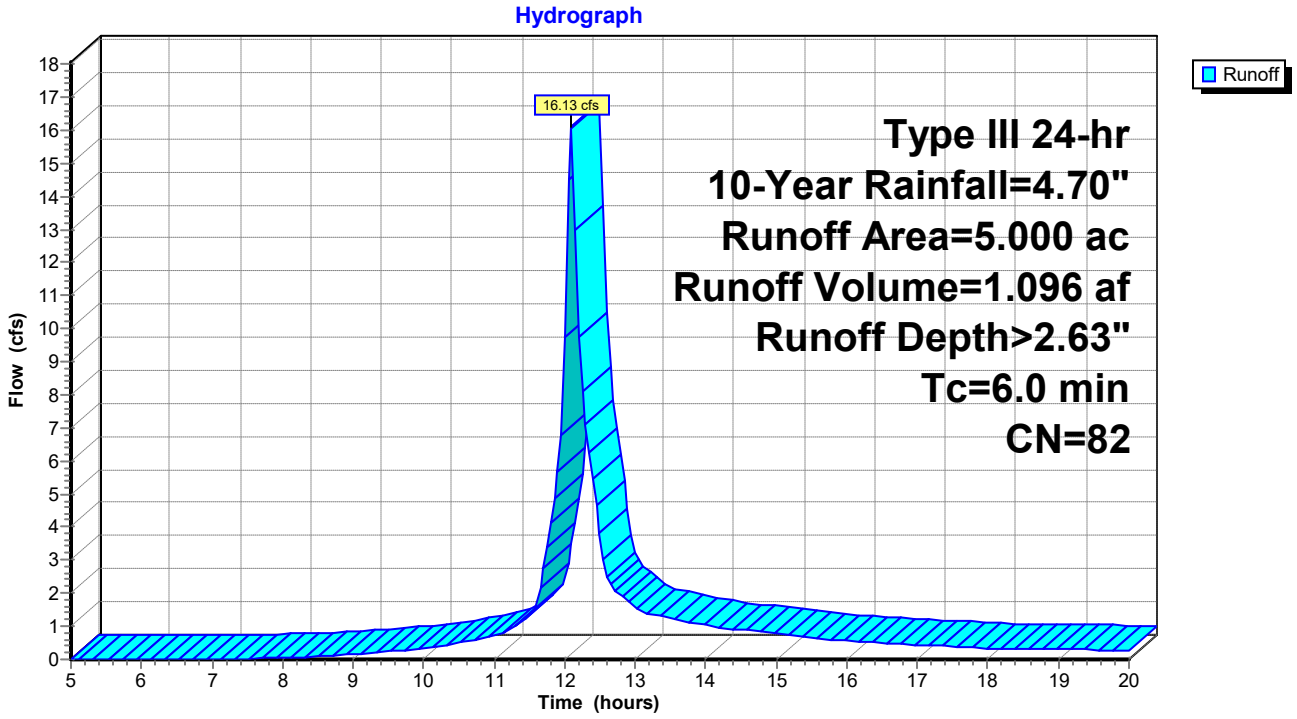
Runoff = 16.13 cfs @ 12.09 hrs, Volume= 1.096 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (ac)	CN	Description
5.000	82	Dirt roads, HSG B
5.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Minimum**

Subcatchment 7S: 5-acre Drainage Area



Summary for Reach 3R: 10-acre Swale >5% slope

Inflow Area = 10.000 ac, 0.00% Impervious, Inflow Depth > 2.63" for 10-Year event
Inflow = 32.26 cfs @ 12.09 hrs, Volume= 2.192 af
Outflow = 32.00 cfs @ 12.10 hrs, Volume= 2.191 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.35 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.61 fps, Avg. Travel Time= 0.6 min

Peak Storage= 440 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.81'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 49.53 cfs

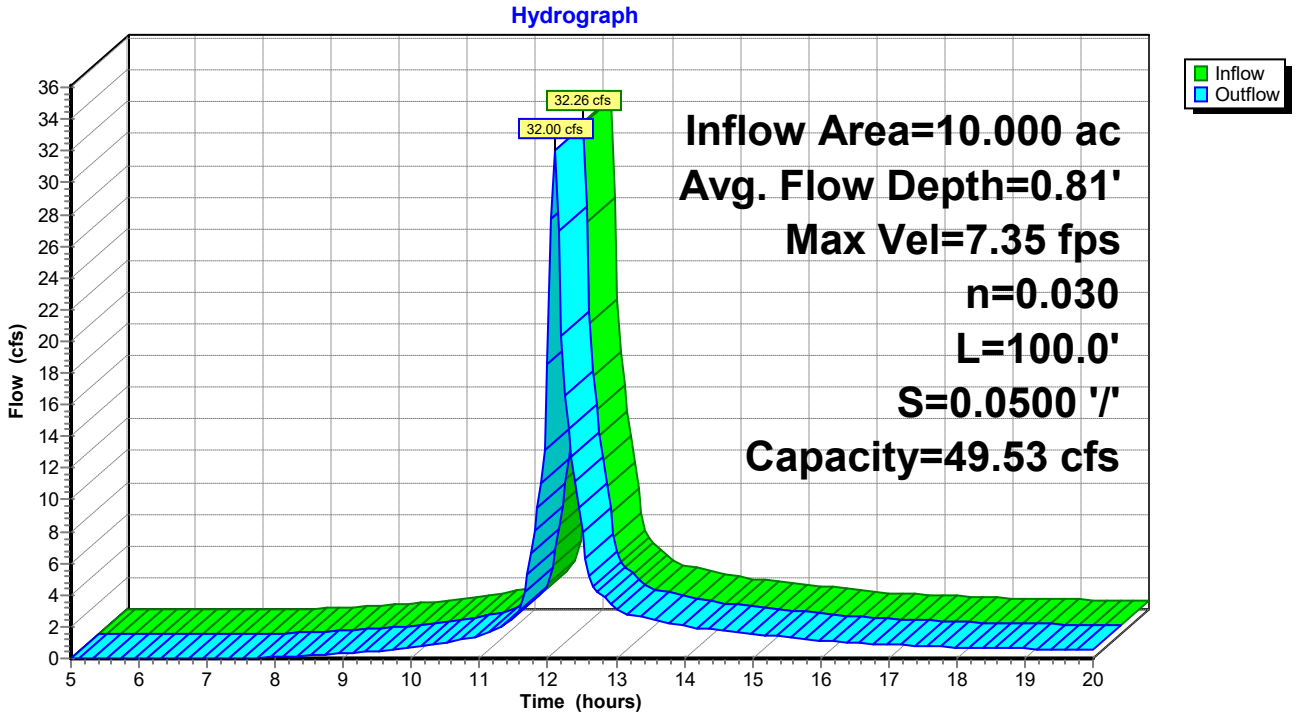
Custom cross-section, Length= 100.0' Slope= 0.0500 '/'
Constant n= 0.030 Short grass
Inlet Invert= 5.00', Outlet Invert= 0.00'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.00	0.00
3.00	-1.00	1.00
6.00	-1.00	1.00
9.00	0.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	3.0	0	0.00
1.00	6.0	9.3	600	49.53

Reach 3R: 10-acre Swale >5% slope



Summary for Reach 4R: 5-acre Swale <5% slope

Inflow Area = 5.000 ac, 0.00% Impervious, Inflow Depth > 2.63" for 10-Year event
Inflow = 16.13 cfs @ 12.09 hrs, Volume= 1.096 af
Outflow = 15.68 cfs @ 12.11 hrs, Volume= 1.095 af, Atten= 3%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.59 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.90 fps, Avg. Travel Time= 1.9 min

Peak Storage= 624 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.92'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 18.92 cfs

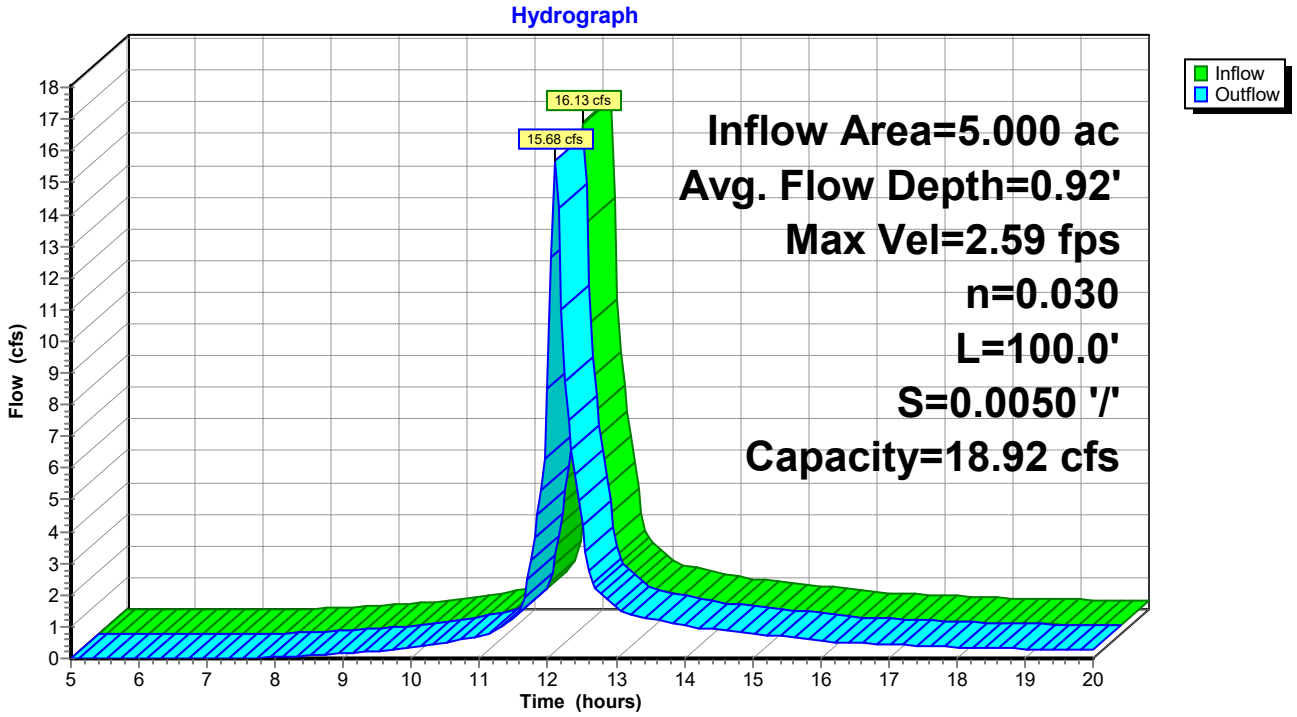
Custom cross-section, Length= 100.0' Slope= 0.0050 '/'
Constant n= 0.030 Short grass
Inlet Invert= 0.50', Outlet Invert= 0.00'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.00	0.00
3.00	-1.00	1.00
7.00	-1.00	1.00
10.00	0.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	4.0	0	0.00
1.00	7.0	10.3	700	18.92

Reach 4R: 5-acre Swale <5% slope



Summary for Reach 6R: 10-acre Swale <5% slope

Inflow Area = 10.000 ac, 0.00% Impervious, Inflow Depth > 2.63" for 10-Year event
Inflow = 32.26 cfs @ 12.09 hrs, Volume= 2.192 af
Outflow = 31.55 cfs @ 12.11 hrs, Volume= 2.190 af, Atten= 2%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.16 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 1.4 min

Peak Storage= 1,023 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.41'
Bank-Full Depth= 1.50' Flow Area= 11.3 sf, Capacity= 36.76 cfs

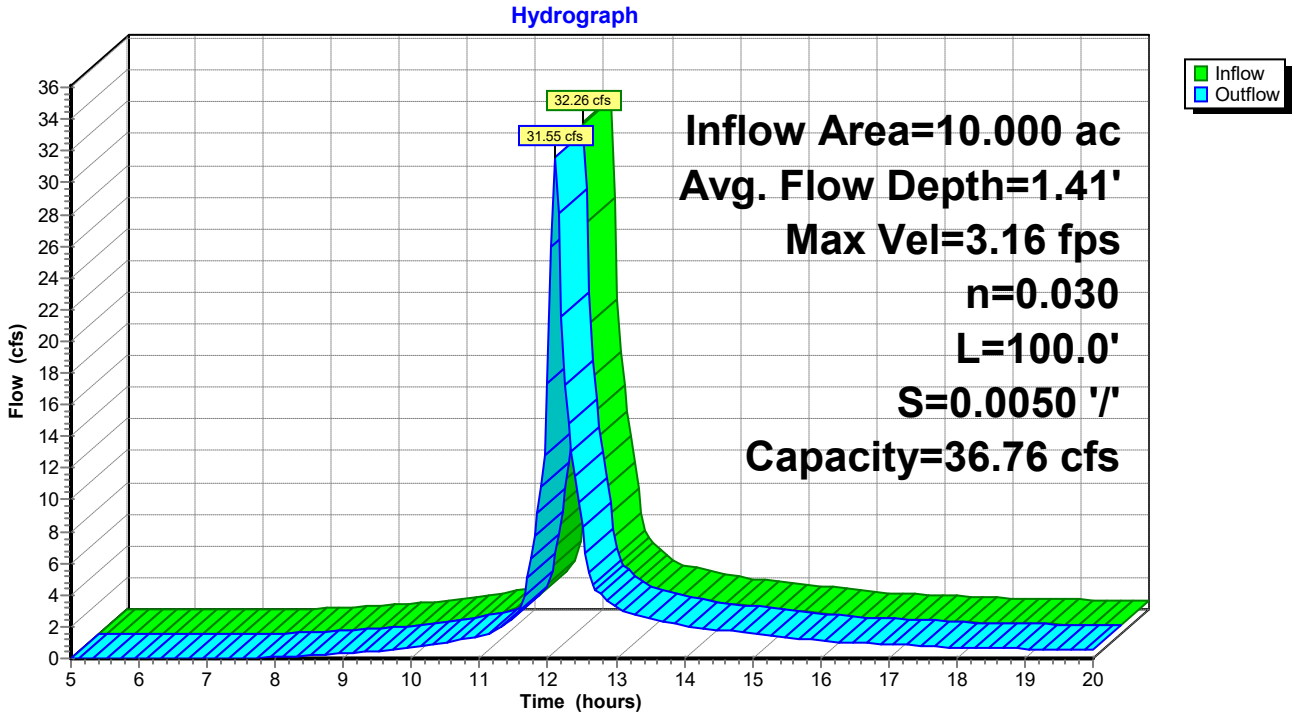
Custom cross-section, Length= 100.0' Slope= 0.0050 '/'
Constant n= 0.030 Short grass
Inlet Invert= 0.50', Outlet Invert= 0.00'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.00	0.00
4.50	-1.50	1.50
7.50	-1.50	1.50
12.00	0.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	3.0	0	0.00
1.50	11.3	12.5	1,125	36.76

Reach 6R: 10-acre Swale <5% slope



Summary for Reach 8R: 5-acre Swale >5% slope

Inflow Area = 5.000 ac, 0.00% Impervious, Inflow Depth > 2.63" for 10-Year event
Inflow = 16.13 cfs @ 12.09 hrs, Volume= 1.096 af
Outflow = 15.98 cfs @ 12.10 hrs, Volume= 1.096 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.35 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.55 fps, Avg. Travel Time= 0.7 min

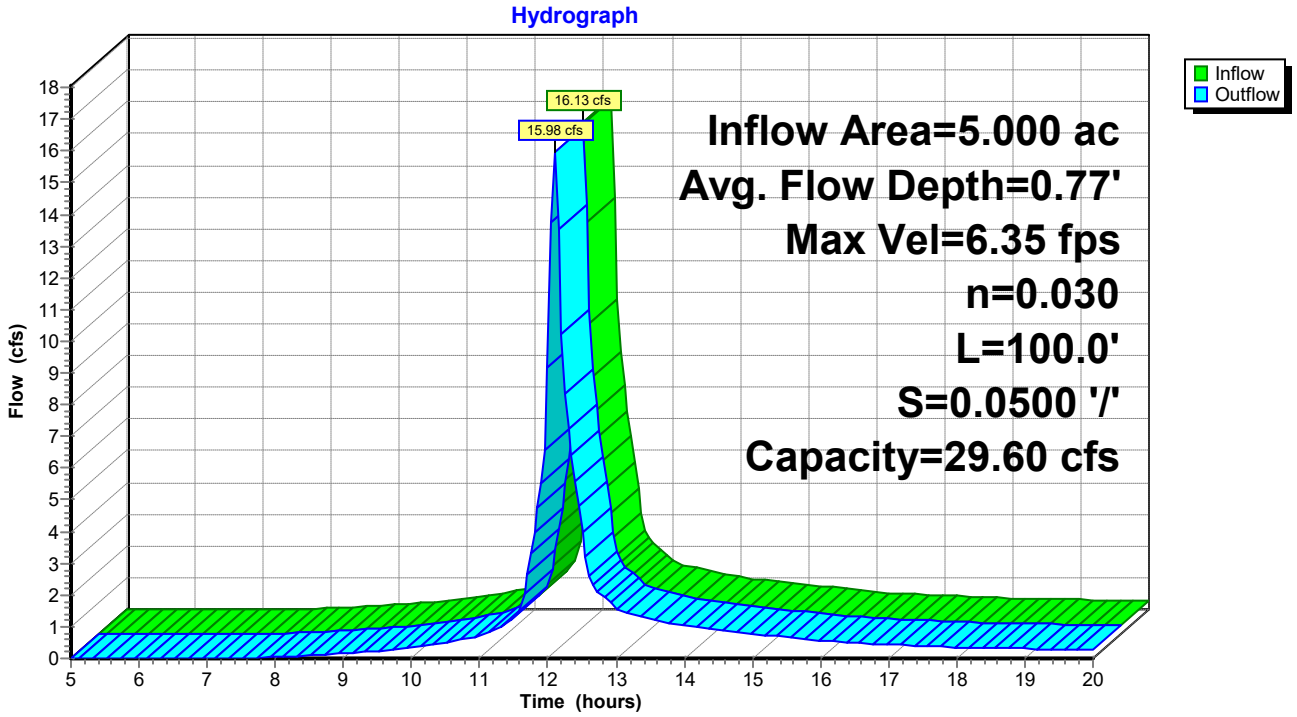
Peak Storage= 255 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.77'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 29.60 cfs

Custom cross-section, Length= 100.0' Slope= 0.0500 '/'
Constant n= 0.030 Short grass
Inlet Invert= 5.00', Outlet Invert= 0.00'

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	0.00	0.00
3.00	-1.00	1.00
4.00	-1.00	1.00
7.00	0.00	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	1.0	0	0.00
1.00	4.0	7.3	400	29.60

Reach 8R: 5-acre Swale >5% slope



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APPENDIX E

Project Name: Quinebaug Solar Project

Stormwater Pollution Control Plan

Sweeping Schedule and Reciepts

All parking areas, sidewalks, driveways and other impervious surfaces (except roofs) shall be swept clean of sand, litter and any other pollutants at least twice a year, once between November 14 and December 15 (after leaf fall) and once during the month of April (after snow melt) and at other times as may be necessary. The following table shall be completed by a member of the Pollution Prevention Team (PPT) after each sweeping. Reciepts shall be kept in a pocket accompanying the schedule sheets in this attachment

Date (MM/DD/YY)	Company/Person Sweeping	Supervising Team Member	Comments

APPENDIX F

Project Name: Quinebaug Solar Project

Stormwater Pollution Control Plan

Potential Spill Location Information

Spill cleanup equipment is kept

_____

(where)

And includes-

_____

(what; speedi-dri, brooms, etc.)

And all personal are instructed in its location and use.

Types of materials present on-site which could potentially spill and discharge to stormwater include:
1.
2.
3.
4.
5.
6.

Areas where spills may potentially occur and discharge to stormwater include:
1.
2.
3.
4.
5.
6.

Measures used to minimize the possibility of spills include:
1.
2.
3.
4.
5.
6.

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APPENDIX G

Project Name: Quinebaug Solar Project

Stormwater Pollution Control Plan

Spill Incident Recording Form

A history of spills and/or leaks is shown below. (*Make additional copies of table if needed).*

Date (MM/DD/YY)	(check one)		Location (as indicated	Description				Response Procedures	Measures to prevent reoccurance
	Spill	Leak		Type of Material	Quantity	Source if Known	Reason		

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APPENDIX H

Connecticut Department of Environmental Protection
Oil and Chemical Spill Response Division
Report of Petroleum or Chemical Product Discharge, Spillage or Release

1. When did the incident occur? Date___/___/___ Time
month/day/year

2. Where did the incident occur?

_____

_____

3. How did the incident occur? (describe the cause)

_____

_____

4. Under whose control was the hazardous material at the time of the incident?
Name: _____

Mailing & Street Address: _____

Town:_____State: _____ Zip:_____Phone:_____

5. Who is the owner of the property onto which the spill occurred?

_____

If this is a corporate property or jointly owned property, who represents the owner?

Corporate Property ☐ Jointly-owned property ☐

Name:_____

Mailing & Street address_____

Town:_____ State:____ Zip:_____ Phone:_____

6. When was the incident verbally reported to the Department of Environmental Protection?
Date___/___/____ Time ___:___
Month/day/year

7. Who reported the incident and whom were they representing?
Name:_____

Mailing & Street Address:_____

Town:_____State: ____ Zip:_____Phone:_____

8. What were the chemicals or petroleum products, etc. released, spilled or discharged? Give an exact description of each of the materials involved in the incident, including chemical names, percent concentrations, trade names, etc.

   If the chemicals are Extremely Hazardous substances or CERCLA hazardous substances they must be identified as such and include the reportable quantity (RQ). Please attach a Material Safety Data Sheet (MSDS) for each chemical involved.

   What were the quantities of hazardous materials that were released, spilled or discharged to each environmental medium (air, surface water, soil, and/or ground water)? [NOTE: Connecticut General Statutes requires the reporting of any amount of any substance or material released to the environment].

9. Did any of these hazardous materials travel beyond the property line? [NOTE: Materials that enter the ground water are considered to have gone beyond the property line.]

10. What actions were taken to respond to and contain the release, spill or discharge?

11. What actions are being taken to prevent reoccurrence of an incident of this type? (Attach additional sheets if necessary.)

_____

_____

_____

12. Were there any injuries as a result of the incident? If so, list the names of injured individuals, their addresses, phone numbers and describe their injuries. (Attach additional sheets if necessary)

Name:_____

Mailing & Street Address:_____

Town:_____State:_____Zip:_____Telephone:_____

13. What is the appropriate advice regarding medical attention necessary for exposed individuals?

_____

_____

_____

14. Are there any known or anticipated health risks, acute or chronic, associated with the release of these hazardous materials or medical advice that should be communicated?

_____

_____

_____

15. Was the incident completely cleaned up by the time this report was submitted? If not, what are the anticipated remedial actions and their duration?

_____

_____

_____

16. CERTIFICATION: I hereby affirm that the foregoing statement is true to the best of my knowledge.

_____

Signature Title Date

_____

Print Name Telephone

_____

Street Address/P.O. Box City/Town State & Zip

This form may be reproduced as long as it contains all of the information requested and is on an 81/2 X 11 sheet of white paper, black type format. For serious incidents the questions may be answered in narrative format which must include the preparer's affidavit.

Mail to:

State of Connecticut
Department of Environmental Protection
Bureau of Waste Management
Oil and Chemical Response Division
79 Elm Street
Hartford, CT 06106-5127
www.dep.state.ct.us

Phone: Routine calls (860) 424-3024
Emergency 24 hrs (860) 424-3338

APPENDIX I

Project Name: Quinebaug Solar Project

Stormwater Pollution Control Plan

Monthly Inspection Checklist for Year 20___

The site is inspected weekly for trash and debris. The table on this page is initialed each month by a member of the PPT. If any problems are observed, write "No" in the "OK?" column and note the problem and measures taken in the space in the following table. Make a new copy of this table for each new year.

Date (List Day	Initials	OK?	Problems Noted and Measures Taken
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
Drainage Structures and outfalls were cleaned on _____ ___, _____ (Month, day, year)			

By

_____

(Company)

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APPENDIX J

Project Name: Quinebaug Solar Project

Report Number:	Page:

Stormwater Pollution Control Plan

Weekly Inspection Checklist for Year 20___

The site is inspected weekly for trash and debris. The table on this page is initialed each week by a member of the PPT. If any problems are observed, write "No" in the "OK?" column and note the problem and measures taken in the space following the table. Make a new copy of this table for each new year

Date (MM/DD/YY)	Initials	OK?	Date (MM/DD/YY)	Initials	OK?	Date (MM/DD/YY)	Initials	OK?

Comments or problems and measures taken:

Project Name: Quinebaug Solar Project

Report Number:	Page:

Stormwater Pollution Control Plan

Inspection Report Form for Stabilization Measures

Project Phase:

□ Initial □ Intermediate □ Final

Inspector: _____ **Date:** _____

No. of Days Since Last Rainfall: _____ **Inches:** _____

Area	Date Last Disturbed	Date of Next Disturbance	Stabilized?	Stabilized With	Condition

Stabilization Notes:

Stabilization Key

CE = Construction Entrance TV = Temporary Vegetation

PV = Permanent Vegetation

To be performed by: _____ **On or before:** _____

Project Name: Quinebaug Solar Project

Report Number:	Page:

Stormwater Pollution Control Plan

Inspection Report Form for Stabilization Measures

Project Phase:

□ Initial □ Intermediate □ Final

Inspector: _____ **Date:** _____

No. of Days Since Last Rainfall: _____ **Inches:** _____

Control Location	In Place?	Condition	Sediment Depth	Washed Out / Overtopped?

Structural Notes:

To be performed by: _____ **On or before:** _____

Project Name: Quinebaug Solar Project

Report Number:	Page:

Stormwater Pollution Control Plan

Inspection Report Form for Stabilization Measures

Project Phase:

□ Initial □ Intermediate □ Final

Inspector: _____ **Date:** _____

No. of Days Since Last Rainfall: _____ **Inches:** _____

Summary of Required Changes

Reasons for Change

To be performed by: _____ **On or before:** _____

Project Name: Quinebaug Solar Project

Report Number:	Page:

Stormwater Pollution Control Plan

Inspection Report Form for Stabilization Measures

Project Phase:

□ Initial □ Intermediate □ Final

Inspector: _____ **Date:** _____

No. of Days Since Last Rainfall: _____ **Inches:** _____

Comments

Maintenance and Other Actions Required (Not Noted Elsewhere):

To be performed by: _____ **On or before:** _____

Project Name: Quinebaug Solar Project

Stormwater Pollution Control Plan

Inspection Report Form for Stabilization Measures

Report Number:	Page:

This certification must be completed after each inspection to signify that the inspection has been properly completed and the site has been found to be in compliance with the Stormwater Pollution Control Plan.

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals resposnible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the General Statutes, pursuant to Section 53a-157b of the General Statutes, and in accordance with any other applicable statute.

Signed: _____

Name: _____

Title: _____

Company: _____

Address: _____

Telephone: _____

Date: _____

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APPENDIX K

Project Name: Quinebaug Solar Project

Stormwater Pollution Control Plan

Comprehensive Annual Stormwater Evaluation and Inspection Report

Once a year, a member of the PPT shall conduct a Comprehensive Annual Stormwater Evaluation and Inspection of all aspects and provisions of the SWPCP. The following report is prepared and a copy maintained on site in the files of the facility. The Comprehensive Annual Stormwater Evaluation and Inspection Report is reviewed and signed by the same party who signed the registration or by their replacement of equivalent position.

Inspection:

Date of Inspection:

Reviewed By:

Update the PPT if necessary. PPT updated? [ ] Yes [ ] No

Review the SMP. Areas of SMP need to be updated? [ ] Yes [ ] No

Review the checklists within the Attachments K & L of the SWPCP. Update the checklists, spill plan and maintenance practices as necessary. Changes to the checklists, spill plan or maintenance practices are noted here and in the appropriate section of the Plan. (Copy this sheet as necessary).

Additional Comments:

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APPENDIX L

Connecticut Department of
Energy & Environmental Protection
Bureau of Materials Management & Compliance Assurance
Water Permitting & Enforcement Division

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, issued 8/21/13, effective 10/1/13
Stormwater Monitoring Report

SITE INFORMATION

Permittee: _____

Mailing Address: _____

Business Phone: _____ ext.: _____ Fax: _____

Contact Person: _____ Title: _____

Site Name: _____

Site Address: _____

Receiving Water (name, basin): _____

Stormwater Permit No. GSN _____

SAMPLING INFORMATION (Submit a separate form for each outfall)

Outfall Designation: _____ Date/Time Collected: _____

Outfall Location(s) (lat/lon or map link): _____

Person Collecting Sample: _____

Storm Magnitude (inches): _____ Storm Duration (hours): _____

Size of Disturbed Area at any time: _____

MONITORING RESULTS

Sample #	Parameter	Method	Results (units)	Laboratory (if applicable)
1	Turbidity			
2	Turbidity			
3	Turbidity			
4	Turbidity			

(provide an attachment if more than 4 samples were taken for this outfall) Avg =

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: _____

Signature: _____ Date: _____

Please send completed form to:

DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
BUREAU OF MATERIALS MANAGEMENT AND COMPLIANCE ASSURANCE
79 ELM STREET
HARTFORD, CT 06106-5127
ATTN: NEAL WILLIAMS

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APPENDIX M

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

Notice of Termination Form

Please complete and submit this form in accordance with the general permit (DEP-PED-GP-015) in order to ensure the proper handling of your termination. Print or type unless otherwise noted.

Note: Ensure that for commercial and industrial facilities, registrations under the *General Permit for the Discharge of Stormwater Associated with Industrial Activity* (DEP-PED-GP-014) or the *General Permit for the Discharge of Stormwater from Commercial Activities* (DEP-PED-GP-004) have been filed where applicable. For questions about the applicability of these general permits, please call the Department at 860-424-3018.

Part I: Registrant Information

1. Permit number: ***GSN***
2. Fill in the name of the registrant(s) as indicated on the registration certificate:

   Registrant:
3. Site Address:

   City/Town: State: Zip Code:
4. Date all storm drainage structures were cleaned of construction sediment:

   Date of Completion of Construction:

   Date of Last Inspection (must be at least three months after final stabilization pursuant to Section 6(b)(6)(D) of the general permit):
5. Check the post-construction activities at the site (check all that apply):

   ☐ Industrial ☐ Residential ☐ Commercial ☐ Capped Landfill

   ☐ Other (describe):

Part II: Certification

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the Connecticut General Statutes, pursuant to Section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."

Signature of Permittee	Date
Name of Permittee (print or type)	Title (if applicable)

Note: Please submit this Notice of Termination Form to:

STORMWATER PERMIT COORDINATOR
BUREAU OF WATER MANAGEMENT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127