CITRINE

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

RE: PETITION OF CP EAST HAMPTON SOLAR I, LLC AND CP EAST HAMPTON SOLAR II, LLC FOR A DECLARATORY RULING THAT A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED IS NOT REQUIRED FOR THE CONSTRUCTION, OPERATION AND MAINTENANCE OF A 1 MW AC AND A 0.975 MW AC SOLAR PHOTOVOLTAIC ELECTRIC GENERATING FACILITY LOCATED OFF OF SKINNER STREET IN EAST HAMPTON, CONNECTICUT

PETITION FOR DECLARATORY RULING

March 6, 2020

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I. INTRODUCTION AND AUTHORITY FOR REQUESTED RELIEF

In accordance with General Statutes § 4-176 (a) and § 16-50k (a), as well as § 16-50j-39 of the Regulations of Connecticut State Agencies, CP East Hampton Solar I, LLC and CP East Hampton Solar II, LLC (collectively, "Petitioners"), respectfully seek a declaratory ruling from the Connecticut Siting Council ("Council") that a Certificate of Environmental Compatibility and Public Need ("Certificate") is not required for the construction, operation and maintenance of a 1.0 megawatt ("MW") alternating current ("AC") and a 0.975 MW AC ground mounted solar photovoltaic ("PV") electric generating facility ("Project") on land located off of Skinner Street (CT Route 196) in the Town of East Hampton, Connecticut ("Site").

General Statutes § 4-176 (a) provides that "[a]ny person may petition an agency . . . for a declaratory ruling as to the validity of any regulation, or the applicability to specified circumstances of a provision of the general statutes, a regulation, or a final decision on a matter within the jurisdiction of the agency."[1] This provision "confers broad rights on *any member of the public* to file a petition for a declaratory ruling without the need to establish any specific, personal and legal interest in the matter." (Emphasis in the original.) *Bingham v. Dept. of Public Works*, 286 Conn. 698, 706, 945 A.2d 927 (2008).

General Statutes § 16-50k(a) provide in relevant part that:

> the council shall, in the exercise of its jurisdiction over the siting of generating facilities, approve by declaratory ruling . . . the construction or location of . . . any customer-side distributed resources project or facility or grid-side distributed resources project or facility with a capacity of not more than sixty-five megawatts, as long as such project meets air and water quality standards of the Department of Energy and Environmental Protection . . . .

[1] General Statutes § 4-166(9) defines "person" to mean "any individual, partnership, corporation, limited liability company, association, governmental subdivision, agency or public or private organization of any character, but does not include the agency conducting the proceeding."

As set forth herein, along with accompanying attachments, the proposed Project satisfies General Statutes § 16-50k(a) and would not have a substantial adverse environmental impact.

II. PETITIONERS AND CONTACT INFORMATION

Petitioners are Connecticut limited liability companies, both formed to develop, construct and operate the two PV facilities. They are wholly owned subsidiaries of Citrine Power LLC ("Citrine"), which is a Delaware limited liability company, with a business address of 55 Greens Farms Road, Suite 200-78, Westport, Connecticut, 06880. Citrine develops and invests in distributed generation renewable energy facilities, with an expertise in large scale commercial and industrial PV systems and small utility scale PV facilities. Citrine and its investors successfully developed, permitted and constructed the CP Middletown Solar I and II Virtual Net Metering ("VNM") projects in 2019, located in Middletown / Middlefield, CT (Petition No. 1367) in which the VNM beneficiaries are the Towns of Wilton and Weston. Citrine brings a unique combination of in-depth local market and regulatory knowledge, risk assessment and underwriting experience. This enables Citrine quickly to assess prospective projects and take the most viable ones through the development cycle.

Citrine owns and develops renewable energy facilities in the states of Connecticut, Illinois, New Jersey and the Commonwealth of Massachusetts. Collectively, the Citrine team has financed more than $150 million of solar assets. Citrine's PV facilities are located on roofs, parking lots or on vacant, unused land including landfills and brownfields. Power generated from these facilities is sold to a variety of customers, including the public service companies, municipalities, schools, businesses and residences via power purchase agreements, community solar arrangements or virtual net metering agreements. Citrine is an active developer of community solar (*i.e.*, shared solar) projects in Massachusetts, New Jersey and Illinois and is

working towards participating in the similar programs in Connecticut. Citrine is also a WBENC certified Woman Owned Business.

All correspondence may be addressed to Petitioners' counsel as follows:

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III. THE PROPOSED PROJECT

A. Site Selection

Petitioners selected the Site initially based on suitability for a PV facility, which takes into account the size of the PV facility contemplated, existing grades and surrounding topography. Additional important factors include the proximity of a potential site to the electric grid for interconnection, congruence with local planning and zoning and the willingness of the property owner. Once a potential suitable site is located, Petitioners assess the potential adverse impacts to environmental and natural resources, as well as scenic and historical values, and meet with the property owner, local land use and municipal officials as to the desirability, benefits, and cooperation for the development of a PV facility for the selected location. For this Site, Petitioners performed an extensive search and assessment, and obtained input and approval of local officials and the property owners, culminating in the selection of the Site. As set forth herein, the Site would have a minimal impact on the environment and historical and scenic values, while also providing a benefit to the public.

B. The Site

The Site consists of one (1) lot, totaling approximately twenty seven acres (+/- 27.42) acres in the Town East Hampton ("Town"). The Site is situated west of Skinner Street (CT Route 196), behind 46 Skinner Street in an industrial zone. See Figure 1, *Site Location.* The parcel is undeveloped and privately owned. The Town previously approved the Site for an industrial subdivision circa 1989 however, the property owner never developed the parcel in accordance with that approval.

The surrounding area is a mix of residential and undeveloped, wooded land with industrial and commercial development along Skinner Street (CT Route 196). Additionally, there is no record of any agricultural or development rights purchased by the State. Please see the Detailed Site Drawings attached as Appendix D to the Environmental Assessment, which is appended hereto as Attachment 1.

The Site consists of one undeveloped and wooded parcel. The Site lies within the Southeast Hills Ecoregion ("Ecoregion") characterized by low, rolling to locally rugged hills of moderate elevation, broad areas of upland, and local areas of steep and rugged topography. Elevations in the Ecoregion generally range from approximately 250 to 750 feet above mean sea level ("AMSL"). The Site's existing topography drops gently and radially from its center. Elevations within the Site range from approximately 425 feet AMSL in the center to 365 feet AMSL to the east, 400 feet AMSL to the west, and 370-395 feet AMSL to the south. Currently, the Site is accessed via an existing dirt road that originates off of Skinner Street (CT Route 196) and extends west into the Site. See Attachment 1.

Figure 1 – Site Location

C. The Project

The Project would consist of two adjacent PV facilities, both of which are subject to lease agreements with the property owner: (1) a 1 MW AC PV facility, owned by CP East Hampton Solar I, LLC and (2) a 0.975 MW AC PV facility, owned by CP East Hampton Solar II, LLC ("PV Facilities"). Both PV Facilities are subject to VNM agreements with the Town.

Upon their completion, the PV Facilities would occupy approximately 8.64 acres of the Site, with an additional ±6.29 acres of disturbance beyond the Project limits, for a total of ±14.93 acres to enable development ("Project Area"). Petitioners anticipate that both PV Facilities will consist of the following components: (a) approximately 6,994[2] Heliene 72^{M} 370W photovoltaic modules ("panels"), installed at a tilt angle of 20 degrees; (b) fifteen (15) CPS 125 kW and one (1) CPS 100kW inverters; (c) two (2) pad mounted switchgear units; and (d) two (2) 1,000 kVA transformers; and (e) one (1) point of interconnection, with two separate interconnections services as there are two separate PV Facilities. A ground-mounted racking system, mounted on driven posts, will be used to secure the panels. Electrical interconnection to existing distribution poles located along the Skinner Street right of way would require the addition of new utility poles along the existing access road. See Appendix D to Attachment 1. Please also see the Equipment Specifications attached as Appendix H to Attachment 1.[3]

The Project would be surrounded by a seven (7) foot high chain link fence to provide security as well as address National Electric Code requirements. Entrance to the Site would be through one (1), sixteen (16) foot wide locked chain link gate, with a site identification sign and

[2] The one (1) MW system would have 3,614 panels while the 0.975 MW system would have 3,380 panels.

[3] The PV Facilities would consist of these components or those of which are substantially similar depending upon availability.

lock box access for trained emergency personnel. Two (2) secondary gated access points located along the western and eastern fence line would be installed to provide access to the maintenance of stormwater management basins. Access to the Project Area would be from the east over the existing dirt and gravel road originating from Skinner Street (CT Route 196), which extends west and connects to the Project Area. See Appendix D to Attachment 1.

1. Utilities and Interconnection

Utilities would extend overhead and connect to the utility distribution lines on Skinner Street (CT Route 196). Petitioners have received interconnection agreements from The Connecticut Light and Power Company *d/b/a* Eversource Energy ("Eversource") and the PV Facilities are currently in the design phase of the interconnection process. See Appendix D to Attachment 1.

2. Construction

Subject to regulatory approvals, Petitioners anticipate construction over approximately four (4) months in early summer and fall of 2020. Construction would commence with initial site preparation work, consisting of clearing and mowing, access improvements, and the installation of erosion and stormwater control measures. The installation of the racking, panels and attendant mechanicals would follow. Fencing and Site stabilization and landscaping would conclude the construction. Please see the Construction Schedule and Hours, which is attached as Appendix E to Attachment 1.

3. Operation & Maintenance

Petitioners would retain a reputable third-party contractor experienced with the operation and maintenance of similar PV facilities. That contractor would monitor the PV Facilities, which would include continuous remote monitoring, routine maintenance, annual inspections,

vegetation management and landscaping, as well as emergency response. Daily monitoring would be conducted via an internet-based data acquisition system, which has the capability to send alarms identifying communication and power generation issues to the extent they occur. Please see the Operations & Management Plan appended hereto as Attachment 2.

4. Decommissioning

The Project is designed with a useful life of at least twenty-five (25) years. At the end of that useful life, Petitioners would remove all of the equipment in accordance with the Project's Decommissioning Plan. The decommissioning process would start with all above grade equipment followed by a restoration of the Project Area. Petitioners would also remove the fencing and utility poles on the access road if the property owner elects not to maintain them for other purposes. Please see the Decommissioning Plan appended hereto as Attachment 3.

IV. PROJECT BENEFITS

The Project will further the public policy of the State and benefit the public in several ways. First, the Project will generate much of its power at peak times, when demand for electricity is high, thus providing the electric grid with flexible peaking capacity to ensure stability. This comports with Connecticut's energy policy, codified at General Statutes § 16a-35k, which declares the need to "develop and utilize renewable energy resources, such as solar and wind energy, to the maximum practicable extent." The Project would also assist the State in meeting its mandated obligations under the Renewable Portfolio Standard as a result of anticipated ZREC agreements with Eversource.[4]

[4] The Petitioners have already submitted the PV Facilities to the Year 8 ZREC auction; however, their bid price was not cleared. Petitioners will submit the PV Facilities into the upcoming Year 9 ZREC Auction in April 2020.

Second, the Project would reduce carbon, thus contributing to the State's carbon-reduction strategies. Based on the United States Environmental Protection Agency's carbon reduction calculator, the construction and operation of the Project would be the equivalent of a reduction in 484 passenger vehicles driven annually or the energy use of 263 residences annually. Please see the Carbon Debt Analysis appended hereto as Attachment 4.

Third, the PV Facilities would further the State's VNM program, which incentivizes the use of renewable energy by allowing municipalities and certain other end-use customers to assign surplus energy production to other metered accounts. General Statutes § 16-244u. As referenced in Part III.C, *supra*, the PV Facilities are subject to VNM agreements with the Town.

Finally, the Project offers local benefits in that it would make productive use of unused land. Additionally, the Project can be used for education about renewable energy.

V. COMMUNITY OUTREACH

A. Collaboration with State and Local Officials

Representatives of Petitioners have collaborated with the Town on an on-going basis. Beginning in March 2019 through October 2019, Petitioners met with the Town's Sustainability Committee, Board of Education, Board of Finance and the Town Council. Petitioners presented to the various Town agencies, including informational meetings before the Inland / Wetlands Watercourse Agency on February 26, 2020 and the Planning & Zoning Commission on March 4, 2020. Petitioners also had multiple one on one work sessions with the Town Manager, Town Planner and the Town Finance Director. The Town is the "Host Customer" for both VNM agreements allocated by Eversource to the PV Facilities.

B. Congruence with Local Zoning and Planning

The Project comports with the Town's planning and zoning policies. The Site is located within an Industrial Zone ("I Zone"). The I Zone permits a variety of industrial uses via site plan review, including, but not limited to, "the manufacturing, assembly, processing, packaging of products deemed by the Commission as non-toxic, non-noxious and non-hazardous . . . Warehousing and shipping facilities . . . [and] Machine and tool shops . . . ." East Hampton Zoning Regs., Art. 5, § 5.3(B). Additional varied uses, which are perhaps more intensive, are permitted with a special permit including, but not limited to, "the [m]anufacturing and storage of alcohol, plastic and chemicals . . . [m]anufacture, processing and storage of asphalt products . . . [m]anufacture of masonry products, bricks, concrete, tile, etc. . . . [b]ulk storage and processing of cement, sand, stone, concrete mixing and batch plants . . . [and] [b]ulk storage of petroleum products . . . ." *Id.*, § 5.3(C). It is worthwhile to note that "Public utility power plants"[5] are also permitted in an I Zone with a special permit. *Id.*

The Zoning Regulations do not address utility scale solar facilities. However, the Zoning Regulations recognize the importance of "solar and other renewable forms of energy" within the context of its housing opportunity development provisions. *Id.*, Art. 6, § 6.3(A)(6). Although the Town's Plan of Conservation & Development ("POCD") does not address renewable energy, it does emphasize the importance of ensuring the adequacy of electricity. East Hampton POCD, Ch. 5, p.104 (2016).

[5] A "public utility power plant" is defined under the Town's Zoning Regulations as "[t]elephone, electric and cable television lines, poles equipment and structures; water or gas pipes, mains, valves or structures: sewer pipes, valves or structures, pumping stations; telephone exchanges and repeater stations; and all other facilities, equipment and structures necessary for conducting a service by a government or public utility." East Hampton Zoning Regs., Art. 2, § 2.2.

C. Notice to Abutters, Agencies and Officials

In accordance with § 16-50j-40 of the Regulations of Connecticut State Agencies, on or about March 6, 2020, Petitioners sent a notice of its intent to file this Petition, via certified mail, return receipt requested, to each person appearing as a record owner of the host properties, those appearing as a record owner of properties which abut the proposed Site and the appropriate municipal officials and government agencies. The service list of abutters and a sample letter to the abutters are appended hereto as Attachment 5; the service list of agencies and officials, as well as the letters sent to the Town, are appended hereto as Attachment 6.

VI. NO SUBSTANTIAL ADVERSE ENVIRONMENTAL EFFECT

General Statutes § 16-50k(a) provides in part that a Certificate is not required if an electric generating facility meets the air and water quality standards of the Department of Energy and Environmental Protection ("DEEP") and does not have a substantial adverse environmental effect. Petitioners and their consultants interfaced with the relevant agencies, evaluated the potential environmental impacts and integrated mitigation measures into the Project design where necessary. To that end, All-Points Technology Corporation, P.C. ("APT") prepared a comprehensive Environmental Assessment ("EA") concerning the potential adverse environmental impacts, which is appended hereto as Attachment 1.

A. Public Health and Safety

The Project would meet or exceed all applicable safety requirements for construction, interconnection and operation applicable to electric generation. The PV Facilities would not consume any raw materials, would not produce any by-products and would be unstaffed during normal operating conditions.

Each employee or consultant working on the Project would:

- Receive required general and Site-specific health and safety training;
- Comply with all health and safety controls as directed by local and state requirements;
- Understand and employ the Site health and safety plan while on the Site;
- Know the location of local emergency care facilities, travel times, ingress and egress routes; and
- Report all unsafe conditions to the construction manager or owner representative.

Additionally, as set forth in Attachment 2, Petitioners would coordinate with municipal first responders concerning responses to emergencies at the PV Facilities.

Construction equipment would be required to access the Site during normal working hours. After construction is complete and during operation, traffic at the Project would be minimal. The PV Facilities would be fenced and gated, with limited access to authorized personnel only.

The solar panels are designed to absorb incoming solar radiation and minimize reflectivity, such that only a small percentage of incidental light would be reflected off the panels. This incidental light is significantly less reflective than common building materials, such as steel, or the surface of smooth water. The panels would be tilted up toward the southern sky at a fixed angle of twenty (20) degrees, further reducing reflectivity.

The Project is not an anticipated source of noise in light of the Project location and minimal noise generating equipment. The only equipment proposed for the Project that would generate noise consists of the fans associated with the inverters. While no noise study was completed for the Project, based on the specified inverters to be used, their locations relative to property boundaries and previous studies completed with similar inverters, sound levels are

expected to be below the applicable noise ordinance standards for daytime hours. It is important to note that the inverters are inactive at night. See Appendix H to Attachment 1.

Petitioners submitted the Project location to the Federal Aviation Administrative ("FAA") to confirm whether additional notification or coordination with the FAA is required. The FAA has determined that the Project would not be a hazard to air navigation. The FAA Determination of No Hazard is appended hereto as Attachment 7.

B. Air Quality

The PV Facilities would not generate any emissions. Rather, as discussed in Part IV, *supra*, the Project would contribute to carbon reduction. There would be some potential minimal air emissions incident to construction activities, primarily from the construction vehicles used during installation. These emissions would be temporary and should not require an air permit. See Attachment 1.

C. Water Resources

The groundwater underlying the Site is classified by DEEP as "GA." This classification indicates groundwater within the area is presumed to be suitable for human consumption without treatment. The Site is not located within a mapped preliminary or final Aquifer Protection Area. See Attachment 1.

Based upon a review of DEEP mapping, the majority of the Site is located in Major Drainage Basin 4 (Connecticut River), Sub Regional Drainage Basin 4709 (Pine Brook). The western portion of the Site (including the majority of the Project Area) is located in Local Drainage Basin 4709-05 (Muddy Gutter Brook at mouth above Pocotopaug Creek). The eastern portion of the Site is located in Local Drainage Basin 4709-04 (unnamed pond at outlet on Pocotopaug Creek). *Id.*

Two (2) surface waterbodies are located in proximity to the Site. Pocotopaug Creek is located east of Skinner Street (Route 196), down gradient and approximately 260 feet east of the Site (approximately 450 feet from the nearest portion of the Project Area). Muddy Gutter Brook is located down gradient and approximately 490 feet west of the Site (approximately 710 feet from the nearest portion of the Project Area). *Id.*

Pocotopaug Creek is classified by DEEP as a Class B surface water body with designated uses that include habitat for fish and other aquatic life and wildlife; recreation; navigation; and water supply for industry and agriculture. Muddy Gutter Brook is classified by DEEP as a Class A surface water body. Designated uses for Class A surface water bodies include habitat for fish and other aquatic life and wildlife; potential drinking water supplies; recreation; and water supply for industry and agriculture. *Id.*

The Site is mapped on FIRM PANEL #09007C 0134 G, dated August 28, 2008. Based upon the reviewed mapping, the Site is classified as Zone X, which is defined as areas of minimal flooding, typically above the 500-year flood level. *Id.*

1. Wetlands

There are three (3) forested wetlands identified on the Site, none of which would be adversely impacted by the Project. The wetland areas comprise approximately 1.66 acres. A majority of the Site's wetland habitat is dominated by edge forest, although interior portions of Wetland 2 consist of segments of interior forested habitats, while intermittent watercourses ("IWC") associated with Wetlands 2 and 3 contain some scrub/shrub and emergent vegetation classes. No wetlands or watercourses are present within the Project Area. See Appendices D and F of Attachment 1.

Wetland 1. This resource is located in the northwest corner of the Site and consists of two 'fingers' of a larger headwater seep wetland system that occurs along the Site's western property boundary and extends off site. Wetland 1 is located within narrow seep outbreaks that lack a defined bank or channel and drain to the west and away from the Site. The northern seep has been historically altered and consists of an artificially formed drainage swale that was constructed to provide drainage connectivity to the Airline Trail that abuts the northern property boundary of the Site.

Wetland 2. Wetland 2 consists of a wetland seep system that is located within the northcentral portion of the Site. This wetland drains southeast to a low point where a drainage swale was constructed to convey drainage from this wetland along the south side of the existing access road and out to Skinner Street and into a closed drainage system. The drainage swale/IWC feature ("IWC 2") currently crosses the existing access road at two (2) locations via a hard-bottom crossing and provides conveyance from Wetland 2, draining from north to southeast/east. IWC 2 has a sandy/stone bottom and is approximately one (1) to three (3) feet wide. IWC 2 continues to drain east before turning north to converge with a narrow IWC feature ("IWC 3"), which is discussed below, on the adjacent property to the east before finally terminating at a catch basin associated with the Skinner Street closed drainage system. While small pockets of inundation and evidence of scour and detritus accumulation were present throughout IWC 2, no significant flows were noted at the time of inspection.

Wetland 3. Wetland 3, located to the northeast of the Site, consists of a forested hillside seep system that generally drains south along the eastern Site boundary. The majority of this resource is not located on the Site. Wetland 3 is a very stony hillside seep system with seasonal saturation and shallow seasonal flooding. The majority of Wetland 3 consists of shallow

hummock/hollow topography with diffuse flows until the southern terminus of the wetland system where, due to topography, it pinches down to IWC 3. IWC 3 consists of an approximately one (1) to two (2)-foot-wide channel with a sandy/stone bottom. This system eventually converges with the outfall from Wetland 2/IWC 2 on the adjacent property to the east and finally terminates at a catch basin that is part of the Skinner Street closed drainage system.

Direct wetland impacts proposed as part of the Project would be limited to the improvement of two existing hard-bottom watercourse crossings of the existing access road associated with IWC 2. As previously noted, these hard-bottom crossings consist of focused overland flows that are conveyed over the top of the dirt access road at two (2) separate points. Petitioners propose to install two (2) culverts to properly convey flows under the access road. These culverts would consist of one (1) 20-foot long 24-inch high-density polyethylene pipe ("HDPE") (westernmost crossing) and one (1) 25-foot long 24-inch HDPE (easternmost crossing). The installation of these two (2) culverts would substantially improve the condition of these crossings and ultimately protect the streambed, which currently experiences regular disturbances to unprotected access.[6]

The proposed improvements would also improve drainage along the access road by enhancing existing broad-based dips at regular intervals to break up currently focused drainage, providing further protection of the watercourse and nearby Wetland 2. During construction Haybale check dams will be installed at the outlet points of these broad-based dips to dissipate stormwater velocity and filter any suspended sediments prior to discharging to the watercourse.

[6] Petitioners are in the process of preparing and filing a Self-Verification Notification Form with the U.S. Army Corps of Engineers ("Corps") for installation of new culverts. The new culverts would comply with the requirements of the New England District of the Corps *General Permit 19 Stream, River & Brook Crossing* and therefore shall be eligible as a Self-Verification Project. The culvert replacements would also be consistent with those guidelines outlined in the DEEP Inland Fisheries Division Habitat *Conservation and Enhancement Program Stream Crossing Guidelines*. See Attachment 1.

To further promote protection of wetland resources during construction, safeguards have been developed to avoid unintentional impacts to these resources. By implementing these management techniques, the Project development would further mitigate the potential for adverse impacts to wetland resources.

Potential short-term temporary impacts associated with the Project's construction activities would be minimized by the proposed sedimentation and erosion controls which would be installed and maintained during construction activities in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control.* Additionally, the Project will maintain a twenty (20) foot "non-disturbed zone" around the nearest wetland resource (Wetland 2) where no impacts including fencing, grading, or tree clearing is proposed. Potential long-term secondary impacts to wetland resources possibly associated with the operation of this Facility are minimized by the following factors: the development would be unstaffed (generating negligible traffic); using an existing gravel access drive reduces the creation of impervious surfaces; and treating the majority of the ground beneath the solar arrays with native grass/vegetation provides ample opportunity for surface water to infiltrate or slow prior to discharge to surrounding resources. See Attachment 1.

2. Vernal Pools

APT assessed all three (3) wetland resource areas for seasonal evidence of vernal pool resources. Based on this assessment, APT determined that there does not appear to be any potential vernal pool breeding habitat on the Site. *Id.*

3. Stormwater

The Project would require clearing and grubbing in the immediate area for the proposed solar installation, including the necessary utilities, access drive extension, and stormwater

management features, resulting in approximately 14.93 acres of disturbance. Overall, hydrologically, through the addition of catchment areas associated with the individual drainage areas of each proposed basin, the post-developed condition is designed to mimic the pre-developed condition.

To manage the increase in post-development runoff due to the change in cover type associated with converting woods to meadow, and the reductions in one full Hydrologic Soil Group within the proposed limit of disturbance, five (5) grass-lined stormwater management basins are proposed along the edges of the Project Area. The basins manage the stormwater runoff through a combination of infiltration and a broad crested overflow weir. These basins also provide the necessary water quality treatment volume for the additional impervious area, as recommended by DEEP's Appendix I.

Swales are proposed along the eastern and southern limits of disturbance to facilitate all the flow reaching the southeastern basin. The swales are designed to convey the 100-year storm event without overtopping. A biodegradable erosion control blanket will be installed within the swales to protect against erosion until turf has been established.

The Project requires a *General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities* from DEEP. Petitioners have applied for a General Permit, which is currently pending before DEEP. Please see the Stormwater Report appended hereto as Attachment 8.

4. Water Quality

The Project would not require any potable water uses or sanitary discharges, nor are any liquid fuels associated with the operations of the Project. To safeguard the above referenced water resources from potential impacts during construction, Petitioners are committed to

implementing erosion control protective measures. These protective measures would include monitoring of established erosion and sediment controls that will be installed and maintained in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control.* Therefore, with the incorporation of adequate protective measures, stormwater runoff from the Project development would not result in an adverse impact to water quality associated with the water resources located on or proximate to the Site. See Attachment 1.

D. Vegetation and Soils

APT evaluated the size and extent of the contiguous forest block (i.e., core forest) present within and adjacent to the Site. Based on this evaluation, approximately 3.3 acres of the Site consist of interior woodlands, which technically fall within a "small core" forest block designation.[7] After reviewing publicly available GIS-based datasets and completing an independent GIS analysis (using 2016 leaf-off aerial photography) and field inspections, APT determined that the on-Site habitat is not ideal for supporting breeding habitat for forest-interior birds and larger wildlife species. This is due to several factors, including the forest block's very small size and existing fragmentation influenced by surrounding residential/commercial development, local roads and the adjacent Air Line Trail. Accordingly, the Project would not have an adverse impact on any core forest habitat.

[7] Part of APT's assessment included the review of publicly available GIS-based datasets designed to assess impacts to core forest habitat. According to one of these datasets, the University of Connecticut's Center for Land Use Education and Research's Forest Fragmentation Analysis ("FFA"), the Site possesses approximately 3.3 acres of interior woodlands and technically falls within a "small core" forest block designation. The FFA designates "core forest" as greater than 300 feet from non-forested habitat. This 300-foot zone is referred to as the "edge width" and represents sub-optimal breeding habitat for forest-interior birds due to decreased forest quality, increased levels of disturbance, and increased rates of nest predation and brood parasitism within this transitional forest edge ("edge effect"). The FFA study identifies three categories of core forest: small (< 250 acres); medium (250-500 acres); and large (>500 acres).

According to the Connecticut Environmental Conditions Online Resource Guide,[8] there are currently no soils located on the Site that are identified as prime, unique, or farmlands of statewide or local importance. See Attachment 1.

E. Wildlife

APT consulted with the United States Fish and Wildlife Service ("USFWS") and DEEP with respect to the potential impact of the Project on wildlife. APT's field survey determined that the Site possesses marginal habitat to support the eastern box turtle, a species of Special Concern, which was confirmed by DEEP. DEEP recommended the implementation of a series of construction related protection strategies. APT has developed protection program involving training, exclusion zones and monitoring to prevent unintentional impacts to the eastern box turtle. See Appendices B and F to Attachment 1.

Additionally, APT performed an evaluation of possible threatened or endangered species under the Federal Endangered Species Act ("ESA"). The northern long-eared bat ("NLEB") is a listed threatened species known to occur in Connecticut. NLEB tend to roost in trees with a diameter at breast height ("DBH") of three (3) inches or greater. Because the proposed Project would result in the removal of trees greater than three (3) inches DBH, a determination of compliance with the ESA is required. APT completed a determination of compliance. In accordance with the USFWS authorities, the Project would not likely result in an adverse effect or unintentional killing of NLEB and does not require a permit from USFWS. The compliance correspondence is attached hereto as Appendix G to Attachment 1.

[8] Connecticut Environmental Conditions Online (CTECO) Resource Guide www.cteco.uconn.edu.

F. Historic and Archaeological Resources

Heritage Consultants, LLC prepared Phase 1A and Phase IB Cultural Recourses Assessment Surveys for the Project and submitted it to the State Historic Preservation Office ("SHPO") for review and comment in January of 2020. The surveys concluded that the Site does not contain substantial numbers of artifacts or research potential and, accordingly, additional examination was not warranted. SHPO responded on February 7, 2020, concurring with the findings of the Phase 1A and 1B, and concluding that (1) additional archeological investigations of the Project Area are not warranted and (2) no historic properties will be affected by the proposed Project. The SHPO correspondence is attached as Appendix C to Attachment 1.

G. Scenic Values

The Project would be set back from Skinner Street (CT Route 196). The solar panels and racking would not exceed a height of approximately eight (8) feet. The proposed overhead electric utility poles required for interconnection with the existing electric distribution system on Skinner Street would be the tallest new features introduced at approximately thirty-five (35) to forty (40) feet in height. These utility poles, however, would be similar to those already existing in the area. There may be some limited views of small portions of the Project during leaf-off conditions from abutting properties to the south. Any views would be minimized by the relatively low height of the PV Facilities, existing topography and the existing mature vegetation surrounding the Project Site. Additionally, there would be no visual impacts on the Airline Trail to the north of the Site or the Belltown Historic District to the southeast of the Site.

VII. CONCLUSION

This Petition and the appended attachments demonstrate that the Project satisfies the requirements of General Statutes § 16-50k(a). The Project would meet DEEP's air and water quality standards and would not have a substantial adverse environmental effect. Petitioners have designed the Project to minimize any environmental effects. The net effect of the Project would result in a benefit to the State because of the production of renewable energy, participation in the State's virtual net metering and ZREC programs and productive use of currently unused industrial property. Petitioners, therefore, respectfully request that the Council grant this Petition that a Certificate is not required for the construction, operation and maintenance of the Project.

Respectfully submitted by,

CP EAST HAMPTON SOLAR I, LLC and CP EAST HAMPTON SOLAR II, LLC

By: _____

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Tab 1

ENVIRONMENTAL ASSESSMENT

PROPOSED

CP EAST HAMPTON SOLAR I & II

SOLAR PROJECTS

SKINNER STREET

(VOL. 437 PG. 989)

EAST HAMPTON, CONNECTICUT

MIDDLESEX COUNTY

Prepared for:

CP East Hampton Solar I & II, LLC

55 Greens Farms Road, Suite 200-78
Westport, CT 06880

Prepared by:

All-Points Technology Corporation, P.C.
567 Vauxhall Street – Suite 311
Waterford, CT

March 2020

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Appendices

Legend

- Site
- Approximate Project Area

Figure 1
Project Location

Proposed Solar Facility
46 Skinner Street
East Hampton, CT

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Map Notes:
Base Map Source: USGS 7.5 Minute Topographic Quadrangle Maps, Middle Haddam and Moodus, CT (1984)
Map Scale: 1:24,000
Map Date: February 2020

2,000 1,000 0 2,000 Feet

1 Project Introduction

All-Points Technology Corporation, P.C. ("APT") prepared this Environmental Assessment ("EA") on behalf of CP East Hampton Solar I, LLC & CP East Hampton Solar II, LLC (collectively "CP EH Solar") for the proposed installation of two (2) solar-based electric generating facilities, one having an output of ±1.0 megawatt[1] ("MW") and the second having an output of ±0.975 MW (collectively, "Project" or "Facility") located in the Town of East Hampton, Connecticut ("Town"). Combined, the total capacity of the two systems would not exceed 1.975 MW. This EA has been completed to support CP EH Solar's submission to the Connecticut Siting Council ("Council") of a petition for declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the construction, maintenance, and operation of the Project.

The proposed Project will be located behind 46 Skinner Street[2] (CT Route 196), East Hampton, Connecticut ("Site"). The Site itself is a privately-owned, industrially zoned and irregularly shaped parcel that consists of approximately 27.42 acres of primarily undeveloped land; a small clearing and existing gravel access road are located in the eastern portion of the Site. The surrounding land use is characterized by sparse residential/commercial development, with CT Route 16 located to the south, the Connecticut Airline State Park Trail ("Airline Trail") abutting the property to the north and Skinner Street (CT Route 196) located to the east. Undeveloped land becomes more prevalent at locations farther to the east and southeast while residential/commercial development becomes more predominant to the north and northeast. Figure 1, *Site Location Map*, depicts the location of the Site and surrounding area.

Upon its completion, the Facility will occupy approximately 8.64 acres of the Site with an additional ±6.29 acres of disturbance beyond the Facility limits, for a total of ±14.93 acres, to enable development ("Project Area"). The Facility will be comprised of approximately 6,994[3] Heliene 72^{M} 370W photovoltaic modules ("panels") installed at a tilt angle of 20 degrees; 15 CPS 125 kW and 1 CPS 100kW inverters; two (2) pad mounted switchgear; two (2) 1,000 kVA transformer, and one (1) service interconnection point. A ground-mounted racking system, mounted on driven posts, will be used to secure the panel arrays; while the Facility will be enclosed within a seven

[1] MWs listed within this report will be shown as AC – Alternate Current.
[2] Town of East Hampton Land Records – Vol. 437 Pg. 989.
[3] The 1.0 MW system will have 3,614 panels while the 0.975 MW system will have 3,380 panels.

(7)-foot tall chain-link security fence. Electrical interconnection to existing distribution poles located along the Skinner Street right of way will require new utility poles along the existing access road.

2 Existing Conditions

2.1 Project Location

The Site is a privately-owned irregular shaped parcel located behind 46 Skinner Street (CT Route 196) in East Hampton, Connecticut. The Site consists of approximately 27.42 acres of primarily undeveloped land. A small clearing and existing gravel access road are located in the eastern portion of the Site. The Project Area would occupy ±14.93 acres within the west and central portions of the Site.

Regionally, the Site lies within the Southeast Hills Ecoregion ("Ecoregion"), consisting of costal uplands lying within ±25 miles of Long Island Sound. This Ecoregion is characterized by low, rolling to locally rugged hills of moderate elevation, broad areas of upland, and local areas of steep and rugged topography[4]. Elevations in the Ecoregion generally range from approximately 250 to 750 feet above mean sea level ("AMSL").

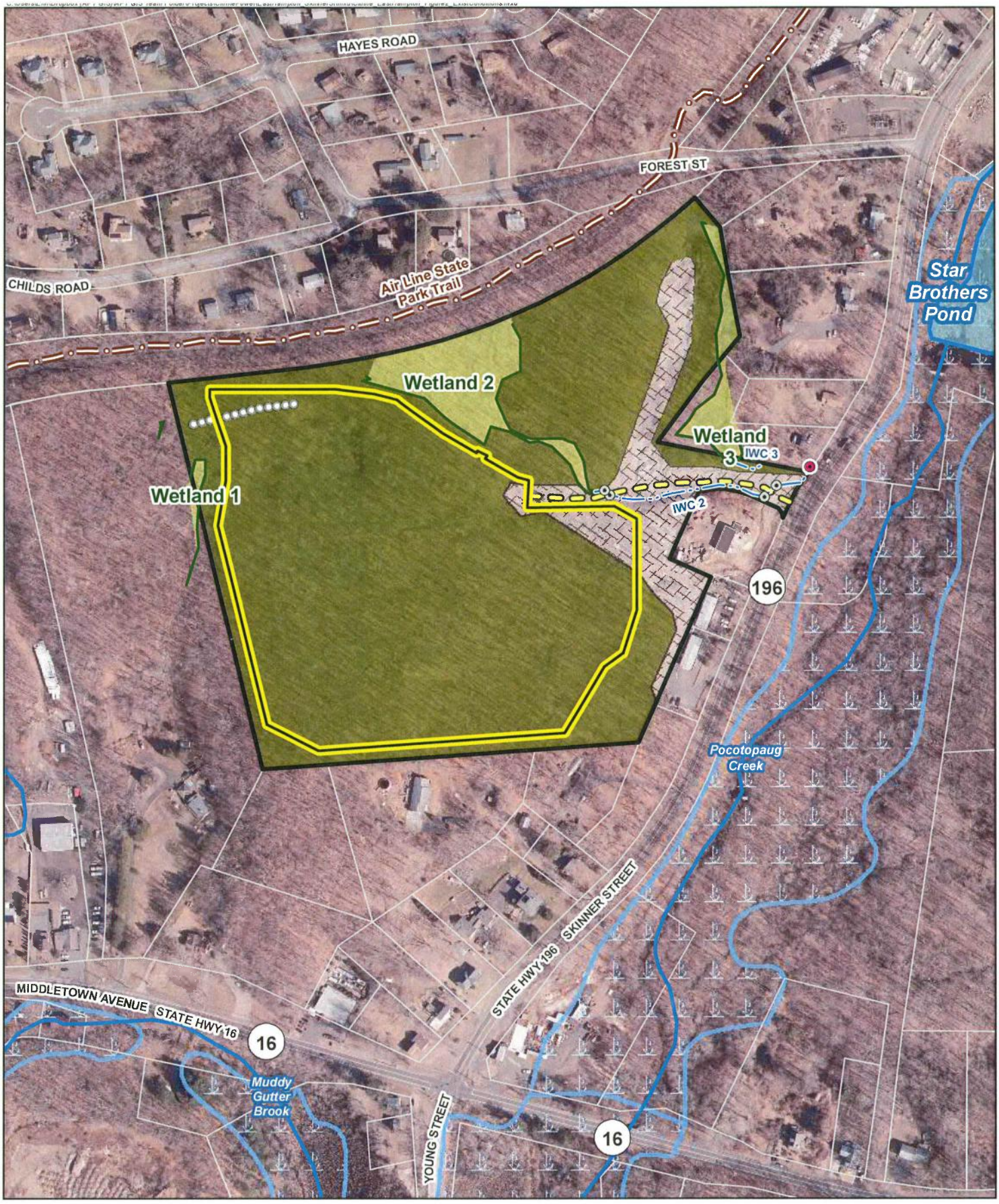
The Site's existing topography drops gently and radially from its center. Elevations within the Site range from approximately 425 feet AMSL in the center to 365 feet AMSL to the east, 400 feet AMSL to the west, and 370-395 feet AMSL to the south.

2.2 Site Access

Currently, the Site is accessed via an existing dirt road that originates off of Skinner Street (CT Route 196) and extends west into the Site.

Figure 2, *Existing Conditions Map*, depicts current conditions on the Site, its access, abutting properties, and several features discussed herein.

[4] Dowhan, J.J. and R.J. Craig, 1976, Rare and endangered species of Connecticut and Their Habitats. State Geological Natural History Survey of Connecticut Department of Environmental Protection, Report of Investigations No. 6.



Legend

- Site
- Approximate Parcel Boundary
- Approximate Project Area
- AccessRoad
- Hardbottom Crossing
- Culvert
- Delineated Wetland Boundary
- Delineated Watercourse
- Stonewall
- Watercourse (CTDEEP)
- Hiking Trail

Habitat Cover Type

- Developed
- Upland Forest
- Forested Wetland

300 150 0 300 Feet

Map Notes:
Base Map Source: CTECO 2019 Aerial Photograph
Map Scale: 1 inch = 300 feet
Map Date: February 2020

Figure 2
Existing Conditions Map

Proposed Solar Facility
46 Skinner Street
East Hampton, CT

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2.3 Habitat and Wildlife

The Project Area is located primarily within an area of Upland Forest habitat with peripheral Wetland Forest and Developed areas. Additional habitat types located on the Site, beyond the Project Area, include separate additional Wetland Forest, Upland Forest, and Developed areas. While small in size, transitional ecotones separate the Project Area cover types introduced above, including areas of scrub/shrub and herbaceous dominant habitats. These transitional areas are folded into the discussion below due to their relatively small sizes. The habitat types and their vegetative communities are depicted on Figure 2, *Existing Conditions Map* and described below.

2.3.1 Upland Forest

This habitat comprises the majority of the central and southwestern portions of the Site and extends off-Site to the west beyond the Project Area. This forest unit transitions into a larger forest block that extends off-Site to the west as part of an 'edge' forest area. Smaller 'edge' Upland Forest units are located in the northeastern extents of the Site bordering the Airline Trail. Collectively, these comprise approximately 21.86 acres of the Site. This habitat type within the Site is dominated in the overstory by complexes of black oak (*Quercus veluntina*), shagbark hickory (*Carya ovata*), and red oak (*Quercus rubra*) with suppressed black birch (*Betula lenta*) and American beech (*Fagus grandifolia*). Understory is dominated by complexes of lowbush and highbush blueberry (*Vaccinium angustifolium* and *corymbosum*), and clonal seedling/sapling American beech. This forest type is generally even-aged with a closed canopy and moderate understory growth.

2.3.2 Forested Wetlands

A total of three (3) forested wetlands, comprising approximately 1.66 acres, were identified on the Site during a field inspection and wetlands delineation completed on November 21, 2019 by APT Connecticut Registered Soil Scientist Matt Gustafson. A majority of the Site's wetland habitat is dominated by edge forest. However interior portions of Wetland 2 consist of segments of interior forested habitats while intermittent watercourses ("IWC") associated with Wetlands 2 and 3 contain some scrub/shrub and emergent vegetation classes. No wetlands or watercourses are present within the Project Area. The information presented below summarizes the results of the field survey. Additional information is provided in Appendix A, *Wetland Inspection Report*.

Wetland 1

This resource is located in the northwest corner of the Site and consists of two 'fingers' of a larger headwater seep wetland system that occurs along the Site's western property boundary and extends off site. Wetland 1 is located within narrow seep outbreaks that lack a defined bank or channel and drain to the west and away from the Site. The northern seep has been historically altered and consists of an artificially formed drainage swale that was constructed to provide drainage connectivity to the Airline Trail that abuttings the northern property boundary.

These wetland areas are entirely forested with sparse understory vegetation with dominant plant species that include Red Maple (*Acer rubrum*), Sphagnum moss (*Sphagnum spp.*), Greenbrier (*Smilax rotundifolia*), Highbush Blueberry (*Vaccinium corymbosum*), Spicebush (*Lindera benzoin*) Japanese Barberry (*Berberis thunbergii* - Connecticut Invasive Species Council invasive plant species), and Cinnamon Fern (*Osmunda cinnamomea*).

Wetland 2

Wetland 2 consists of a wetland seep system that is located within the northcentral portion of the Site. This wetland drains southeast to a low point where a drainage swale was constructed to convey drainage from this wetland along the south side of the existing access road and out to Skinner Street and into a closed drainage system.

The drainage swale/IWC feature (identified as "IWC 2") currently crosses the existing access road at two (2) locations via a hard-bottom crossing and provides conveyance from Wetland 2, draining from north to southeast/east. IWC 2 has a sandy/stone bottom and is approximately one (1) to three (3) feet wide. IWC 2 continues to drain east before turning north to converge with IWC 3 on the adjacent property to the east before finally terminating at a catch basin associated with the Skinner Street closed drainage system. While small pockets of inundation and evidence of scour and detritus accumulation were present throughout IWC 2, no significant flows were noted at the time of inspection.

Wetland 2 consists of complexes of mature hardwood forest associated with the core wetland area while IWC 2 is dominated by emergent and scrub/shrub vegetation as a result of historic disturbances. Dominant plant species associated with Wetland 2 includes Green Bulrush (*Scirpus atrovirens*), Sphagnum moss (*Sphagnum spp.*), Sweet Pepperbush (*Clethera alnifolia*), Highbush

Blueberry (*Vaccinium corymbosum*), White Oak (*Quercus alba*), Soft Rush (*Juncus effuses*), Steeplebush (*Spiraea tomentosa*), Red Maple (*Acer rubrum*), and Sphagnum moss (*Sphagnum spp.*).

Wetland 3

Wetland 3, located to the northeast of the Site, consists of a forested hillside seep system that generally drains south along the eastern Site boundary. The majority of this resource is not located on the Site. Wetland 3 is a very stony hillside seep system with seasonal saturation and shallow seasonal flooding (<2 inches based on water staining observed on tree trunks). The majority of Wetland 3 consists of shallow hummock/hollow topography with diffuse flows until the southern terminus of the wetland system where, due to topography, it pinches down to a narrow IWC feature ("IWC 3").

IWC 3 consists of an approximately one (1) to two (2)-foot-wide channel with a sandy/stone bottom. This system eventually converges with the outfall from Wetland 2/IWC 2 on the adjacent property to the east and finally terminates at a catch basin that is part of the Skinner Street closed drainage system.

Dominant plant species associated with Wetland 3 includes Red Maple (*Acer rubrum*), Spicebush (*Lindera benzoin*), White Oak (*Quercus alba*), Highbush Blueberry (*Vaccinium corymbosum*), and Sweet Pepperbush (*Clethera alnifolia*).

2.3.3 Vernal Pools

During the wetland investigation, which was performed on November 21, 2019, Apt assessed all three (3) wetland resource areas for indications of vernal pool resources. Based on a lack of evidence of seasonally flooded areas observed on that date, it does not appear that any *potential* vernal pool breeding habitat exists on the Site.[5]

[5] The Wetland investigation was completed outside a period of breeding activity by vernal pool indicator species, so no formal vernal pool survey was conducted.

2.3.4 Developed

Small peripheral developed areas are located on the Site. These areas consist of existing gravel/dirt access roads and a small clearing. Collectively, developed areas comprise approximately 2.98 acres of the Site.

2.4 Core Forest Determination

APT evaluated the size and extent of the contiguous forest block (i.e., core forest) present within and adjacent to the Site. APT initially reviewed two publicly available GIS-based datasets designed to assess impacts to core forest habitat. The first source, Connecticut Department of Energy and Environmental Protection's ("DEEP") Forestland Habitat Impact Mapping, does not include the Site within an area mapped as core forest. The second source was UConn's Center for Land Use Education and Research's Forest Fragmentation Analysis ("FFA") study which designates "core forest" as greater than 300 feet from non-forested habitat. This 300-foot zone is referred to as the "edge width" and represents sub-optimal breeding habitat for forest-interior birds due to decreased forest quality, increased levels of disturbance, and increased rates of nest predation and brood parasitism within this transitional forest edge ("edge effect"). The FFA study identifies three categories of core forest: small (< 250 acres); medium (250-500 acres); and large (>500 acres). Based on the FFA criteria, the Site possesses ±3.3 acres of interior woodlands and technically falls within a "small core" forest block designation.

After reviewing these sources and completing an independent GIS analysis (using 2016 leaf-off aerial photography) and field inspections APT determined that the habitat is not ideal for supporting breeding habitat for forest-interior birds and larger wildlife species. This is due to several factors, including the forest block's very small size and existing fragmentation influenced by surrounding residential/commercial development, local roads and the adjacent Air Line Trail.

Generalist wildlife species that are tolerant of human disturbance could be expected to use these areas, including several song birds and mammals such as raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), grey squirrel (*Sciurus carolinensis*), Virginia opossum (*Didelphus virginiana*), and eastern chipmunk (*Tamias striatus*).

2.5 Rare Species

The DEEP Natural Diversity Data Base ("NDDB") program performs hundreds of environmental reviews each year to determine the impact of proposed development projects on state listed species and to help landowners conserve the state's biodiversity. In furtherance of this endeavor, the DEEP also developed maps to serve as a pre-screening tool to help applicants determine if there is the potential project-related impact to state-listed species.

The NDDB maps represent approximate locations of (i) endangered, threatened and special concern species and, (ii) significant natural communities in Connecticut. The locations of species and natural communities depicted on the maps are based on data collected over the years by DEEP staff, scientists, conservation groups, and landowners. In some cases, an occurrence represents a location derived from literature, museum records and/or specimens. These data are compiled and maintained in the NDDB. The general locations of species and communities are symbolized as shaded (or cross-hatched) areas on the maps. Exact locations have been masked to protect sensitive species from collection and disturbance and to protect landowner's rights whenever species occur on private property.

APT reviewed the most recent DEEP NDDB mapping (December 2019) to determine if any such species or habitats occur within the vicinity of the Site. The NDDB mapping reveals the Site is located within an area potentially containing Threatened, Endangered, or Special Concern species and/or critical habitats. Based on APT's professional knowledge of the general Project area, potential species include both eastern box turtle *(Terrapene c. caroline*) and timber rattlesnake (*Crotalus horridus Linnaeus*).

On October 24, 2019, at the request of CP EH Solar, APT coordinated the completion of a field assessment prior to submitting a review request to NDDB to determine if any suitable habitat for these species occurs at the Site. Results of the field survey, as documented in a Timber Rattlesnake and Eastern Box Turtle Habitat Assessment report, determined that no suitable habitat for timber rattlesnakes appears present at the Site. While no turtles were encountered during the inspection, the Site does possess marginal habitat to support the species. In addition, many turtles have been reported in very close proximity.

In conformance with the DEEP and Council requirements, APT submitted a review request to the NDDB with respect to this Project. The submission included the Timber Rattlesnake and Eastern

Box Turtle Habitat Assessment report. APT received a response from the DEEP on November 20, 2019, stating that records indicate known extant population of eastern box turtle exist in this area. Copies of APT's submission and DEEP's response is provided in Appendix B, *DEEP NDDB Correspondence.*

2.5.1 Northern Long-eared Bat

The northern long-eared bat ("NLEB"; *Myotis septentrionalis*) is a federally-listed[6] threatened species also known to occur in the vicinity of the Site. The NLEB's range encompasses the entire State of Connecticut and suitable NLEB roost habitat includes trees (live, dying, dead, or snag) with a diameter at breast height ("DBH") of three (3) inches or greater.

The *Northern long-eared bat areas of concern in Connecticut to assist with Federal Endangered Species Act Compliance map* (February 1, 2016) was reviewed to determine the locations of any known maternity roost trees or hibernaculum in the state. This map reveals that there are currently no known NLEB maternity roost trees in Connecticut. The nearest NLEB habitat resource to the Site is located in North Branford, approximately 18 miles to the southwest.

2.6 Ground and Surface Water Classification

2.6.1 Groundwater

Groundwater underlying the Site is classified by DEEP as "GA". This classification indicates groundwater within the area is presumed to be suitable for human consumption without treatment. Designated uses in GA-classified areas include existing private and potential public or private supplies of drinking water and base flow for hydraulically-connected surface water bodies. Based upon a review of available DEEP mapping, the Site is not located within a mapped preliminary or final Aquifer Protection Area ("APA").

2.6.2 Surface Water

Based upon a review of DEEP mapping, the majority of the Site is located in Major Drainage Basin 4 (Connecticut River), Sub Regional Drainage Basin 4709 (Pine Brook). The western portion of the Site (including the majority of the Project Area) is located in Local Drainage Basin 4709-05

[6] Listing under the federal Endangered Species Act

(Muddy Gutter Brook at mouth above Pocotopaug Creek). The eastern portion of the Site is located in Local Drainage Basin 4709-04 (unnamed pond at outlet on Pocotopaug Creek).

Based upon reviewed DEEP mapping, two (2) surface waterbodies are located in proximity to the Site. Pocotopaug Creek is located east of Skinner Street (Route 196), downgradient and approximately 260 feet east of the Site (approximately 450 feet from the nearest portion of the Project Area). Muddy Gutter Brook is located downgradient and approximately 490 feet west of the Site (approximately 710 feet from the nearest portion of the Project Area).

Pocotopaug Creek is classified by the DEEP as a Class B surface water body with designated uses that include habitat for fish and other aquatic life and wildlife; recreation; navigation; and water supply for industry and agriculture. Muddy Gutter Brook is classified by the DEEP as a Class A surface water body. Designated uses for Class A surface water bodies include habitat for fish and other aquatic life and wildlife; potential drinking water supplies; recreation; and water supply for industry and agriculture.

2.7 Floodplain Areas

APT reviewed the United States Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Maps ("FIRM") for the Site. A FIRM is the official map of a community on which FEMA has delineated both the special hazard areas and risk premium zones applicable to the community. The Site is mapped on FIRM PANEL #09007C 0134 G, dated August 28, 2008. Based upon the reviewed mapping, the Site is classified as Zone X, which is defined as areas of minimal flooding, typically above the 500-year flood level.

2.8 Air Quality

The Site is currently undeveloped and as such, no air emissions are generated.

2.9 Soils and Geology

Surficial materials on and within the vicinity of the Site are comprised of thin deposits of glacial till while soils located on and within the vicinity of the Site are identified as Nipmuck-Brimfield-Rock outcrop complex, Canton and Charlton fine sandy loams, and smoothed Udorthents. Nipmuck-Brimfield-Rock outcrop complex are somewhat excessively drained and well drained loamy supraglacial melt out till soils derived from mica schist parent material. Canton and Charlton

fine sandy loams are well drained coarse-loamy eolian deposits over sandy melt-out till soils derived from gneiss, granite, and/or schist parent material. Smoothed Udorthents are poorly and moderately well drained soil from drift parent material.

Bedrock geology beneath the Site is identified as Brimfield Schist (which includes Hamilton Reservoir Formation). Brimfield Schist is described as a gray, rusty-weathering, medium to coarse-grained, interlayered schist and gneiss, composed of oligoclase, quartz, K-feldspar, and biotite, and commonly garnet, sillimanite, graphite, and pyrrhotite. The formation includes minor layers and lenses of hornblende and pyroxene-bearing gneiss, amphibolite, and calc-silicate rock.

2.10 Farmland Soils

In accordance with the Code of Federal Regulations, CFR Title 7, part 657, farmland soils include land that is defined as prime, unique, or farmlands of statewide or local importance based on soil type. They represent the most suitable land for producing food, feed, fiber, forage, and oilseed crops.

According to the Connecticut Environmental Conditions Online Resource Guide,[7] there are currently no soils located on the Site that are identified as prime, unique, or farmlands of statewide or local importance.

2.11 Historic and Archaeological Resources

Heritage Consultants LLC ("Heritage Consultants") of Newington, Connecticut, reviewed relevant historic and archaeological information to determine whether the Site holds potential cultural resource significance. Their review of historic maps and aerial images of the Site, examination of files maintained by the Connecticut State Historic Preservation Office ("SHPO"), and a pedestrian survey of the Site revealed that the proposed Project is located southwest and adjacent to a resource listed on the National Register of Historic Places ("NHRP"), the Belltown Historic District ("District").

Listed on the NHRP on October 28, 1985, the Belltown Historic District contains a large concentration of contributing historic buildings. The vast majority of the buildings in the District were built after 1800. The Belltown Historic District is historically significant as the only mill town

[7] Connecticut Environmental Conditions Online (CTECO) Resource Guide www.cteco.uconn.edu.

in the nation known to be exclusively devoted to bell making. One is part of a historic mill complex and the other is associated with a small number of industrial archaeological sites in the southwestern portion of the District.

In terms of archaeological potential, review of the same resources determined that the Site is located within an area of low slopes, well drained soils and is situated in proximity to Muddy Gutter Brook to the west and Pocotopaug Creek to the east. As a result, it was determined that this area may contain intact archaeological deposits in the subsoil and, at the request of CP EH Solar, a Phase 1B Professional Cultural Resources Assessment and Reconnaissance Survey was performed in January of 2020 by Heritage Consultants.

Fieldwork for this assessment included a pedestrian survey, photo-documentation, and the excavation of 95 shovel tests across the Project Area. The associated access road alignment was found to be previously disturbed and was therefore, not tested.

The excavated areas did not produce evidence of substantial numbers of artifacts, temporally diagnostic materials, and/or cultural features. As a result, the Project Area was determined to be lacking in research potential. Therefore, the excavated areas were assessed as ineligible for listing on the NHRP and no additional archaeological examination of the Project Area was recommended prior to construction of the proposed Project.

APT submitted Project and Site historic/cultural information as well as copies of the Phase 1A and 1B Cultural Resources Assessment and Reconnaissance Survey's to the SHPO for agency review and comment in January of 2020. SHPO responded on February 7, 2020, concurring with the findings of the Phase 1A and 1B and that no additional archeological investigations of the Project Area are warranted and that no historic properties will be affected by the proposed activities.

Copies of the Phase 1A/1B Cultural Resources Reconnaissance Survey Report and the agency's Concurrence Letter are included in Appendix C, *SHPO Correspondence*.

2.12 Scenic and Recreational Areas

No State Designated Scenic Roads or scenic areas are located near the Site. The nearest recreational area is The Airline State Park Trail that abuts the Site to the north, is approximately 10-15 feet lower than the Site, and extends in an east to west direction. There are additional

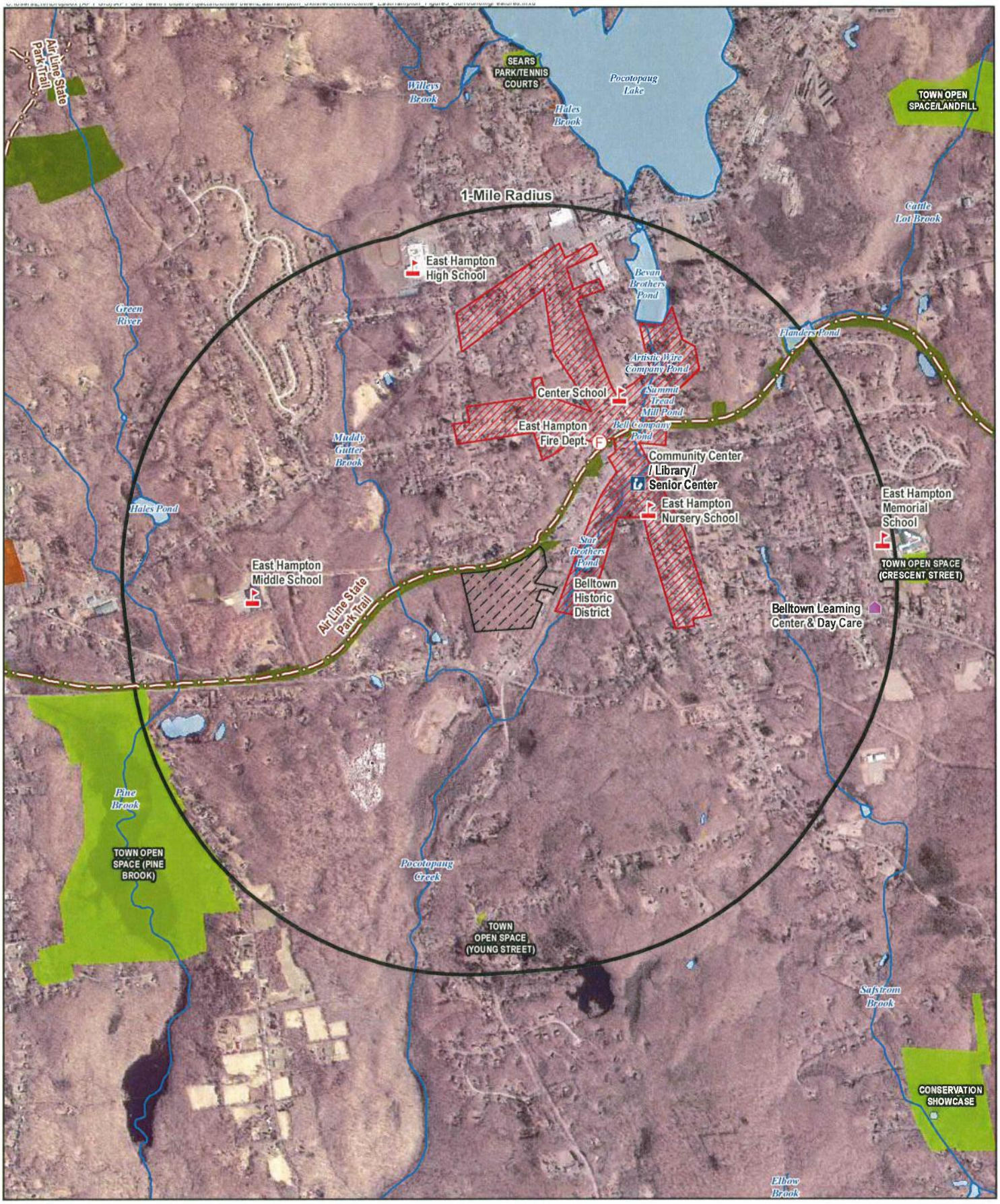
recreation areas located within the Town, but none are proximate to the Site. See Figure 3, *Surrounding Features Map,* for those resources located within one-mile of the Site.

2.1 Noise

The entire Site is undeveloped, where no noise sources presently exist.

2.2 Lighting

The Site is undeveloped, where no lighting sources that currently exist.



Legend

- Site
- 1 Mile Radius
- National Register of Historic Places District
- Open Water
- Municipal Building
- Fire Dept.
- School / Day Care
- Licensed Child Day Care
- Municipal and Private Open Space Property
- State Forest/Park
- Hiking Trail

N W E S

2,000 1,000 0 2,000 Feet

Map Notes:
Base Map Source: CTECO 2019 Aerial Photograph
Map Scale: 1 inch = 2,000 feet
Map Date: February 2020

Figure 3
Surrounding Features Map

Proposed Solar Facility
46 Skinner Street
East Hampton, CT

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3 Effects on the Environment

The purpose of this Section is to analyze and discuss the Project's potential effects on the environment and demonstrate that the proposed development will have no significant adverse effect.

3.1 Proposed Project Development

The Project Area will require approximately 14.93 acres of disturbance which will include land clearing, grading, and new access road development. Once constructed, the Facility will consist of two (2) solar-based electric generating facilities[8] and will occupy approximately 8.64 acres. The Project Area is primarily located within an Upland Forest habitat with a small component extending eastward into a clearing and incorporating a portion of the existing gravel access road. The Project Area's existing topography drops gradually and radially from its center. Existing grades throughout the Project Area will remain with the exception of the installation of the stormwater management/erosion and sedimentation features which will require some manipulation (cuts/fills) and regrading to allow for Facility Approximately 14.27 acres of trees will be removed for construction and to prevent shading of the Facility.

The ±1.975-megawatt Facility will be comprised of approximately 6,994[9] Heliene 72^{M} 370W photovoltaic modules installed at a tilt angle of 20 degrees; 15 CPS 125 kW and 1 CPS 100 kW inverters; two (2) pad mounted switchgear; two (2) 1,000 kVA transformer, and one (1) service interconnection point. The solar arrays will use a ground-mounted racking system, installed on driven posts, to minimize soil disturbance during installation. The entire Facility will be enclosed within a seven (7)-foot tall chain-link security fence.

Electrical connections to existing distribution poles located along Skinner Street (CT 196) will require the installation of approximately seven (7) new utility poles along the existing access road. No utility poles will be located within the Facility.

[8] One Facility will have an output of ±1.0 megawatt while the second will have an output of ±0.975 MW. Combined, the total capacity of the two systems would not exceed 1.975 MW.
[9] The 1.0 MW system will have 3,614 panels while the 0.975 MW system will have 3,380 panels.

3.1.1 Public Health and Safety

The Project is not expected to create any impact with regard to public health or safety issues. The Project will meet or exceed applicable local, state, national and industry health and safety standards and requirements. The Facility will not consume any raw materials, will not produce any by-products and will be unstaffed during normal operating conditions. The Facility will be enclosed by a seven (7)-foot tall chain-link fence. The main entrance to the Facility, located within the northeastern portion of the Project Area, will be gated, limiting access to authorized personnel only. All Town emergency response personnel will be provided access codes to on-site locks. Two (2) secondary gated access points located along the western and eastern fence line will also be installed to provide accesses for maintenance of stormwater management basins.

Overall, the Project will meet or exceed health and safety requirements applicable to electric power generation. Each employee working on the Site will:

- Receive required general and Project specific health and safety training;
- Comply with all health and safety controls as directed by local and state requirements;
- Understand and employ the health and safety plan while on the Project Site;
- Know the location of local emergency care facilities, travel times, ingress and egress routes; and
- Report all unsafe conditions to the construction manager.

Construction equipment will be required to access the Site during normal working hours. Please refer to Appendix E, the *Construction Schedule* and *Construction Work Hours/Days Letter* for detailed information concerning the construction schedule and proposed construction work hours/days. After construction is complete and the Facility (unstaffed) is operable, traffic at the Site will be minimal. It is anticipated that the Facility will require mowing and routine maintenance of the electrical equipment one (1) time per year. Annual maintenance will typically involve two (2) technicians for a day. Any equipment that breaks down will be repaired on an as-needed basis.

The solar modules are designed to absorb incoming solar radiation and minimize reflectivity, such that only a small percentage of incidental light will be reflected off the panels. This incidental light is significantly less reflective than common building materials, such as steel, or the surface

of smooth water. The panels will be tilted up toward the southern sky at a fixed angle of 20 degrees, thereby further reducing reflectivity.

The leading edge of the panels will be approximately thirty-six (36) inches above the existing ground surface, which will provide adequate room for any accumulating snow to "sheet" off. Any production degradation due to snow build-up has already been modeled into the annual system output and performance calculations. At this time, CP EH Solar does not envision requiring any "snow removal" operations; rather, the snow will be allowed to melt or slide off.

3.1.2 Local, State and Federal Land Use Plans

The Project is consistent with state and Federal land-use plans and will support the state's energy policies and strategies by developing a renewable energy resource while not having a substantial adverse environmental effect. Although local land use application processes do not specifically apply to this Project, it has been designed to meet the intent of the local land use regulations, to the extent feasible. The Site lies within the Town's Industrial (I) Zone.

3.1.3 Existing and Future Development

CP EH Solar has entered into two Virtual Net Metering contracts with the Town. The Project's output will be used by the Town and the Town's Board of Education to help offset costs associated with their school district's electrical demands

Once construction is complete, disturbed areas will be seeded to re-establish or enhance permanent cover.

Figure 4, *Proposed Conditions Map*, depicts the Project Area. Project Plans are provided in Appendix D.

3.2 Site Access

There is an existing gravel access drive that originates off Skinner Street (CT196) and extends west into the Site. This drive will be extended approximately 150 feet farther west to access the Facility. The existing access drive and its extension will require minor regrading and gravel resurfacing. A new paved apron will be installed by the property owner at the entrance to Skinner Street (CT196), as part of their existing Connecticut Department of Transportation

Encroachment Permit. Two (2) new pipe culverts will be installed at the locations where the stream (IWC 2) currently crosses the existing access road, each consisting of one (1) 24-inch high-density polyethylene pipes("HDPE"). The new pipe culverts have been sized to handle the 100-year storm event, allowing IWC 2 to pass under the gravel access drive unimpeded and continue on to the Skinner Street closed drainage system. See Figure 4, *Proposed Conditions Map*, Appendix D, *Project Plans*, and *Stormwater Management Report* under separate cover.

Legend

- Site
- Limit of Disturbance
- Hiking Trail
- Stonewall
- Delineated Watercourse
- Watercourse (CTDEEP)
- Hardbottom Crossing
- Culvert
- Delineated Wetland Boundary
- Delineated Wetland Area
- 100ft Upland Review Area
- Wetlands (CTDEEP)
- Solar Modules
- Pavement
- Concrete Pad
- Gravel
- Stormwater Basin
- Treeline Clearing Limit
- Perimeter Fence
- Stormwater Swale
- Stormwater 24" RCP

N W E S

300 150 0 300 Feet

Map Notes:
Base Map Source: CTECO 2019 Aerial Photograph
Map Scale: 1 inch = 300 feet
Map Date: February 2020

Figure 4
Proposed Conditions Map

Proposed Solar Facility
46 Skinner Street
East Hampton, CT

CITRINE

ALL-POINTS TECHNOLOGY CORPORATION

3.3 Habitat and Wildlife

The Project Area will occupy approximately ±14.93 acres, the majority of which is located within Upland Forested habitat while a small portion of the existing developed area will also be used. The solar arrays and gravel/grass surfaces associated with the development of the Project Area will alter the habitats present on the Site, as discussed below. However, as impacts to the Developed habitat type will not result in a significant negative impact to the habitat value of these areas, a discussion is not provided.

3.3.1 Upland Forest

The majority of the Project Area is located within Upland Forested habitat. Of the ±14.27 acres of Upland Forested habitat where tree removal is proposed, ±3.1 acres is located within 'core' forest with the majority of impacts affecting 'edge' forest. A detailed discussion of core forest impacts is provided in *Section 3.4, Core Forest Determination.*

3.3.2 Wetlands

Direct wetland impacts proposed as part of the Project will be limited to the improvement of two existing hardbottom watercourse crossings of the existing access road associated with IWC 2. As previously noted, these hard-bottom crossings consist of focused overland flows that are conveyed over the top of the dirt access road at two (2) separate points. CP EH Solar is proposing to install two (2) culverts to properly convey flows under the access road. These culverts will consist of one (1) 20-foot long 24-inch HDPE (westernmost crossing) and one (1) 25-foot long 24-inch HDPE (easternmost crossing). The installation of these two (2) culverts will substantially improve the condition of these crossings and ultimately protect the streambed which currently experiences regular disturbances to unprotected access. Details of the culvert crossings are depicted in Appendix D, Project Plans (Sheet Number GP-1, Detail 4/DN-2).

Drainage along the access road will also be improved by enhancing existing broad-based dips at regular intervals to break up currently focused drainage, providing further protection of the watercourse and nearby Wetland 2. During construction Haybale check dams will be installed at the outlet points of these broad-based dips to dissipate stormwater velocity and filter any suspended sediments prior to discharging to the watercourse.

CP EH Solar is in the process of preparing and filing a Self-Verification Notification Form with the U.S. Army Corps of Engineers ("Corps") for installation of new culverts. The new culverts will comply with the requirements of the New England District of the Corps *General Permit 19 Stream, River & Brook Crossing* and therefore shall be eligible as a Self-Verification Project. The culvert replacements will also be consistent with those guidelines outlined in the DEEP Inland Fisheries Division Habitat *Conservation and Enhancement Program Stream Crossing Guidelines* document referenced by the Corps including: the tributary watershed to the culvert does not exceed 1 sq. mile, for a crossing constructed using a pipe culvert, the inverts are set such that not less than 25% of the pipe diameter or 12 inches, whichever is less, is set below the streambed elevation; their gradient no steeper than the streambed gradient upstream or downstream of the existing crossing structures; the culvert is backfilled with natural substrate material matching upstream and downstream streambed substrate; the structure, including inlet and outlet protection measures, does not otherwise impede the passage of fish and other aquatic organisms; and, the structure allows for continuous flow of the 50-year frequency storm flows. The culverts will be installed during low/no flow conditions, as determined by the contractor, but at a minimum will include the use of dewatering techniques, as required, (per the DEEP 2002 *Guidelines for Soil and Sediment Control*) to provide temporary flow across the access road during the culvert replacements to prevent the risk of sediment release.

Potential short-term temporary impacts associated with the Project's construction activities will be minimized by the proper installation and maintenance of proposed sedimentation and erosion controls, in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control*. To protect Site wetlands, this Project will maintain a buffer distance (a minimum setback of ±20 feet to Wetland 2, the nearest wetland resource) and developed additional safeguards to avoid unintentional impacts to these resources. No impacts including fencing, grading, or tree clearing is proposed within this 20 foot "non-disturbed zone" or to any adjacent wetland resources. See Appendix F, *Wetland and Eastern Box Turtle Protection Program*.

Post-construction, any potential long-term secondary impacts to wetland resources associated with the operation of this Facility are minimized by the following factors: the development will be unstaffed (generating negligible traffic); using an existing gravel access drive reduces the creation of impervious surfaces; and, treating the majority of the ground beneath the solar arrays with

native grass/vegetation provides ample opportunity for surface water to infiltrate or slow prior to discharge to surrounding resources.

3.3.3 Vernal Pool

During the wetland investigation, which was performed on November 21, 2019, APT assessed all three (3) wetland resource areas for indications of vernal pool resources. Based on a lack of evidence of seasonally flooded areas observed on that date, it does not appear that any *potential* vernal pool breeding habitat exists on the Site.[10] Therefore, the Project will not result in any impacts to vernal pool resources.

3.4 Core Forest Determination

As introduced in Section 2.4, the existing core forest associated with the Site is limited to ±3.3 acres and has been heavily fragmented from adjacent and nearby residential/commercial development, the Airline Trail to the north, and CT Route 16 and Skinner Street (CT 196) to the south and east respectively. As a result, the habitat is not ideal for supporting breeding birds and larger wildlife species that require bigger core forest blocks. These significant fragmentation features have diminished the habitat's value and potential wildlife utilization of the on-Site forested resource. As such, it is not anticipated that the Project will result in a significant negative impact to core forest.

3.5 Rare Species

As previously introduced, a review of the most recent DEEP NDDB mapping revealed the Site is located within an area potentially containing Threatened, Endangered, or Special Concern species and/or critical habitats. While APT's field survey determined that no suitable habitat for timber rattlesnakes (*Crotalus horridus Linnaeus*) appears present at the Site, it does possess marginal habitat to support the eastern box turtle *(Terrapene c. caroline*). The DEEP's November 20, 2019 letter confirmed the presence of eastern box turtle (*Terrapene c. caroline*) in the general area of the Site.

[10] Due to time of year restrictions at the time of the wetland delineation, a formal vernal pool survey was not conducted. Based on observation made at the time of this inspection, a formal vernal pool survey was not deemed necessary

3.5.1 Eastern Box Turtle

DEEP recommended a series of construction-related protection strategies be implemented, including: hiring a qualified herpetologist to be on Site during construction activities to provide awareness/identification training to contractors/workers; establishing exclusion zones to prevent unintentional mortality to migrating eastern box turtles; and, monitoring compliance with these protection measures. As such, a *Wetland and Eastern Box Turtle Protection Program* has been developed for this Project and is provided as Appendix F.

Additionally, CP EH Solar has committed to implementing additional protection strategies by having the bottom of the security fence installed six (6) inches above final grade. This additional protection measure will allow for the unimpeded migration of turtles and any other small wildlife while preventing any such species from being trapped within the fence line. See Appendix D – *Project Plans* for additional fence information.

3.5.2 Northern Long-eared Bat

The Project will result in the removal of a number of trees with greater than three (3) inches DBH.[11] Since tree removal activities can potentially impact NLEB habitat, APT completed a determination of compliance with Section 7 of the Endangered Species Act of 1973 for the Project.

In compliance with the US Fish and Wildlife Service ("USFWS") criteria for assessing NLEB, the Project will not likely result in an adverse effect or incidental take[12] of NLEB and does not require a permit from USFWS. A letter confirming compliance was received by USFWS on January 9, 2020 thus no further consultation with USFWS is required for the proposed activity. A full review of the *Endangered Species Act (ESA) Compliance Determination* is provided in Appendix G, *USFWS Compliance Statement*.

3.6 Water Quality

The Facility will be unstaffed and no potable water uses or sanitary discharges are planned. No liquid fuels are associated with the operations of the Project. Once operative, the stormwater

[11] Suitable NLEB roost habitat includes trees (live, dying, dead, or snag) with a diameter a DBH of three (3) inches or greater.

[12] "Incidental take" is defined by the Endangered Species Act as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." For example, harvesting trees can kill bats that are roosting in the trees, but the purpose of the activity is not to kill bats.

generated by the proposed development will be properly handled and treated in accordance with the 2004 *Connecticut Stormwater Quality Manual*. Therefore, upon its completion the Project will have no adverse environmental effect on wetlands, watercourses or other water resources.

The proposed post-development drainage characteristics of the Site will change minimally. Within the Project Area, there will be an increase in the time of concentration of stormwater discharge due to the tree removal activities and the establishment of grasses. To compensate for this increase, a series of grass-lined stormwater management basins with overflow weirs are proposed along the northern, southwestern and southeastern edges of the Facility. The Project Area that is cleared and grubbed during construction will be stabilized with a low growth seed mix, New England semi-shade grass and forbs mix or equal. The Project has also been designed to meet the current draft of DEEP's *Appendix I, Stormwater Management at Solar Array Construction Projects*.

To safeguard water resources from potential impacts during construction, CP EH Solar is committed to implementing protective measures in the form of a Stormwater Pollution Control Plan ("SWPCP") to be finalized and submitted to the Council, pending approval by DEEP Stormwater Management. The SWPCP will include monitoring of established sedimentation and erosion controls that will be installed and maintained in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control*. CP EH Solar will also apply for a *General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities* from DEEP. Therefore, with the incorporation of the proposed protective measures, stormwater runoff from Project development will not result in an adverse impact to water quality associated with nearby surface water bodies.

3.7 Floodplain Areas

The Project Area is located in an area designated as Zone X, which is defined as an area of minimal flooding, typically above the 500-year flood level. As such, no special considerations or precautions relative to flooding are required for the Project.

3.8 Air Quality

Due to the nature of the Project as a solar energy generating facility, no air emissions will be generated during operations and, therefore, an air permit will not be required.

Temporary, potential, construction-related mobile source emissions will include those associated with construction vehicles and equipment. Any potential air quality impacts related to construction activities can be considered *de minimis*. Such emissions will, nonetheless, be mitigated using available measures, including, *inter alia*, limiting idling times of equipment; proper maintenance of all vehicles and equipment; and, watering/spraying to minimize dust and particulate releases. In addition, all on-site and off-road equipment will meet the latest standards for diesel emissions, as prescribed by the United States Environmental Protection Agency and will consider reducing exhaust emissions by utilizing effective controls.

3.9 Soils and Geology

Once vegetative clearing activities are completed, minimal grading is required for construction of the Project. The majority of the proposed grading activities will occur within portions of the Project Area, just beyond the proposed fence line, for the installation of the stormwater controls. Some additional grading will be required for the improvements associated with the gravel access road. See *Appendix D, Project Plans.*

All exposed soils resulting from construction activities will be properly and promptly treated in accordance with the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control.*

3.10 Farmland Soils

No soils defined as prime, unique, or farmlands of statewide or local importance will be impacted from the Project, as none exist at the Site.

3.11 Historic and Archaeological Resources

No properties or historic standing structures listed on or eligible for listing on the National or State Registers of Historic Places are located on Site. One (1) historic resource listed on the NHRP, the Belltown Historic District, is located northwest and adjacent to the Site.

APT submitted Project and Site historic/cultural information as well as copies of the Phase 1A/1B Cultural Resources Reconnaissance Survey Report to the SHPO for agency review and comment in January of 2020. SHPO responded on February 7, 2019, concurring with the findings of the Phase 1A/1B that no additional archeological investigations of the Project Area are warranted and no historic properties will be affected by the proposed activities.

Copies of the Phase 1A/1B Cultural Resources Reconnaissance Survey Report and the agency's Concurrence Letter are included in Appendix C, *SHPO Correspondence*.

3.12 Scenic and Recreational Areas

No state designated scenic roads or recreational areas will be physically or visually impacted by development of the Project. The abutting Airline State Park Trail that passes to the north, is approximately 10 to 15 feet lower in elevation than the Site and will not be physically or visually impacted by development of the Project.

3.13 Noise

Construction noise is exempted under the Connecticut regulations for the control of noise under RCSA 22a-69-1.8(h).[13] During construction of the Facility, the temporary increase in noise would likely raise localized ambient sound levels immediately surrounding the Project Area. Standard types of construction equipment would be used for the Project. In general, the highest noise level from this type of equipment (e.g., backhoe, bulldozer, crane, trucks, etc.) is approximately 88 dBA at the source.

Once operational, noise from the Project will be minimal and meet applicable DEEP noise standards for a Class A Noise Zones.[14] The Site is located within an industrial area and is abutted by residential and recreational areas. Conservatively, the Site Facility would be considered a Class C (Industrial) noise emitter to Class A (Residential) receptors. As such, it is subject to noise standards of 61dBA during the daytime and 51 dBA at night.

The only noise generating equipment planned at the Facility are the inverters. Based on information provided by specified equipment manufacturers, the selected inverters for the proposed Facility will typically generate sound levels less than 65 dBA, at a distance of 3 meters (less than 10 feet). The closest property line relative to the nearest inverter is approximately 370 feet to the north. Sound reduces with distance and it is anticipated that noise levels from the Project-related equipment will be below 61 dBA at surrounding property lines.

[13] The Town does not currently have noise ordnance guidelines in place.
[14] RCSA 22a-69-3.5. Noise Zone Standards

Inverters are inactive at night. Noise levels at nearby property lines and/or residences should not change from current conditions.

Please refer to the inverter specification sheet provided in Appendix H, *Inverter and Solar Panel Product Information Sheet*.

3.14 Lighting

No exterior lighting is planned for the Facility. There will be some small lighting fixtures within the equipment to aide in maintenance.

3.15 Visibility

The Facility will consist of a total of 6,994 non-reflective solar panels surrounded by a seven (7) foot tall security fence. The proposed electrical interconnection to the existing electrical distribution lines located on Skinner Street (CT 196) will require the installation of approximately seven (7) new utility poles along the existing access drive. No utility poles will be located within the Facility and the new utility poles will be similar to those used on local roadways.

In general, year-round visibility of the proposed Facility will be minimal and confined to areas on the Site immediately surrounding the development. Limited seasonal views, when the leaves are off of the deciduous trees, could extend to abutting properties immediately south of the Facility's limits of disturbance.[15] Any views would be minimized by the Facility's relatively low height, existing topography, and the inclusion of a 35-foot (or greater) buffer of existing mature vegetation surrounding the Facility. No visual impacts to the Airline Trail or the Belltown Historic District are anticipated as separation distances, coupled with existing topography and intervening mature stands of vegetation will prevent such views. These resources are ±100 feet or more away to the north and southeast of the Project.

[15] Nearest residence to southern clearing limits is ±60 feet.

4 Conclusion

As demonstrated in this Environmental Assessment, the Project will comply with the DEEP air and water quality standards. Further, it will not have an undue adverse effect on the existing environment and ecology; nor will it affect the scenic, historic and recreational resources in the vicinity of the Project. Once operative, the Facility will be unstaffed and generate minimal traffic.

Although impacts have been minimized to the greatest extent feasible, the Project will likely result in the removal of approximately fourteen (14) acres of a significantly fragmented forested habitat. Due to this fragmentation and resultant degradation of this habitat, the Project would not result in negative impacts to wildlife.

Visibility of the Project from surrounding areas, including residences, the Airline Trail and Belltown Historic District, is diminished by a combination of the proposed Facility's location, topography and the presence of mature vegetation that serves as a buffer.

Overall, the Project's design minimizes the creation of impervious surfaces. The Project has been designed to adequately handle stormwater runoff through the creation of several stormwater infiltration basins along the northeastern, southeastern and southwestern portions of the Facility. Some Site manipulation (cuts/fills) and regrading will be required to allow for stormwater management basin development and the extension/upgrades to the existing access road but overall the majority of the Project Area will use existing grades for the installation of the solar arrays. To safeguard resources from potential impacts during construction and in accordance with the DEEP's *General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities,* a SWPCP will be developed and implemented. The SWPCP will include provisions for monitoring of construction activities and the establishment of sedimentation and erosion controls that will be installed and maintained throughout construction in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control.*

APPENDIX A

Wetlands Inspection Report

ALL-POINTS TECHNOLOGY CORPORATION

WETLAND INSPECTION

December 7, 2019 **APT Project No.: CT567110**

Prepared For: Citrine Power, LLC
55 Greens Farms Road
Westport, CT 06880
Attn: Cela Sinay-Bernie

Site Address: 46 Skinner Street
East Hampton, Connecticut

Date(s) of Investigation: 11/21/2019

Field Conditions: **Weather:** sunny, mid 40's
Soil Moisture: moist; **Snow:** 0"; **Frost:** 0"

Wetland/Watercourse Delineation Methodology*:

☒Connecticut Inland Wetlands and Watercourses
☐Connecticut Tidal Wetlands
☐Massachusetts Wetlands
☐U.S. Army Corps of Engineers

Municipal Upland Review Area/Buffer Zone:
Wetlands: 100 feet
Watercourses: 100 feet

The wetlands inspection was performed by†:

Matthew Gustafson, Registered Soil Scientist

Enclosures: Wetland Delineation Field Forms & Wetland Inspection Map

This report is provided as a brief summary of findings from APT's wetland investigation of the referenced Study Area that consists of proposed development activities and areas generally within 200 feet.‡ If applicable, APT is available to provide a more comprehensive wetland impact analysis upon receipt of site plans depicting the proposed development activities and surveyed location of identified wetland and watercourse resources.

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* *Wetlands and watercourses were delineated in accordance with applicable local, state and federal statutes, regulations and guidance.*

† *All established wetlands boundary lines are subject to change until officially adopted by local, state, or federal regulatory agencies.*

‡ *APT has relied upon the accuracy of information provided by Citrine Power, LLC and its contractors regarding proposed solar facility and access road/utility easement locations for identifying wetlands and watercourses within the study area.*

Attachments

- Wetland Delineation Field Forms
- Wetland Inspection Map

Wetland Delineation Field Form

Wetland I.D.:	Wetland 1	
Flag #'s:	WF 1-01 to 1-09 and 1-20 to 1-24	
Flag Location Method:	Site Sketch ☒	GPS (sub-meter) located ☒

WETLAND HYDROLOGY:

NONTIDAL ☒

Intermittently Flooded ☐	Artificially Flooded ☐	Permanently Flooded ☐
Semipermanently Flooded ☐	Seasonally Flooded ☐	Temporarily Flooded ☐
Permanently Saturated ☐	Seasonally Saturated – seepage ☒	Seasonally Saturated - perched ☐
Comments: Wetland 1 consists of two headwater seep areas that extend onto the subject property with seasonally saturated hydrology resulting from seepage. One seep 'finger' has been historically altered through construction of a drainage conveyance feature that extends to the Airline Trail to the north.		

TIDAL ☐

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Irregularly Flooded ☐		
Comments: None		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☐	Palustrine ☒
Lacustrine ☐	Marine ☐	
Comments: None		

CLASS:

Emergent ☐	Scrub-shrub ☐	Forested ☒
Open Water ☐	Disturbed ☐	Wet Meadow ☐
Comments: Headwater wetlands are entirely forested with mature hardwoods.		

WATERCOURSE TYPE:

Perennial ☐	Intermittent ☐	Tidal ☐
Watercourse Name: None		
Comments: None		

Wetland Delineation Field Form (Cont.)

SPECIAL AQUATIC HABITAT:

Vernal Pool Yes ☐ No ☒ Potential ☐	Other ☐
Vernal Pool Habitat Type: None	
Comments: None	

SOILS:

Are field identified soils consistent with NRCS mapped soils?	Yes ☐	No ☐
If no, describe field identified soils		

DOMINANT PLANTS:

Red Maple (Acer rubrum)	Spicebush (Lindera benzoin)
Sphagnum moss (Sphagnum spp.)	Japanese Barberry* (Berberis thunbergii)
Greenbrier (Smilax rotundifolia)	Cinnamon Fern (Osmunda cinnamomea)
Highbush Blueberry (Vaccinium corymbosum)	

* denotes Connecticut Invasive Species Council invasive plant species

GENERAL COMMENTS:

Citrine Power is proposing the construction of a solar energy generation facility to be generally located in the central and southern portions of the forested hillside property off Skinner Street in East Hampton, CT. Three wetland resources have been identified within proximity to the proposed development area including the use of a recently constructed gravel road that provides access to the interior of the property from Skinner Street. Wetland areas are located throughout the property with Wetland 1 located to the far northwest, Wetland 2 located in the northcentral portion of the property, which drains south and east through the middle of the property out to Skinner Street, and Wetland 3 located along the eastern property boundary. Access to the solar facility will require improving two existing hard bottom crossings within IWC 2. As such, it is recommended that a wetland impact analysis be performed under separate cover once the site plan for the proposed development has been finalized in order to evaluate possible impacts to these nearby wetland resources.

Wetland 1 consists of two 'fingers' of a larger headwater seep wetland system that occurs along the western property boundary and off site. This wetland is located within narrow seep outbreaks that drain west away from the subject property within narrow seep channels that lack a defined bank or channel. These wetland areas are entirely forested with sparse understory vegetation. The northern seep (WF 1-20 to 1-25) consists of an artificially formed drainage swale that was constructed to provide drainage connectivity to the Airline Trail that abuts the northern property boundary.

Wetland Delineation Field Form

Wetland I.D.:	Wetland 2	
Flag #'s:	WF 2-01 to 2-31 and IWC 2-1 to 2-14	
Flag Location Method:	Site Sketch ☒	GPS (sub-meter) located ☒

WETLAND HYDROLOGY:

NONTIDAL ☒

Intermittently Flooded ☐	Artificially Flooded ☐	Permanently Flooded ☐
Semipermanently Flooded ☐	Seasonally Flooded ☐	Temporarily Flooded ☐
Permanently Saturated ☐	Seasonally Saturated – seepage ☒	Seasonally Saturated - perched ☐
Comments: Wetland 2 consists of a broad hillside seep system with seasonal saturation and an associated drainage swale that contains artificial saturation.		

TIDAL ☐

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Irregularly Flooded ☐		
Comments: None		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☐	Palustrine ☒
Lacustrine ☐	Marine ☐	
Comments: None		

CLASS:

Emergent ☒	Scrub-shrub ☒	Forested ☒
Open Water ☐	Disturbed ☒	Wet Meadow ☐
Comments: This wetland consists of complexes of mature hardwood forest associated with the core wetland area while the constructed drainage swale acting as an intermittent watercourse is dominated by emergent and scrub/shrub vegetation as a result of historic and regular disturbances.		

WATERCOURSE TYPE:

Perennial ☐	Intermittent ☒	Tidal ☐
Watercourse Name: Unnamed		
Comments: A constructed drainage swale the provides conveyance from Wetland 2 is acting as an intermittent watercourse draining from north to south/southeast. The intermittent watercourse is 1 to 3 feet wide with a sandy/stone bottom. This watercourse converges with IWC 3 (which conveys flows from Wetland 3) on an adjacent property and into a catch basin that is connected to the Skinner Street closed drainage system. No significant flows were noted at the time of inspection, with small pockets of inundation present throughout the watercourse and evidence of scour and detritus accumulation present.		

Wetland Delineation Field Form (Cont.)

SPECIAL AQUATIC HABITAT:

Vernal Pool Yes ☐ No ☒ Potential ☐	Other ☐
Vernal Pool Habitat Type: None	
Comments: None	

SOILS:

Are field identified soils consistent with NRCS mapped soils?	Yes ☒	No ☐
If no, describe field identified soils		

DOMINANT PLANTS:

Green Bulrush (Scirpus atrovirens)	Soft Rush (Juncus effuses)
Sphagnum moss (Sphagnum spp.)	Steeplebush (Spiraea tomentosa)
Sweet Pepperbush (Clethera alnifolia)	Red Maple (Acer rubrum)
Highbush Blueberry (Vaccinium corymbosum)	Sphagnum moss (Sphagnum spp.)
White Oak (Quercus alba)	

* denotes Connecticut Invasive Species Council invasive plant species

GENERAL COMMENTS:

Citrine Power is proposing the construction of a solar energy generation facility to be generally located in the central and southern portions of the forested hillside property off Skinner Street in East Hampton, CT. Three wetland resources have been identified within proximity to the proposed development area including the use of a recently constructed gravel road that provides access to the interior of the property from Skinner Street. Wetland areas are located throughout the property with Wetland 1 located to the far northwest, Wetland 2 located in the northcentral portion of the property, which drains south and east through the middle of the property out to Skinner Street, and Wetland 3 located along the eastern property boundary. Access to the solar facility will require improving two existing hard bottom crossings within IWC 2. As such, it is recommended that a wetland impact analysis be performed under separate cover once the site plan for the proposed development has been finalized in order to evaluate possible impacts to these nearby wetland resources.

Wetland 2 consists of a wetland seep system that is located in the northcentral portion of the subject property. This wetland drains southeast to a low point where a drainage swale was constructed to convey drainage from this wetland along the south side of the existing access road and out to the Skinner Street closed drainage system. The drainage swale/intermittent watercourse feature currently crosses the access road at two locations via hard bottom crossings.

Wetland Delineation Field Form

Wetland I.D.:	Wetland 3	
Flag #'s:	WF 3-01 to 3-19 and IWC 3-1 to 3-3	
Flag Location Method:	Site Sketch ☒	GPS (sub-meter) located ☒

WETLAND HYDROLOGY:

NONTIDAL ☒

Intermittently Flooded ☐	Artificially Flooded ☐	Permanently Flooded ☐
Semipermanently Flooded ☐	Seasonally Flooded ☒	Temporarily Flooded ☐
Permanently Saturated ☐	Seasonally Saturated – seepage ☒	Seasonally Saturated - perched ☐
Comments: Wetland 3 consists of a very stony hillside seep system with seasonal saturation and shallow seasonal flooding (<2 inches based on water staining on tree trunks).		

TIDAL ☐

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Irregularly Flooded ☐		
Comments: None		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☐	Palustrine ☒
Lacustrine ☐	Marine ☐	
Comments: None		

CLASS:

Emergent ☐	Scrub-shrub ☐	Forested ☒
Open Water ☐	Disturbed ☐	Wet Meadow ☐
Comments: This seep system is entirely dominated by mature hardwood forest.		

WATERCOURSE TYPE:

Perennial ☐	Intermittent ☒	Tidal ☐
Watercourse Name: Unnamed		
Comments: The wetland drains to the southern terminus of the wetland system which discharges into a narrow intermittent watercourse. The watercourse consists of a 1 to 2 foot wide channel with a sandy/stone bottom.		

Wetland Delineation Field Form (Cont.)

SPECIAL AQUATIC HABITAT:

Vernal Pool Yes ☐ No ☒ Potential ☐	Other ☐
Vernal Pool Habitat Type: None	
Comments: None	

SOILS:

Are field identified soils consistent with NRCS mapped soils?	Yes ☒	No ☐
If no, describe field identified soils		

DOMINANT PLANTS:

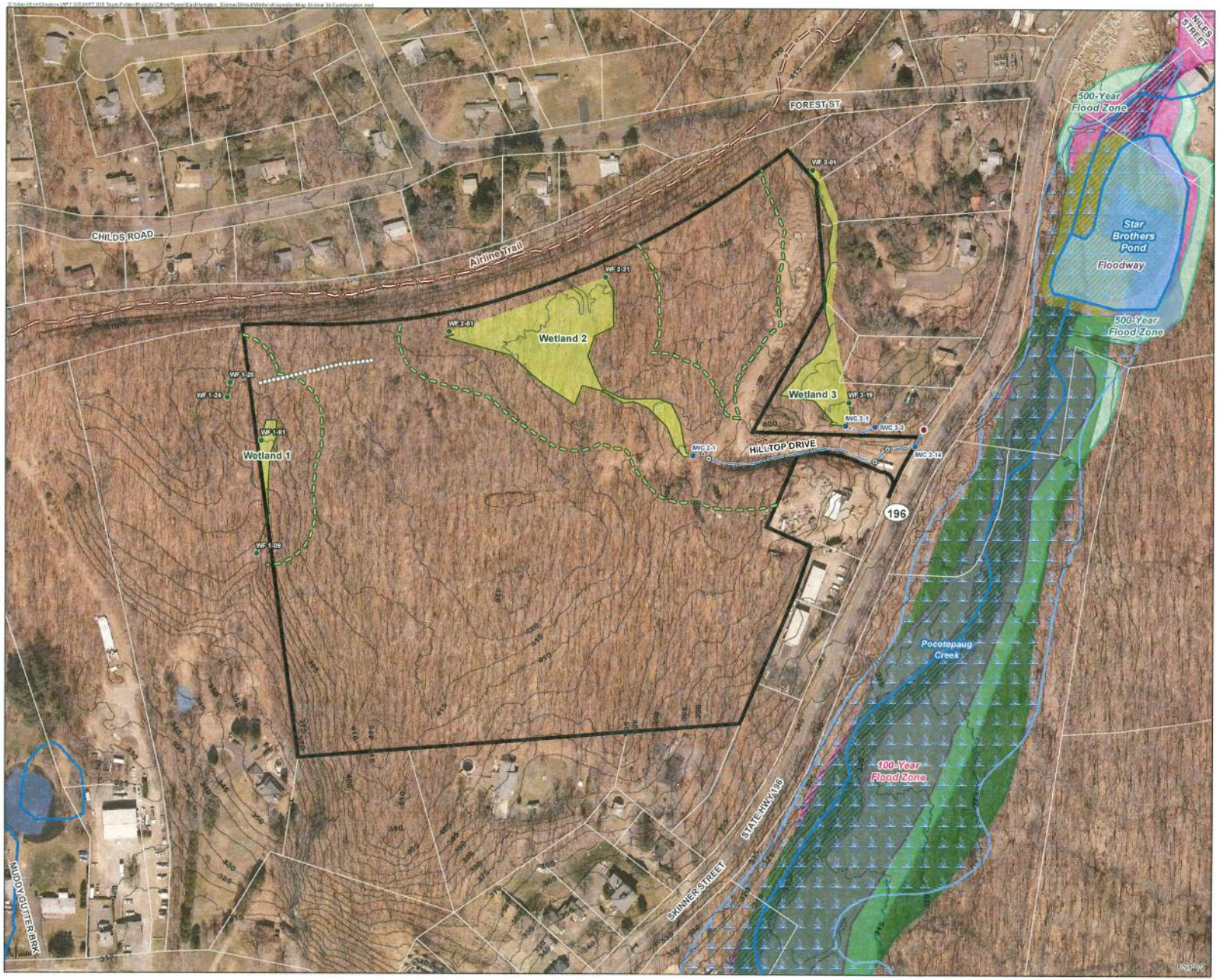
Red Maple (Acer rubrum)	Highbush Blueberry (Vaccinium corymbosum)
Spicebush (Lindera benzoin)	Sweet Pepperbush (Clethera alnifolia)
White Oak (Quercus alba)	

* denotes Connecticut Invasive Species Council invasive plant species

GENERAL COMMENTS:

Citrine Power is proposing the construction of a solar energy generation facility to be generally located in the central and southern portions of the forested hillside property off Skinner Street in East Hampton, CT. Three wetland resources have been identified within proximity to the proposed development area including the use of a recently constructed gravel road that provides access to the interior of the property from Skinner Street. Wetland areas are located throughout the property with Wetland 1 located to the far northwest, Wetland 2 located in the northcentral portion of the property, which drains south and east through the middle of the property out to Skinner Street, and Wetland 3 located along the eastern property boundary. Access to the solar facility will require improving two existing hard bottom crossings within IWC 2. As such, it is recommended that a wetland impact analysis be performed under separate cover once the site plan for the proposed development has been finalized in order to evaluate possible impacts to these nearby wetland resources.

Wetland 3 consists of a forested hillside seep system that generally drains south along the eastern property boundary. This system consists of shallow hummock/hollow topography with diffuse flows until the southern end of the wetland where it pinches down to a topographic narrow discharge as an intermittent watercourse feature. This system eventually converges with the outfall from Wetland 2/IWC 2 on an adjacent property and discharges to a catch basin that is part of the Skinner Street closed drainage system.



Wetland Inspection Map
Proposed Solar Facility
46 Skinner Street
East Hampton, CT

CITRINE

Legend

- Site
- Approximate Parcel Boundary
- Delineated Wetland Flag
- Delineated Wetland Boundary
- Delineated Wetland Area
- 100ft Upland Review Area
- Delineated Watercourse Flag
- Delineated Watercourse
- Hardbottom Crossing
- Culvert
- Stonewall
- Hiking Trail
- 5' Contours
- Wetlands (CTDEEP)
- Open Water (CTDEEP)
- Watercourse (CTDEEP)

Bioscience/CT NWI Wetland Functions 2010

- Freshwater Forested/Shrub Wetland

FEMA Flood Zones

- 100-Year Flood Zone
- 500-Year Flood Zone
- Floodway

N, W, E, S

200 100 0 200 Feet

1 inch = 200 feet

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Map Sources:

Ortho Base Map: State of Connecticut 2016 aerial imagery provided by CTECO Map Service

Elevation contours derived from 2016 LiDAR data provided by CTECO

Wetland Field Delineation by:
Registered Soil Scientist, Matthew Gustafson, APT; Date: 11/21/2019

CTDEEP's data library (http://www.ct.gov/deep)
Data layers are maintained and updated by CTDEEP and represent the most recent publications.

NWI+ wetland data provided by CTECO

Flood Zones obtained from FEMA National Flood Hazard Layer(NFHL) dataset.

Map Date: December 2019

APPENDIX B

DEEP NDDB CORRESPONDENCE

Connecticut Department of Energy & Environmental Protection
Bureau of Natural Resources
Wildlife Division

CPPU USE ONLY
App #:
Doc #:
Check #: No fee required
Program: Natural Diversity Database Endangered Species
Hardcopy _____ Electronic _____

Request for Natural Diversity Data Base (NDDB) State Listed Species Review

Please complete this form in accordance with the instructions (DEEP-INST-007) to ensure proper handling of your request.
There are no fees associated with NDDB Reviews.

Part I: Preliminary Screening & Request Type

Before submitting this request, you must review the most current Natural Diversity Data Base "State and Federal Listed Species and Significant Natural Communities Maps" found on the DEEP website. These maps are updated twice a year, usually in June and December.

Does your site, including all affected areas, fall in an NDDB Area according to the map instructions:

☒ Yes ☐ No **Enter the date** of the map reviewed for pre-screening: **June 2019**

This form is being submitted for a :

☒ *New* NDDB request ☐ *Renewal/Extension* of a NDDB Request, ***without*** *modifications and within* ***two years*** *of issued NDDB determination* (no attachments required) [*CPPU Use Only - NDDB-Listed Species Determination #* 1736]	☐ *New* **Safe Harbor Determination** (optional) must be associated with an application for a GP for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities ☐ *Renewal/Extension* of an existing Safe Harbor Determination ☐ With modifications ☐ Without modifications (no attachments required) [*CPPU Use Only - NDDB-Safe Harbor Determination #* 1736]
Enter NDDB Determination Number for Renewal/Extension:	Enter Safe Harbor Determination Number for Renewal/Extension:

Part II: Requester Information

If the requester is a corporation, limited liability company, limited partnership, limited liability partnership, or a statutory trust, it must be registered with the Secretary of State. If applicable, the name shall be stated **exactly as it is registered with the Secretary of State. Please note, for those entities registered with the Secretary of State, the registered name will be the name used by DEEP. This information can be accessed at the Secretary of the State's database CONCORD. (www.concord-sots.ct.gov/CONCORD/index.jsp)*

If the requester is an individual, provide the legal name (include suffix) in the following format: First Name; Middle Initial; Last Name; Suffix (Jr, Sr., II, III, etc.).

If there are any changes or corrections to your company/facility or individual mailing or billing address or contact information, please complete and submit the Request to Change company/Individual Information to the address indicated on the form.

1. Requester*

Company Name: **Citrine Power, LLC**

Contact Name: **Cela Sinay-Bernie, Managing Parner**

Address: **55 Greens Farms Road**

City/Town: **Westport** State: **CT** Zip Code: **06880**

Business Phone: **203.557.5554** ext.

E-mail: **cela@citrinepower.com

**By providing this email address you are agreeing to receive official correspondence from the department, at this electronic address, concerning this request. Please remember to check your security settings to be sure you can receive emails from "ct.gov" addresses. Also, please notify the department if your e-mail address changes

a) Requester can best be described as:

☐ Individual ☐ Federal Agency ☐ State agency ☐ Municipality ☐ Tribal

☒ *business entity (* if a business entity complete i through iii):

i) Check type ☐ corporation ☒ limited liability company ☐ limited partnership
☐ limited liability partnership ☐ statutory trust ☐ Other:

ii) Provide Secretary of the State Business ID #: This information can be accessed at the Secretary of the State's database (CONCORD). (www.concord-sots.ct.gov/CONCORD/index.jsp)

iii) ☒ Check here if your business is **NOT** registered with the Secretary of State's office.

b) Acting as (Affiliation), pick one:

☐ Property owner ☐ Consultant ☐ Engineer ☐ Facility owner ☒ Applicant

☐ Biologist ☐ Pesticide Applicator ☐ Other representative:

2. List Primary Contact to receive Natural Diversity Data Base correspondence and inquiries, if different from requester.

Company Name: **All-Points Technology Corporation, P.C.**

Contact Person: **Dean Gustafson** Title: **Senior Biologist**

Mailing Address: **3 Saddlebrook Drive**

City/Town: **Killingworth** State: **CT** Zip Code: **06419**

Business Phone: **860.552.2033** ext.

E-mail: **dgustafson@allpointstech.com

Part III: Site Information

This request can only be completed for one site. A separate request must be filed for each additional site.

1. **SITE NAME AND LOCATION**

Site Name or Project Name: **East Hampton Solar Facility**

Town(s): **East Hampton**

Street Address or Location Description:
46 Skinner Street

Size in acres, or site dimensions: **±27 acres**

Latitude and longitude of the center of the site in decimal degrees (e.g., 41.23456 -71.68574):

Latitude: **41.568759°** Longitude: **-72.508615°**

Method of coordinate determination (check one):

☐ GPS ☒ Photo interpolation using CTECO map viewer ☐ Other (specify):

2a. Describe the current land use and land cover of the site.

The Site is comprised of an undeveloped property that is mainly forested. Some construction activities have occurred in the eastern portion of the property, including the construction of a gravel road providing access into the interior of the property from Skinner Street. Forested wetlands are located in the northwestern portion of the property and along the northeastern property boundary.

b. Check all that apply and enter the size in acres or % of area in the space after each checked category.

☐ Industrial/Commercial _____	☐ Residential _____	☒ Forest 90%
☒ Wetland 15%	☐ Field/grassland _____	☐ Agricultural _____
☐ Water _____	☐ Utility Right-of-way _____	
☐ Transportation Right-of-way _____	☐ Other (specify): _____	

Part IV: Project Information

1. **PROJECT TYPE:**

Choose Project Type: Other , If other describe: **Large Scale Commercial Solar Facility**

2. Is the subject activity limited to the maintenance, repair, or improvement of an existing structure within the existing footprint? ☐ Yes ☒ No If yes, explain.

Part IV: Project Information (continued)

3. Give a detailed description of the activity which is the subject of this request and describe the methods and equipment that will be used. Include a description of steps that will be taken to minimize impacts to any known listed species.

   Citrine Power, LLC proposes the installation of a large-scale commercial solar-based electric generating facility consisting of photovoltaic (PV) module technology. Upon its completion, the facility would occupy approximately six (6) acres of the property. The facility would be comprised of PV modules along with associated electrical equipment (e.g, inverters, transformers, etc.) and would use a ground mounted, pile-driven racking system; some rock anchoring is anticipated due to the shallow depths to bedrock in portions of the property.

   Typical equipment anticipated to be used include trucks of varying sizes, excavators, bulldozers, forklifts, and other equipment necessary for the clearing of vegetation, installation of gravel access drive, movement of materials, installation of racking foundation system and solar panels, electrical conduits and limited grading for the solar array development footprint.

   Erosion control measures will follow the CTDEEP 2002 Connecticut Guidelines for Soil Erosion and Sediment Control and stormwater will be treated in accordance with the CTDEEP 2004 Connecticut Stormwater Quality Manual.

   Eastern box turtle protection measures recommended by Dennis Quinn, refer to attached October 2019 report, will be implemented to avoid any incidental impact to this Special Concern Species.

4. If this is a renewal or extension of an existing Safe Harbor request *with* modifications, explain what about the project has changed.

   N/A

5. Provide a contact for questions about the project details if different from Part II primary contact.

   Name: **N/A**

   Phone:

   E-mail:

Part V: Request Requirements and Associated Application Types

Check *one* box from either Group 1, Group 2 *or* Group 3, indicating the appropriate category for this request.

Group 1. If you check one of these boxes, complete Parts I – VII of this form and submit the required attachments A and B.

- ☐ Preliminary screening was negative but an NDDB review is still requested
- ☐ Request regards a municipally regulated or unregulated activity (no state permit/certificate needed)
- ☐ Request regards a preliminary site assessment or project feasibility study
- ☐ Request relates to land acquisition or protection
- ☐ Request is associated with a *renewal* of an existing permit or authorization, with no modifications

Group 2. If you check one of these boxes, complete Parts I – VII of this form and submit required attachments A, B, *and* C.

- ☒ Request is associated with a *new* state or federal permit or authorization application or registration
- ☐ Request is associated with modification of an existing permit or other authorization
- ☐ Request is associated with a permit enforcement action
- ☐ Request regards site management or planning, requiring detailed species recommendations
- ☐ Request regards a state funded project, state agency activity, or CEPA request

☐ **Group 3.** If you are requesting a **Safe Harbor Determination**, complete Parts I-VII and submit required attachments A, B, and D. Safe Harbor determinations can only be requested if you are applying for a GP for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

If you are filing this request as part of a state or federal permit application(s) enter the application information below.

Permitting Agency and Application Name(s):
Connecticut Siting Council, Petition for a Declaratory Ruling & CTDEEP Construction Stormwater General Permit

Related State DEEP Permit Number(s), if applicable: _____

State DEEP Enforcement Action Number, if applicable: _____

State DEEP Permit Analyst(s)/Engineer(s), if known: _____

Is this request related to a previously submitted NDDB request? ☐ Yes ☒ No

If yes, provide the previous NDDB Determination Number(s), if known: _____

Part VI: Supporting Documents

Check each attachment submitted as verification that *all* applicable attachments have been supplied with this request form. Label each attachment as indicated in this part (e.g., Attachment A, etc.) and be sure to include the requester's name, site name and the date. **Please note that Attachments A and B are required for all new requests and Safe Harbor renewals/extensions with modifications.** Renewals/Extensions with no modifications do not need to submit any attachments. Attachments C and D are supplied at the end of this form.

☒ Attachment A:	**Overview Map:** an 8 1/2" X 11" print/copy of the relevant portion of a USGS Topographic Quadrangle Map clearly indicating the exact location of the site.
☒ Attachment B:	**Detailed Site Map:** fine scaled map showing site boundary and area of work details on aerial imagery with relevant landmarks labeled. (Site and work boundaries in GIS [ESRI ArcView shapefile, in NAD83, State Plane, feet] format can be substituted for detailed maps, see instruction document)
☒ Attachment C:	**Supplemental Information, Group 2 requirement (attached, DEEP-APP-007C)** ☒ Section i: Supplemental Site Information and supporting documents ☒ Section ii: Supplemental Project Information and supporting documents
☐ Attachment D:	**Safe Harbor Report Requirements, Group 3 (attached, DEEP-APP-007D)**

Part VII: Requester Certification

The requester *and* the individual(s) responsible for actually preparing the request must sign this part. A request will be considered incomplete unless all required signatures are provided.

"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 the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief."

Signature of Requester (a typed name will substitute for a handwritten signature)	**November 5, 2019** Date
Cela Sinay-Bernie, Citrine Power, LLC Name of Requester (print or type)	**Managing Partner** Title (if applicable)
Signature of Preparer (if different than above)	**November 5, 2019** Date
Dean Gustafson, All-Points Techology Corp., P.C. Name of Preparer (print or type)	**Senior Biologist** Title (if applicable)

Note: Please submit the completed Request Form and all Supporting Documents to:

CENTRAL PERMIT PROCESSING UNIT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

Or email request to: **deep.nddbrequest@ct.gov**

Attachment C: Supplemental Information, Group 2 requirement

Section i: Supplemental Site Information

1. **Existing Conditions**

   Describe all natural and man-made features including wetlands, watercourses, fish and wildlife habitat, floodplains and any existing structures potentially affected by the subject activity. Such features should be depicted and labeled on the site plan that must be submitted. Photographs of current site conditions may be helpful to reviewers.

   The proposed solar facility will be located within a forested upland area that will require approximately 7 acres of tree clearing. No wetlands are anticipated to be directly impacted by the proposed development. Proper erosion and sedimentation controls will be employed to avoid sediment discharge to nearby wetland resources.

   ☒ **Site Photographs (optional) attached**

   ☒ **Site Plan/sketch of existing conditions attached**

2. **Biological Surveys**

   Has a biologist visited the site and conducted a biological survey to determine the presence of any endangered, threatened or special concern species ☒ Yes ☐ No

   If yes, complete the following questions and submit any reports of biological surveys, documentation of the biologist's qualifications, and any NDDB survey forms.

   Biologist(s) name: **Dennis Quinn**

   Habitat and/or species targeted by survey: **Crotalis horridus & Terrapene carolina carolina**

   Dates when surveys were conducted: **October 24, 2019**

   ☒ **Reports of biological surveys attached**

   ☒ **Documentation of biologist's qualifications attached**

   ☐ **NDDB Survey forms for any listed species observations attached**

Section ii: Supplemental Project Information

1. Provide a schedule for all phases of the project including the year, the month and/or season that the proposed activity will be initiated and the duration of the activity.

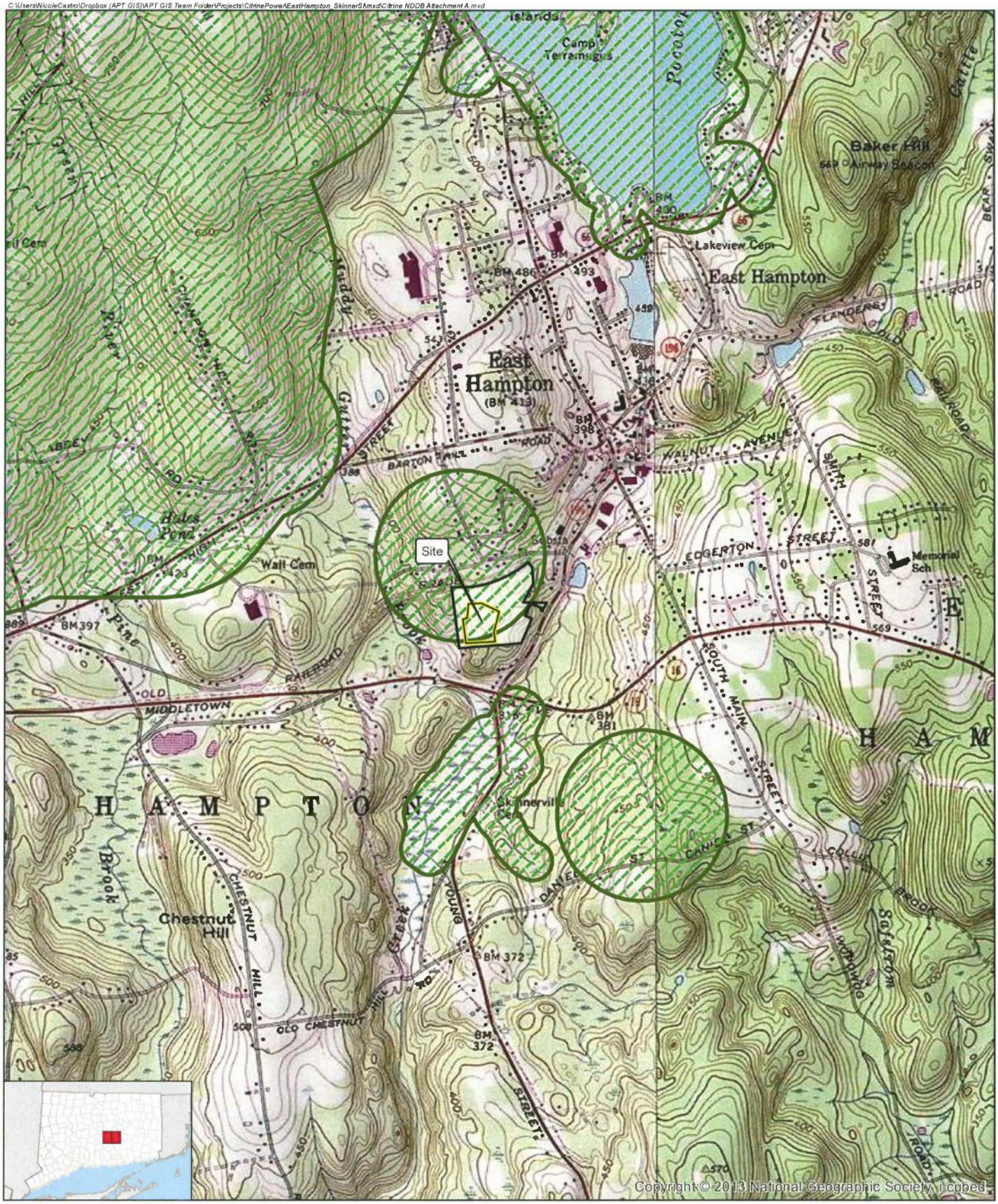
   The proposed construction project is anticipated to extend over a period of 6 to 9 months. Construction would start once approval is granted by the Connecticut Siting Council, DEEP and other reviewing agencies.

2. Describe and quantify the proposed changes to existing conditions and describe any on-site or off-site impacts. In addition, provide an annotated site plan detailing the areas of impact and proposed changes to existing conditions.

   Approximately 7 acres of forest clearing will be required for the solar facility and to avoid shading effects on the solar panels. Minor grading of soils will also be required although no significant cuts or fills are anticipated. No significant grading of soils is required for the solar facility. No direct impact to nearby wetland resources would result from the proposed solar facility.

   ☐ **Annotated Site Plan attached**

C:\Users\NicoleCastro\Dropbox (APT GIS)\APT GIS Team Folder\Projects\CitrinePowerEastHampton_SkinnerSt\mxd\Citrine NDDB Attachment A.mxd



Legend

- Site
- Approximate Project Area
- Natural Diversity Database (June 2019)

Attachment A:
Overview Map

Proposed Solar Facility
46 Skinner Street
East Hampton, CT

CITRINE

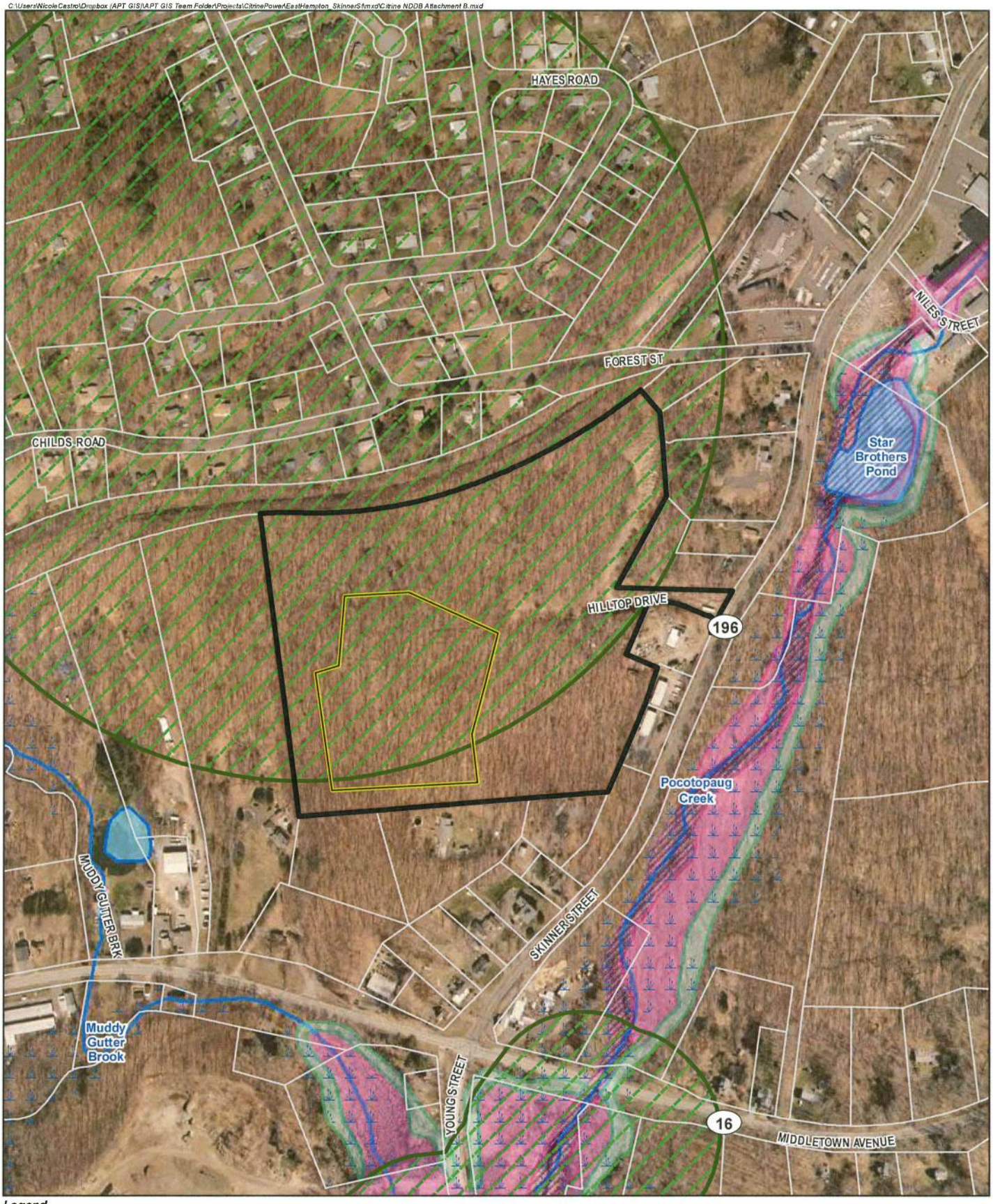
ALL-POINTS TECHNOLOGY CORPORATION

Map Notes:
Base Map Source: USGS 7.5 Minute Topographic Quadrangle Maps, Middle Haddam and Moodus, CT (1984)
Map Scale: 1:24,000
Map Date: October 2019

N W E S

1,000 500 0 1,000 Feet

C:\Users\NicoleCastro\Dropbox (APT GIS)\APT GIS Team Folder\Projects\CitrinePowerEastHampton_Skinner\Smxd\Citrine NDDB Attachment B.mxd



Legend

- Site
- Approximate Project Area
- Natural Diversity Database (June 2019)
- Approximate Parcel Boundary
- Town Line
- CTDEEP Wetland
- 100-Year Flood Zone
- 500-Year Flood Zone
- Floodway

Attachment B: Detailed Site Map

Proposed Solar Facility
46 Skinner Street
East Hampton, CT

CITRINE

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N
W E
S

400 200 0 400
Feet

Map Notes:
Base Map Source: 2016 Aerial Photograph (CTECO)
Map Scale: 1 inch = 400 feet
Map Date: October 2019

ALL-POINTS TECHNOLOGY CORPORATION

PHOTO DOCUMENTATION
Citrine Power East Hampton Solar Facility
46 Skinner Road, East Hampton, CT
Photos taken on October 24, 2019 by D. Quinn

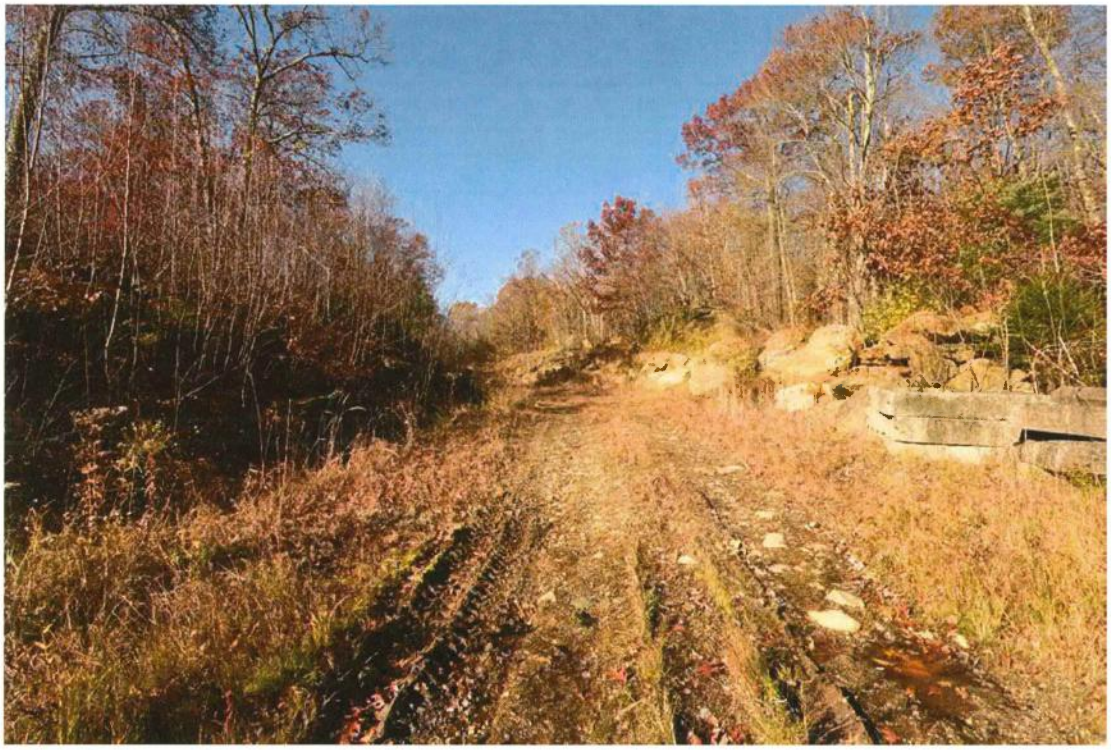

Photo 1: Access road entrance looking west from Skinner St into subject property, showing early successional habitat flanking rock cut exposed during previous construction activities.

Photo 2: Access road, photo looking east toward Skinner St out of subject property, showing rock cut on the north side of access road exposed during previous construction activities.

Photo 3: Access road, photo looking east toward Skinner St out of subject property, showing rock cut on the south side of access road exposed during previous construction activities.

Photo 4: Top of access road, photo looking west from Skinner St into forested area of subject property.

Photo 5: Forested habitat of the subject property where construction of the solar facility is proposed.

Photo 6: Forested habitat of the subject property where construction of the solar facility is proposed.

Timber Rattlesnake and Eastern Box Turtle Habitat Assessment
Proposed Solar Facility - 46 Skinner Street
East Hampton, Connecticut

Prepared by: Dennis P. Quinn
October 2019

Background:

Timber Rattlesnake:

The core distribution and strong-hold for the timber rattlesnake in Connecticut is restricted to a small number of populations located in the northwest highlands and uplands east of the Connecticut River. They favor remote mountainous terrain characterized by steep ledges and associated rock slides in deciduous and mixed deciduous forests, over-wintering in communal den sites that typically occur on steep forested ledges. Gravid females congregate in sparsely vegetated open canopy ledges strewn with large rock slabs. Once widely distributed in Connecticut the timber rattlesnake is now listed as Endangered under Connecticut's Endangered Species Act and as Most Important in Connecticut's Wildlife Action Plan for Species of Greatest Conservation Need (CT DEEP 2015).

Connecticut's timber rattlesnake populations have been drastically reduced since colonial settlement through the combined impacts of bounties, illegal collection, quarrying, and habitat fragmentation (Klemens et al. *in press*). As a long-lived reptile with delayed sexual maturity and low fecundity, the timber rattlesnake is highly vulnerable to long-term population declines resulting from adult mortality, both from collection at the den sites, but also through road mortality, as males of this species move several miles from denning sites. Conservation challenges facing many of the remaining rattlesnake populations and include; persistent illegal collection and road mortality, habitat loss, and emerging diseases including Snake Fungal Disease (SFD), caused by *Ophidiomyces ophiodiicola*, the presence of which has been confirmed at several sites in the state.

Eastern Box Turtle:

Eastern box turtles (*Terrapene c. carolina*) reach their north-eastern range limit in Connecticut where they favor low-lying regions of the State below 500 feet (Klemens et al. *in press*). Once abundant and widely distributed in Connecticut, the eastern box turtle is now listed as a species of Special Concern under Connecticut's Endangered Species Act and as Very Important in Connecticut's Wildlife Action Plan for Species of Greatest Conservation Need (CT DEEP 2015). Over the past few decades eastern box turtles have been experiencing a rapid decline throughout their range. These declines are often attributed to habitat destruction, fragmentation, degradation, alteration and over exploitation for the commercial pet trade. These impacts are compounded by the box turtle's delayed sexual maturity (typically 15 years in CT), low reproductive potential (one clutch of approximately 6 eggs every one to two years), and high nest and hatchling depredation rates.

Box turtles are the only fully terrestrial turtle species in Connecticut, using a mosaic of habitats seasonally. During the spring, box turtles prefer early and late successional habitats, but by late summer move into shadier and cooler upland forests. Hibernacula locations of adults are generally reported to occur within forests (Quinn 2008). Eastern box turtles are considered to be faithful to their home ranges

from year to year, with some excursions beyond to look for mates or to nest (Dodd 2001). For terrestrial turtles, the size of the home range is inversely related to the quality of the home range as determined by food availability, protection, nesting sites, access to mates (Stickel, 1950), habitat structure (Dodd, 2001), and age (Schwartz and Swartz 1991). Average home-range sizes and distances moved have been calculated in two studies representing three box turtle populations in Connecticut (Quinn and Gruner, 2008 and Quinn, 2008). Based on the results of the fore mentioned box turtle studies (n = 38) had average home-ranges of 12.23 acres, ranging from 0.98 to 40.03 acres, with an average straight line movement of 1,230.31 feet (maximum 3,444.90 feet) (Quinn et al., 2017 and Quinn, 2008).

Results:

General Site Characteristics:

The proposed solar facility located at 46 Skinner Street in East Hampton, CT is known to occur within the geographic range of both the eastern box turtle and timber rattlesnake. On October 24, 2019 a field assessment was conducted for both species to determine if any suitable habitat occurs within the subject property. The property is comprised of mixed oak-beech forest with an understory of predominately huckleberry. A small amount of early successional habitat flanks the access road on the eastern side of the property. Overall the site topography is characteristically flat throughout, with very little naturally exposed rock. A small amount of rock, exposed during previous construction activities at the property, flanks both sides of the access road.

Timber Rattlesnake:

In reviewing the most recent distributional and radio-telemetry data for timber rattlesnakes, no occurrences have been reported within approximately 1.5 miles of the proposed project site location. All of the documented occurrences were over 1 mile northwest of Route 66 in the vicinity of Meshomasic State Forest, with the exception of one historic record southeast of Route 66 in the 1800s. During the site assessment the only suitable habitat observed was a young mixed deciduous forest. The site was mostly flat, lacking the preferred mountainous terrain characterized by steep ledges and associated rock slides. No habitat with characteristic over-wintering features for denning were observed. Additionally, no suitable open canopy ledge habitats for gravid females were observed.

Although mixed deciduous habitat occurs on the subject property, it is over 3 miles from the closest known denning site and unlikely to be used by foraging rattlesnakes originating from this den. The majority of the snakes originating from this den remain within the state forest boundary throughout the active season. Those that stray outside the state forest boundary do not stray far, often remaining in contiguous forested areas to forage. No impacts to timber rattlesnakes or their rookery, denning or foraging habitats are anticipated as a result of the construction of the proposed solar facility. At this time, no protection actions are recommended.

Eastern Box Turtle:

The habitat for eastern box turtles is marginal and moderately fragmented from a landscape scale perspective at the subject property. This site lacks the classic mosaic of early to late successional and wetland habitats typically seen in populations with large numbers of turtles. There is however a fragmented patchwork of suitable habitat mosaics surrounding the subject property and although no turtles were encountered during the site visit, many turtles have been reported in very close proximity

to the subject property. There is a fair amount of suitable forested habitat for hibernating turtles and as a result this site may see an increase in turtle activity during the late-summer, fall and winter months when turtles are utilizing forested habitats. During these seasons turtles can be difficult to encounter due to their cryptic behaviors and being more widespread across the landscape. Without further surveys to confirm the presence of box turtles, it is recommended the following Turtle Protection Measures be implemented.

Recommended Turtle Protection Measures:

To reduce potential impacts to box turtles the following Turtle Protection Plan should be implemented.

1. Isolation Measures & Erosion and Sedimentation Controls

a. Plastic netting used in a variety of erosion control products (i.e., erosion control blankets, fiber rolls [wattles], reinforced silt fence) has been found to entangle wildlife, including reptiles, amphibians, birds and small mammals. These products or reinforced silt fencing should not be used on the project. Temporary erosion control products, either erosion control blankets, fiber rolls composed of processed fibers mechanically bound together to form a continuous matrix (net less), and/or netting composed of planar woven natural biodegradable fiber should be used to avoid/minimize wildlife entanglement.

b. Installation of erosion and sedimentation controls (i.e., silt fencing), required for erosion control compliance and creation of a barrier to migrating/dispersing herpetofauna, should be installed by the Contractor prior to clearing activities or any earthwork. ***No clearing or earthwork should occur during the inactive period for box turtles between the dates of September 30th and April 15th. The exclusionary area should be searched for box turtles multiple times over the course of one to two weeks prior to any clearing activities.***

c. The intent of the barrier is to segregate the majority of the work zone and isolate it from foraging/migrating/dispersing herpetofauna. Oftentimes complete isolation of a work zone is not feasible due to accessibility needs and locations of staging/material storage areas, etc. In those circumstances, the barriers should be positioned to deflect migrating/dispersal routes away from the work zone to minimize potential encounters with herpetofauna. All openings in the isolation barrier, used during the work day for accessibility, should be closed with temporary silt fencing backed with hay bales at the completion of each day.

d. The fencing should consist of non-reinforced conventional erosion control woven fabric, installed approximately six inches below surface grade and staked at seven to ten-feet intervals using four-foot oak stakes or approved equivalent. In areas where the silt fence cannot be buried, the fencing should be placed with the unburied flap facing away from the construction area and covered with six inches of crushed stone or other suitable material. The Environmental Monitor and/or Contractor is responsible for daily inspections of the fencing for tears or breeches in the fabric and accumulation levels of sediment, particularly following storm events of 0.25 inch of rain or greater. All compromised areas of silt fence should be repaired immediately. The extent of the barrier fencing should be as shown on the site plans. The Contractor should have available additional barrier fencing should field conditions warrant extending the fencing as directed by the Environmental Monitor.

e. No equipment, vehicles or construction materials shall be stored outside of the isolation barrier fencing.

f. All silt fencing shall be removed within 30 days of completion of work and permanent stabilization of site soils.

2. Contractor Education

a. Prior to work on site, the Contractors should attend an educational session at the preconstruction meeting with a qualified herpetologist. This orientation and educational session will consist of an introductory meeting providing photos of herpetofauna that may be encountered during construction activities, including box turtle, emphasizing the non-aggressive nature of these species, the absence of need to destroy wildlife that might be encountered and the need to follow Turtle Protective Measures as described in Section 3 below.

b. The education session will also focus on means to discriminate between the species of concern and other native species to avoid unnecessary "false alarms". Encounters with all species will be documented.

c. The Contractor will immediately report any encounters with box turtles to the environmental monitor. Educational poster materials will be provided and must be displayed on the job site to maintain worker awareness as the project progresses.

3. Turtle Protective Measures

a. If a turtle is found, it shall be immediately moved by carefully grasped in both hands, one on each side of the shell, between the turtle's forelimbs and the hind limbs, and placed just outside of the isolation barrier closest to where it was encountered.

b. Extra caution will be taken by the Contractor during early morning and evening hours so that basking or foraging turtles are not harmed by construction activities.

4. Reporting

a. Following completion of the construction project, a summary report to the CTDEEP documenting the monitoring and maintenance of the barrier fence and erosion control measures should be completed.

b. Any observations of state listed species will be reported to CTDEEP with photo-documentation (if possible) and with specific information on the location and disposition of the animal. These data will be collected by the Environmental Monitor and reported to the CTDEEP.

Recommended Mitigation Measures:

Although impacts to the early/late successional edge habitat will result from the construction of the solar facility, creating a small shrub and herbaceous buffer of 30 feet between the development and forested edge would benefit the box turtle. The buffer does not need special plantings, native vegetation will establish in the buffered area. Although some non-native plant species may colonize the buffered area, box turtles are a structural species and will not be deterred by their presence. To maintain and suppress non-native species within the early/late successional ecotone, a five year mowing cycle can be implemented during the inactive period between the dates of November 15th to March 15th.

Literature Cited:

Connecticut Department of Energy and Environmental Protection, Bureau of Natural Resources (CT DEEP). 2015. 2015 Connecticut Wildlife Action Plan.

Dodd, C.K. 2001. North American Box Turtles. University of Oklahoma Press, Norman, OK. 267 pp.

Klemens, M.W. 1993. Amphibian and reptiles of Connecticut and adjacent regions. State Geological and Natural History Survey of Connecticut Bulletin 112:1–318.

Klemens, M.W., H.J. Gruner, D.P. Quinn and E.R. Davison. *In press*. Conservation of Amphibians and Reptiles in Connecticut. Department of Energy and Environmental Protection, Hartford CT.

Quinn, D., H.J. Gruner, and S. Cronkite. 2017. Eastern box turtle and eastern hog-nosed snake final monitoring report 2011. Parsons Transportation Group Project 18-113/129 U.S. Route 7 Bypass, Brookfield, Connecticut. Connecticut Department of Transportation.

Quinn, D. 2008. A radio-telemetric study of the eastern box turtle (*Terrapene carolina carolina*) home range, habitat use, and hibernacula selection in Connecticut. M.Sc. Thesis. Department of Biology, Central Connecticut State University, New Britain, CT. 84 pp.

Stickel, L.F. 1950. Population and home range relationships of the box turtle, *Terrapene c. carolina* (Linnaeus). Ecological Monographs 20:351-378.

Stickel, L.F. 1989. Home range behavior among box turtles (*Terrapene c. carolina*) of a bottomland forest in Maryland. Journal of Herpetology 23:40–44.

Dennis P. Quinn

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EDUCATION

University of Massachusetts, Amherst, MA.

- New England Regional Soil Science Certificate Program. (2014)

Central Connecticut State University (CCSU), New Britain, CT.

- Masters in Ecology and Environmental Science. Thesis research: Radio-telemetry of eastern box turtles to determine home-range, habitat use and hibernacula selection in CT. (2008)
- Bachelors in Biology with a concentration in Ecology, Biodiversity and Evolutionary Biology. (2002)

Recognized Qualified Bog Turtle Surveyor - Housatonic/Hudson Recovery Unit - United States Fish & Wildlife Sevice

PADI Certified Scuba Diver. (1999)

EMPLOYMENT

Owner – CTHerpConsultant, LLC. Plantsville, CT. (2007 – present)

CTHerpConsultant, LLC was founded in 2007 to facilitate the pursuit and passion I have for amphibian and reptile research, conservation and preservation. A wide variety of ecological services are offered by my company, ranging from general wildlife and habitat characterization surveys, to detailed environmental impact assessments complete with land use planning, mitigation design and monitoring. I have worked directly with a variety of State and Federally threatened and endangered species, ranging from the diploid blue-spotted salamander and spadefoot toad, to the bog turtle. I currently serve as the consulting herpetologist for the Connecticut Department of Energy and Environmental Protection where I coordinate state and northeast regional amphibian and reptile research and conservation projects associated with both the Regional Conservation Needs and State Wildlife Grant programs.

Clients:

CT Department of Energy and Environmental Protection
CT Department of Transportation
Farmington River Watershed Association
Fitzgerald & Halliday, Inc.
Michael W. Klemens, LLC
O & G Industries, Inc.
Regional Water Authority
Simsbury Land Trust
Wildlife Management Institute
Steep Rock Association
MA Division of Fisheries & Wildlife, NHESP
Parsons Corporation

Creator and maintainer of www.ctherpetolgy.com: A photographic atlas to the amphibians and reptiles of Connecticut.

Wildlife Photographer – photographs can be viewed at www.dennisquinnphotography.com

Associate Scientist, Parsons Corporation East Berlin, CT. (2005 - 2007)

- Radio-telemetric study of eastern box turtles and eastern hog-nosed snakes for ConnDOT CT Route 7 Bypass. Responsible for data collection, terrestrial mitigation design, assist with culvert design and placement, data analysis, and report preparation.
- Northern slimy salamander presence/absence survey for ConnDOT CT Route 7 Bypass. Responsibilities included field surveys and assist in report preparation.

Environmental Scientist, Maguire Group Inc. New Britain, CT. (2005)

- Field surveys for proposed Route 11 corridor and assisted in preparation of the environmental impact statement.
- Impact Assessment for emergency by-pass pipeline, data analysis, technical writing and mitigation planning.

Herpetological Field Surveyor, Farmington River Watershed and Wildlife Conservation Society (2002)

- Surveyed local reptile and amphibian populations throughout the Farmington River Valley. Identification, data collection, photography.

EMPLOYMENT IN EDUCATION

Adjunct Instructor, Naugatuck Valley Community College Waterbury, CT. (2004 - present)
Courses Taught:

Bio 105 Introductory Biology - Lec/Lab
Bio 171 Field Biology - Lec/Lab

Bio 145 General Zoology - Lec/Lab

Technical Advisor, CCSU New Britain, CT. (2011 - present)

- Serve as a technical research advisor to undergraduate and graduate students working on research in the field of herpetology.
- Graduate Thesis Committee – serve as an expert external committee member for herpetological theses.

Environmental Science Instructor, Post University Waterbury, CT. (2006)
Courses Taught:

Bio 134 General Biology - Lab
Bio 200 Ecology - Lec
Env 200 Sustainable Development - Lec
Env 230 Environmental Policy - Lec

Received honors for outstanding service to students in environmental science instruction.

Graduate Teaching Assistant, CCSU New Britain, CT. (2003)
Courses Taught:

Bio 121 General Biology I - Lab
Bio 202 Principles of Ecology and Evolution - Lab

PUBLICATIONS

- Quinn, D. 2016. *Macrophotography: Capture Larger-Than-Life Photographs of Nature's Smallest Subjects*. Amherst Media, Inc. Buffalo, NY.
- Gruner, H. and Quinn, D. 2012. Project 18-113/129 U.S. Route 7 Bypass Brookfield, Connecticut, Slimy Salamander (*Plethodon glutinosus*) Ridge-wide Habitat Study, Kent to Bethel, Connecticut. Connecticut Department of Transportation, Newington, CT.
- Quinn, D. 2011. The Timber Rattlesnake: A Modern Day Legend. *Connecticut Wildlife*. Volume 31, No. 1, Jan/Feb 2011.
- Quinn, D. and Gruner, H. 2010. Project 18-113 U.S. Route 7 Bypass Brookfield, Connecticut, Eastern Box Turtle and Eastern Hog-nosed Snake Monitoring Report 2009. Connecticut Department of Transportation, Newington, CT.
- Quinn, D. 2009. Project 131-190 Removal of Bridge No. 00518 and Intersection Improvements Route 10 and Route 322 Southington, Connecticut: Eastern Box Turtle and Wood Turtle Presence/Absence Surveys and Report. Connecticut Department of Transportation, Newington, CT.
- Quinn, D. 2008. A radio-telemetric study of the Eastern Box Turtle (*Terrapene carolina carolina*) home range, habitat use, and hibernacula selection in Connecticut. M. Sc Thesis. Central Connecticut State University, New Britain, CT. 84 pp.

PRESENTATIONS, RADIO and VOLUNTEER WORK

Seminars:

- Mystic Aquarium. CT Amphibians and Reptiles and their Conservation Challenges. (2015)
- WNPR Where We Live hosted by John Dankosky Everything You Want to Know About Turtles. (2014)
- WNPR An Atlas to Track Connecticut Critters that Slither, Hop and Crawl. (2014)
- UCONN Department of Pathobiology and Veterinary Science Seminar Series. CT Amphibians and Reptiles and their Conservation Challenges. (2014)
- CT Department of Energy and Environmental Protection. CT Salamanders and their Conservation Challenges. (2014)
- CT Department of Energy and Environmental Protection. *Natural History of the Northern Copperhead. (2013)*
- CT Department of Energy and Environmental Protection. *Natural History of the Hog-nosed Snake. (2013)*
- Simsbury Land Trust 25th Anniversary Celebration. *Connecticut Reptiles and Amphibians*. (2006)
- Biological Sciences Seminar Series. CCSU. *Land Management and Conservation Strategies for the Reptiles and Amphibians of the Farmington River Valley* (2002)

Volunteer:

Nutmeg Big Brothers Big Sisters. Big Brother Mentor. (2007 – 2010)
Regional Water Authority. A Walk with Connecticut's Reptiles and Amphibians. Pine Hill Recreational Area. (2010)
Connecticut Bio Blitz.

- Keney Park and Goodwin College. Hartford, CT. (2009)
- Wilbert Snow School. Middletown, CT. (2007)
- Two Rivers Magnet School. East Hartford, CT. (2005)

Wethersfield Nature Center. Reptile Day. Gave interactive talk with school children on reptiles and amphibians. (2005)
Simsbury Land Trust. Educational walk on vernal pools and the fauna that depend on them for survival. (2003, 2004 & 2005)

COMPUTER EXPERIENCE

Microsoft Office: Word, Excel, Access, Power Point; PC-ORD, ArcGIS, Graphical Analysis, Sigma Plot, Adobe Photoshop.

AWARDS and HONORS

Leeds M. Carluccio Award: For outstanding student service and leadership in Biological Sciences (2002)
Member Tri-beta National Honor Society (2002)

REFERENCES

Dr. Michael Klemens. Research Associate in Herpetology. American Museum of Natural History. fenbois@aol.com. (203) 448-8068. New York, NY 10024

Hank Gruner, Vice President of Programs. Connecticut Science Center, Hartford, CT. 06106. hgruner@ctsciencecenter.org (860) 712-1308.

Dr. Barbra Nicholson, Professor. Central Connecticut State University, New Britain, CT. 06050. nicholsonb@ccsu.edu. (860) 832-2706.

Cynthia Donaldson, Naugatuck Valley Community College, Waterbury, CT. 06708. cdonaldson@nvcc.commnet.edu (203) 596-8703.

Connecticut Department of

ENERGY &
ENVIRONMENTAL
PROTECTION

November 20, 2019

Mr. Dean Gustafson
All-Points Technology Corporation
3 Saddlebrook Drive
Killingworth, CT 06419-2323
dgustafson@allpointstech.com

Project: Citrine Power, LLC East Hampton Solar Facility Located at 46 Skinner Street in East Hampton, Connecticut
Request No.: 201913402

Dear Dean Gustafson,

I have reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map you provided for the proposed Citrine Power, LLC East Hampton Solar Facility Located at 46 Skinner Street in East Hampton, Connecticut. According to our information there are known extant populations of State Special Concern eastern box turtle (*Terrapene carolina carolina*) that occur within your project boundaries.

I concur with your proposed best management practices that include the conservation and protection of State Special Concern eastern box turtle (*Terrapene c. carolina*). I concur that by utilizing your proposed best management practices and protection protocols that the proposed activities will lessen the impact on the turtle. I have attached the herpetologist's conservation plan for these turtles.

This determination is good for two years. Please re-submit an NDDB Request for Review if the scope of work changes or if work has not begun on this project by November 20, 2021.

Natural Diversity Data Base information includes all information regarding critical biological resources 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, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. 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 Data Base as it becomes available.

Please contact me if you have further questions at (860) 424-3592, or dawn.mckay@ct.gov . Thank you for consulting the Natural Diversity Data Base.
Sincerely,

Dawn M. McKay

Dawn M. McKay
Environmental Analyst 3

APPENDIX C

SHPO Correspondence

JANUARY 2020

PHASE IB CULTURAL RESOURCES RECONNAISSANCE SURVEY OF THE PROPOSED CITRINE SOLAR FACILITY IN EAST HAMPTON, CONNECTICUT

PREPARED FOR:

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION – SUITE 311
WATERFORD, CONNECTICUT 06385

HERITAGE CONSULTANTS
55 EAST CEDAR STREET
NEWINGTON, CONNECTICUT 06111

ABSTRACT

This report presents the results of a Phase IA/Phase IB cultural resources survey of the proposed Citrine Solar Facility project, which will occupy approximately 12.95 ac of land within a larger 27.4 ac parcel, in East Hampton, Connecticut. Heritage completed the current survey on behalf of All-Points in January of 2020. After completion of background research, total of 95 of 95 (100 percent) planned shovel tests were excavated throughout the areas containing the proposed solar panel locations associated with the Citrine development area. The associated access road alignment was found to be previously disturbed and was not tested. The excavation effort at the proposed solar facility resulted in the identification of a single historic artifact consisting of an unglazed redware ceramic sherd. Since this non-site cultural resource did not contain associated evidence of architectural remains, either buried or on the surface, it was interpreted as typical field scatter. This deposit did not contain substantial numbers of artifacts or research potential; thus, it was deemed not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional examination of the project area is recommended prior to construction.

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CHAPTER I
INTRODUCTION

This report presents the results of a Phase IA/Phase IB cultural resources survey for a proposed solar facility project area in East Hampton, Connecticut (Figure 1). All-Points Technology Corporation requested that Heritage Consultants, LLC (Heritage) complete the current reconnaissance survey as part of the planning process for the facility development, which was completed in January of 2020. All work associated with this investigation was performed in accordance with the *Environmental Review Primer for Connecticut's Archaeological Resources* (Poirier 1987), which is promulgated by the Connecticut State Historic Preservation Office.

Project Description and Methods Overview

The proposed undertaking will involve construction the of solar facility, associated driveways, and utilities. The proposed facility will occupy approximately 12.95 ac of land within a larger 27.4 ac parcel. The proposed 12.95 development area is hereafter referred to as the Limit of Work (LOW). The project parcel occupies a forested area that is bordered by the Airline State Park Trail to the north, residential parcels along Skinner Street to the east, Middletown Avenue to the south, and by a slope down to a wetland to the west. Access to the development area will be from Skinner Street (CT Route 196). During this investigation, Heritage conducted a cultural resources review that consisted of the completion of the following tasks: 1) a contextual overview of the region's prehistory, history, and natural setting (e.g., soils, ecology, hydrology, etc.); 2) a literature search to identify previously completed cultural resources surveys and previously recorded cultural resources in the region encompassing the study area; 3) a review of readily available historic maps and aerial imagery depicting the project area in order to identify potential historic resources and/or areas of past disturbance; 4) Phase IB fieldwork, and 5) preparation of the current Phase IA/ Phase IB cultural resources assessment survey report.

Based on the results of the background search it was determined that the 12.95 ac of land comprising the LOW contains low slopes, well drained soils, and is situated in proximity to Muddy Gutter Brook to the west and Pocotopaug Creek to the east. As a result, it was determined that this area may contain intact archaeological deposits in the subsoil, which according to the National Conservation Resources Service should extend to a depth of approximately 65 cmbs (26 inbs). Finally, in January 2020, Heritage conducted the Phase IB cultural survey of the LOW in order to assess current field conditions and soil integrity.

Project Results and Management Recommendations Overview

During the current Phase IB cultural resources survey, a total of 95 of 95 (100 percent) planned shovel tests were excavated throughout the project area associated with the proposed solar facility in East Hampton, Connecticut (Figure 2). This effort resulted in the identification of a single historic period artifact. It was collected from the northern portion of the project area and was domestic in nature; no architectural features, either buried or above ground, were identified in the project area. Due to the lack of any research potential the isolated find is considered not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional examination of the project area is recommended prior to construction.

Project Personnel

Key personnel for this project included. David R. George, M.A., R.P.A., (Project Manager), Mr. Cory Atkinson, M.A. (Field Director); Mr. Stephen Anderson, B.A., (GIS Specialist); Dr. Kristen Keegan (Historian); and Ms. Elizabeth Correia, B.A., (Laboratory Specialist) completed the artifact analysis and curation for this project.

Organization of the Report

The natural setting of the region encompassing the study area is presented in Chapter II; it includes a brief overview of the geology, hydrology, and soils, of the project region. The prehistory of the project region is outlined briefly in Chapter III. The history of the region encompassing the project region and study area is chronicled in Chapter IV, while a discussion of previous archaeological investigations near the study area is presented in Chapter V. The methods used to complete this investigation are discussed in Chapter VI. The results of this investigation and management recommendations for the study area and the identified cultural resources are presented in Chapter VII.

CHAPTER II
NATURAL SETTING

Introduction

This chapter provides a brief overview of the natural setting of the region containing the proposed solar project in East Hampton. Previous archaeological research has documented that a few specific environmental factors can be associated with both prehistoric and historic period site selection. These include general ecological conditions, as well as types of fresh water sources, soils, and slopes present in the area. The remainder of this section provides a brief overview of the ecology, hydrological resources, and soils present within the project area and the larger region in general.

Ecoregions of Connecticut

Throughout the Pleistocene and Holocene Periods, Connecticut has undergone numerous environmental changes. Variations in climate, geology, and physiography have led to the "regionalization" of Connecticut's modern environment. It is clear, for example, that the northwestern portion of the state has very different natural characteristics than the coastline. Recognizing this fact, Dowhan and Craig (1976), as part of their study of the distribution of rare and endangered species in Connecticut, subdivided the state into various ecoregions. Dowhan and Craig (1976:27) defined an ecoregion as:

> "an area characterized by a distinctive pattern of landscapes and regional climate as expressed by the vegetation composition and pattern, and the presence or absence of certain indicator species and species groups. Each ecoregion has a similar interrelationship between landforms, local climate, soil profiles, and plant and animal communities. Furthermore, the pattern of development of plant communities (chronosequences and toposequences) and of soil profile is similar in similar physiographic sites. Ecoregions are thus natural divisions of land, climate, and biota."

Dowhan and Craig defined nine major ecoregions for the State of Connecticut. They are based on regional diversity in plant and animal indicator species (Dowhan and Craig 1976). Only one of the ecoregions is germane to the current investigation: Southeast Hills Ecoregion. A summary of this ecoregion is presented below. It is followed by a discussion of the hydrology and soils found in and adjacent to the project area.

Southeast Hills Ecoregion

The Southeast Hills ecoregion consists of "coastal uplands, lying within 25 miles of Long Island Sound, characterized by low, rolling to locally rugged hills of moderate elevation, broad areas of upland, and local areas of steep and rugged topography" (Dowhan and Craig 1976). Elevations in the Southeast Hills ecoregion generally range from 75.7 to 227.2 m (250 to 750 ft) above sea level (Dowhan and Craig 1976). The bedrock of the region is composed of schists, and gneisses deposited during the Paleozoic. Soils in the region have developed on top of glacial till in upland locales, and on top of stratified deposits of sand, gravel, and silt in the local valleys and upland areas (Dowhan and Craig 1976

Hydrology of the Study Region

The project parcel is located within close proximity to several streams, ponds, and wetlands. These fresh water sources include the Bevins Pond, Muddy Gutter Brook, Pine Brook, Pocotopaug Creek, and the Green River, as well as several unnamed ponds, streams, and associated wetlands. Both Muddy Gutter

Brook and Pocotopaug Creek are located within 300 m (984.2 ft) of the project parcel. Previously completed archaeological investigations in Connecticut have demonstrated that streams, rivers, and wetlands were focal points for prehistoric occupations because they provided access to transportation routes, sources of freshwater, and abundant faunal and floral resources. These water sources also provided the impetus for the construction of water powered mill facilities during the eighteenth and nineteenth centuries.

Soils Comprising the Project area

Soil formation is the direct result of the interaction of several variables, including climate, vegetation, parent material, time, and organisms present (Gerrard 1981). Once archaeological deposits are buried within the soil, they are subject to many diagenic processes. Different classes of artifacts may be preferentially protected, or unaffected by these processes, whereas others may deteriorate rapidly. Cyclical wetting and drying, freezing and thawing, and compression can accelerate chemically and mechanically the decay processes for animal bones, shells, lithics, ceramics, and plant remains. Lithic and ceramic artifacts are largely unaffected by soil pH, whereas animal bones and shells decay more quickly in acidic soils such as those that are present in within the current project area. In contrast, acidic soils enhance the preservation of charred plant remains.

A review of the soils within the project area is presented below. The project area is characterized predominantly by Canton and Charlton oils occurring on low slopes, and to a lesser extent Hollis-Chatfield rock outcrop complex that occurs on moderate slopes (Figure).

Canton Soils:

The Canton series consists of very deep, well drained soils formed in a loamy mantle underlain by sandy till. They are on nearly level to very steep moraines, hills, and ridges. Slope ranges from 0 to 45 percent. Saturated hydraulic conductivity is moderately high in the solum and high or very high in the substratum. The mean annual temperature is about 9 degrees C and the annual precipitation is about 1205 mm. Canton soils comprise the northwestern portion of the proposed project area. Typical sequence, depth and composition of this soil is as follows: **Oi**-- 0 to 5 cm; slightly decomposed plant material; (0 to 13 cm thick.) **A**-- 5 to 13 cm; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; common fine roots; 5 percent gravel; very strongly acid (pH 4.6); abrupt smooth boundary. (3 to 10 cm thick.) **Bw1**-- 13 to 30 cm; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; 5 percent gravel; very strongly acid (pH 4.6); clear smooth boundary. **Bw2**-- 30 to 41 cm; yellowish brown (10YR 5/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; 5 percent gravel; strongly acid (pH 5.1); clear smooth boundary. **Bw3**-- 41 to 56 cm; yellowish brown (10YR 5/4) gravelly fine sandy loam; weak medium subangular blocky; friable; common fine and medium roots; 15 percent gravel; strongly acid (pH 5.1); abrupt smooth boundary. (Combined thickness of the Bw horizons is 43 to 84 cm.) **2C**-- 56 to 170 cm; grayish brown (2.5Y 5/2) gravelly loamy sand; massive; friable; 25 percent gravel; moderately acid (pH 5.6).

Charlton Soils:

The Charlton series consists of very deep, well drained soils formed in loamy melt-out till. They are nearly level to very steep soils on moraines, hills, and ridges. Slope ranges from 0 to 60 percent. Saturated hydraulic conductivity is moderately high or high. Mean annual temperature is about 9 degrees C and mean annual precipitation is about 1205 mm. Charlton soils comprise the northwestern portion of the proposed project area. Typical sequence, depth and composition of this soil is as follows: **Oe** -- 0 to 4 cm; black (10YR 2/1) moderately decomposed forest plant material. (0 to 5 cm thick.) **A** -- 4

to 10 cm; dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; very friable; many fine roots; 5 percent gravel; very strongly acid; abrupt smooth boundary. (2 to 15 cm thick.) **Bw1** -- 10 to 18 cm; brown (7.5YR 4/4) fine sandy loam; weak coarse granular structure; very friable; many fine and medium roots; 5 percent gravel; very strongly acid; clear wavy boundary. **Bw2** -- 18 to 48 cm; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; very friable; common fine and medium roots; 10 percent gravel and cobbles; very strongly acid; clear wavy boundary. **Bw3** -- 48 to 69 cm; light olive brown (2.5Y 5/4) gravelly fine sandy loam; massive; very friable; few medium roots; 15 percent gravel and cobbles; very strongly acid; abrupt wavy boundary. (Combined thickness of the Bw horizons is 35 to 91 cm.) **C** -- 69 to 165 cm; grayish brown (2.5Y 5/2) gravelly fine sandy loam with thin lenses of loamy sand; massive; friable, some lenses firm; few medium roots; 25 percent gravel and cobbles; strongly acid.

Chatfield Soils:

The Chatfield series consists of well drained soils formed in loamy melt-out till. They are moderately deep to bedrock. They are nearly level to very steep soils on bedrock-controlled hills and ridges. Slope ranges from 0 to 70 percent. Crystalline bedrock is at depths of 50 to 100 cm. Saturated hydraulic conductivity is moderately high or high in the mineral soil. Mean annual temperature is about 9 degrees C, and mean annual precipitation is about 1205 mm. Chatfield fine sandy loam, on a 13 percent slope in a wooded area. (Colors are for moist soil unless otherwise noted). Chatfield soils comprise most of the proposed project area. Typical sequence, depth and composition of this soil is as follows: **Oi** -- 0 to 3 cm, slightly decomposed leaf, needle, and twig litter; extremely acid, pH 4.2. (0 to 15 cm thick.) **A** -- 3 to 5 cm, very dark gray (10YR 3/1) fine sandy loam, gray (10YR 5/1), dry; weak fine subangular blocky structure; friable; many fine and medium roots throughout; 5 percent mixed gravel and cobbles; very strongly acid, pH 4.5; abrupt smooth boundary. (1 to 25 cm thick.) **Bw1**-- 5 to 33 cm, strong brown (7.5YR 5/6) gravelly fine sandy loam; weak fine subangular blocky structure; friable; common fine roots throughout and common medium roots throughout; 15 percent mixed gravel and cobbles; very strongly acid, pH 4.5; abrupt wavy boundary. **Bw2** -- 33 to 76 cm, strong brown (7.5YR 5/6) gravelly fine sandy loam; moderate medium subangular blocky structure; friable; few fine roots throughout; 20 percent mixed rock fragments; very strongly acid, pH 4.5; abrupt irregular boundary. (Combined thickness of the Bw horizons is 10 to 80 cm.) **2R** -- 76 cm; fractured slightly weathered schist bedrock.

Hollis Soils:

The Hollis series consists of well drained and somewhat excessively drained soils formed in a thin mantle of till. They are shallow to bedrock. They are nearly level to very steep upland soils on bedrock-controlled hills and ridges. Slope ranges from 0 through 60 percent. Saturated hydraulic conductivity is moderately high or high. Depth to hard bedrock ranges from 25 to 50 cm. Mean annual temperature is about 9 degrees C, and mean annual precipitation is about 1205 mm. Hollis soils comprise most of the proposed project area. Typical sequence, depth and composition of this soil is as follows: **Oi**--0 to 3 cm; slightly decomposed plant material. **Oa**--3 to 5 cm; black (10YR 2/1) highly decomposed plant material; moderate fine granular structure; very friable; many fine and very fine roots; abrupt smooth boundary. (Combined thickness of the O horizons is 0 to 10 cm.) **A**--5 to 18 cm; very dark grayish brown (10YR 3/2) gravelly fine sandy loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; very friable; common fine, very fine, medium, and coarse roots; 10 percent gravel, 5 percent channers; very strongly acid; clear smooth boundary. (3 to 15 cm thick) **Bw1**--18 to 25 cm; dark yellowish brown (10YR 4/4) gravelly fine sandy loam; moderate medium subangular blocky structure; friable; few very fine and fine roots, common medium roots; 10 percent gravel, 10 percent channers; strongly acid; clear wavy boundary. **Bw2**--25 to 41 cm; yellowish brown (10YR 5/6) gravelly fine sandy loam; moderate medium and coarse subangular blocky structure; friable; few fine and very fine roots, common medium roots; 10

percent gravel, 5 percent channers; strongly acid; abrupt smooth boundary. (Combined thickness of the Bw horizons is 18 to 48 cm.) **2R**--41 cm; schist bedrock.

Summary

A review of mapping, geological data, ecological conditions, soils, slopes, and proximity to freshwater, suggests that the project parcel appears to be favorable to both prehistoric and historic period occupations. This includes areas of low to moderate slopes with well drained soils located near freshwater sources. The types of Native American sites that may be contained in these areas include seasonal base camps and may include areas of lithic tool manufacturing, hearths, post-molds and storage pits. Historic resources that may be encountered include the buried remains of outbuildings, wells, and small family cemeteries. Based on the close proximity to streams, it is possible that the area may contain buried architectural remains related to early East Hampton industry such as mills, tanneries, ash production and timber harvesting. The current survey resulted in the identification of apparently intact soils and a moderate/high probability to contain both Native American and historic archaeological resources based on the criteria presented above.

CHAPTER III
PREHISTORIC SETTING

Introduction

Prior to the late 1970s and early 1980s, very few systematic archaeological surveys of large portions of the state of Connecticut had been undertaken. Rather, the prehistory of the region was studied at the site level. As a result, a skewed interpretation of the prehistory of Connecticut was developed. It was suggested that the upland portions of the state, i.e., the northeastern and northwestern hills ecoregions, were little used and rarely occupied by prehistoric Native Americans, while the coastal zone, i.e., the eastern and western coastal and the southeastern and southwestern hills ecoregions, were the focus of settlements and exploitation in the prehistoric era. This interpretation remained unchallenged until the 1970s and 1980s when several town-wide and regional archaeological studies were completed. These investigations led to the creation of several archaeological phases that subsequently were applied to understand the prehistory of Connecticut. The remainder of this chapter provides an overview of the prehistoric setting of the region encompassing the current project area.

Paleo-Indian Period (12,000 to 10,000 B.P.)

The earliest inhabitants of the area encompassing the State of Connecticut, who have been referred to as Paleo-Indians, arrived in the area by ca. 12,000 B.P. (Gramly and Funk 1990; Snow 1980). Due to the presence of large Pleistocene mammals at that time and the ubiquity of large fluted projectile points in archaeological deposits of this age, Paleo-Indians often have been described as big-game hunters (Ritchie and Funk 1973; Snow 1980); however, as discussed below, it is more likely that they hunted a broad spectrum of animals.

While there have been numerous surface finds of Paleo-Indian projectile points throughout the State of Connecticut, only two sites, the Templeton Site (6-LF-21) in Washington, Connecticut and the Hidden Creek Site (72-163) in Ledyard, Connecticut, have been studied in detail and dated using the radiocarbon method (Jones 1997; Moeller 1980). The Templeton Site (6-LF-21) is in Washington, Connecticut and was occupied between 10,490 and 9,890 years ago (Moeller 1980). In addition to a single large and two small fluted points, the Templeton Site produced a stone tool assemblage consisting of gravers, drills, core fragments, scrapers, and channel flakes, which indicates that the full range of stone tool production and maintenance took place at the site (Moeller 1980). Moreover, the use of both local and non-local raw materials was documented in the recovered tool assemblage, suggesting that not only did the site's occupants spend some time in the area, but they also had access to distant stone sources, the use of which likely occurred during movement from region to region.

The only other Paleo-Indian site studied in detail in Connecticut is the Hidden Creek Site (72-163) (Jones 1997). The Hidden Creek Site is situated on the southeastern margin of the Great Cedar Swamp on the Mashantucket Pequot Reservation in Ledyard, Connecticut. While excavation of the Hidden Creek Site produced evidence of Terminal Archaic and Woodland Period components (see below) in the upper soil horizons, the lower levels of the site yielded artifacts dating from the Paleo-Indian era. Recovered Paleo-Indian artifacts included broken bifaces, side-scrapers, a fluted preform, gravers, and end-scrapers. Based on the types and number of tools, Jones (1997:77) hypothesized that the Hidden Creek Site represented a short-term occupation, and separate stone tool reduction and rejuvenation areas were present.

While archaeological evidence for Paleo-Indian occupation is scarce in Connecticut, it, combined with data from the West Athens Road and King's Road Site in the Hudson drainage and the Davis and Potts Sites in northern New York, supports the hypothesis that there was human occupation of the area not long after ca. 12,000 B.P. (Snow 1980). Further, site types currently known suggest that the Paleo-Indian settlement pattern was characterized by a high degree of mobility, with groups moving from region to region in search of seasonally abundant food resources, as well as for the procurement of high quality raw materials from which to fashion stone tools.

Archaic Period (10,000 to 2,700 B.P.)

The Archaic Period, which succeeded the Paleo-Indian Period, began by ca., 10,000 B.P. (Ritchie and Funk 1973; Snow 1980), and it has been divided into three subperiods: Early Archaic (10,000 to 8,000 B.P.), Middle Archaic (8,000 to 6,000 B.P.), and Late Archaic (6,000 to 3,400 B.P.). These periods were devised to describe all non-farming, non-ceramic producing populations in the area. Regional archaeologists recently have recognized a final "transitional" Archaic Period, the Terminal Archaic Period (3,400-2,700 B.P.), which was meant to describe those groups that existed just prior to the onset of the Woodland Period and the widespread adoption of ceramics into the toolkit (Snow 1980; McBride 1984; Pfeiffer 1984, 1990; Witthoft 1949, 1953).

Early Archaic Period (10,000 to 8,000 B.P.)

To date, very few Early Archaic sites have been identified in southern New England. As a result, researchers such as Fitting (1968) and Ritchie (1969) have suggested a lack of these sites likely is tied to cultural discontinuity between the Early Archaic and preceding Paleo-Indian Period, as well as a population decrease from earlier times. However, with continued identification of Early Archaic sites in the region, and the recognition of the problems of preservation, it is difficult to maintain the discontinuity hypothesis (Curran and Dincauze 1977; Snow 1980).

Like their Paleo-Indian predecessors, Early Archaic sites tend to be very small and produce few artifacts, most of which are not temporally diagnostic. While Early Archaic sites in other portions the United States are represented by projectile points of the Kirk series (Ritchie and Funk 1973) and by Kanawha types (Coe 1964), sites of this age in southern New England are identified recognized on the basis of a series of ill-defined bifurcate-based projectile points. These projectile points are identified by the presence of their characteristic bifurcated base, and they generally are made from high quality raw materials. Moreover, finds of these projectile points have rarely been in stratified contexts. Rather, they occur commonly either as surface expressions or intermixed with artifacts representative of later periods. Early Archaic occupations, such as the Dill Farm Site and Sites 6LF64 and 6LF70 in Litchfield County, and are represented by camps that were relocated periodically to take advantage of seasonally available resources (McBride 1984; Pfeiffer 1986). In this sense, a foraging type of settlement pattern was employed during the Early Archaic Period.

Middle Archaic Period (8,000 to 6,000 B.P.)

By the onset of the Middle Archaic Period, essentially modern deciduous forests had developed in the region (Davis 1969). It is at this time that increased numbers and types of sites are noted in Connecticut (McBride 1984). The most well-known Middle Archaic site in New England is the Neville Site, which is in Manchester, New Hampshire and studied by Dincauze (1976). Careful analysis of the Neville Site indicated that the Middle Archaic occupation dated from between ca. 7,700 and 6,000 years ago. In fact, Dincauze (1976) obtained several radiocarbon dates from the Middle Archaic component of the Neville Site. The dates, associated with the then-newly named Neville type projectile point, ranged from 7,740±280 and 7,015±160 B.P. (Dincauze 1976).

In addition to Neville points, Dincauze (1976) described two other projectile point styles that are attributed to the Middle Archaic Period: Stark and Merrimac projectile points. While no absolute dates were recovered from deposits that yielded Stark points, the Merrimac type dated from 5,910±180 B.P. Dincauze argued that both the Neville and later Merrimac and Stark occupations were established to take advantage of the excellent fishing that the falls situated adjacent to the site area would have afforded Native American groups. Thus, based on the available archaeological evidence, the Middle Archaic Period is characterized by continued increases in diversification of tool types and resources exploited, as well as by sophisticated changes in the settlement pattern to include different site types, including both base camps and task-specific sites (McBride 1984:96).

Late Archaic Period (6,000 to 3,700 B.P.)

The Late Archaic Period in southern New England is divided into two major cultural traditions that appear to have coexisted. They include the Laurentian and Narrow-Stemmed Traditions (Funk 1976; McBride 1984; Ritchie 1969a and b). Artifacts assigned to the Laurentian Tradition include ground stone axes, adzes, gouges, ulus (semi-lunar knives), pestles, atlatl weights, and scrapers. The diagnostic projectile point forms of this time period in southern New England include the Brewerton Eared-Notched, Brewerton Eared and Brewerton Side-Notched varieties (McBride 1984; Ritchie 1969a; Thompson 1969). In general, the stone tool assemblage of the Laurentian Tradition is characterized by flint, felsite, rhyolite and quartzite, while quartz was largely avoided for stone tool production.

In terms of settlement and subsistence patterns, archaeological evidence in southern New England suggests that Laurentian Tradition populations consisted of groups of mobile hunter-gatherers. While a few large Laurentian Tradition occupations have been studied, sites of this age generally encompass less than 500 m^2 (5,383 ft^2). These base camps reflect frequent movements by small groups of people in search of seasonally abundant resources. The overall settlement pattern of the Laurentian Tradition was dispersed in nature, with base camps located in a wide range of microenvironments, including riverine as well as upland zones (McBride 1978, 1984:252). Finally, subsistence strategies of Laurentian Tradition focused on hunting and gathering of wild plants and animals from multiple ecozones.

The second Late Archaic tradition, known as the Narrow-Stemmed Tradition, is unlike the Laurentian Tradition, and it likely represents a different cultural adaptation. The Narrow-Stemmed tradition is recognized by the presence of quartz and quartzite narrow stemmed projectile points, triangular quartz Squibnocket projectile points, and a bipolar lithic reduction strategy (McBride 1984). Other tools found in Narrow-Stemmed Tradition artifact assemblages include choppers, adzes, pestles, antler and bone projectile points, harpoons, awls, and notched atlatl weights. Many of these tools, notably the projectile points and pestles, indicate a subsistence pattern dominated by hunting and fishing, as well the collection of a wide range of plant foods (McBride 1984; Snow 1980:228; Wiegand 1978, 1980).

The Terminal Archaic Period (3,700 to 2,700 B.P.)

The Terminal Archaic, which lasted from ca. 3,700 to 2,700 BP, is perhaps the most interesting, yet confusing of the Archaic Periods in southern New England prehistory. Originally termed the "Transitional Archaic" by Witthoft (1953) and recognized by the introduction of technological innovations, e.g., broadspear projectile points and soapstone bowls, the Terminal Archaic has long posed problems for regional archaeologists. While the Narrow-Stemmed Tradition persisted through the Terminal Archaic and into the Early Woodland Period, the Terminal Archaic is coeval with what appears to be a different technological adaptation, the Susquehanna Tradition (McBride 1984; Ritchie 1969b). The Susquehanna Tradition is recognized in southern New England by the presence of a new stone tool industry that was

based on the use of high quality raw materials for stone tool production and a settlement pattern different from the "coeval" Narrow-Stemmed Tradition.

The Susquehanna Tradition is based on the classification of several Broadspear projectile point types and associated artifacts. There are several local sequences within the tradition, and they are based on projectile point type chronology. Temporally diagnostic projectile points of these sequences include the Snook Kill, Susquehanna Broadspear, Mansion Inn, and Orient Fishtail types (Lavin 1984; McBride 1984; Pfeiffer 1984). The initial portion of the Terminal Archaic Period (ca., 3,700-3,200 BP) is characterized by the presence of Snook Kill and Susquehanna Broadspear projectile points, while the latter Terminal Archaic (3,200-2,700 BP) is distinguished by the use Orient Fishtail projectile points (McBride 1984:119; Ritchie 1971).

In addition, it was during the late Terminal Archaic that interior cord marked, grit tempered, thick walled ceramics with conoidal (pointed) bases made their initial appearance in the Native American toolkit. These are the first ceramics in the region and they are named Vinette I (Ritchie 1969a; Snow 1980:242); this type of ceramic vessel appears with much more frequency during the ensuing Early Woodland Period. In addition, the adoption and widespread use of soapstone bowls, as well as the implementation subterranean storage, suggests that Terminal Archaic groups were characterized by reduced mobility and longer-term use of established occupation sites (Snow 1980:250).

Finally, while settlement patterns appeared to have changed, Terminal Archaic subsistence patterns were analogous to earlier patterns. The subsistence pattern still was diffuse in nature, and it was scheduled carefully. Typical food remains recovered from sites of this period consist of fragments of white-tailed deer, beaver, turtle, fish and various small mammals. Botanical remains recovered from the site area consisted of *Chenopodium* sp., hickory, butternut and walnut (Pagoulatos 1988:81). Such diversity in food remains suggests at least minimal use of a wide range of microenvironments for subsistence purposes.

Woodland Period (2,700 to 350 B.P.)

Traditionally, the advent of the Woodland Period in southern New England has been associated with the introduction of pottery; however, as mentioned above, early dates associated with pottery now suggest the presence of Vinette I ceramics appeared toward the end of the preceding Terminal Archaic Period (Ritchie 1969a; McBride 1984). Like the Archaic Period, the Woodland Period has been divided into three subperiods: Early, Middle, and Late Woodland. The various subperiods are discussed below.

Early Woodland Period (ca., 2,700 to 2,000 B.P.)

The Early Woodland Period of the northeastern United States dates from ca. 2,700 to 2,000 B.P. and it has thought to have been characterized by the advent of farming, the initial use of ceramic vessels, and increasingly complex burial ceremonialism (Griffin 1967; Ritchie 1969a and 1969b; Snow 1980). In the Northeast, the earliest ceramics of the Early Woodland Period are thick walled, cord marked on both the interior and exterior, and possess grit temper.

Careful archaeological investigations of Early Woodland sites in southern New England have resulted in the recovery of narrow stemmed projectile points in association with ceramic sherds and subsistence remains, including specimens of White-tailed deer, soft and hard-shell clams, and oyster shells (Lavin and Salwen: 1983; McBride 1984:296-297; Pope 1952). McBride (1984) has argued that the combination of the subsistence remains and the recognition of multiple superimposed cultural features at various sites indicates that Early Woodland Period settlement patterns were characterized by multiple re-use of

the same sites on a seasonal basis by small co-residential groups.

Middle Woodland Period (2,000 to 1,200 B.P.)

The Middle Woodland Period is marked by an increase in the number of ceramic types and forms utilized (Lizee 1994a), as well as an increase in the amount of exotic lithic raw material used in stone tool manufacture (McBride 1984). The latter suggests that regional exchange networks were established, and that they were used to supply local populations with necessary raw materials (McBride 1984; Snow 1980). The Middle Woodland Period is represented archaeologically by narrow stemmed and Jack's Reef projectile points; increased amounts of exotic raw materials in recovered lithic assemblages, including chert, argillite, jasper, and hornfels; and conoidal ceramic vessels decorated with dentate stamping. Ceramic types indicative of the Middle Woodland Period includes Linear Dentate, Rocker Dentate, Windsor Cord Marked, Windsor Brushed, Windsor Plain, and Hollister Stamped (Lizee 1994a:200).

In terms of settlement patterns, the Middle Woodland Period is characterized by the occupation of village sites by large co-residential groups that utilized native plant and animal species for food and raw materials in tool making (George 1997). These sites were the principal place of occupation, and they were positioned close to major river valleys, tidal marshes, estuaries, and the coastline, all of which would have supplied an abundance of plant and animal resources (McBride 1984:309). In addition to villages, numerous temporary and task-specific sites were utilized in the surrounding upland areas, as well as in closer ecozones such as wetlands, estuaries, and floodplains. The use of temporary and task-specific sites to support large village populations indicates that the Middle Woodland Period was characterized by a resource acquisition strategy that can best be termed as logistical collection (McBride 1984:310).

Late Woodland Period (ca., 1,200 to 350 B.P.)

The Late Woodland Period in southern New England dates from ca., 1,200 to 350 B.P., and it is characterized by the earliest evidence for the use of corn in the lower Connecticut River Valley (Bendremer 1993; Bendremer and Dewar 1993; Bendremer et al. 1991; George 1997; McBride 1984); an increase in the frequency of exchange of non-local lithics (Feder 1984; George and Tryon 1996; McBride 1984; Lavin 1984); increased variability in ceramic form, function, surface treatment, and decoration (Lavin 1980, 1986, 1987; Lizee 1994a, 1994b); and a continuation of a trend towards larger, more permanent settlements in riverine, estuarine, and coastal ecozones (Dincauze 1974; McBride 1984; Snow 1980; Wiegand 1983).

Stone tool assemblages associated with Late Woodland occupations, especially village-sized sites, are functionally variable and they reflect plant and animal resource processing and consumption on a large scale. Finished stone tools recovered from Late Woodland sites include Levanna and Madison projectile points; drills; side-, end-, and thumbnail scrapers; mortars and pestles; nutting stones; net sinkers; and celts, adzes, axes, and digging tools. These tools were used in activities ranging from hide preparation to plant processing to the manufacture of canoes, bowls, and utensils, as well as other settlement and subsistence-related items (McBride 1984; Snow 1980). Finally, ceramic assemblages recovered from Late Woodland sites are as variable as the lithic assemblages. Ceramic types identified include Windsor Fabric Impressed, Windsor Brushed, Windsor Cord Marked, Windsor Plain, Clearview Stamped, Sebonac Stamped, Selden Island, Hollister Plain, Hollister Stamped, and Shantok Cove Incised (Lavin 1980, 1988a, 1988b; Lizee 1994a; Pope 1953; Rouse 1947; Salwen and Ottesen 1972; Smith 1947). These types are more diverse stylistically than their predecessors, with incision, shell stamping, punctation, single point, linear dentate, rocker dentate stamping, and stamp and drag impressions common (Lizee 1994a: 216).

Summary of Connecticut Prehistory

In sum, the prehistory of Connecticut spans from ca. 12,000 to 350 B.P., and it is characterized by numerous changes in tool types, subsistence patterns, and land use strategies. For most of the prehistoric era, local Native American groups practiced a subsistence pattern based on a mixed economy of hunting and gathering wild plant and animal resources. It is not until the Late Woodland Period that incontrovertible evidence for the use of domesticated species is available. Further, settlement patterns throughout the prehistoric era shifted from seasonal occupations of small co-residential groups to large aggregations of people in riverine, estuarine, and coastal ecozones. In terms of the region containing the proposed project area, a variety of prehistoric site types may be expected. These range from seasonal camps utilized by Archaic populations to temporary and task-specific sites of the Woodland era.

CHAPTER IV
HISTORIC OVERVIEW

As discussed in Chapter I of this report, the project area is located in the town of East Hampton, which is situated in Middlesex County Connecticut. The remainder of this chapter presents a brief overview history of East Hampton, as well as data specific to the project area.

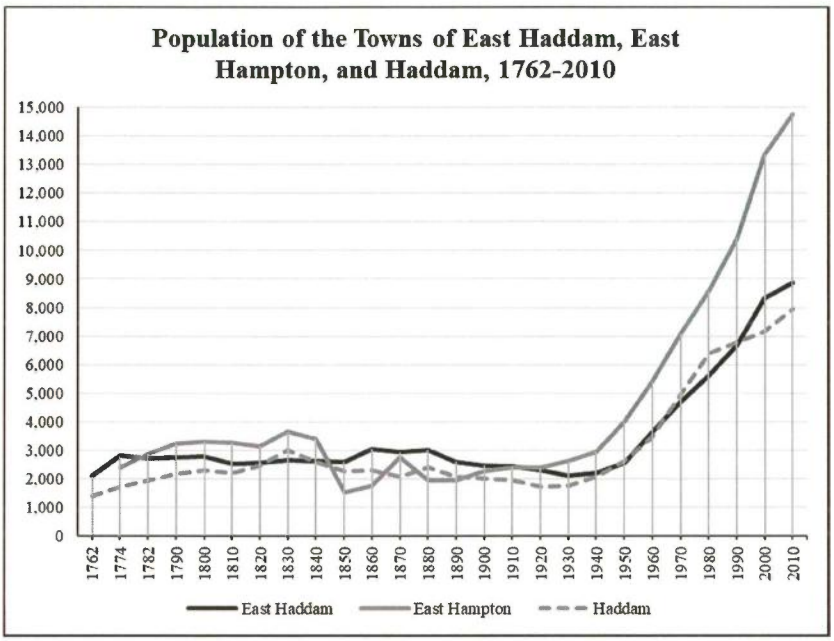
Native American History

In the 1630s Mattabesett, the area now known as Middletown, was the stronghold of a Native American group led by a man named Sowheag. His relations with the colonists were contentious, as can be seen by a 1639 incident when the General Assembly planned to send 100 men to apprehend some Pequots that Sowheag was harboring (De Forest 1852; Crofut 1937; Cleary 1979). Sowheag's tribe included three sub-groups, the Wangunk, Mattabesec, and Machamoodus; their territory covered what are now the towns of Wethersfield, Newington, Rocky Hill, Cromwell, Middletown, Middlefield, Durham, Haddam, East Haddam, East Hampton, Portland, as well as parts of Glastonbury, Marlborough, and Colchester (Spiess 1934). They are most often known to history simply as the Wangunks, however. It was recorded that in 1651, that the General Court granted a colony at "Mattabeseck" town privileges, and in 1653 named it Middletown, indicating that some purchase had been made by that time (De Forest 1852; Crofut 1937). The Haddam area, in contrast to much of the rest, was definitely purchased in the 1660s as part of a larger area running from Middletown to its north down to Chester to its south, out of which the Wangunks (according to De Forest and Spiess) reserved Thirty Mile Island in the Connecticut River at Haddam, and an area called Pattyquonck in what is now Chester (Clark 1808). There is also evidence that a number of the Indians stayed on at Haddam Neck on the river, at a place called Indian Hollow (Field 1819). Others resided in the Middletown area.

In 1672, the General Assembly acquired a confirmatory deed (indicating the uncertainty of their claims to the territory) to the whole area between Wethersfield and Haddam. Two reservations were held back from this re-sale: one on the east bank of the river (now Portland), and another on the west side, north of the present center of Middletown in the area known as Newfields. A number of the Wangunks remained on one or the other of these reservations at least through 1713. In 1764, there were still 30 or 40 members in the tribe, though some had moved elsewhere, and a colonists' committee began selling their lands in order to support aged and infirm members; by 1785 the Native Americans appeared to have entirely abandoned the region to the colonists (De Forest 1852; Crofut 1937).

History of the Town of East Hampton

Originally called Chatham (the name was changed in 1915), East Hampton separated from Middletown in 1767, at a time when it had a growing ship-building business and a cobalt mine, both no longer active by the 1880s. At the time of the colonial census of 1774, the town had 2,397 residents, which increased by 1790 to include 3,230 residents. The population then remained steady or declining until 1820, after which it rose to its nineteenth-century high point of 3,646 in 1830. The sudden drop between 1840 and 1850 was due to the separation of the town of Portland in 1842, which left East Hampton with only 1,525 residents (see population chart below; Keegan 2012). In 1819, a gazetteer of the state mentioned the potential of the cobalt mine, the brownstone quarries in the future Portland, and the grain and dairy production of the town, as well as the shad fishery and 15 vessels trading with New York and the South. At the time, the town had a woolen factory, a forge, and several furnaces and distilleries (Pease and



Niles 1819). The Bevin Brothers Bell Factory was established in 1838 and by the 1880s employed between 50 and 75 workers; other manufactures in the later part of the century included a silk mill, two hardware and tool factories, and five additional bell companies (J.H. Beers 1874). According to nineteenth-century historic maps of the vicinity, the area abutting the Barton and Bevin factories were a rugged area with no roads or buildings nearby (Figures 3 and 4).

During this same period, however, East Hampton's population varied a great deal, though it began a steady increase after 1890, and as of 1930 it had 2,616 residents (see population chart above; Keegan 2012). A 1932 summary of key information about the town identified its main industries as agriculture and several kinds of manufacturing, including bells and thread (Connecticut 1932). The 1934 aerial photography shows the project area as being in the midst of a large, apparently rugged forested area with a small patch of farmland (Figure 5).

East Hampton saw its population begin to rise quickly as city people moved out into the suburbs in the 1940s, and by 2010 its number of residents had quintupled to 14,761 (see population chart above; Keegan 2012). In the 1957 aerial photography, there was as yet no sign of the future growth near the project area (Figure 6). This growth was enabled by the 1938 construction of a highway bridge across the Connecticut River to Middletown, and of course by the advent of the affordable automobile. It is a bedroom community, most of whose residents work elsewhere, but can also point to natural recreation opportunities. The town expects more future development and intends to manage that to protect natural resources, open space, and historic resources (East Hampton 2016). There were few signs of the farming activity that was visible in the earlier aerial photographs, but also relatively few new houses in the area near the project area visible in the progression of the 1970, through 2018 aerial photographs (Figures 7 through 12).

History of the Project Area

The project area is located to the southwest of and adjacent to the National Register of Historic Places listed Belltown Historic District, which is considered to be the center of East Hampton. The Belltown Historic District contains approximately 147 contributing historic buildings and was listed on the

National Register of Historic Places in 1985. Two historic sites, functional stone dams, are located within the district. One is part of a historic mill complex and the other is associated with a small number of industrial archaeological sites in the southwestern portion of the district.

In the 1859 and 1874 historic maps, the project area is located across from the former site of the William Barton Manufacturing Company. The Barton family migrated to East Hampton from the Windsor/Bloomfield area in 1806-1808 to carry out their bell manufacturing business there (Figures 3 and 4). William Barton remained in East Hampton for 18 years manufacturing bells and had a specialized knowledge of brass metallurgy. Barton is credited with invention a one-piece, sand-mold casting process for brass bells which remained as the basic method used by the industry for the rest of the century. Most of the industrial development of East Hampton occurred and progressed throughout the early to mid-nineteenth century. Another noted manufacturing company, the Bevin Brothers Bell Factory was founded by William, Chauncey and Abner Bevin in 1832.

Historic maps of the project area indicate in the 1859 and 1874 that the railroad was close to the project area (Figure 3 and 4). However, as visible in the 1934 aerial view, the railroad line is running along the northwestern portion of the project area (Figure 5). Opened in 1873 as the New Haven, Middletown and Willimantic Railroad, the line was 25 miles shorter than the Shore Line Railroad. After the failure of its parent company in 1875 the company was reorganized as the Boston and New York Air-Line Railroad and later as the New York and New England Railroad.

Summary

It is clear that the project area has long been absent of residential occupation. Aerial images from 1934 indicate a portion of the project parcel area was used for farming, but by 1986 and 1990, respectively, reforestation had occurred throughout the project area with residential development occurring north and southeast to the project area. No significant historic resources area expected within the project area.

CHAPTER V
PREVIOUS INVESTIGATIONS

Introduction

This chapter presents an overview of previous cultural resources identified within the vicinity of the proposed project area in East Hampton, Connecticut, including archaeological sites, National and State Register of Historic Places properties/districts, and inventoried historic standing structures (Figures 13 and 14). This discussion provides the comparative data necessary for assessing the results of the current survey, and it ensures that the potential impacts to all previously recorded cultural resources located within and adjacent to the proposed project parcel are taken into consideration. This review revealed there are eight previously identified historic archaeological sites in the area, in addition, there are three State Register Historic Properties, as well as a National Register of Historic Places area located within 1.6 km (1 mi) of the proposed project parcel. These cultural resources are described below.

Previously Recorded Cultural Resources Within the Vicinity of the Project Area

As mentioned above, there are eight previously identified historic archaeological sites, three State Register Historic Properties, and a single a National Register of Historic Places area located within 1.6 km (1 mi) of the proposed project parcel. These are discussed in turn below.

Belltown Historic District

Listed on the National Register of Historic Places on October 28, 1985, the Belltown Historic District is located in the center of East Hampton. It contains a large concentration of contributing historic buildings. Although settlement in this area dates from the early eighteenth century, the vast majority of the buildings in the district were built after 1800, the period associated with the industrial development of the town as a bell-manufacturing center. The Belltown Historic District is historically significant as the only mill town in the nation known to be exclusively devoted to bell making, a highly specialized industry which prospered for over 100 years. A significant cohesive and distinguishable entity, the district contains a full range of historic resources that illustrate in their diversity of scale, function, or level of architectural style the social and economic development of the town. Exceptionally well-preserved buildings of all types dating from 1748 to 1935 can be found in the Belltown Historic District. Two historic sites, functioning stone dams, also dating from the nineteenth century, are also located in the district. One is part of a historic mill complex and the other is associated with a small number of industrial archaeological sites in the southwestern portion of the district. This historic district will not be impacted directly or indirectly by the construction of the proposed solar facility.

Standing Structure 42-5

Standing Structure 42-4, also known as, The Octagon House, dates from ca,. 1850 and is located on the north side of Middletown Avenue (Route 16), approximately 125 yards to the west of junction with South Main Street. The structure represents an example of the fairly rare octagonal plan of building popular around the middle of the nineteenth century and attributed to Orson Squire Fowler of Fishkill, New York. The structure walls are comprised of stucco over masonry and the porch extends across the front and two adjacent sides, with scalloped valance boards repeating those which extend around the house at the edge of the eaves. A single chimney appears at the center point of a low-pitch roof. At the corners, large scrolled brackets with recessed side-faces support the wide overhang of eaves.

Standing Structure 42-6

Located on the north side of Barton Hill Road facing south, approximately two-tenths of a mile east of the junction with Maple Street, this Mansard style house dates from c. 1870. Occupying a sizeable plot in a suitable location on a hill above the town center, this building may be regarded as a local mansion of an earlier day and more prosperous economy for the former industrial center of East Hampton. The structure is in full Mansard style, retaining the square cupola of the immediately preceding Italianate villa. A typical tower occupies the right front corner with dormers clustered on its steep roof slopes showing gables with scrolled brackets beneath their eaves. Similar brackets in larger scale appears on the dormers of the main structure with segmental roofs, beneath wide eaves of cupola in two sizes and in pairs with turned bosses on side faces along principal eaves of the house. The front entry has received the attention usually found in this style, exhibiting double-leaf arch-headed door with panels and bosses in a heavy molded frame. The porch is supported by square columns and pilasters with paneled sides and molded caps from which spring molded wooden arches repeating the door outline, with open work circles in spandrels. The low slope of the porch roof has a railing of turned balusters with urns on corner posts, while the roof is comprised of variegated slate shingled of hexagonal shape. Finally, the foundation is granite slabs on edge, the faces tooled in parallel ridges.

Standing Structure 42-7

Situated on the north end of Bevin Boulevard, this is the second house of the octagonal style discovered in East Hampton proper; it is somewhat larger than the other example (42-5). As seems characteristic of the type, this building has a porch on three of eight sides and stucco over masonry walls. Eaves of matching scale top the house walls, also very plain in style, and it is not clear whether brackets formerly supported these eaves and were removed in extensive renovation work by one of the owners, a retired builder, who may have also removed the chimneys. A two-story wing with exterior latticed stairway extends from the rear face of the building, apparently of the same construction as the house itself, although the window frames differ. If not original, it seems to have been in place for many years, its low-pitched gable roof according well with that of the main structure.

Site 42-15

The Skinner Saw and Grist Mill Site is located at the northeast corner of the intersection of Routes 196 and 16. It consists of the standing ruins of two stone, brick, and concrete structures, as well as the remains of a stone sluice gate located in a meadow on the west bank of Pocotopaug Creek. The Skinner sawmill was in continuous operation for most of the nineteenth century and used between one and seven up-and-down saws powered by a 140-foot water wheel that supplied most of the lumber for the shipbuilding industry in Middle Haddam, formerly Chatham. Ox wagons were made in the early part of the century, and as the ship building industry declined, a paper box factory, the first of its kind in the area, was added in the 1850's. The main buildings foundation shows evidence of being rebuilt on several occasions and finally burned to the ground in 1974. Although this was one of the largest sawmill operations in the area and it stayed in continuous operation for the longest period of time, further archaeological investigation is not warranted since the operation of the mill and its occupation range is already well documented.

Site 42-16

The Skinner Street Dam Site, which apparently supplied the waterpower to the sawmill to the south, is located next to Skinner Street in a heavily wooded area and runs east-west across the Pocotopaug Creek for 10 meters (32.8 feet). A concrete sluiceway gate was added at the western end when an earlier dam was surfaced and capped with concrete. A dam was located here in 1859 as evidenced by the pond recorded at this location, one of two historic millponds below spring-fed Lake Pocotopaug, which

supplied the water for several industries along this section of the creek below Main Street in East Hampton. This dam was clearly associated with the sawmill and quite possibly the bell factory south of Route 16. However, particularly after the dam was resurfaced it may have been associated with this latter site where no dam ruins were located and presumed to have been destroyed by road construction Any further archaeological investigation at either of these sites should take the location of this dam into consideration.

Site 42-17

The Patent Bell Manufactory Site consists of standing ruins built into a steep wooded slope next to Skinner Street and 30 meters (98.4 feet) from the Western bank of Pocotopaug Creek. One of three known extant bell manufacturing sites in East Hampton and identified as the Patent Bell Manufactury in 1859, it was owned by J. and J.W. Barton. It may have later become the N.N. Hill Brass Co., which was originally founded as a bell factory in 1880, and continued in business until 1915, specializing in sleigh and toy bell manufacture. Water turbine power was apparently used exclusively at this site. Together with the surface finds (leather harness, stamped metal wheeled toys) and the use of formed concrete, the identification and occupation range are supported.

Site 42-18

This unknown metal foundry site is located in a level, open area immediately to the west of Pocotopaug Creek and 30 meters (98.4 feet) south of the dam at Site 42-19 (below); it contains ruins of three structures. This manufacturing site, possibly the W.E. Barton Bell Manufactury, was probably used as a metal foundry for manufacturing bells, or could have supplied the raw materials for the bell factory site to the south. Although a deed search could clarify the water privileges at this dam, the second level of the dam, presumably added in 1880, apparently was constructed after this site had ceased to function. Any further archaeological investigation would be of slight value unless it also included the adjacent sites discussed.

Site 42-19

This extensive intact dam is three meters (9.8 feet) in height with an eight meter (26.2 feet) spillway; it lies west to east across Pocotopaug Creek and was constructed in two stages. The dam apparently supplied both Sites 42-17 and 42-18 at different periods in history. From the direct associations of the brownstone level to the 1880 bell factory site, it is presumed that the later addition was added at that time, which raised the pond level at least 1 meter (3.2 feet). This construction made no provision for supplying water to the foundry to the south, establishing a reasonable *terminus post quem* for that site. As a separate entity, this dam is of no further archaeological value but should be considered a part of any investigation of the associated sites.

Site 42-20

The Sexton Bell Factory Site, which contains standing ruins of stone, concrete, and vertical planks, includes a former factory wheel pit and is situated 20 meters (65.6 feet) from Pocotopaug Creek. This site is one of several bell factory sites in East Hampton. Originally the site was occupied by J. Arthur, a metal smelter. By 1859, D.W. and L.S. Sexton had erected a larger building on the site for the manufacture of wrought iron cowbells. However, the surface remains and features suggest other metals were used, perhaps at a later date, and archaeological excavation would establish not only the chronology of this development, but the processes used. Taken together with other known bell factory sites, this site has the archaeological potential for furthering the knowledge of this relatively unique industry by tracing its development from 1800 to the present, since bells are still being manufactured in the town today.

Site 42-24

The Niles and Parmalee Bell Manufacturing Site is located east of Route 196 in East Hampton and made bells as early as 1853. The manufacturing site was later taken over by Niles and Sons' who continued to make bells and coffin trimmings and ultimately sold the site to the Labanay Casket Company. A survey of the immediate site area on the western bank of the Pocotopaug Creek indicated that the original site has been destroyed. A brick building now used for storage located on or near the site was apparently built over older ruins, but the site is so disturbed by modern industrial development, road and bridge building that its archaeological potential is most likely destroyed.

Site 42-25

The Hoe Manufactory Site is located on South Main Street and to the north of the intersection with Route 196 in East Hampton. The remains of a small brownstone dam and the foundation walls of an elevated structure next to the dam are located on the east bank of the Pocotopaug Creek in a level meadow area. Slag and coal as well as the remains of a pouring ladle were collected next to the foundation. Additional surface finds included pottery and bottle fragments to the south. These artifacts, associated with former sites, indicate that the area had been used as a nineteenth century trash dump. As identified in 1859, the site was a Hoe Manufactory A.H. Markham. Earlier it had been used by Newbury Darling to manufacture scythes and later by Clark and Watrous bell and coffin trim manufacturers. It is presumed that the rest of the factory area was located across the creek, including the "large wooden buildings" used for other purposes.

Summary and Interpretations

The review of the previously identified cultural resources in the vicinity of the proposed project area, combined with the history of the area as described in Chapter IV, indicates that the project region possesses a significant record of historic period occupation and use. This occupation and use stretch back to the early eighteenth century and is represented by numerous standing structures, foundations, and presumably, associated archaeological deposits. While prehistoric archaeological sites have not yet been recorded in the project region, this is most likely related to the fact that very few archaeological surveys have been completed in this part of East Hampton. Thus, the identification of prehistoric occupations in the area cannot be ruled out.

CHAPTER VI
METHODS

Introduction

This chapter describes the research design and field methodology used to complete the current cultural resources survey of the study area in East Hampton, Connecticut. It also includes a discussion of the laboratory methods and the procedures used to process and analyze the recovered cultural material. Finally, the location and point-of-contact for the final facility at which all cultural material, drawings, maps, photographs, and field notes generated during survey will be curated is provided below.

Research Design

The current cultural resources survey was designed to identify all prehistoric and historic cultural resources located within the study area associated with the proposed project area. Fieldwork for the project was comprehensive in nature; planning considered the results of each previously completed archaeological survey within the project area, the distribution of previously recorded archaeological sites located near the proposed project area, and a geological assessment of the study area. The methods used to complete this investigation were designed to provide complete and thorough coverage of all portions of the study area. This undertaking entailed pedestrian survey, systematic subsurface testing, detailed mapping, and photo-documentation throughout the limits of the study area.

Field Methodology

Following the completion of all background research, the study area was subjected to an archaeological reconnaissance survey utilizing pedestrian survey, photo-documentation, mapping, and systematic shovel testing. The field strategy was designed such that the entire study area was examined visually and photographed. The pedestrian survey portion of this investigation included visual reconnaissance of all areas scheduled for impacts by the proposed development project. The field methodology also included subsurface testing of the proposed solar panel locations within the Citrine Solar Facility parcel. The associated access road alignment was previously disturbed and tested.

During survey, each shovel test measured 50 x 50 cm (19.7 x 19.7 in) in size and each was excavated until the glacially derived C-Horizon was encountered or until large buried objects (e.g., boulders) prevented further excavation. Each shovel test was excavated in 10 cm (3.9 in) arbitrary levels within natural strata, and the fill from each level was screened separately. All shovel test fill was screened through 0.635 cm (0.25 in) hardware cloth and examined visually for cultural material. Soil characteristics were recorded in the field using Munsell Soil Color Charts and standard soils nomenclature. Finally, each shovel test was backfilled immediately upon completion of the archaeological recordation process.

Laboratory Analysis

Laboratory analysis of recovered cultural material, which consisted of only historic artifacts, followed established archaeological protocols. To begin the laboratory analysis process, field specimen bag proveniences first were crosschecked against the field notes and the specimen inventories for accuracy and completeness. Following this quality-control process, all recovered material was washed by hand, air-dried, and sorted into basic material categories. The nature and structure of the laboratory analysis was determined by the goals of the project. The artifact analysis consisted of making and recording a series of observations for each recovered specimen. The observations were chosen to provide the most

significant information about each specimen. Separate databases, designed specifically for the analysis of the recovered historic and prehistoric artifacts, were employed to store, organize, and manipulate data gathered during the analytical process. A detailed discussion of the recovered artifacts is discussed in detail in the following chapter.

Historic Cultural Material Analysis

The analysis of the historic cultural material recovered during the current Phase I cultural resources reconnaissance survey was organized by class, functional group, type, and subtype. The first level, class, represented the material category, e.g., ceramic, glass, metal. The second level, functional group, e.g., architecture, kitchen, or personal, was based on standard classifications. The third and fourth levels, type and subtype, described the temporally and/or functionally diagnostic artifact attributes. The identification of artifacts was aided by consulting standard reference works.

Curation

Following the completion and acceptance of the Final Report of Investigations, all cultural material, drawings, maps, photographs, and field notes will be curated with:

Office of Connecticut State Archaeology
Box U-1023
University of Connecticut
Storrs, Connecticut 06269

CHAPTER VII
RESULTS OF THE INVESTIGATION

Introduction

This chapter presents the results of a cultural resources survey of the proposed Citrine Solar Center in East Hampton, Connecticut (Figures 1 and 2). The investigation was completed on behalf of All-Points Technology Corporation in January 2020, by personnel representing Heritage. All fieldwork was performed in accordance with the *Environmental Review Primer for Connecticut's Archaeological Resources* (Poirier 1987) promulgated by the Connecticut State Historic Preservation Office. The Phase IB cultural resources reconnaissance survey results are presented below.

Results of the Phase IB Cultural Resources Reconnaissance Survey of the Study Area

As discussed in Chapter I of this report, the LOW associated with the proposed solar facility measures approximately 12.95 ac in size. It occupies a forested area that is bordered by the Airline State Park Trail to the north, parcels along Skinner Street to the east, properties along Middletown Avenue to the south, and by a slope down to a wetland to the west (Figures 15 through 18). Access to the development area will be from Skinner Street (CT Route 196). The neighborhood around the project parcel is residential in character and contains mainly single-family homes and light industry.

The current effort consisted of pedestrian survey, subsurface testing, and mapping of the project parcel. The subsurface testing regime resulted in the excavation of 95 of 95 (100 percent) planned shovel tests measuring 50 x 50 cm (19.7 x 19.7 in) in size throughout the area containing the proposed solar facility (Figure 2). This effort resulted in the identification of a single unglazed redware base sherd recovered from the A Horizon at 20-30 cmbs (7.8 to 11.8 inbs). No evidence of historic period structures, either above-ground or buried, was noted with the LOW, which suggests that the artifact is representative of field scatter. Since it is a typical domestic artifact and no structural remains were identified during survey, the historic period deposit within LOW does not possess any unique characteristics or research potential. Thus, it was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional archaeological examination of the area is recommended prior to construction.

CHAPTER VIII
SUMMARY AND MANAGEMENT RECOMMENDATIONS

Heritage completed the current cultural resources survey on behalf of All-Points Technology Corporation in January 2020. A total of 95 of 95 (100 percent) planned shovel tests excavated throughout the areas containing the proposed solar facility development parcel. This effort resulted in the identification of a single unglazed redware base sherd. No evidence of historic period structures, either above-ground or buried, was noted with the LOW, indicating that the artifact is representative of field scatter. As it does not possess any unique characteristics or research potential, it was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional archaeological examination of the area is recommended prior to construction.

BIBLIOGRAPHY

Asch, D.L., and N. B. Asch

1985 Prehistoric Plant Cultivation in West-Central Illinois. In *Prehistoric Food Production in North America*, edited by R.I. Ford, pp. 149-203. Museum of Anthropology Anthropological Papers No. 75. University of Michigan, Ann Arbor.

Banks, R.C., R.W. McDiarmid, A.L. Gardner

1987 *Checklist of vertebrates of the Unites States: The U.S. Territories and Canada*. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.

Barber, J. W.

1837 *Connecticut Historical Collections*. Hanover, N.H., Bibliopola Press; Distributed by the University Press of New England, Storrs, Connecticut.

Beers, F. W.

1884 *County Atlas of Middlesex, Connecticut*. New York: F. W. Beers & Co.

Bell, Michael

1985 *The Face of Connecticut: People, Geology, and the Land.* State Geological Natural History Survey of Connecticut Department of Environmental Protection.

Bendremer, J.

1993 *Late Woodland Settlement and Subsistence in Eastern Connecticut.* Ph.D. Dissertation, Department of Anthropology, University of Connecticut, Storrs, Connecticut.

Bendremer, J. and R. Dewar

1993 The Advent of Maize Horticulture in New England. In *Corn and Culture in the Prehistoric New World.* Ed. by S. Johannessen and C. Hastorf. Westview Press, Boulder.

Bendremer, J., E. Kellogg and T. Largy

1991 A Grass-Lined Storage Pit and Early Maize Horticulture in Central Connecticut. *North American Archaeologist 12(4):325-349.*

Braun, E.L.

1950 *Deciduous Forests of Eastern North America.* The Free Press.

Brown, Clair A.

1965 *Louisiana Trees and Shrubs.* Louisiana Forestry Commission Bulletin No. 1. Claitor's Publishing Division, Baton Rouge, Louisiana.

Chapman, J., and A.B. Shea

1981 The Archaeobotanical Record: Early Archaic Period to Contact in the Lower Little Tennessee River Valley. *Tennessee Anthropologist* 6(1):61-84.

Coe, Joffre Lanning
1964 The Formative Cultures of the Carolina Piedmont. *Transactions of the American Philosophical Society*, Vol. 54, Part 5. Philadelphia, Pennsylvania.

Connecticut, State of
1932 *State Register and Manual.* Hartford, CT: The State.

Connecticut Department of Environmental Protection (CT DEP)
1970 Connecticut Statewide Aerial Photograph Series. Hartford, Connecticut: Connecticut State Archives.

Curran, M.L., and D.F. Dincauze
1977 Paleo-Indians and Paleo-Lakes: New Data from the Connecticut Drainage. In *Amerinds and their Paleoenvironments in Northeastern North America.* Annals of the New York Academy of Sciences 288:333-348.

Davis, M.
1969 Climatic changes in southern Connecticut recorded by Pollen deposition at Rogers Lake. *Ecology* 50: 409-422.

De Forest, J. W.
1852 *History of the Indians of Connecticut from the Earliest Known Period to 1850.* Wm. Jas. Hamersley, Hartford, Connecticut.

Dincauze, Dena F.
1974 An Introduction to Archaeology in the Greater Boston Area. *Archaeology of Eastern North America* 2(1):39-67.

1976 *The Neville Site: 8000 Years at Amoskeag.* Peabody Museum Monograph No. 4. Cambridge, Massachusetts.

Dowhan, J.J. and R.J. Craig
1976 *Rare and endangered species of Connecticut and Their Habitats.* State Geological Natural History Survey of Connecticut Department of Environmental Protection, Report of Investigations No. 6.

Dwight, Benjamin W.
1975 *The History of the Descendants of Elder John Strong, of Northampton, Mass.* Baltimore, Maryland: Gateway Press, Inc

Fairchild Aerial Surveys
1934 Connecticut Statewide Aerial Photograph Series. Hartford, Connecticut: Connecticut State Archives.

Feder, Kenneth
1984 *Pots, Plants, and People: The Late Woodland Period of Connecticut.* Bulletin of the Archaeological Society of Connecticut 47:99-112.

Fitting, J.E.
1968 *The Spring Creek Site*. In *Contributions to Michigan Archaeology*, pp. 1-78. Anthropological Papers No. 32. Museum of Anthropology, University of Michigan, Ann Arbor.

Ford, R.I.
1985 Patterns of Prehistoric Food Production in North America. In *Prehistoric Food Production in North America*, edited by R.I. Ford, pp. 341-364. Museum of Anthropology Anthropological Papers No. 75. University of Michigan, Ann Arbor.

Fritz, Gayle J.
1990 Multiple Pathways to Farming in Pre-Contact Eastern North America. *Journal of World Prehistory* 4(4):387-435.

Funk, R.E.
1976 *Recent Contributions to Hudson Valley Prehistory.* New York State Museum Memoir 22. Albany.

George, D.
1997 A Long Row to Hoe: The Cultivation of Archaeobotany in Southern New England. *Archaeology of Eastern North America* 25:175 - 190.

George, D. and C. Tryon
1996 *Lithic and Raw Material Procurement and Use at the Late Woodland Period Cooper Site, Lyme, Connecticut.* Paper presented at the joint meeting of the Archaeological Society of Connecticut and the Massachusetts Archaeological Society, Storrs Connecticut

George, D.R., and R. Dewar
1999 Prehistoric Chenopodium in Connecticut: Wild, Weedy, Cultivated, or Domesticated? *Current Northeast Paleoethnobotany*, edited by J. Hart, New York State Museum, Albany, New York.

Gerrard, A.J.
1981 *Soils and Landforms, An Integration of Geomorphology and Pedology*. George Allen & Unwin: London.

Gramly, R. Michael, and Robert E. Funk
1990 What is Known and Not Known About the Human Occupation of the Northeastern United States Until 10,000 B. P. *Archaeology of Eastern North America* 18: 5-32.

Griffin, J.B.
1967 Eastern North America Archaeology: A Summary. *Science* 156(3772):175-191.

Hartford Courant, The
2010 "Frederick Treat Strong Obituary." Published July 8, 2010. Accessed February 22, 2019. https://www.legacy.com/obituaries/hartfordcourant/obituary.aspx?n=frederick-treat-strong&pid=143972782.

Hopkins, F. M., Jr.
1859 *Clark's Map of Litchfield County, Connecticut.* Philadelphia: Richard Clark.

Johannessen, Sissel
1984 Paleoethnobotany. In *American Bottom Archaeology: A Summary of the FAI-270 Project Contribution to the Culture History of the Mississippi River Valley*, edited by Charles J. Bareis and James W. Porter, pp. 197-214. University of Illinois Press, Urbana.

Jones, B.
1997 The Late Paleo-Indian Hidden Creek Site in Southeastern Connecticut. *Archaeology of Eastern North America* 25:45-80.

Keegan, Kristen Noble, comp.
2012 Historical Population Data of Connecticut. Unpublished Excel spreadsheet.

Lavin, L.
1980 Analysis of Ceramic Vessels from the Ben Hollister Site, Glastonbury, Connecticut. *Bulletin of the Archaeological Society of Connecticut* 43:3-46.

1984 Connecticut Prehistory: A Synthesis of Current Archaeological Investigations. *Archaeological Society of Connecticut Bulletin* 47:5-40.

1986 *Pottery Classification and Cultural Models in Southern New England Prehistory.* North American Archaeologist 7(1):1-12.

1987 The Windsor Ceramic Tradition in Southern New England. *North American Archaeologist* 8(1):23-40.

1988a Coastal Adaptations in Southern New England and Southern New York. *Archaeology of Eastern North America*, Vol.16:101-120.

1988b The Morgan Site, Ricky Hill, Connecticut: A Late Woodland Farming Community in the Connecticut River Valley. *Bulletin of the Archaeological Society of Connecticut* 51:7-20.

Lizee, J.
1994a *Prehistoric Ceramic Sequences and Patterning in southern New England: The Windsor Tradition.* Unpublished Ph.D. dissertation, Department of Anthropology, University of Connecticut, Storrs.

1994b *Cross-Mending Northeastern Ceramic Typologies.* Paper presented at the 1994 Annual Meeting of the Northeastern Anthropological Association, Geneseo, New York.

McBride, K.
1978 Archaic Subsistence in the Lower Connecticut River Valley: Evidence from Woodchuck Knoll. *Man in the Northeast* 15 & 16:124-131.

1983 *Prehistory of the Lower Connecticut River Valley.* Ph.D. Dissertation, Department of Anthropology, University of Connecticut, Storrs, Connecticut.

Moeller, R.
1980 *6-LF-21: A Paleo-Indian Site in Western Connecticut.* American Indian Archaeological Institute, Occasional Papers No. 2.

Niering, W.A., and N.C. Olmstead
1995 *National Audubon Society Field Guide to North American Wildflowers: Eastern Region.* Chanticleer Press, New York.

Pagoulatos, P.
1988 Terminal Archaic Settlement and Subsistence in the Connecticut River Valley. *Man in the Northeast* 35:71-93.

Pease, John C. and John M. Niles
1819 *A Gazetteer of the States of Connecticut and Rhode-Island.* Hartford, Connecticut: William S. Marsh.

Peterson, T. R., and M. McKenny
1968 *Wildflowers of Northeastern and North-Central America.* Houghton Mifflin Company, Boston, Massachusetts.

Pfeiffer, J.
1984 The Late and Terminal Archaic Periods in Connecticut Prehistory. *Bulletin of the Bulletin of the Archaeological Society of Connecticut* 47:73-88.

1986 Dill Farm Locus I: Early and Middle Archaic Components in Southern Connecticut. *Bulletin of the Archaeological Society of Connecticut* 49:19-36.

1990 The Late and Terminal Archaic Periods in Connecticut Prehistory: A Model of Continuity. In *Experiments and Observations on the Archaic of the Middle Atlantic Region.* R. Moeller, ed.

Poirier, D.
1987 *Environmental Review Primer for Connecticut's Archaeological Resources.* Connecticut Historical Commission, State Historic Preservation Office, Hartford, Connecticut.

Pope, G.
1952 Excavation at the Charles Tyler Site. *Bulletin of the Archaeological Society of Connecticut* 26:3-29.

1953 The Pottery Types of Connecticut. *Bulletin of the Archaeological Society of New Haven* 27:3-10.

Ritchie, W.A.
1969a *The Archaeology of New York State*. Garden City: Natural History Press.

1969b *The Archaeology of Martha's Vineyard: A Framework for the Prehistory of Southern New England; A study in Coastal Ecology and Adaptation*. Garden City: Natural History Press

1971 *A Typology and Nomenclature for New York State Projectile Points*. New York State Museum Bulletin Number 384, State Education Department. University of the State of New York, Albany, New York.

Ritchie, W.A., and R.E. Funk

1973 *Aboriginal Settlement Patterns in the Northeast*. New York State Museum Memoir 20. The State Education Department, Albany.

Robinson, P., and Hall, L. M.

1980 Tectonic synthesis of southern New England. In *International Geological Correlation Project, Proceedings, Project 27: The Caledonides in the U.S.A.*: Blacksburg, Virginia, Virginia Polytechnic Institute and State University Department of Geological Sciences Memoir 2, edited by Wones, D.R.

Rouse, I.

1947 Ceramic Traditions and sequences in Connecticut. *Bulletin of the Archaeological Society of Connecticut* 21:10-25.

Salwen, B., and A. Ottesen

1972 Radiocarbon Dates for a Windsor Occupation at the Shantok Cove Site. *Man in the Northeast* 3:8-19.

Shelford, V.E.

1963 *The Ecology of North America*. University of Illinois Press.

Smith, B.D.

1992 *Rivers of Change: Essays on Early Agriculture in Eastern North America.* Smithsonian Institution Press, Washington and London.

Smith, C.

1947 An Outline of the Archaeology of Coastal New York. *Bulletin of the Archaeological Society of Connecticut* 21:2-9.

Snow, D.

1980 *The Archaeology of New England.* Academic Press, New York.

Spiess, Matthias

1934 *Connecticut Circa 1625: Its Indian Trails Villages and Sachemdoms*. [N.p.]: The Connecticut Society of the Colonial Dames of America, Inc.

Swanton, J.R.

1946 *The Indians of the United States.* Smithsonian Institution Bureau of American Ethnology Bulletin 137. Reprinted 1979. Washington, D.C.

Turner, G. M., and M. W. Jacobus

1989 *Connecticut Railroads: An Illustrated History*. Hartford, Connecticut: Connecticut Historical Society.

Tuck, J.A.

1978 Regional Cultural Development, 3,000 B.C., to A.D. 1,000. In *Handbook of North American Indians, Volume 15*. Edited by B. G. Trigger, Smithsonian Institution Press, Washington, D.C.

United States Department of Agriculture (USDA)

1951 Agricultural Stabilization and Conservation Service Aerial Photography for Connecticut. Washington, DC: Collections of the National Archives and Records Administration.

Watson, P.J.

1989 Early Plant Cultivation in the Eastern Woodlands of North America. In Foraging and Farming, edited by D. R. Harris and G. C. Hillman, pp. 555-571. Unwin Hyman, London.

Witthoft, J.

1949 An Outline of Pennsylvania Indian History. Pennsylvania History 16(3):3-15.

1953 Broad Spearpoints and the Transitional Period Cultures. Pennsylvania Archaeologist, 23(1):4-31.

Wood, Frederic J.

1919 *The Turnpikes of New England and Evolution of the Same Through England, Virginia, and Maryland*. Boston: Marshall Jones Company.

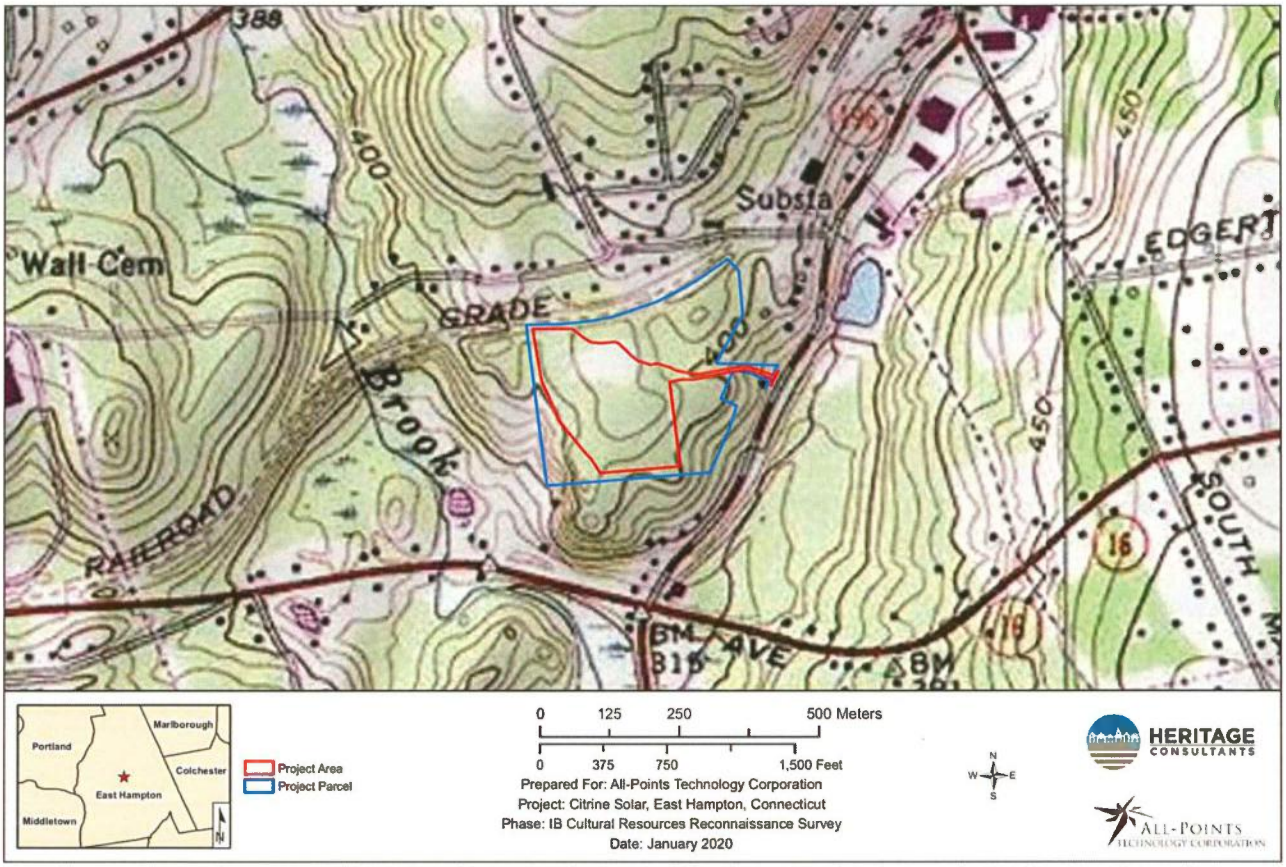


Figure 1. Excerpt from recent USGS topographic quadrangle map depicting the proposed project area in East Hampton, Connecticut.

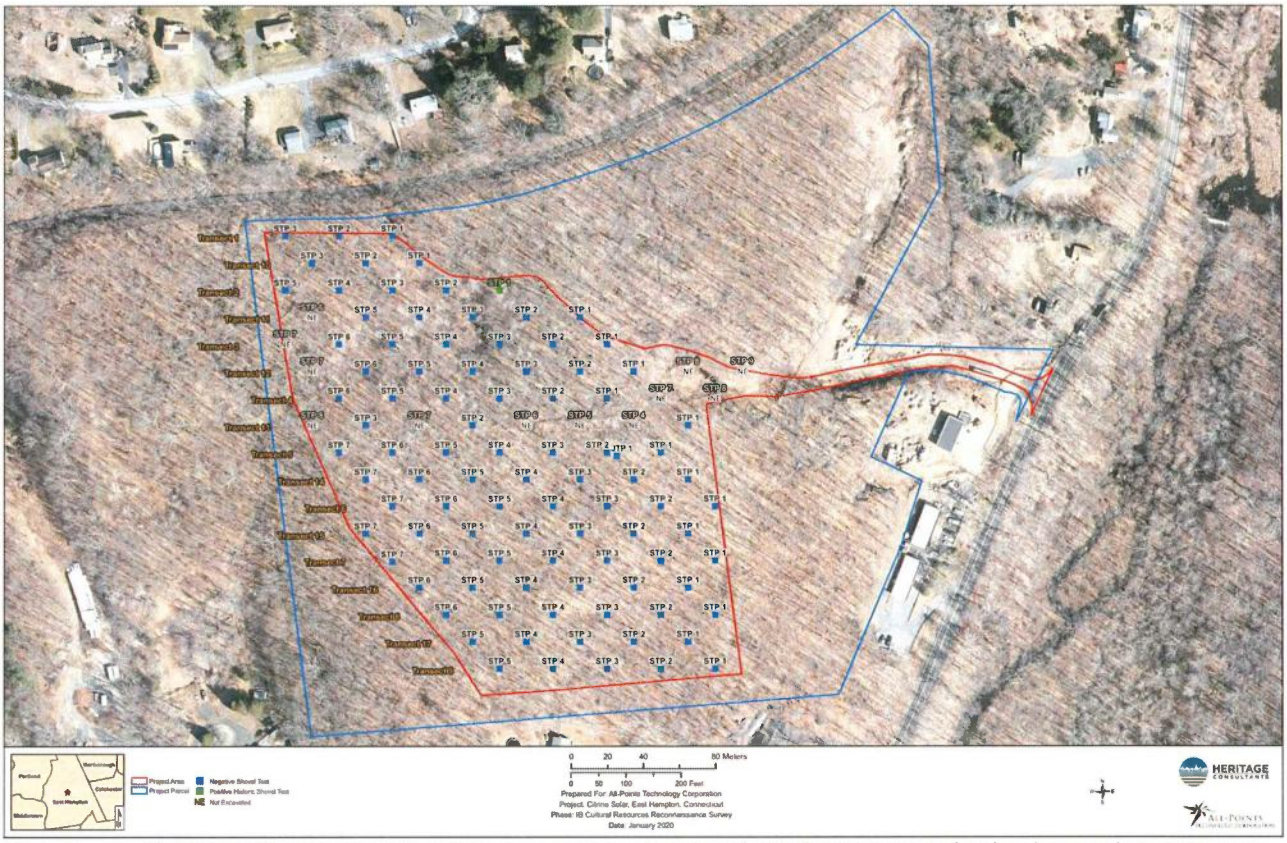


Figure 2. Plan for the Phase IB survey shovel tests at the proposed Citrine Solar Facility Project parcel and project area in East Hampton, Connecticut.

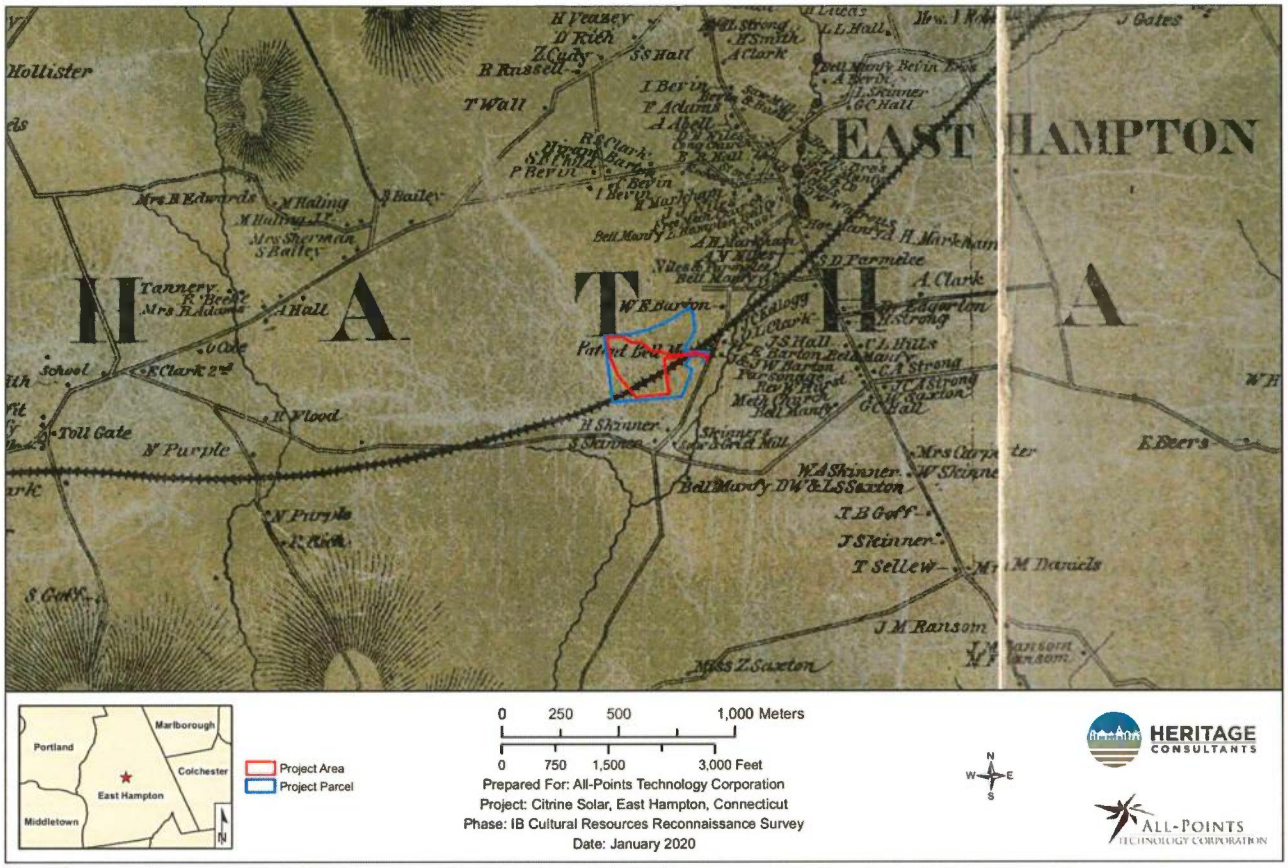


Figure 3. Excerpt from a 1859 historic map depicting the location of the proposed project area in East Hampton, Connecticut.

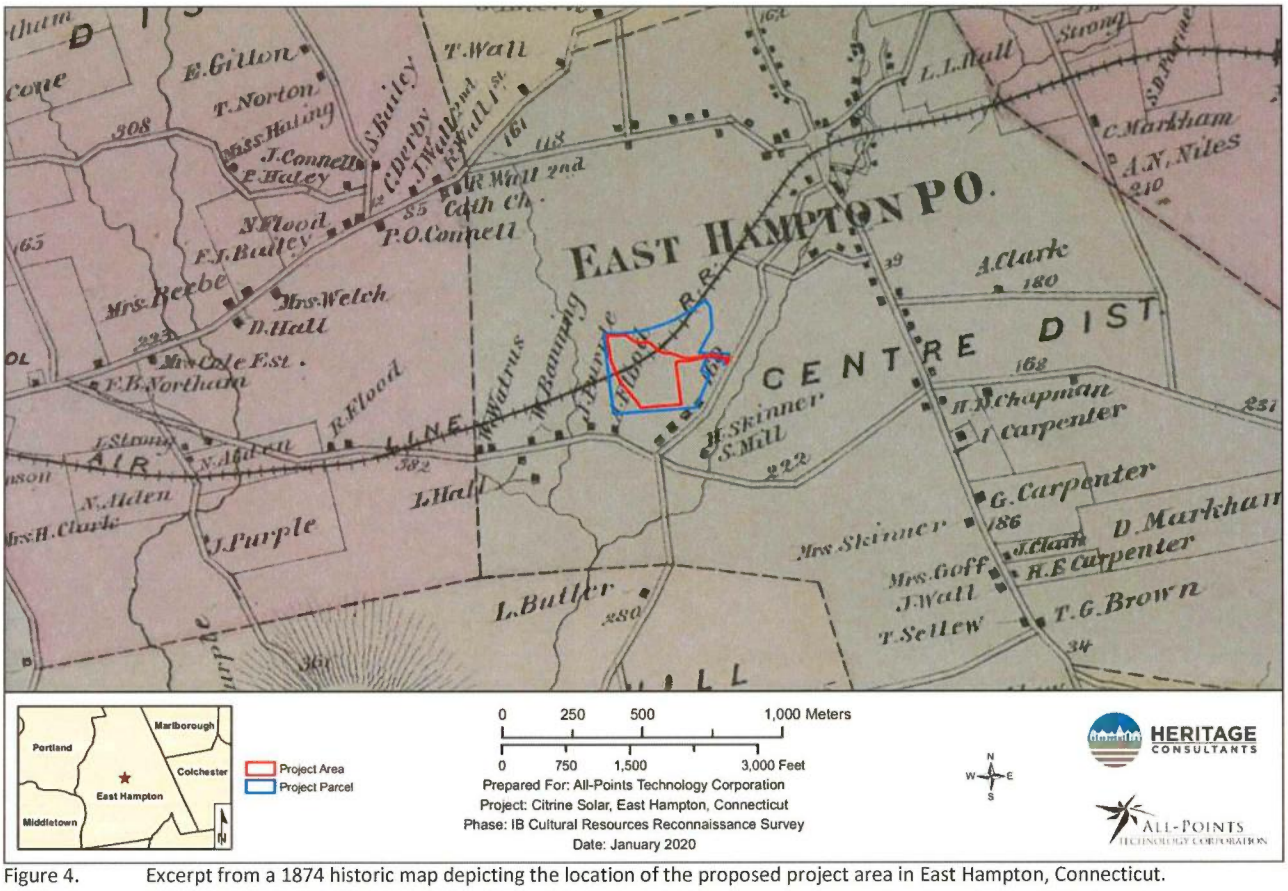


Figure 4. Excerpt from a 1874 historic map depicting the location of the proposed project area in East Hampton, Connecticut.

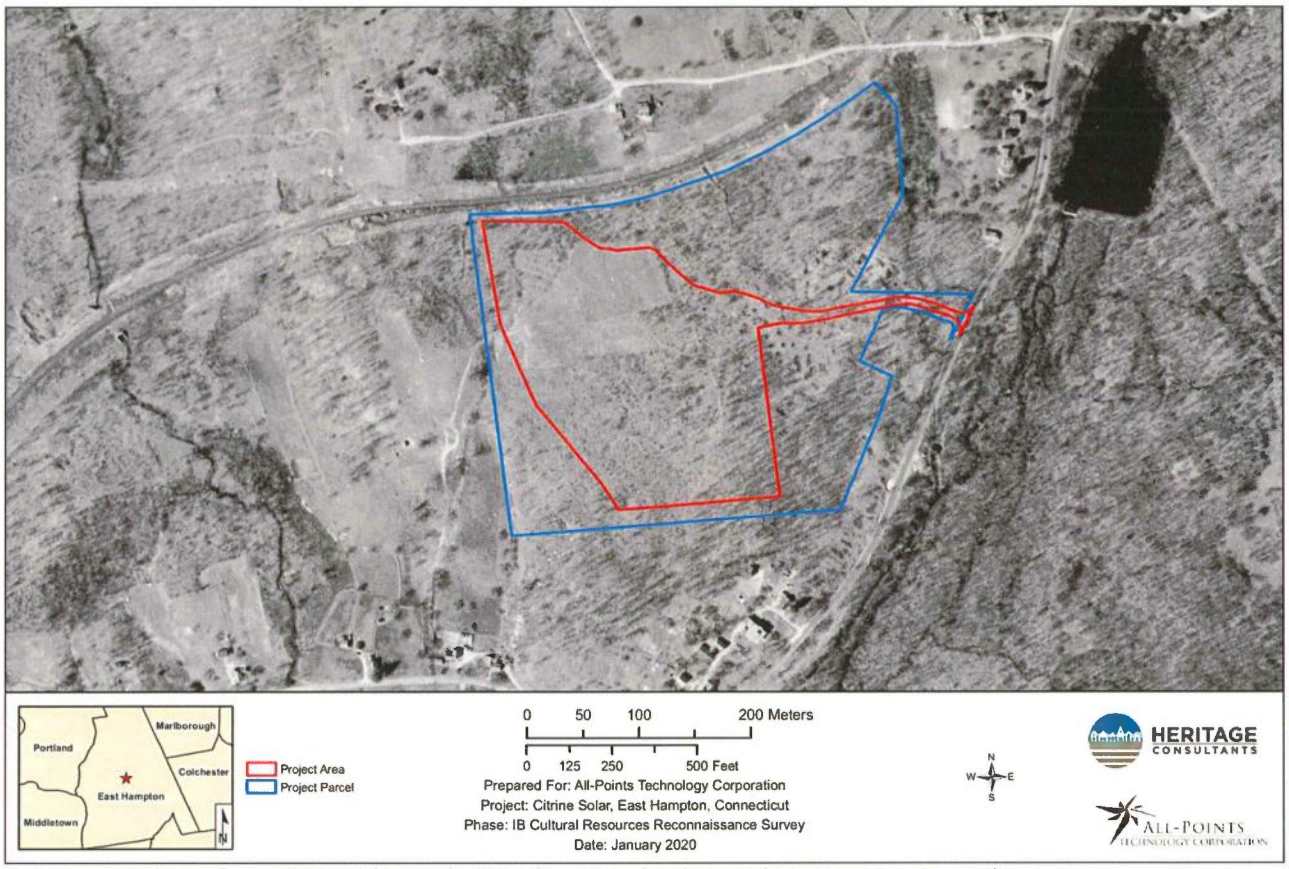


Figure 5. Excerpt from a 1934 aerial image depicting the proposed project area in East Hampton, Connecticut.

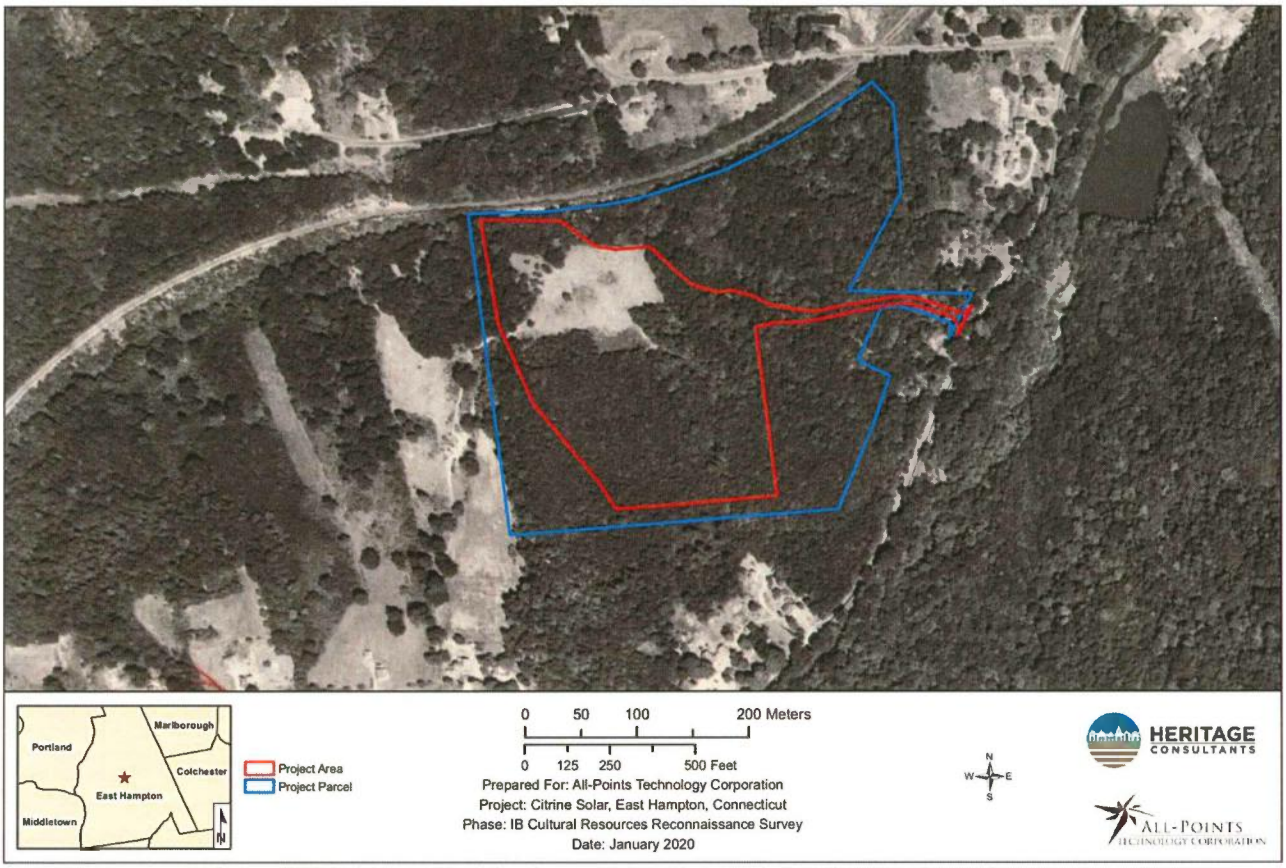


Figure 6. Excerpt from a 1957 aerial image depicting the proposed project area in East Hampton, Connecticut.

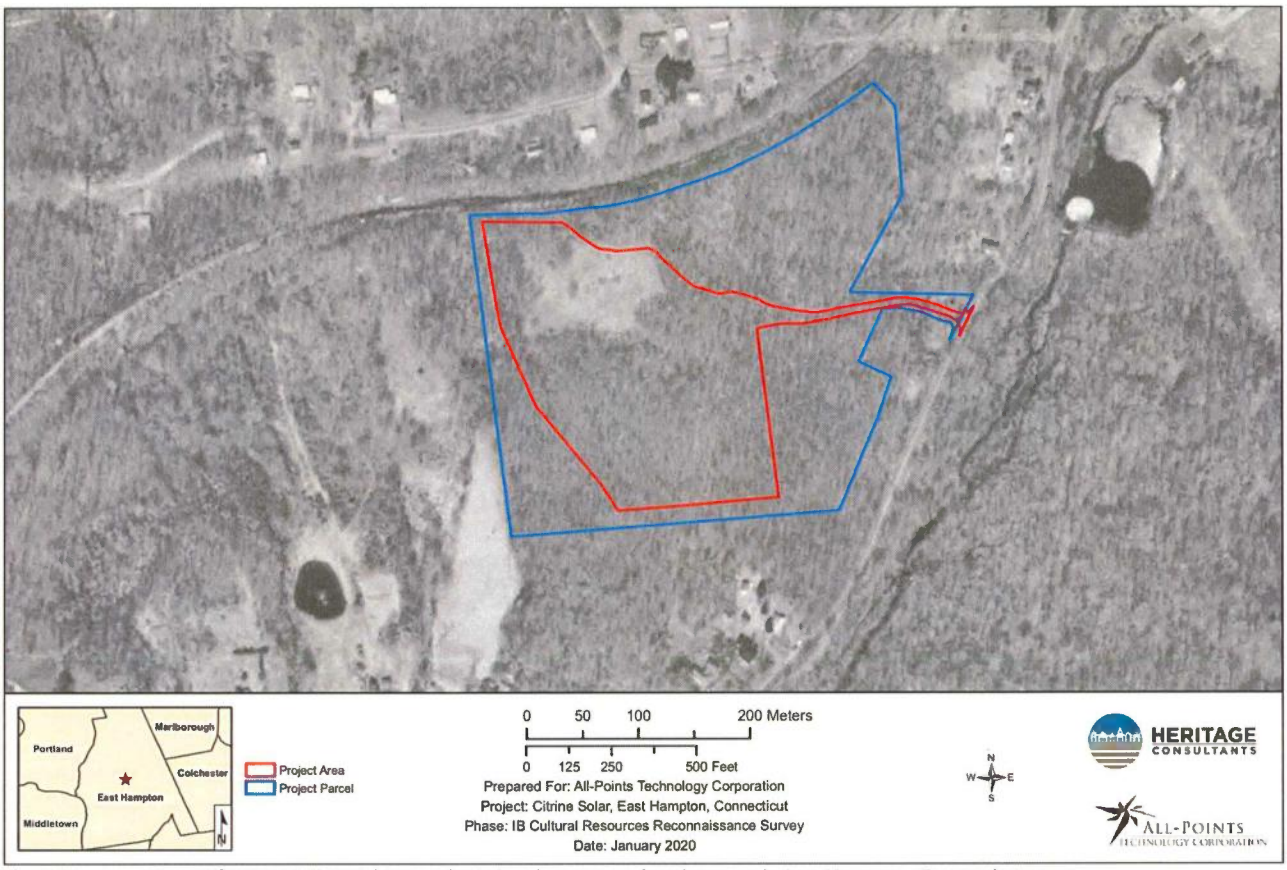


Figure 7. Excerpt from a 1970 aerial image depicting the proposed project area in East Hampton, Connecticut.

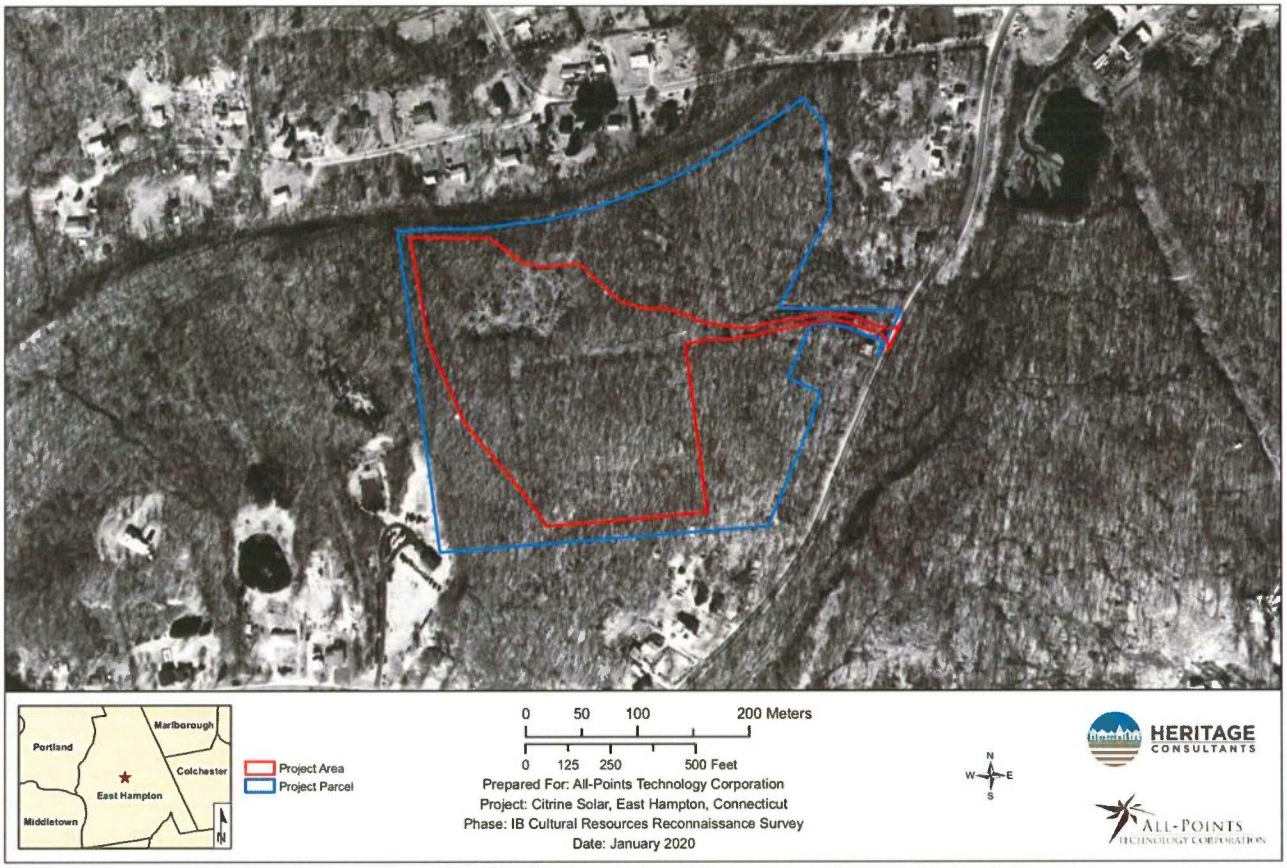


Figure 8. Excerpt from a 1986 aerial image depicting the proposed project area in East Hampton, Connecticut.

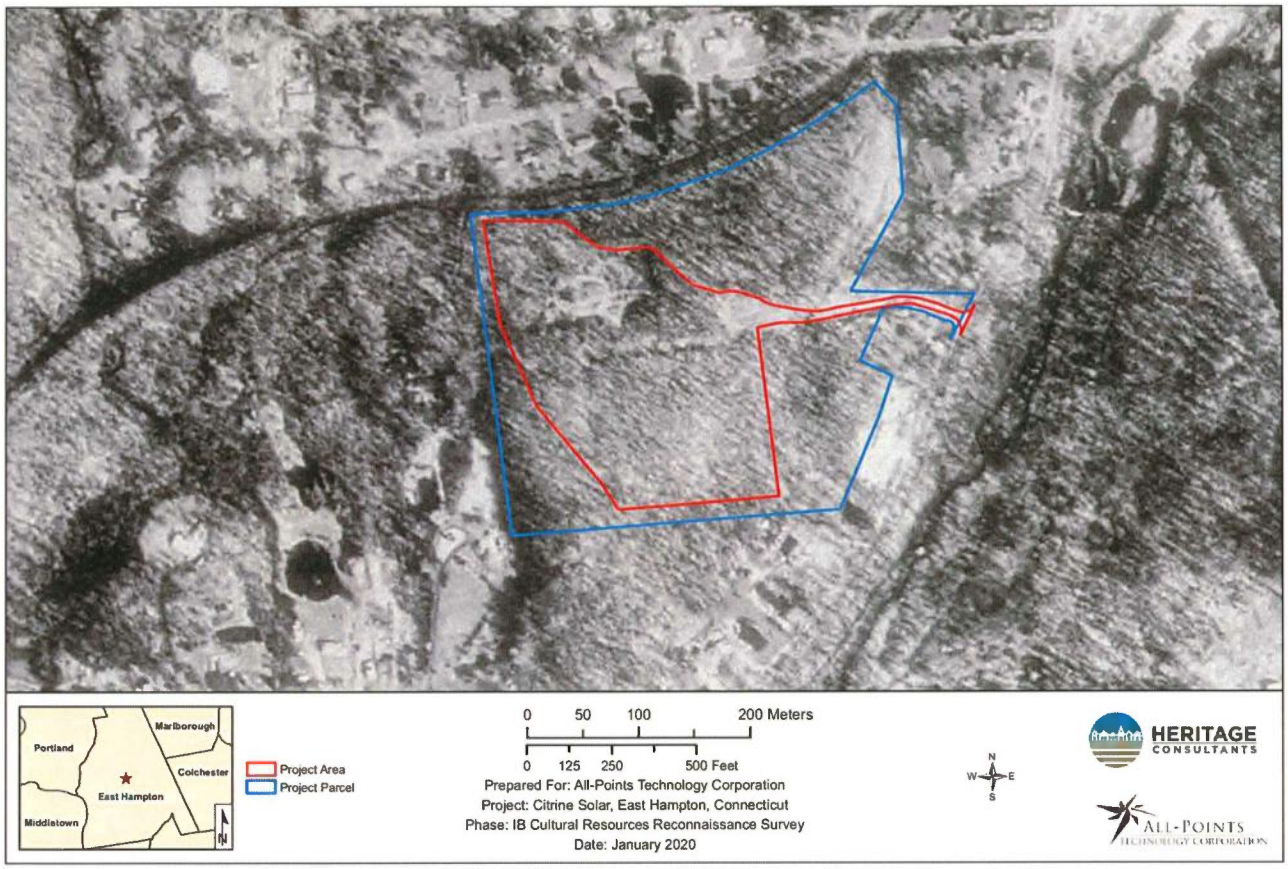


Figure 9. Excerpt from a 1990 aerial image depicting the proposed project area in East Hampton, Connecticut.

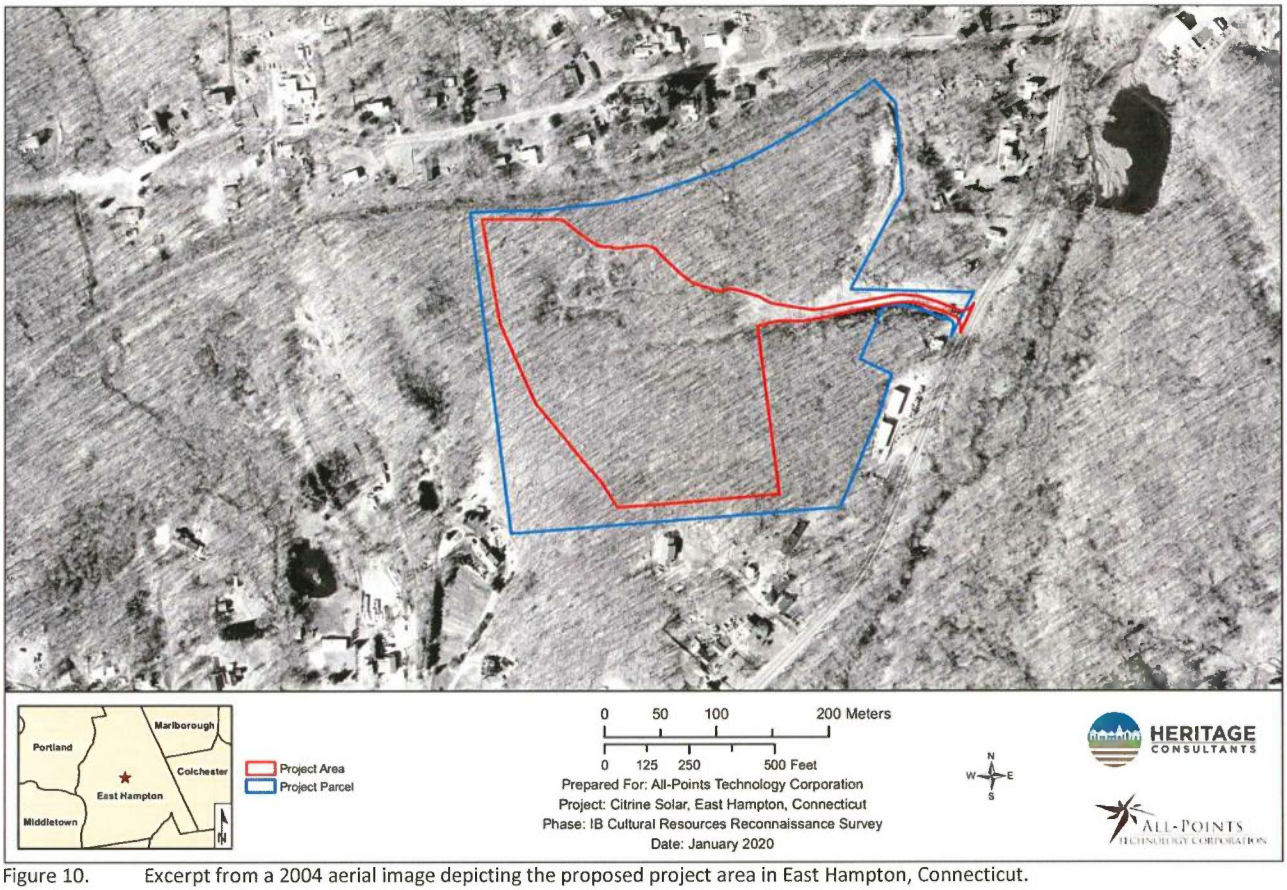


Figure 10. Excerpt from a 2004 aerial image depicting the proposed project area in East Hampton, Connecticut.

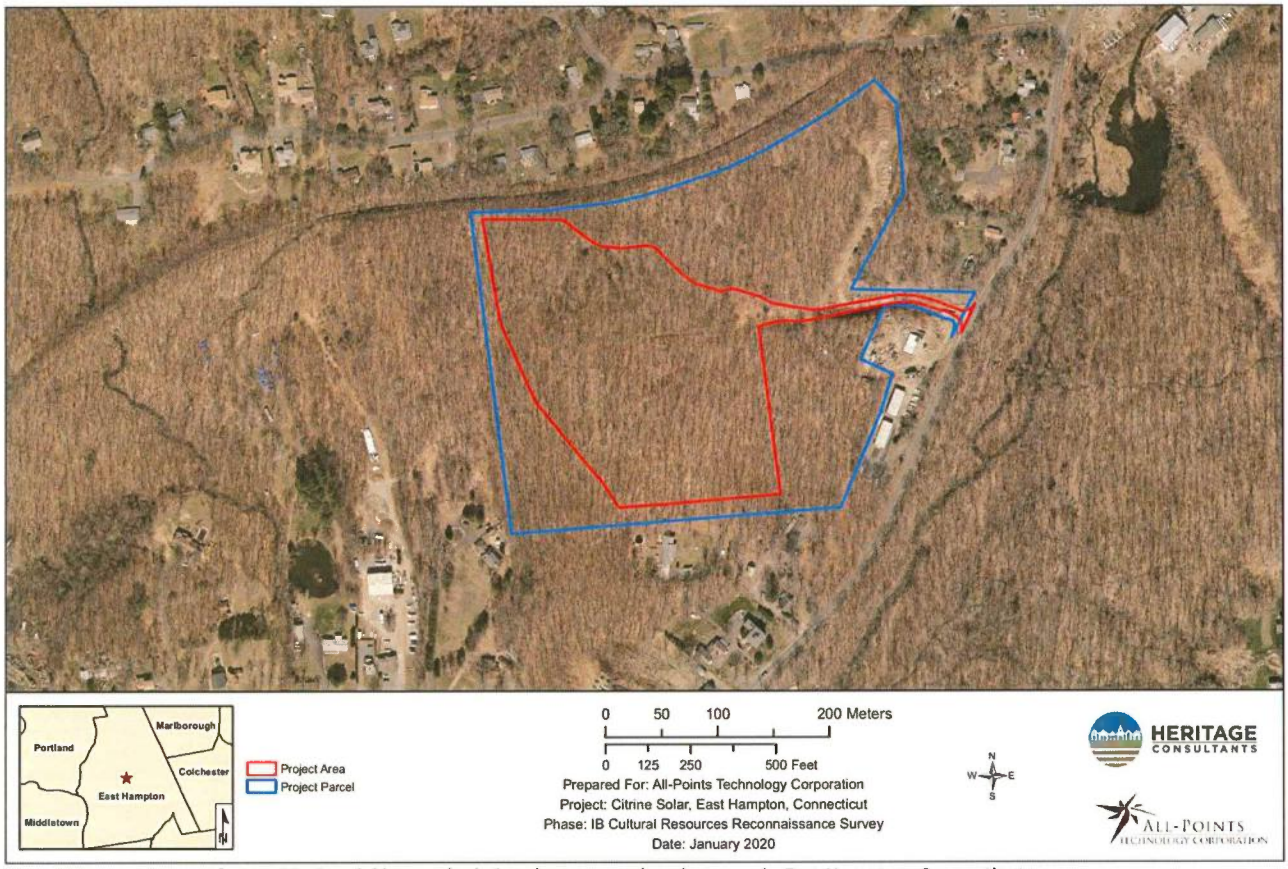


Figure 11. Excerpt from a 2016 aerial image depicting the proposed project area in East Hampton, Connecticut.

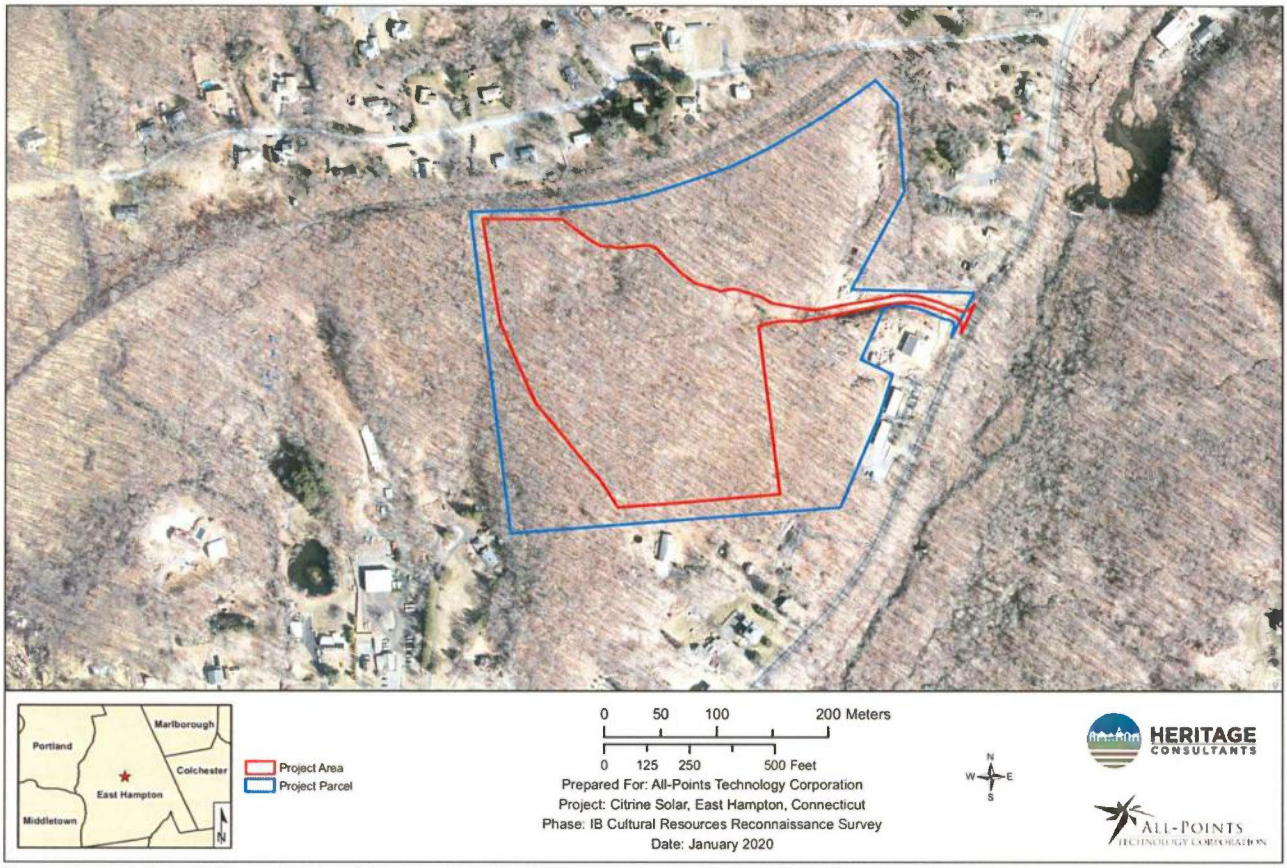


Figure 12. Excerpt from a 2019 aerial image depicting the proposed project area in East Hampton, Connecticut.

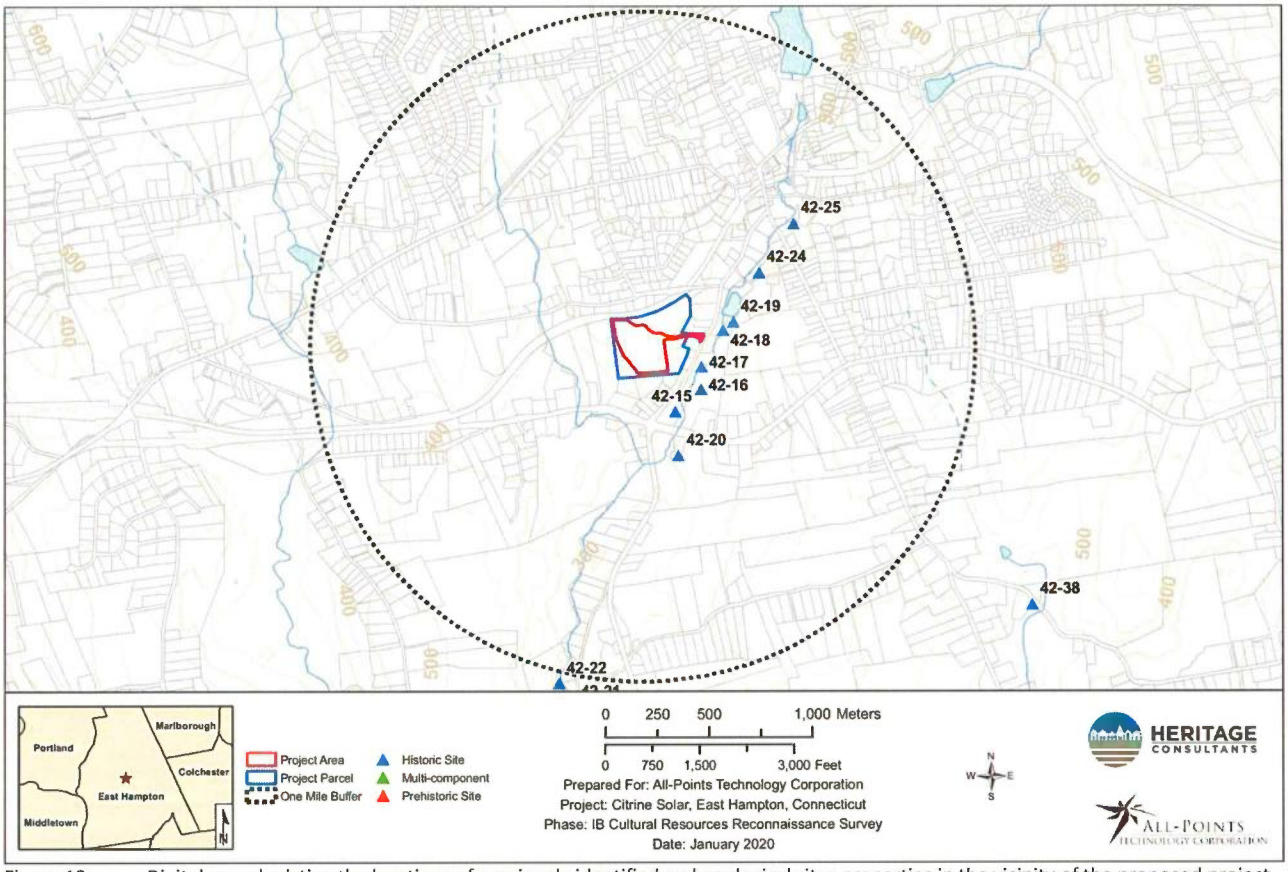


Figure 13. Digital map depicting the locations of previously identified archaeological sites properties in the vicinity of the proposed project area in East Hampton, Connecticut.

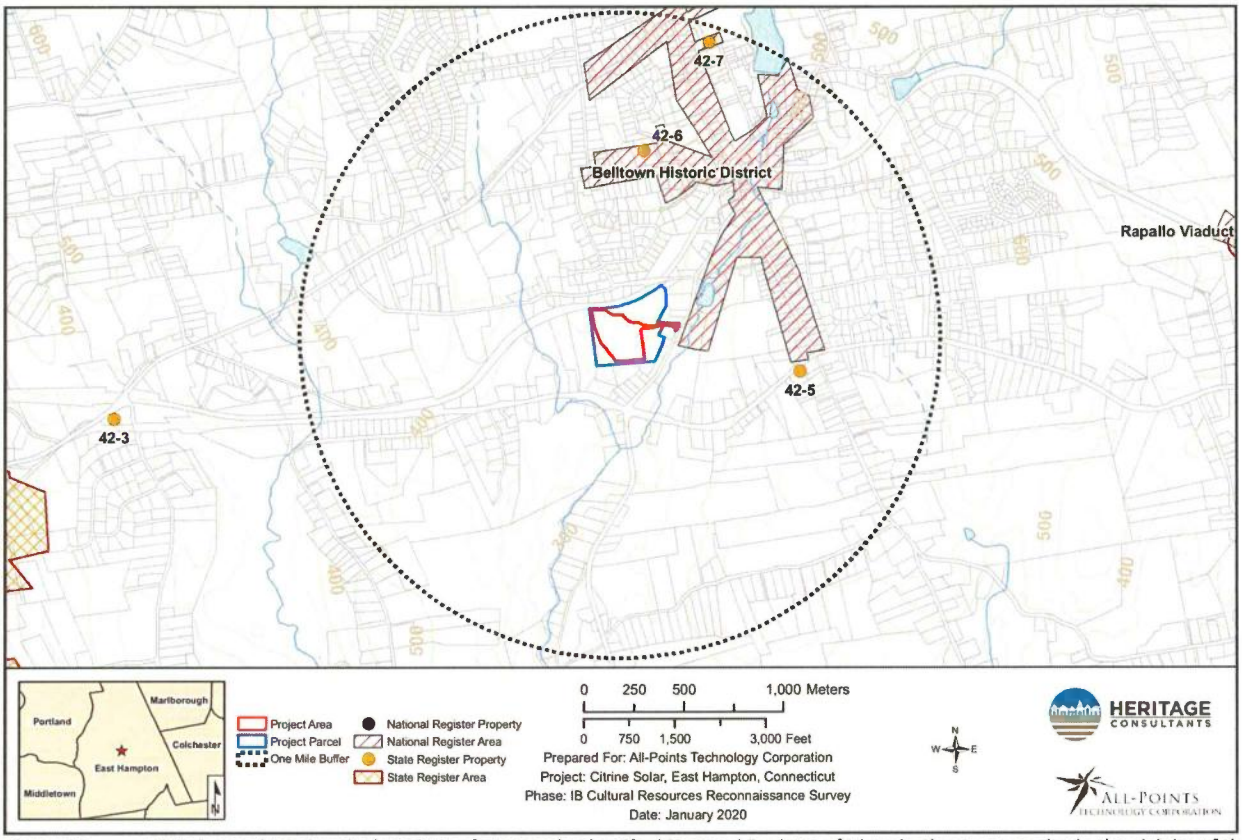


Figure 14. Digital map depicting the locations of previously identified National Register of Historic Places properties in the vicinity of the proposed project area in East Hampton, Connecticut.

Figure 15. Overview photo of the access road leading into the solar facility facing west.

Figure 16. Overview photo of the project parcel facing south.

Figure 17. Overview photo of the project parcel facing west.

Figure 18. Overview photo of the project parcel facing north.

Connecticut
Department of Economic and Community Development
State Historic Preservation Office

February 7, 2020

Mr. David R. George
Heritage Consultants
PO Box 310249
Newington, CT 06131

Subject: Phase IA and Phase IB Cultural Resource Reconnaissance Survey
Proposed Citrine Solar Facility
Skinner Street
East Hampton, Connecticut
ENV-20-0504

Dear Mr. George:

The State Historic Preservation Office (SHPO) has reviewed the cultural resource reconnaissance survey prepared by Heritage Consultants, LLC (Heritage), dated January 2020. The proposed activities are under the jurisdiction of the Connecticut Siting Council and are subject to review by this office pursuant to the Connecticut Environmental Policy Act (CEPA). The proposed facility includes the construction of a solar facility, which is to occupy an approximately 12.95 acre Limit of Work (LOW), within a larger 27.4 acre parcel. The LOW is bordered to the north by Airline State Park Trail, Skinner Street to the east, Middletown Avenue to the south, and wetlands to the west. Access to the facility is to be from Skinner Street. The submitted report is well-written, comprehensive, and meets the standards set forth in the *Environmental Review Primer for Connecticut's Archaeological Resources*.

The Phase IA assessment survey identified eight previously known archaeological sites located within 1 mile of the project area; however, none will be impacted by the proposed undertaking. One property listed on the National Register of Historic Places, the Belltown Historic District (NR# 85003543) is located within 1 mile of the project area; however, it will not be impacted by the proposed undertaking. Three properties listed on the State Register of Historic Places, identified as Structures 42-5, 42-6, and 42-7. None will be impacted by the proposed undertaking.

Phase IB of the reconnaissance survey consisted of subsurface testing of areas deemed to have moderate to high archaeological sensitivity during Phase IA, and that would be subject to ground disturbing impacts as part of the proposed undertaking. A total of 95 of 95 planned shovel tests

were excavated successfully throughout the proposed work area. A single unglazed redware base sherd was recovered for the A Horizon, indicative of field scatter. No other cultural materials or features from either the historic or prehistoric periods were identified.

As a result of the information submitted, SHPO concurs with the findings of the report that additional archeological investigations of the project areas are not warranted and that no historic properties will be affected by the proposed activities. However, please be advised that if construction plans change to include previously uninvestigated/undisturbed areas, SHPO should be contacted for additional consultation.

This office appreciates the opportunity to review and comment upon this project. For additional information, please contact Marena Wisniewski, Environmental Reviewer, at (860) 256-2754 or marena.wisniewski@ct.gov.

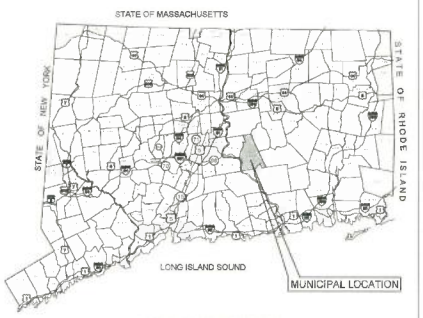
Sincerely,

Mary B. Dunne

Mary B. Dunne
State Historic Preservation Officer

APPENDIX D

Project Plans



CITRINE POWER, LLC

"CP EAST HAMPTON SOLAR I & CP EAST HAMPTON SOLAR II"

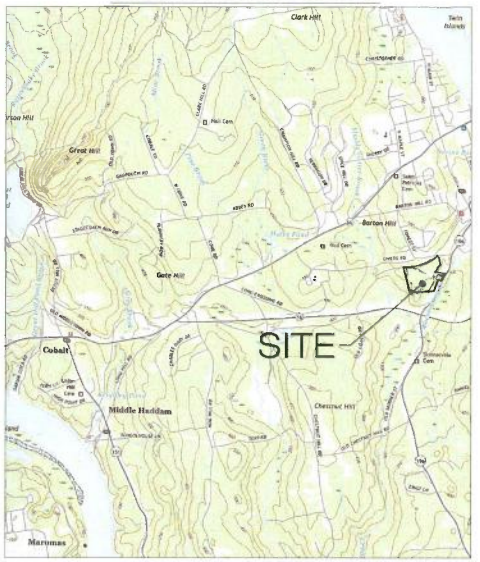
SKINNER STREET
EAST HAMPTON, CT 06424

LIST OF DRAWINGS

SITE INFORMATION

SITE NAME:	"CP EAST HAMPTON SOLAR I & CP EAST HAMPTON SOLAR II"
LOCATION:	SKINNER STREET EAST HAMPTON, CT 06424
SITE TYPE/DESCRIPTION:	ADD TWO (2) GROUND MOUNTED SOLAR PANEL ARRAY W/ ASSOCIATED EQUIPMENT.
PROPERTY OWNER:	SKINNER STREET PROPERTIES LLC 9 SEQUONIA TRAIL EAST HAMPTON, CT 06424
APPLICANT:	CP EAST HAMPTON SOLAR I & CP EAST HAMPTON SOLAR II 55 GREENS FARMS ROAD WESTPORT, CT 06880
ENGINEER CONTACT:	BRADLEY J. PARSONS, P.E. (860) 663-1697 x208
LATITUDE: LONGITUDE: ELEVATION:	41°34'05.44" N 72°30'31.80" W 426'± AMSL
MBLU: ZONE: EXISTING LAND USE: PROPOSED LAND USE:	20-48C-9 I INDUSTRIAL COMMUNICATIONS, TRANSPORTATION AND PUBLIC UTILITY USES - LARGE SCALE GROUND MOUNTED SOLAR PHOTOVOLTAIC INSTALLATIONS
TOTAL SITE ACERAGE: TOTAL DISTURBED AREA:	27.42± AC. 14.93± AC.
APPROX. VOLUME OF CUT: APPROX. VOLUME OF FILL: APPROX. NET VOLUME:	2,919± CY 1,445± CY 1,474± CY OF CUT

USGS TOPOGRAPHIC MAP



SCALE : 1" = 2000'± SOURCE: USGS 7.5 MIDDLE HADDAM QUADRANGLE, CT 2018

CITRINE
55 GREENS FARMS ROAD
WESTPORT, CT 06880
OFFICE: (203)-557-5554

ALL-POINTS TECHNOLOGY CORPORATION
3 SADDLEBROOK DRIVE PHONE: (860)-663-1697
KILLINGWORTH, CT 06419 FAX: (860)-663-0935
WWW.ALLPOINTSTECH.COM

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PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 3 SADDLEBROOK DRIVE KILLINGWORTH, CT 06419

OWNER: SKINNER STREET PROPERTIES LLC
ADDRESS: 9 SEQUONIA TRAIL EAST HAMPTON, CT 06424

CP EAST HAMPTON SOLAR I & CP EAST HAMPTON SOLAR II

SITE ADDRESS: SKINNER STREET EAST HAMPTON, CT 06424

APT FILING NUMBER: CT367110

DRAWN BY: CSH

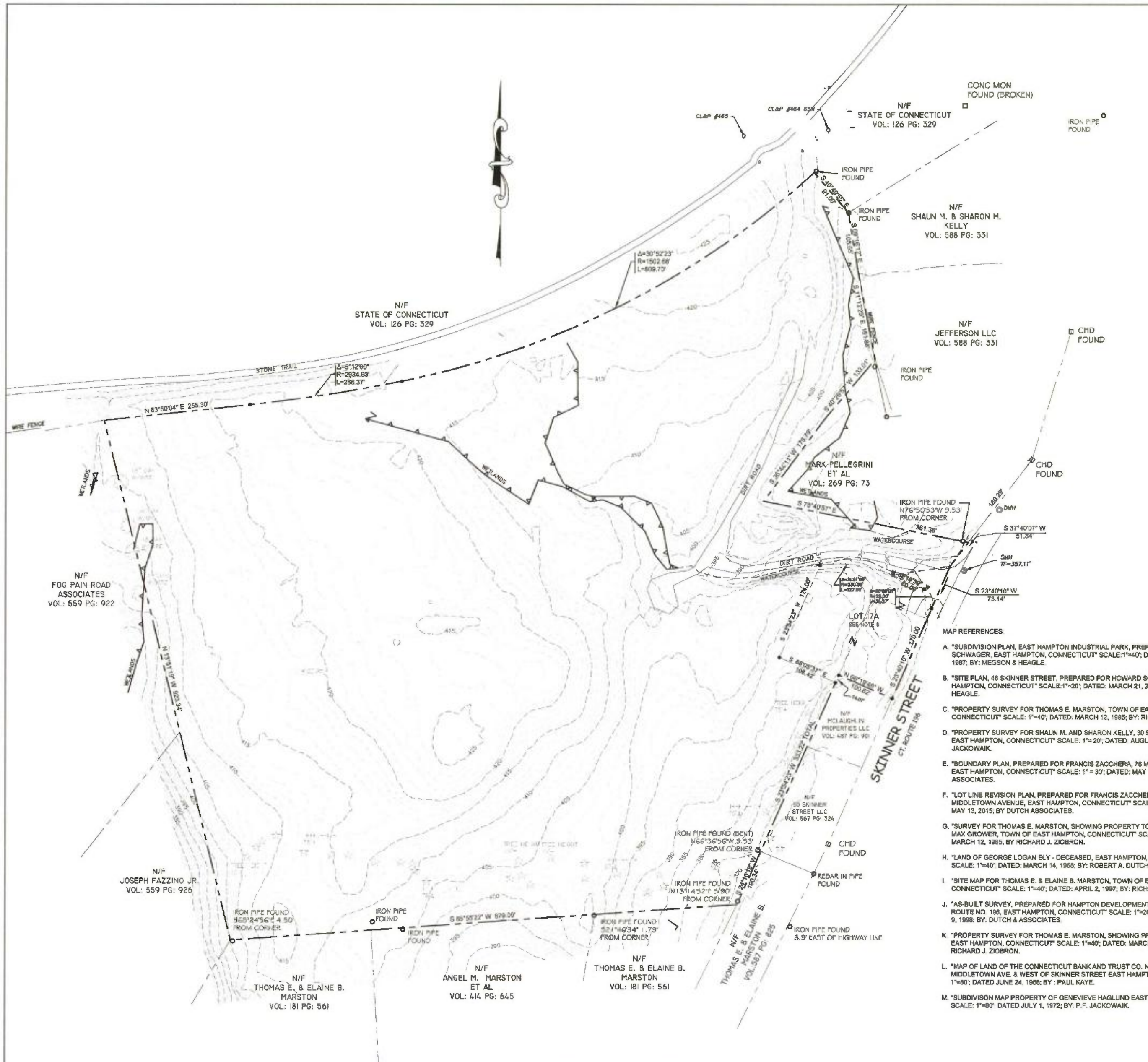
DATE: 02/14/20 CHECKED BY: BJP

SHEET TITLE:

TITLE SHEET & INDEX

SHEET NUMBER:

T-1



SITE LOCATION MAP (NOT TO SCALE)

MAP NOTES:

1. THIS MAP AND SURVEY HAVE BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND "THE MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" ADOPTED JUNE 21, 1996; AMENDED OCTOBER 26, 2018.
2. THE TYPE OF SURVEY PERFORMED AND THE MAPPED FEATURES DEPICTED HEREON ARE IN ACCORDANCE WITH THE REQUIREMENTS OF A PROPERTY & TOPOGRAPHIC SURVEY.
3. THE PROPERTY/BOUNDARY DETERMINATION/OPINION IS BASED UPON A RESURVEY OF MAP REFERENCE 'A'.
4. THE MAPPED FEATURES DEPICTED HEREON ON ARE A RESULT OF A FIELD SURVEY CONDUCTED ON JANUARY 6, 2020.
5. THE GROUND RELIEF CONTOURS DEPICTED HEREON ARE BASED UPON THE 2016 ORTHOPHOTOGRAPHY AND LIDAR DATA SET AVAILABLE AT CTECO UCONN.EDU
6. THE HORIZONTAL BASELINE CONFORMS TO A CLASS A-2 ACCURACY. THE VERTICAL BASELINE CONFORMS TO A CLASS V-2 ACCURACY. THE TOPOGRAPHIC FEATURES CONFORM TO A CLASS T-3 ACCURACY.
7. THE NORTH ARROW AND BEARINGS ARE BASED UPON THE CONNECTICUT STATE COORDINATE SYSTEM N.A.D. 1983 (2011). THE ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) USING GEOID 12B. COORDINATES AND ELEVATIONS WERE DETERMINED FROM RTK GPS OBSERVATIONS MADE ON JANUARY 6, 2020, USING THE CT DOT RTK NETWORK KNOWN AS ACORN (CTNE BASE), HAVING THE FOLLOWING VALUES:

   LATITUDE = N 41° 40' 24.71719"
   LONGITUDE = W 72° 42' 52.25224"
   ELLIPSOID HEIGHT = 41.746M
8. THE AREA DEPICTED AS LOT 17A IS INCLUDED IN THE LEGAL DESCRIPTION AS DESCRIBED IN VOLUME 437 PAGE 989 OF THE TOWN OF EAST HAMPTON LAND RECORDS AND APPEARS TO BE DIVIDED AND APPROVED BY THE TOWN PLANING AND ZONING COMMISSION. NO DEED OF RECORD FOR DESCRIBING LOT 17A AS A SEPARATE PARCEL.
9. UNDERGROUND UTILITIES, STRUCTURES AND FACILITY LOCATIONS DEPICTED AND NOTED HEREON HAVE BEEN COMPILED, IN PART FROM RECORD MAPPING SUPPLIED BY THE RESPECTIVE COMPANIES OR GOVERNMENTAL AGENCIES AND FROM OTHER SOURCES. THESE LOCATIONS MUST BE CONSIDERED AS APPROXIMATE IN NATURE. ADDITIONALLY, OTHER SUCH FEATURES MAY EXIST ON THE SITE, THE EXISTENCE WHICH IS UNKNOWN TO MARTIN SURVEYING ASSOCIATES, LLC. ALL CONTRACTORS ARE REQUIRED TO CONTACT CALL-BEFORE-YOU-DIG AT 1-800-922-4455 FOR LOCATION AND OR STAKEOUT OF ANY UTILITY PRIOR TO ANY EXCAVATION.

MAP REFERENCES:

A. "SUBDIVISION PLAN, EAST HAMPTON INDUSTRIAL PARK, PREPARED FOR HOWARD SCHWAGER, EAST HAMPTON, CONNECTICUT" SCALE:1"=40'; DATED:NOVEMBER 21, 1987; BY: MEGSON & HEAGLE.
B. "SITE PLAN, 46 SKINNER STREET, PREPARED FOR HOWARD SCHWAGER, EAST HAMPTON, CONNECTICUT" SCALE:1"=20'; DATED: MARCH 21, 2006, BY: MEGSON & HEAGLE.
C. "PROPERTY SURVEY FOR THOMAS E. MARSTON, TOWN OF EAST HAMPTON, CONNECTICUT" SCALE: 1"=40', DATED. MARCH 12, 1985; BY: RICHARD J. ZIOBRON.
D. "PROPERTY SURVEY FOR SHAUN M. AND SHARON KELLY, 30 SKINNER STREET, EAST HAMPTON, CONNECTICUT" SCALE. 1"= 20', DATED AUGUST 18, 1999, BY JACKOWAIK.
E. "BOUNDARY PLAN, PREPARED FOR FRANCIS ZACCHERA, 76 MIDDLETOWN AVENUE, EAST HAMPTON, CONNECTICUT" SCALE: 1" = 30'; DATED: MAY 19, 2015; BY DUTCH ASSOCIATES.
F. "LOT LINE REVISION PLAN, PREPARED FOR FRANCIS ZACCHERA, 78 & 76 MIDDLETOWN AVENUE, EAST HAMPTON, CONNECTICUT" SCALE 1"= 40'; DATED: MAY 13, 2015; BY DUTCH ASSOCIATES.
G. "SURVEY FOR THOMAS E. MARSTON, SHOWING PROPERTY TO BE RETAINED BY MAX GROWER, TOWN OF EAST HAMPTON, CONNECTICUT" SCALE: 1"=40'; DATED: MARCH 12, 1985; BY RICHARD J. ZIOBRON.
H. "LAND OF GEORGE LOGAN ELY - DECEASED, EAST HAMPTON, CONNECTICUT" SCALE: 1"=40' DATED: MARCH 14, 1968; BY: ROBERT A. DUTCH.
I. "SITE MAP FOR THOMAS E. & ELAINE B. MARSTON, TOWN OF EAST HAMPTON, CONNECTICUT" SCALE: 1"=40'; DATED: APRIL 2, 1997; BY: RICHARD J. ZIOBRON.
J. "AS-BUILT SURVEY, PREPARED FOR HAMPTON DEVELOPMENT, CONNECTICUT ROUTE NO. 196, EAST HAMPTON, CONNECTICUT" SCALE: 1"=20'; DATED: NOVEMBER 9, 1998; BY: DUTCH & ASSOCIATES.
K. "PROPERTY SURVEY FOR THOMAS E. MARSTON, SHOWING PROPERTY TOWN OF EAST HAMPTON, CONNECTICUT" SCALE: 1"=40'; DATED: MARCH 12, 1985; BY: RICHARD J. ZIOBRON.
L. "MAP OF LAND OF THE CONNECTICUT BANK AND TRUST CO. NORTH OF MIDDLETOWN AVE. & WEST OF SKINNER STREET EAST HAMPTON, CONN." SCALE: 1"=80'; DATED JUNE 24, 1966; BY : PAUL KAYE.
M. "SUBDIVISON MAP PROPERTY OF GENEVIEVE HAGLUND EAST HAMPTON, CONN." SCALE: 1"=80'; DATED JULY 1, 1972; BY: P.F. JACKOWAIK.

SUBJECT PARCEL
1,194,325 S.F. ±
27.42 ACRES ±
VOL. 437 PG. 989

SCALE IN FEET

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

DEAN MARTIN — LICENSE NO. 70147

THIS DOCUMENT AND COPIES THEREOF ARE VALID ONLY IF THEY BEAR THE SIGNATURE AND EMBOSSED SEAL OF THE DESIGNATED LICENSED PROFESSIONAL. UNAUTHORIZED ALTERATIONS TO THIS PLAN RENDER THE DECLARATION HEREON NULL AND VOID.

LEGEND:

- IRON PIN (FOUND)
- Rebar/Drill Hole (To Be Set)
- MONUMENT (FOUND)
- MANHOLE
- DRAINAGE MANHOLE
- SANITARY MANHOLE
- ELEC. MANHOLE
- TELE. MANHOLE
- "C" CATCH BASIN
- "C-L" CATCH BASIN
- DECIDUOUS TREES
- EVERGREEN TREES
- SHRUB/BUSH
- FLAG POLE
- TRAFFIC CONTROL BOX
- SIGN
- POST
- LIGHT POLE
- GUY ANCHOR
- UTILITY POLE
- WATER GATE
- WATER METER
- GAS VALVE
- GAS METER
- TRANSFORMER
- ELEC. METER
- MAIL BOX
- HAND HOLE
- BUTTON BOX
- A.C. UNIT
- TRAFFIC LIGHT POLE
- BOUNDARY LINE
- GUARD RAIL
- UNDERGROUND PIPING (San.,Stm.)
- U/G GAS LINE
- U/G ELEC. LINE
- WATER LINE
- OVERHEAD UTILITIES
- U/G TELE. LINE
- CHAIN LINK FENCE
- TREE LINE

martin
Surveying Associates, LLC
201 CHRISTIAN LANE BERLIN, CT 06037
860-832-8328 860-357-4604 (FAX)

REVISIONS:

PROPERTY & TOPOGRPHIC SURVEY
PREPARED FOR
CITRINE POWER, LLC
LAND OF
SKINNER STREET PROPERTIES, LLC
SKINNER STREET
EAST HAMPTON, CONNECTICUT

MSA PROJECT NO: 19-131	
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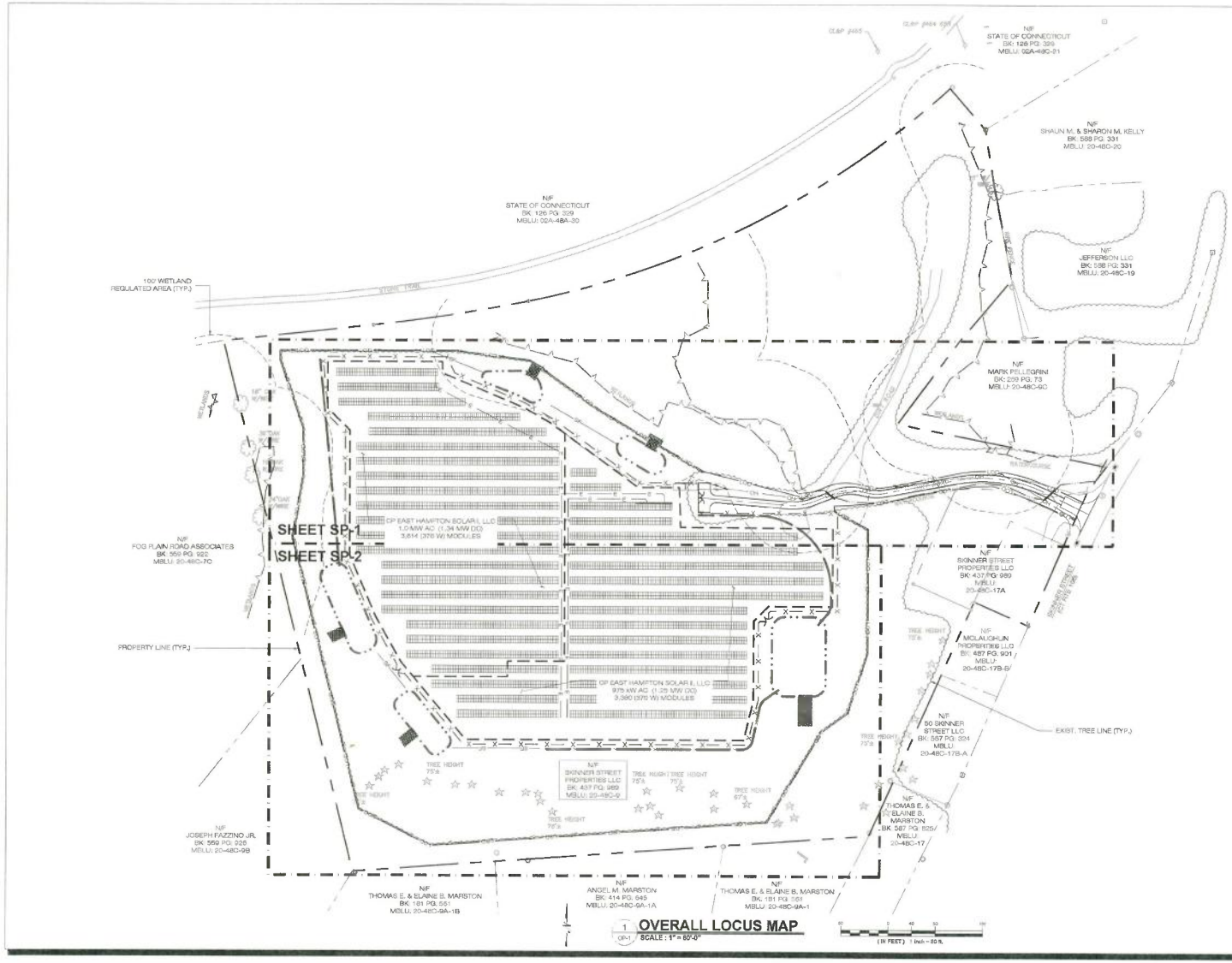
DATE: 1/15/2020	CHECKED BY: D.G.M
STATE OF CONNECTICUT DEAN G. MARTIN No. 70147 LICENSED LAND SURVEYOR	SHEET: 1 OF 1



CITRINE
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WESTPORT, CT 06880
OFFICE: (203)-557-5554

ALL-POINTS TECHNOLOGY CORPORATION
3 SADDLEBROOK DRIVE PHONE: (860)-663-1697
KILLINGWORTH, CT 06419 FAX: (860)-663-0935
WWW.ALLPOINTSTECH.COM

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PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 3 SADDLEBROOK DRIVE KILLINGWORTH, CT 06419

OWNER: SKINNER STREET PROPERTIES LLC
ADDRESS: 9 SEQUONIA TRAIL EAST HAMPTON, CT 06424

CP EAST HAMPTON SOLAR I & CP EAST HAMPTON SOLAR II

SITE ADDRESS: SKINNER STREET EAST HAMPTON, CT 06424

APT FILING NUMBER: CT307110

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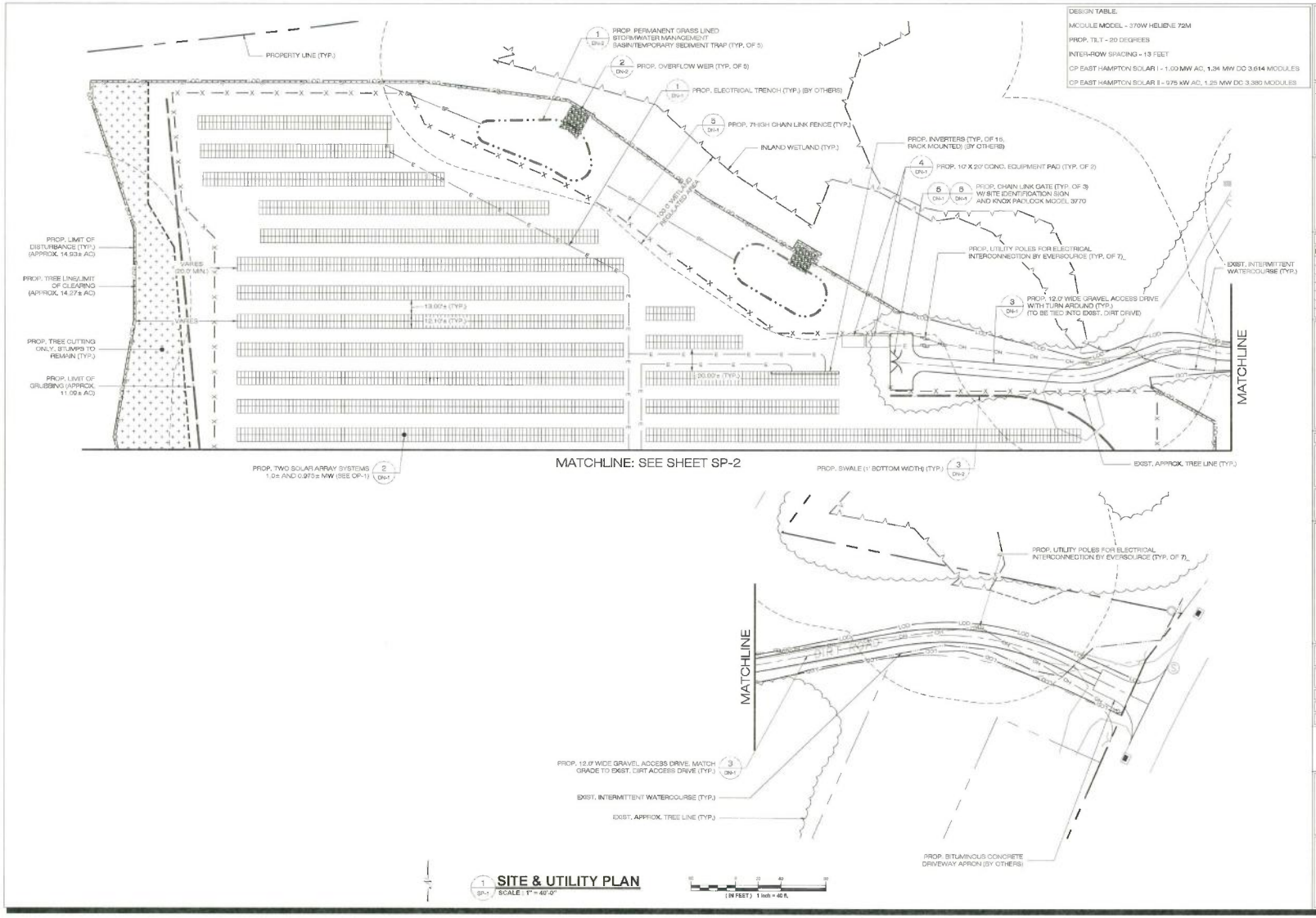

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DATE: 02/14/20 CHECKED BY: BJP

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SITE & UTILITY PLAN

SHEET NUMBER:
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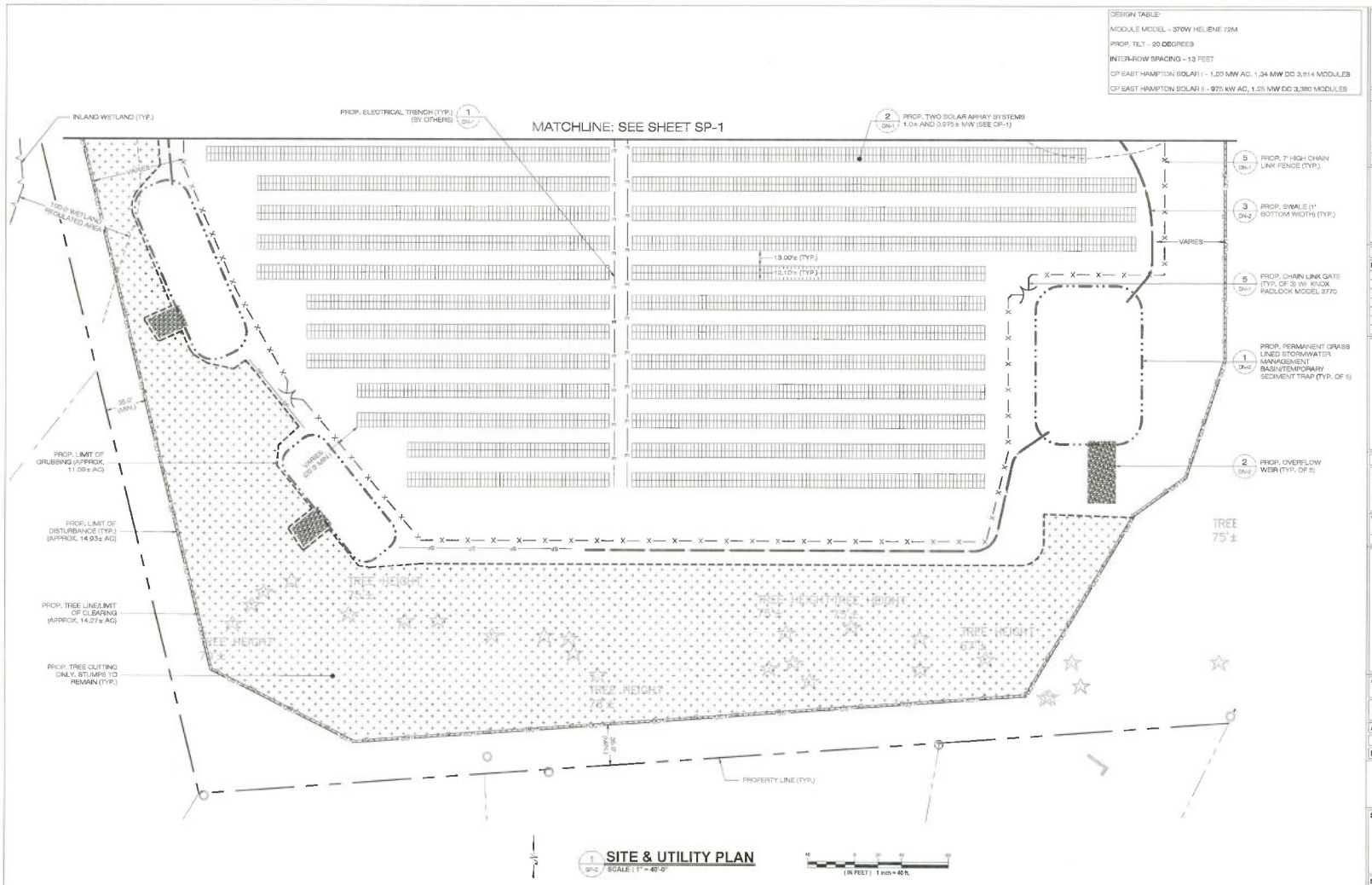

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OWNER: SKINNER STREET PROPERTIES LLC
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CP EAST HAMPTON SOLAR I & CP EAST HAMPTON SOLAR II

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APT FILING NUMBER: CT557110

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DATE: 02/14/20 CHECKED BY: BJP

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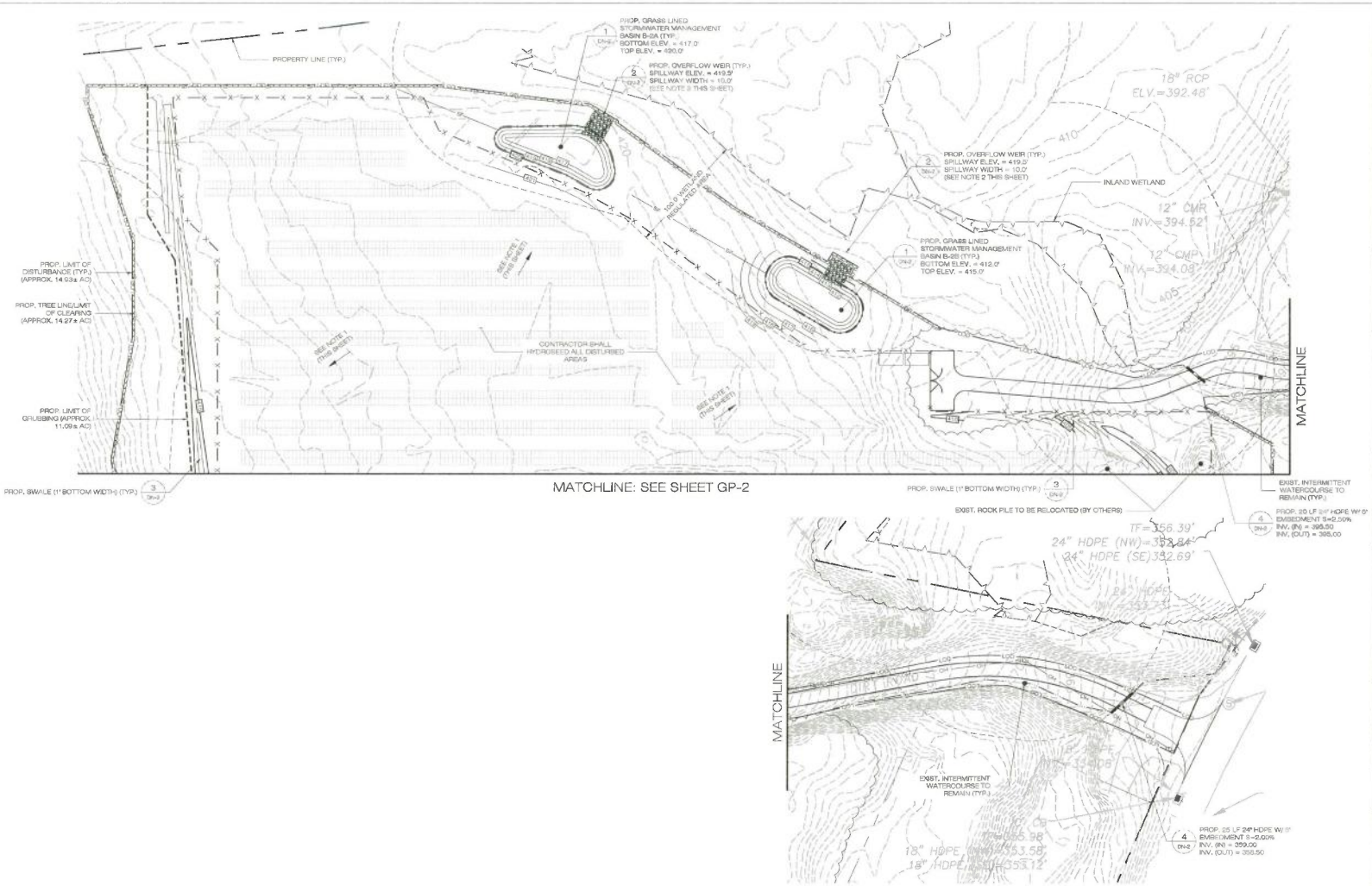

GRADING & DRAINAGE PLAN

SCALE : 1" = 40'-0"

(IN FEET) 1 inch = 40 ft.

NOTES:
1. GRADE/SHAPE DISTURBED AREA TO MATCH EXISTING GRADE AND FLOW TOWARDS PROP. GRASS LINED STORMWATER MANAGEMENT BASINS.
2. CONTRACTOR SHALL REPLACE TEMPORARY SEDIMENT TRAP OUTLET WITH RIP-RAP OVERFLOW WEIR UPON THE SITE OR DRAINAGE AREA BEING DEEMED STABILIZED PER THE SWPCP.

CITRINE
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WESTPORT, CT 06880
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DATE: 02/14/20 CHECKED BY: BJP

SHEET TITLE:
GRADING & DRAINAGE PLAN

SHEET NUMBER:
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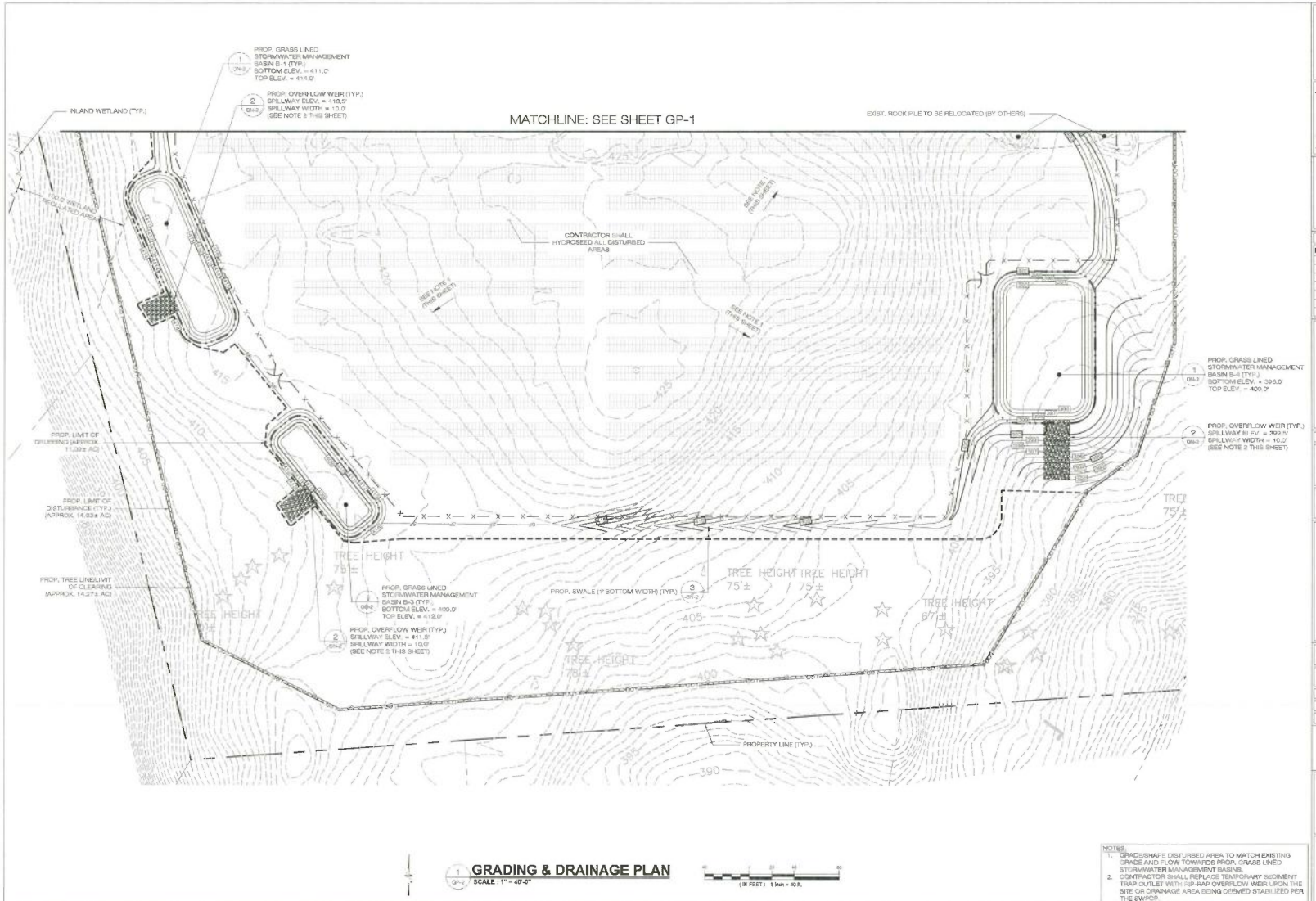

1 GP-2 **GRADING & DRAINAGE PLAN**
SCALE : 1" = 40'-0"

(IN FEET) 1 inch = 40 ft.

NOTES:
1. GRADE/SHAPE DISTURBED AREA TO MATCH EXISTING GRADE AND FLOW TOWARDS PROP. GRASS LINED STORMWATER MANAGEMENT BASINS.
2. CONTRACTOR SHALL REPLACE TEMPORARY SEDIMENT TRAP OUTLET WITH RIP-RAP OVERFLOW WEIR UPON THE SITE OR DRAINAGE AREA BEING DEEMED STABILIZED PER THE SWPCP.

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WESTPORT, CT 06880
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SHEET TITLE:
GRADING & DRAINAGE PLAN

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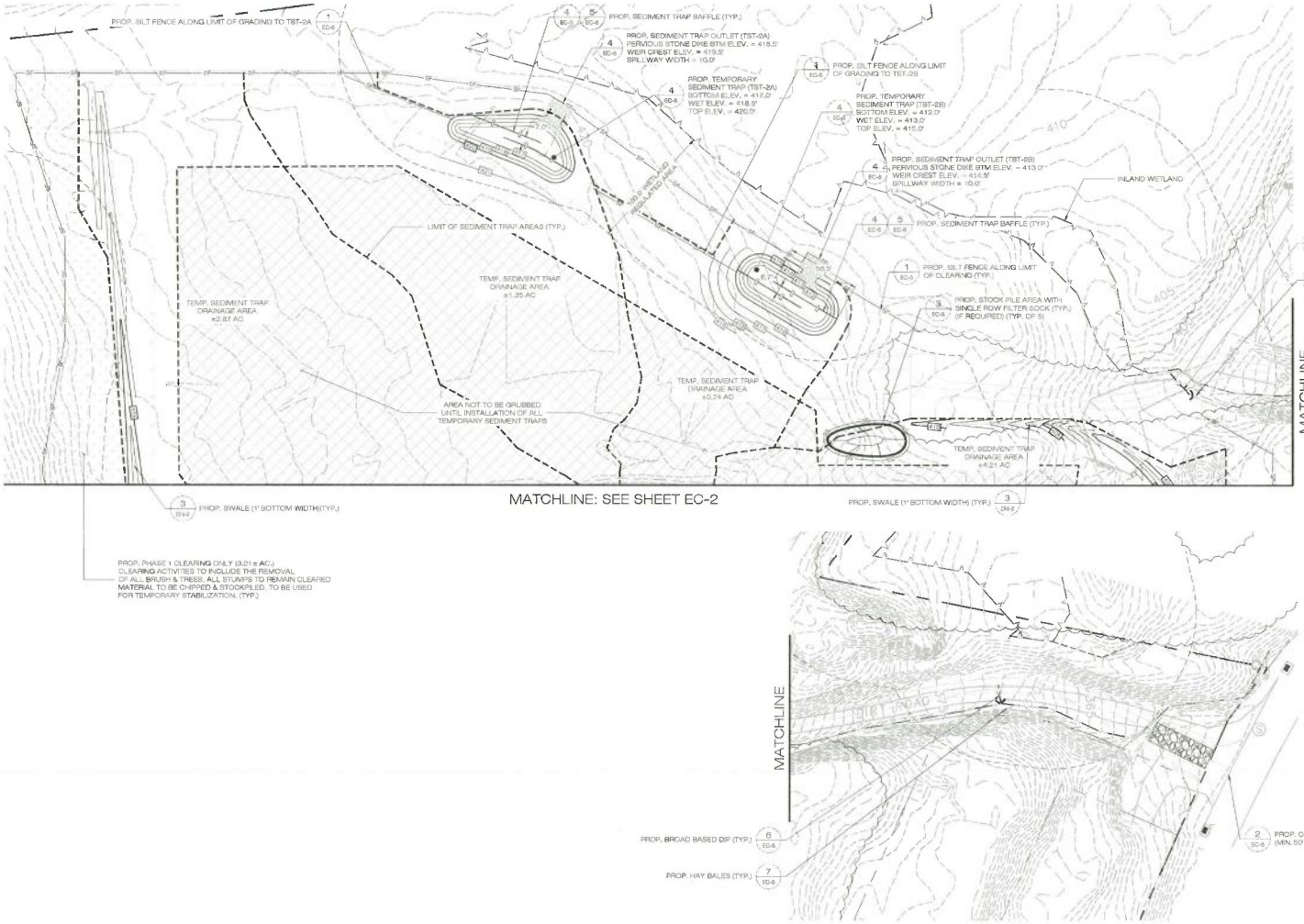

1 SEDIMENTATION & EROSION CONTROL PLAN

SCALE : 1" = 40'-0"

(IN FEET) 1 inch = 40 ft.

CITRINE
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DESIGN PROFESSIONAL OF RECORD

PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 3 SADDLEBROOK DRIVE KILLINGWORTH, CT 06419

OWNER: SKINNER STREET PROPERTIES LLC
ADDRESS: 9 SEQUONIA TRAIL EAST HAMPTON, CT 06424

CP EAST HAMPTON SOLAR I & CP EAST HAMPTON SOLAR II

SITE ADDRESS: SKINNER STREET EAST HAMPTON, CT 06424

APT FILING NUMBER: CT567110

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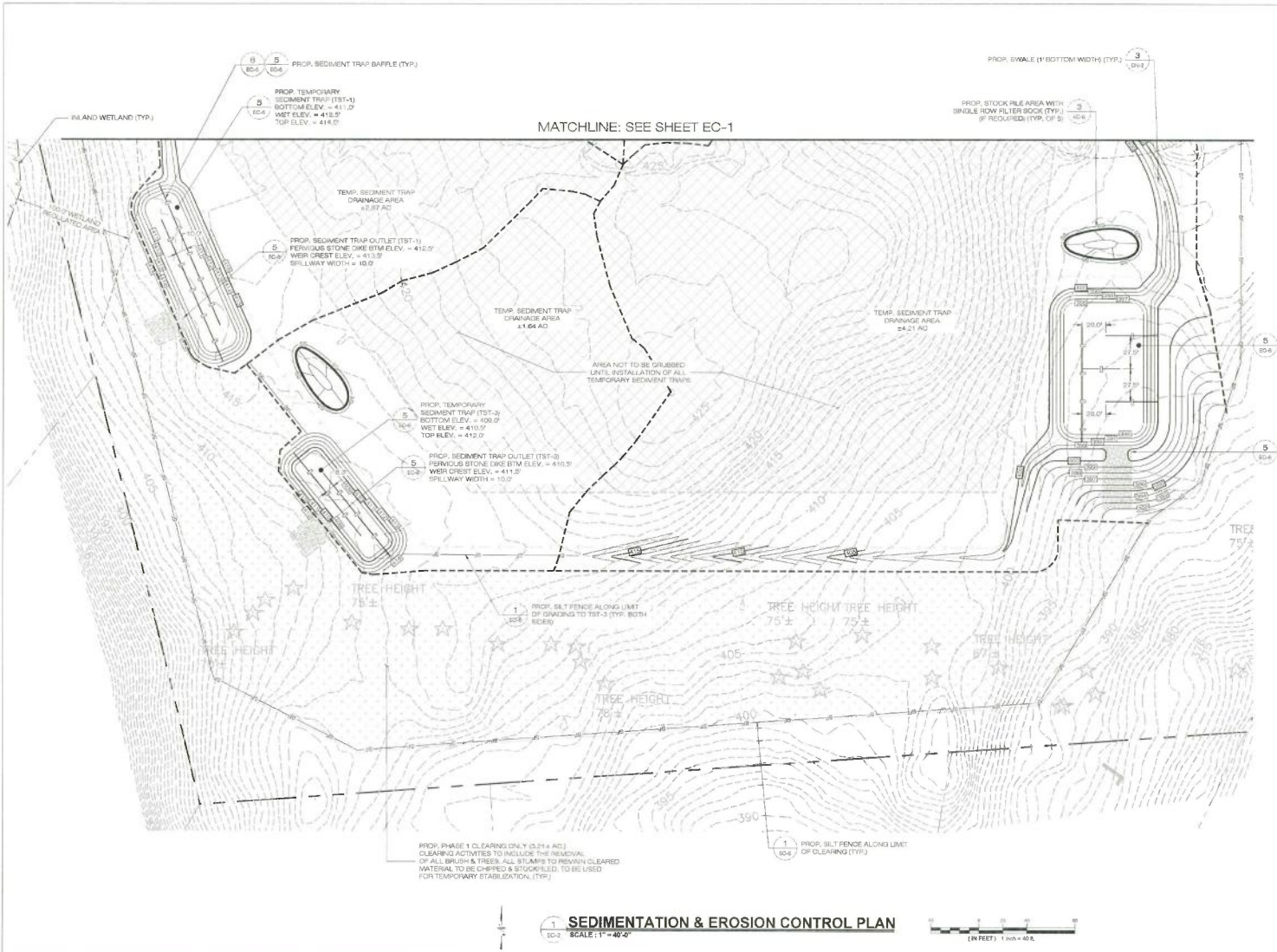
DATE: 02/14/20 CHECKED BY: BJP

SHEET TITLE:
SEDIMENTATION & EROSION CONTROL PLAN (PHASE 1)

SHEET NUMBER:
EC-1



SEDIMENTATION & EROSION CONTROL PLAN

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APT FILING NUMBER: CT067110

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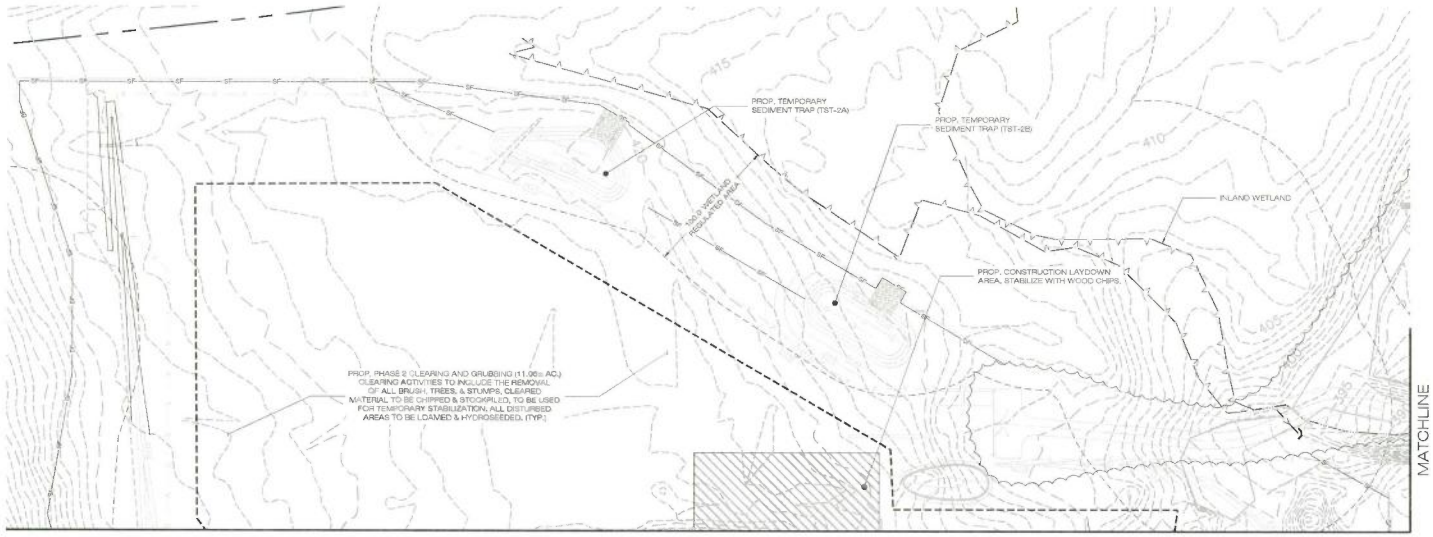
DATE: 02/14/20 CHECKED BY: BJP

SHEET TITLE:
SEDIMENTATION & EROSION CONTROL PLAN (PHASE 1)

SHEET NUMBER:
EC-2



1 EC-3 **SEDIMENTATION & EROSION CONTROL PLAN**
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CP EAST HAMPTON SOLAR I & CP EAST HAMPTON SOLAR II

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APT FILING NUMBER: CT367110

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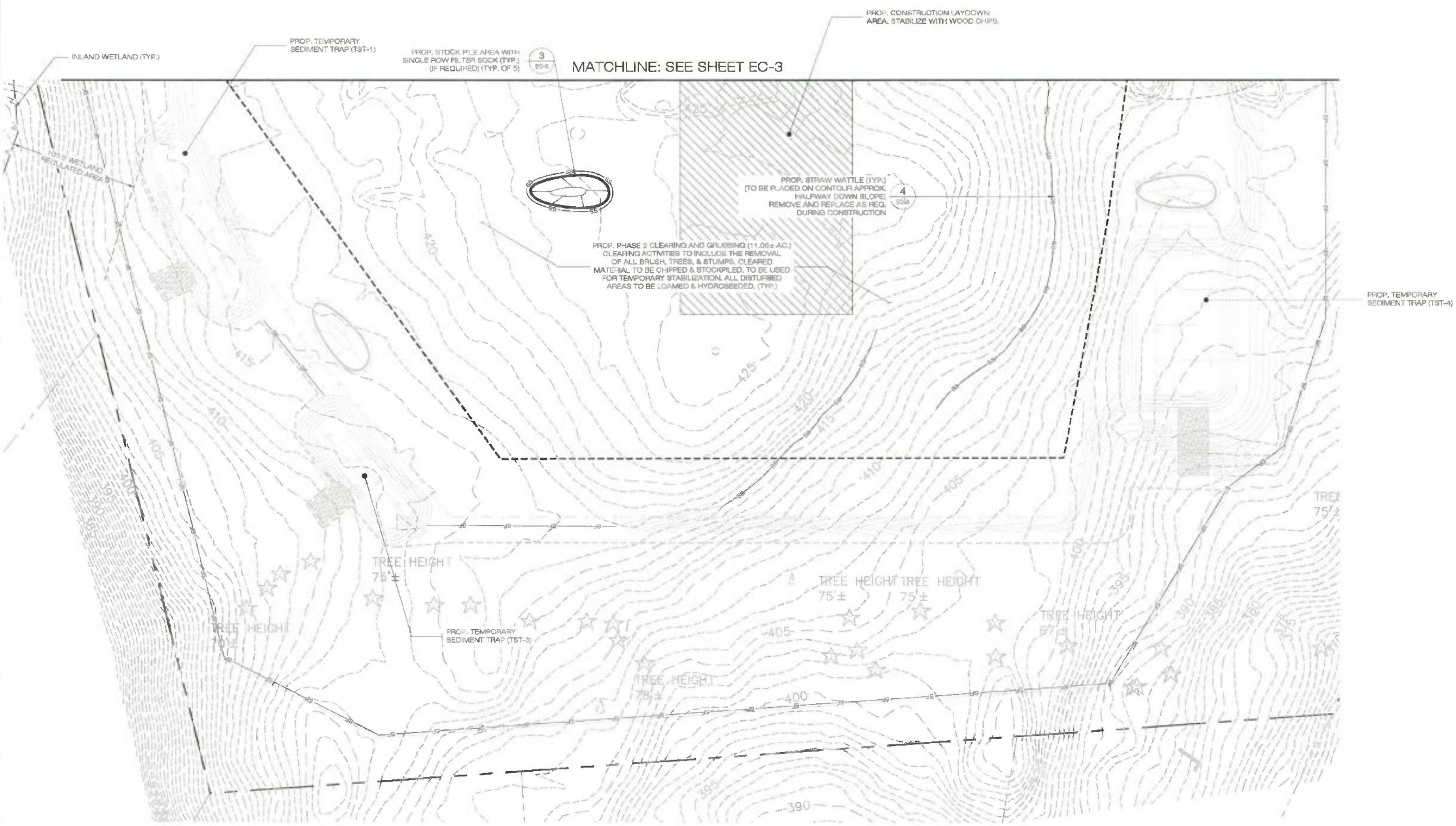
SHEET TITLE:
SEDIMENTATION & EROSION CONTROL PLAN (PHASE 2)

SHEET NUMBER:
EC-3



1 EC-4 **SEDIMENTATION & EROSION CONTROL PLAN**
SCALE : 1" = 40'-0"

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CP EAST HAMPTON SOLAR I & CP EAST HAMPTON SOLAR II
SITE ADDRESS: SKINNER STREET EAST HAMPTON, CT 06424
APT FILING NUMBER: CT567110
DRAWN BY: CSH
DATE: 02/14/20
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SHEET TITLE:
SEDIMENTATION & EROSION CONTROL PLAN (PHASE 2)

SHEET NUMBER:
EC-4

EROSION CONTROL NOTES

EROSION AND SEDIMENT CONTROL PLAN NOTES

1. THE CONTRACTOR SHALL CONSTRUCT ALL SEDIMENT AND EROSION CONTROLS IN ACCORDANCE WITH THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, LATEST EDITION, IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, AND AS DIRECTED BY THE TOWN OF PERMITTEE AND/OR SWPCP MONITOR. ALL PERIMETER SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF CLEARING AND GRUBBING AND DEMOLITION OPERATIONS.

2. THESE DRAWINGS ARE ONLY INTENDED TO DESCRIBE THE SEDIMENT AND EROSION CONTROL MEASURES FOR THIS SITE. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THE EROSION & SEDIMENT CONTROL PLAN ARE SHOWN IN A GENERAL SIZE AND LOCATION ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL EROSION CONTROL MEASURES ARE CONFIGURED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION OF SOILS AND PREVENT THE TRANSPORT OF SEDIMENTS AND OTHER POLLUTANTS TO STORM DRAINAGE SYSTEMS AND/OR WATERCOURSES. ACTUAL SITE CONDITIONS OR SEASONAL AND CLIMATIC CONDITIONS MAY WARRANT ADDITIONAL CONTROLS OR CONFIGURATIONS, AS REQUIRED, AND AS DIRECTED BY THE PERMITTEE AND/OR SWPCP MONITOR. SEE SEDIMENT AND EROSION CONTROL DETAILS AND SUGGESTED CONSTRUCTION SEQUENCE FOR MORE INFORMATION. REFER TO SITE PLAN FOR GENERAL INFORMATION AND OTHER CONTRACT PLANS FOR APPROPRIATE INFORMATION.

3. THE CONTRACTOR SHALL APPLY THE MINIMUM EROSION & SEDIMENT CONTROL MEASURES SHOWN ON THE PLAN IN CONJUNCTION WITH CONSTRUCTION SEQUENCING, SUCH THAT ALL ACTIVE WORK ZONES ARE PROTECTED. ADDITIONAL AND/OR ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES MAY BE INSTALLED DURING THE CONSTRUCTION PERIOD IF FOUND NECESSARY BY THE CONTRACTOR, OWNER, SITE ENGINEER, MUNICIPAL OFFICIALS, OR ANY GOVERNING AGENCY. THE CONTRACTOR SHALL CONTACT THE OWNER AND APPROPRIATE GOVERNING AGENCIES FOR APPROVAL IF ALTERNATIVE CONTROLS OTHER THAN THOSE SHOWN ON THE PLANS ARE PROPOSED BY THE CONTRACTOR.

4. THE CONTRACTOR SHALL TAKE EXTREME CARE DURING CONSTRUCTION SO AS NOT TO DISTURB UNPROTECTED WETLAND AREAS OR INSTALLED SEDIMENTATION AND EROSION CONTROL MEASURES. THE CONTRACTOR SHALL INSPECT ALL SEDIMENT AND EROSION CONTROLS WEEKLY AND WITHIN 24 HOURS OF A STORM WITH A RAINFALL AMOUNT OF 0.25 INCHES OR GREATER TO VERIFY THAT THE CONTROLS ARE OPERATING PROPERLY AND MAKE REPAIRS AS NECESSARY IN A TIMELY MANOR.

5. THE CONTRACTOR SHALL KEEP A SUPPLY OF EROSION CONTROL MATERIAL (SILT FENCE, COMPOST FILTER SOCK, EROSION CONTROL BLANKET, ETC.) ON-SITE FOR PERIODIC MAINTENANCE AND EMERGENCY REPAIRS.

6. ALL FILL MATERIAL PLACED ADJACENT TO ANY WETLAND AREA SHALL BE GOOD QUALITY, WITH LESS THAN 5% FINES PASSING THROUGH A #200 SIEVE (BANK RUN), SHALL BE PLACED IN MAXIMUM ONE FOOT LIFTS, AND SHALL BE COMPACTED TO 95% MAX. DRY DENSITY MODIFIED PROCTOR OR AS SPECIFIED IN THE CONTRACT SPECIFICATIONS.

7. CONSTRUCTION ENTRANCES (ANTI-TRACKING PADS) SHALL BE INSTALLED PRIOR TO ANY SITE EXCAVATION OR CONSTRUCTION ACTIVITY AND SHALL BE MAINTAINED THROUGHOUT THE DURATION OF ALL CONSTRUCTION IF REQUIRED, THE LOCATION OF THE TRACKING PADS MAY CHANGE AS VARIOUS PHASES OF CONSTRUCTION ARE COMPLETED. CONTRACTOR SHALL ENSURE THAT ALL VEHICLES EXITING THE SITE ARE PASSING OVER THE ANTI-TRACKING PADS PRIOR TO EXISTING.

8. ALL CONSTRUCTION SHALL BE CONTAINED WITHIN THE LIMIT OF DISTURBANCE, WHICH SHALL BE MARKED WITH SILT FENCE, SAFETY FENCE, HAY BALES, RIBBONS, OR OTHER MEANS PRIOR TO CLEARING. CONSTRUCTION ACTIVITY SHALL REMAIN ON THE UPHILL SIDE OF THE SEDIMENT BARRIER UNLESS WORK IS SPECIFICALLY CALLED FOR ON THE DOWNHILL SIDE OF THE BARRIER.

9. NO CUT OR FILL SLOPES SHALL EXCEED 2:1 EXCEPT WHERE STABILIZED BY ROCK FACED EMBANKMENTS OR EROSION CONTROL BLANKETS. ALL SLOPES SHALL BE SEEDED AND BANKS WILL BE STABILIZED IMMEDIATELY UPON COMPLETION OF FINAL GRADING UNTIL TURF IS ESTABLISHED.

10. DIRECT ALL DEWATERING PUMP DISCHARGE TO A SEDIMENT CONTROL DEVICE THE GUIDELINES WITHIN THE APPROVED LIMIT OF DISTURBANCE IF REQUIRED. DISCHARGE TO STORM DRAINS OR SURFACE WATERS FROM SEDIMENT CONTROLS SHALL BE CLEAR AND APPROVED BY THE PERMITTEE OR MUNICIPALITY.

11. THE CONTRACTOR SHALL MAINTAIN A CLEAN CONSTRUCTION SITE AND SHALL NOT ALLOW THE ACCUMULATION OF RUBBISH OR CONSTRUCTION DEBRIS ON THE SITE. PROPER SANITARY DEVICES SHALL BE MAINTAINED ON-SITE AT ALL TIMES AND SECURED APPROPRIATELY. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID THE SPILLAGE OF FUEL OR OTHER POLLUTANTS ON THE CONSTRUCTION SITE AND SHALL ADHERE TO ALL APPLICABLE POLICIES AND REGULATIONS RELATED TO SPILL PREVENTION AND RESPONSE/CONTAINMENT.

12. MINIMIZE LAND DISTURBANCES. SEED AND MULCH DISTURBED AREAS WITH TEMPORARY MIX AS SOON AS PRACTICABLE USING PERENNIAL RYEGRASS AT 40 LBS PER ACRE. MULCH ALL CUT AND FILL SLOPES AND SWALES WITH LOOSE HAY AT A RATE OF 2 TONS PER ACRE, IF NECESSARY, REPLACE LOOSE HAY ON SLOPES WITH EROSION CONTROL BLANKETS OR JUTE CLOTH. MODERATELY GRADED AREAS, ISLANDS, AND TEMPORARY CONSTRUCTION STAGING AREAS MAY BE HYDROSEEDED WITH TACKIFIER.

13. SWEEP AFFECTED PORTIONS OF OFF SITE ROADS ONE OR MORE TIMES A DAY (OR LESS FREQUENTLY IF TRACKING IS NOT A PROBLEM) DURING CONSTRUCTION, FOR DUST CONTROL, PERIODICALLY MOISTEN EXPOSED SOIL SURFACES WITH WATER ON UNPAVED TRAVELWAYS TO KEEP THE TRAVELWAYS DAMP. CALCIUM CHLORIDE MAY ALSO BE APPLIED TO ACCESS ROADS. DUMP TRUCK LOADS EXITING THE SITE SHALL BE COVERED.

14. TURF ESTABLISHMENT SHALL BE PERFORMED OVER ALL DISTURBED SOIL, UNLESS THE AREA IS UNDER ACTIVE CONSTRUCTION, IT IS COVERED IN STONE OR SCHEDULED FOR PAVING WITHIN 30 DAYS. TEMPORARY SEEDING OR NON-LIVING SOIL PROTECTION OF ALL EXPOSED SOILS AND SLOPES SHALL BE INITIATED WITHIN THE FIRST 7 DAYS OF SUSPENDING WORK IN AREAS TO BE LEFT LONGER THAN 30 DAYS.

15. MAINTAIN ALL PERMANENT AND TEMPORARY SEDIMENT CONTROL DEVICES IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF WORK SWEEP CONCRETE PADS, CLEAN THE STORMWATER MANAGEMENT SYSTEMS AND REMOVE ALL TEMPORARY SEDIMENT CONTROLS ONCE THE SITE IS FULLY STABILIZED AND APPROVAL HAS BEEN RECEIVED FROM PERMITTEE OR THE MUNICIPALITY.

16. SEEDING MIXTURES SHALL BE NEW ENGLAND SEMI-SHADE GRASS AND FORBS MIX (SEE SITE DETAILS SHEET DN-1), OR APPROVED EQUAL BY OWNER.

SEDIMENT & EROSION CONTROL NARRATIVE

1. THE PROJECT INVOLVES THE CONSTRUCTION OF A GROUND MOUNTED SOLAR PANEL FACILITY WITH ASSOCIATED EQUIPMENT, INCLUDING THE CLEARING ONLY OF APPROXIMATELY 3.21 ACRES AND THE CLEARING, GRUBBING AND GRADING OF APPROXIMATELY 11.05 ACRES OF EXISTING LOT.

THE PROPOSED PROJECT INVOLVES THE FOLLOWING CONSTRUCTION:

A. CLEARING, GRUBBING, AND GRADING OF EXISTING LOT.
B. CONSTRUCTION OF 5,994 GROUND MOUNTED SOLAR PANELS AND ASSOCIATED EQUIPMENT.
B. THE STABILIZATION OF DISTURBED AREAS WITH PERMANENT GRASS TREATMENTS.

2. FOR THIS PROJECT, THERE ARE APPROXIMATELY 14.93± ACRE OF THE SITE BEING DISTURBED WITH NEGLIGIBLE INCREASE IN THE IMPERVIOUS AREA OF THE SITE, AS ALL ACCESS THOUGH THE SITE WILL BE GRAVEL. IMPERVIOUS AREAS ARE LIMITED TO THE CONCRETE PADS FOR ELECTRICAL EQUIPMENT.

3. THE PROJECT SITE, AS MAPPED IN THE SOIL SURVEY OF STATE OF CONNECTICUT (NRCS, VERSION 16, DEC 6, 2018), CONTAINS TYPE 51B AND 71C (HYDROLOGIC SOIL GROUP B), 308 (HYDROLOGIC SOIL GROUP C) AND THE (HYDROLOGIC SOIL GROUP D) SOILS.

4. IT IS ANTICIPATED THAT CONSTRUCTION WILL BE COMPLETED IN APPROXIMATELY 3-4 MONTHS.

5. REFER TO THE CONSTRUCTION SEQUENCING AND EROSION AND SEDIMENTATION NOTES FOR INFORMATION REGARDING SEQUENCING OF MAJOR OPERATIONS IN THE ON-SITE CONSTRUCTION PHASES.

6. STORMWATER MANAGEMENT DESIGN CRITERIA UTILIZES THE APPLICABLE SECTIONS OF THE 2004 CONNECTICUT STORMWATER QUALITY MANUAL AND THE TOWN OF EAST HAMPTON STANDARDS, TO THE EXTENT POSSIBLE AND PRACTICABLE FOR THIS PROJECT ON THIS SITE. EROSION AND SEDIMENTATION MEASURES ARE BASED UPON ENGINEERING PRACTICE, JUDGMENT AND THE APPLICABLE SECTIONS OF THE CONNECTICUT EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS, LATEST EDITION.

7. DETAILS FOR THE TYPICAL STORMWATER MANAGEMENT AND EROSION AND SEDIMENTATION MEASURES ARE SHOWN ON THE PLAN SHEETS OR PROVIDED AS SEPARATE SUPPORT DOCUMENTATION FOR REVIEW IN THIS PLAN.

8. CONSERVATION PRACTICES TO BE USED DURING CONSTRUCTION AREA:
   A. STAGED CONSTRUCTION.
   B. MINIMIZE THE DISTURBED AREAS TO THE EXTENT PRACTICABLE DURING CONSTRUCTION.
   C. STABILIZE DISTURBED AREAS AS SOON AS POSSIBLE WITH TEMPORARY OR PERMANENT MEASURES.
   D. MINIMIZE IMPERVIOUS AREAS.
   E. UTILIZE APPROPRIATE CONSTRUCTION EROSION AND SEDIMENTATION MEASURES.

9. THE FOLLOWING SEPARATE DOCUMENTS ARE TO BE CONSIDERED A PART OF THE EROSION AND SEDIMENTATION PLAN.
   A. STORMWATER MANAGEMENT MEMO FOR EXISTING AND PROPOSED PEAK FLOWS.

CONSTRUCTION SEQUENCE

THE FOLLOWING SEQUENCE OF CONSTRUCTION ACTIVITIES IS PROJECTED BASED UPON ENGINEERING JUDGEMENT AND BEST MANAGEMENT PRACTICES. THE CONTRACTOR SHALL NOT ALTER THE CONSTRUCTION SEQUENCE WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER AND CT DEEP. ANY PROPOSED CHANGES TO THE CONSTRUCTION SEQUENCE SHALL BE SUBMITTED TO THE ENGINEER IN WRITING FOR REVIEW PRIOR TO THE START OF CONSTRUCTION.

PRE-CONSTRUCTION

1. CONTACT THE APPLICANT, ENGINEER, CT DEEP, AND REPRESENTATIVES TO SCHEDULE A PRE-CONSTRUCTION MEETING AT LEAST 5 DAYS PRIOR TO THE START OF CONSTRUCTION. PHYSICALLY FLAG THE LIMITS OF CLEARING IN THE FIELD AS NECESSARY TO FACILITATE THE PRE-CONSTRUCTION MEETING.
2. CONDUCT A PRE-CONSTRUCTION MEETING TO DISCUSS THE PROP. WORK AND EROSION AND SEDIMENTATION CONTROL MEASURES. THE MEETING SHOULD BE ATTENDED BY THE APPLICANT, THE APPLICANT REPRESENTATIVE(S), CT DEEP, THE GENERAL CONTRACTOR, DESIGNATED SUB-CONTRACTORS AND THE PERSON, OR PERSONS, RESPONSIBLE FOR THE IMPLEMENTATION, OPERATION, MONITORING AND MAINTENANCE OF THE EROSION AND SEDIMENTATION MEASURES. THE CONSTRUCTION PROCEDURES FOR THE ENTIRE PROJECT SHALL BE REVIEWED AT THIS MEETING.
3. NOTIFY THE APPLICANT AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO COMMENCEMENT OF ANY DEMOLITION, CONSTRUCTION OR REGULATED ACTIVITY ON THIS PROJECT. NOTIFY CALL BEFORE YOU DIG AT 1-800-922-4455.

PHASE 1

- PERFORM CLEARING OF TREES ON SITE WITH NO GRUBBING, STUMPS TO REMAIN. CLEARING WORK SHALL BE ALLOWED DURING THE WINTER MONTHS ONLY IF THE GROUND IS FROZEN.
- CLEAR AND GRUB AS REQUIRED AND SHOWN ON EC-1 AND EC-2 TO INSTALL THE PERIMETER EROSION SEDIMENTATION CONTROL MEASURES AND CONSTRUCTION ENTRANCE.
- INSTALL PERIMETER SILT FENCE.
- ALL WETLAND AREAS SHALL BE PROTECTED PRIOR TO THE START OF MAJOR CONSTRUCTION.
- INSTALL GRAVEL AND COMPACTED EARTH ACCESS ROADS.
- INSTALL SWALES, TST-1, TST-2A, TST-2B, TST-3, AND TST-4.
- STOCKPILE TOPSOIL FOR REUSE.
- STABILIZE DISTURBED AREAS WITH LOAM AND HYDROSEED WITH TACKIFIER.
- INSTALL TREE PROTECTION IF APPLICABLE.
- NOTIFY CONNECTICUT RIVER COASTAL CONSERVATION DISTRICT AND QUALIFIED PROFESSIONAL OF COMPLETION PHASE FOR REQUIRED SITE INSPECTIONS IN ACCORDANCE WITH THE GENERAL PERMIT.

PHASE 2 (UPON INSTALLATION OF TEMPORARY SEDIMENT TRAPS)

- PERFORM REMAINING GRUBBING AS NECESSARY. REMOVE CUT WOOD AND STOCKPILE FOR FUTURE USE OR REMOVE OFF-SITE. REMOVE AND DISPOSE OF DEMOLITION DEBRIS OFF-SITE IN ACCORDANCE WITH APPLICABLE LAWS.
- STOCKPILE TOPSOIL.
- PERFORM ANY GRADING NECESSARY FOR THE SHAPING OF THE SITE BASIN OF THE COMPACTED EARTH ACCESS ROAD.
- LOAM AND HYDROSEED (WITH TEMPORARY SEED MIX) WITH TACKIFIER REMAINING DISTURBED AREAS.
- NOTIFY CONNECTICUT RIVER COASTAL CONSERVATION DISTRICT AND QUALIFIED PROFESSIONAL OF COMPLETION PHASE FOR REQUIRED SITE INSPECTIONS IN ACCORDANCE WITH THE GENERAL PERMIT.

PHASE 3

- INSTALL ELECTRICAL CONDUIT AND CONCRETE PADS.
- INSTALL RACKING POSTS FOR GROUND MOUNTED SOLAR PANELS
- INSTALL GROUND MOUNTED SOLAR PANELS AND COMPLETE ELECTRICAL INSTALLATION.
- INSTALL PERIMETER CHAIN LINK FENCE AS SHOWN ON THE PLANS.
- NOTIFY CONNECTICUT RIVER COASTAL CONSERVATION DISTRICT AND QUALIFIED PROFESSIONAL OF COMPLETION PHASE FOR REQUIRED SITE INSPECTIONS IN ACCORDANCE WITH THE GENERAL PERMIT.

PHASE 4

- HYDROSEED WITH TACKIFIER ALL REMAINING DISTURBED AREAS.
- HYDROSEED WITH TACKIFIER THE POLLINATOR HABITAT.
- AFTER SUBSTANTIAL COMPLETION OF THE INSTALLATION OF THE SOLAR FACILITY AND THE AREAS ABOVE TSTS ARE DEEMED STABILIZED BY THE QUALIFIED INSPECTOR, COMPLETE REMAINING SITE WORK, INCLUDING CLEANING INFILTRATION BASINS, REMOVING BAFFLES, AND REBUILDING OVERFLOW WEIRS WITH IMPERVIOUS CORE.
- INSTALL/REBUILD GRAVEL ACCESS DRIVES.
- FINE GRADE, RAKE, SEED, AND MULCH ALL REMAINING DISTURBED AREAS.
- NOTIFY CONNECTICUT RIVER COASTAL CONSERVATION DISTRICT AND QUALIFIED PROFESSIONAL OF COMPLETION PHASE FOR REQUIRED SITE INSPECTIONS IN ACCORDANCE WITH THE GENERAL PERMIT.
- AFTER THE SITE IS STABILIZED AND WITH THE APPROVAL OF THE PERMITTEE AND QUALIFIED INSPECTOR, REMOVE PERIMETER EROSION AND SEDIMENTATION CONTROLS.
- ISSUE NOTICE OF TERMINATION AND PERFORM PROJECT CLEANUP.

CONSTRUCTION OPERATION AND MAINTENANCE PLAN - BY CONTRACTOR

E&S MEASURE	INSPECTION SCHEDULE	MAINTENANCE REQUIRED
CONSTRUCTION ENTRANCE	DAILY	PLACE ADDITIONAL STONE, EXTEND THE LENGTH OR REMOVE AND REPLACE THE STONE. CLEAN PAVED SURFACES OF TRACKED SEDIMENT.
COMPOST FILTER SOCK	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.25"	REPAIR/REPLACE WHEN FAILURE OR DETERIORATION IS OBSERVED.
SILT FENCE	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.25"	REPAIR/REPLACE WHEN FAILURE OR DETERIORATION IS OBSERVED. REMOVE SILT WHEN IT REACHES 1/2 THE HEIGHT OF THE FENCE.
TOPSOIL/BORROW STOCKPILES	DAILY	REPAIR/REPLACE SEDIMENT BARRIERS AS NECESSARY.
TEMPORARY SEDIMENT BASIN (W/ BAFFLES)	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.5"	REMOVE SEDIMENT ONCE IT HAS ACCUMULATED TO ONE HALF OF MINIMUM REQUIRED VOLUME OF THE WET STORAGE, DEWATERING AS NEEDED. RESTORE TRAP TO ORIGINAL DIMENSIONS. REPAIR/REPLACE BAFFLES WHEN FAILURE OR DETERIORATION IS OBSERVED.
TEMPORARY SEDIMENT TRAP (W/ BAFFLES)	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.5"	REMOVE SEDIMENT ONCE IT HAS ACCUMULATED TO ONE HALF OF MINIMUM REQUIRED VOLUME OF THE WET STORAGE, DEWATERING AS NEEDED. RESTORE TRAP TO ORIGINAL DIMENSIONS. REPAIR/REPLACE BAFFLES WHEN FAILURE OR DETERIORATION IS OBSERVED.
TEMPORARY SOIL PROTECTION	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.25"	REPAIR ERODED OR BARE AREAS IMMEDIATELY. RESEED AND MULCH.

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APT FILING NUMBER: CT667119

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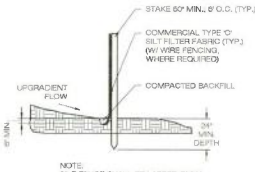
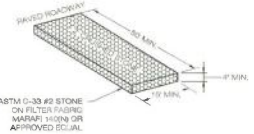
SHEET TITLE:
SEDIMENTATION & EROSION CONTROL NOTES

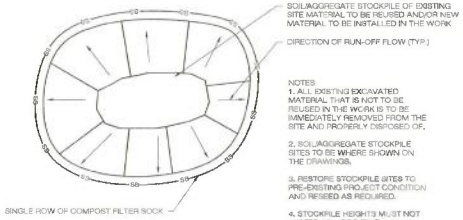
SHEET NUMBER:
EC-5



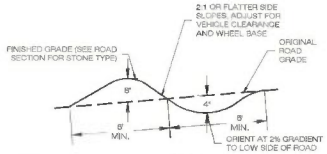
1 EC-6 **SILT FENCE DETAIL**
SCALE : N.T.S.



2 EC-6 **CONSTRUCTION ENTRANCE DETAIL**
SCALE : N.T.S.



3 EC-6 **MATERIALS STOCKPILE DETAIL**
SCALE : N.T.S.

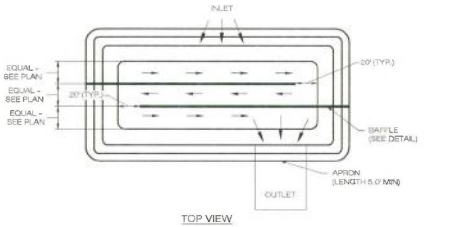


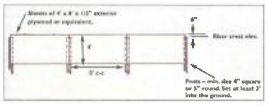
NOTES:
1. SHALL BE ORIENTATED AT A 10 DEGREE ANGLE DOWNGRADE.
2. RIP-RAP OUTFALL SHALL BE INSTALLED AT OUTFALL TO AVOID WASHOUT.
3. WATER BARS SHALL MAINTAIN A MINIMUM OF 8" STONE IN ALL AREAS.
2. WATERBARS SHALL DISCHARGE TO A STABLE AREA OR HAVE A RIP-RAP OUTFALL SHALL BE INSTALLED TO AVOID WASHOUT.
3. DAMAGED OR ERODED WATERBARS SHALL BE RESTORED TO ORIGINAL DIMENSIONS WITHIN 48 HOURS OF INSPECTION.
4. MAINTENANCE OF WATERBARS SHALL BE PROVIDED UNTIL ROADWAY, SKIDTRAIL, OR DITCH HAS ACHIEVED PERMANENT STABILIZATION.
5. WATERBARS SHALL BE INSTALLED PRIOR TO ANY SWITCH BACK OR SHARP CURVE.
6. WATERBARS SHALL BE GRADED TO PREVENT DAMAGE DURING CONSTRUCTION

RECOMMENDED WATER BAR SPACING	
PERCENT SLOPE	SPACING (FT)
1%	400*
5%	125
10%	75
15%	50

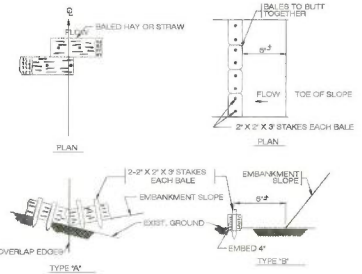
* OR AS DIRECTED BY THE ENGINEER OF RECORD.

6 EC-6 **BROAD BASED DIP DETAIL**
SCALE : N.T.S.





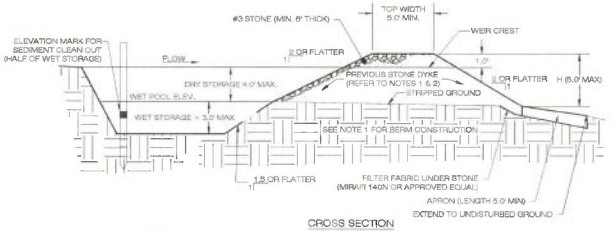
5 EC-6 **SEDIMENT TRAP BAFFLE**
SCALE : N.T.S.



NOTE:
TO BE USED IN LOCATIONS WHERE THE EXISTING GROUND SLOPES IN TOWARD THE TOE OF THE EMBANKMENT.

NOTE:
TO BE USED WHERE THE EXISTING GROUND SLOPES AWAY FROM THE TOE OF THE EMBANKMENT

7 EC-6 **HAYBALE CHECK DAM SEDIMENTATION CONTROL BARRIER**
SCALE : N.T.S.



NOTES:
1. CONSTRUCT TEMPORARY SEDIMENT TRAP BERMS AND SIDEWALLS PER THE INFILTRATION BASIN DETAIL.
2. PERVIOUS STONE DIKE SHALL BE CONSTRUCTED OF CT DOT MODIFIED RIP-RAP WITH #3 STONE ON FACE.
3. SEDIMENT TRAP BAFFLES SHALL BE INSTALLED AS SHOWN ON EC-1 AND EC-2.
4. SEE TST SIZING TABLE FOR WET AND DRY STORAGE VOLUMES.

4 EC-6 **TEMPORARY SEDIMENT TRAP**
SCALE : N.T.S.

TEMPORARY SEDIMENT TRAP SIZING TABLE

NAME	DRAINAGE AREA (AC)	SEDIMENT VOLUME/ACRE AREA (CY)	REQ. VOLUME (CY)	REQ. WET VOLUME (CY)	PROP. BTM. ELEV. (FT)	PROP. STONE DIKE BTM. ELEV. (FT)	PROP. WEIR CREST ELEV. (FT)	PROP. TOP ELEV. (FT)	WET VOL. PROVIDED (CY)	TOTAL VOL. PROVIDED. (CY)
TST-1	2.83 AC	134 CYD	379.67 CY	189.83 CYD	411.0	412.5	413.5	414.0	270.32 CY	496.66 CY
TST-2A	1.26 AC	134 CYD	168.49 CY	84.25 CYD	417.0	418.5	419.5	420.0	103.66 CY	203.68 CY
TST-2B	0.67 AC	134 CYD	89.45 CY	44.73 CYD	412.0	413.0	414.5	415.0	58.03 CY	156.17 CY
TST-3	1.62 AC	134 CYD	216.75 CY	108.38 CYD	409.0	410.5	411.5	412.5	169.30 CY	319.12 CY
TST-4	4.32 AC	134 CYD	578.66 CY	289.33 CYD	396.0	397.0	399.5	400.5	289.32 CY	1190.41 CY

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DESIGN PROFESSIONAL OF RECORD
PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 3 SADDLEBROOK DRIVE KILLINGWORTH, CT 06419

OWNER: SKINNER STREET PROPERTIES LLC
ADDRESS: 9 SEQUOIA TRAIL EAST HAMPTON, CT 06424

CP EAST HAMPTON SOLAR I & CP EAST HAMPTON SOLAR II

SITE ADDRESS: SKINNER STREET EAST HAMPTON, CT 06424

APT FILING NUMBER: CT887110

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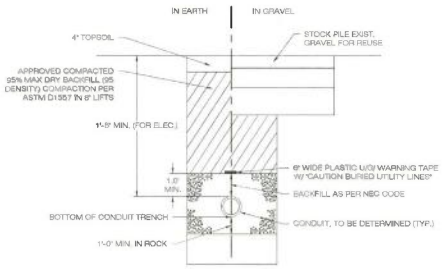
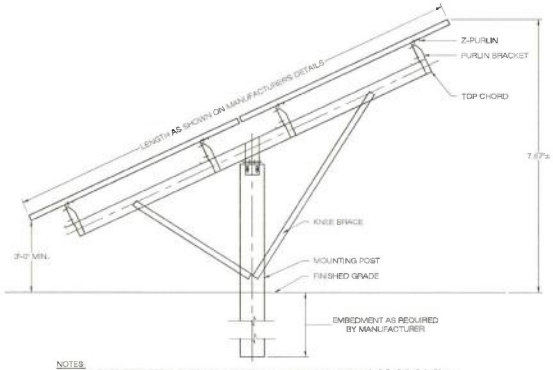
SHEET TITLE:
SEDIMENTATION & EROSION CONTROL DETAILS

SHEET NUMBER:
EC-6

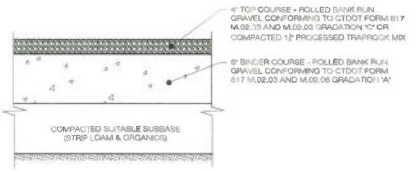


1 DN-1 **ELECTRICAL TRENCH DETAIL**
SCALE : N.T.S.



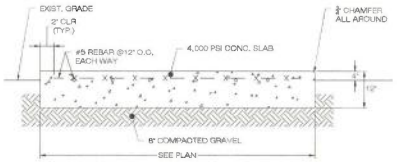
NOTES:
SEE MANUFACTURERS DETAIL SHEETS FOR ADDITIONAL INFORMATION REGARDING RACKING SYSTEM REQUIREMENTS AND INSTALLATION PROCEDURES. RACKING SYSTEM TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS REQUIREMENTS.

2 DN-1 **TYPICAL POST MOUNTED RACKING SYSTEM**
SCALE : N.T.S.

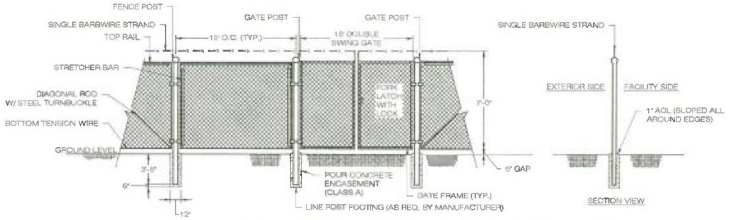


NOTES:
1. SUBBASE MAY CONSIST OF NATIVE MATERIALS IF FOUND ACCEPTABLE BY THE ENGINEER. SUBBASE TO BE COMPACTED TO 95% MAX DRY DENSITY.
2. SUBBASE IS TO BE FREE FROM DEBRIS AND UNSUITABLE MATERIALS.

3 DN-1 **GRAVEL ACCESS DRIVE SECTION**
SCALE : N.T.S.



4 DN-1 **CONCRETE EQUIPMENT PAD**
SCALE : N.T.S.



5 DN-1 **CHAIN-LINK FENCE & GATE DETAIL**
SCALE : N.T.S.

CP EAST HAMPTON
GROUND MOUNT SOLAR FARM

IN CASE OF EMERGENCY
CALL T.B.D.

NOTES:
EMERGENCY CALL NUMBER TO BE PROVIDED ONCE DETERMINED.

6 DN-1 **NOTIFICATION SIGN DETAIL**
SCALE : N.T.S.

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CP EAST HAMPTON SOLAR I & CP EAST HAMPTON SOLAR II
SITE ADDRESS: 2 SKINNER STREET EAST HAMPTON, CT 06424
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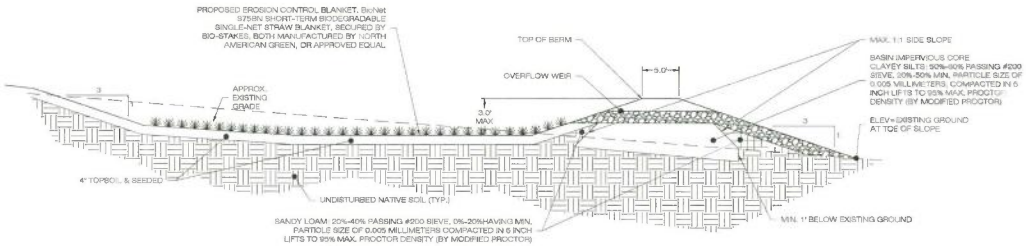
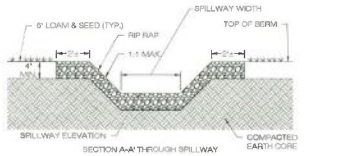
SHEET TITLE:
SITE DETAILS

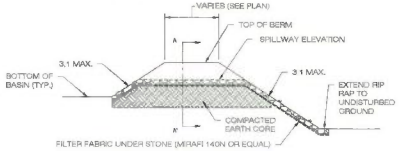
SHEET NUMBER:
DN-1



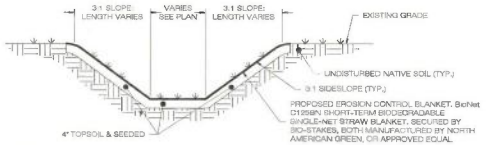
NOTES:
- SEED MIX TO BE NEW ENGLAND EROSION CONTROL/ RESTORATION MIX FOR MOIST SITES ON THE BOTTOM OF THE BASIN AND NEW ENGLAND EROSION/RESTORATION MIX FOR DRY SITES ON THE SIDE SLOPES.
- FOR CONVERTING TST TO INFILTRATION BASIN, REMOVE BAFFLES, CLEAN OUT SEDIMENT, RESHAPE AS REQUIRED, RECONSTRUCT OUTLET WEIR INCLUDING ADDITIONAL IMPERVIOUS CORE, AND RESEEDING.
- INSPECT AND CLEAN PIPES PRIOR TO INSTALLING PERMANENT OUTLET.

1 GRASS LINED INFILTRATION BASIN
DN-2 SCALE : N.T.S.



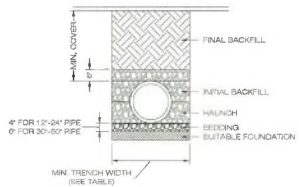


2 OVERFLOW WEIR DETAIL
DN-2 SCALE : N.T.S.



NOTES:
1. SEED MIX TO BE NEW ENGLAND EROSION CONTROL/ RESTORATION MIX FOR MOIST SITES ON THE BOTTOM OF THE BASIN AND NEW ENGLAND EROSION/RESTORATION MIX FOR DRY SITES ON THE SIDE SLOPES.

3 GRASS LINED SWALE
DN-2 SCALE : N.T.S.



RECOMMENDED MIN. TRENCH WIDTH	
PIPE DIA.	MIN. TRENCH WIDTH
8"	23"
8"	28"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
48"	80"
60"	96"

NOTES:
1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, 'STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS', LATEST ADDITION.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE.
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER, UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 4"-24" (100mm-600mm), 6" (150mm) FOR 30"-60" (750mm-900mm).
5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54"-60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

4 HDPE STORM DRAINAGE TRENCH DETAIL
DN-2 SCALE : N.T.S.

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SHEET TITLE:
SITE DETAILS

SHEET NUMBER:
DN-2

GENERAL NOTES

1. ALL CONSTRUCTION SHALL COMPLY WITH PROJECT DEVELOPER STANDARDS, TOWN OF EAST HAMPTON STANDARDS, CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS IN THE ABOVE REFERENCED INCREASING HIERARCHY. IF SPECIFICATIONS ARE IN CONFLICT, THE MORE STRINGENT SPECIFICATION SHALL APPLY.
2. IF NO PROJECT CONSTRUCTION SPECIFICATION PACKAGE IS PROVIDED BY THE PROJECT DEVELOPER OR THEIR REPRESENTATIVE, THE CONTRACTOR SHALL COMPLY WITH THE MANUFACTURE, TOWN OF EAST HAMPTON, OR CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, AND BE IN ACCORDANCE WITH ALL APPLICABLE OSHA, FEDERAL, STATE AND LOCAL REGULATIONS.
3. THE PROJECT DEVELOPER IS RESPONSIBLE FOR OBTAINING ALL NECESSARY ZONING AND STORMWATER PERMITS REQUIRED BY GOVERNMENT AGENCIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL OBTAIN ALL TOWN OF EAST HAMPTON CONSTRUCTION PERMITS. THE CONTRACTOR SHALL POST ALL BONDS, PAY ALL FEES, PROVIDE PROOF OF INSURANCE AND PROVIDE TRAFFIC CONTROL NECESSARY FOR THIS WORK.
4. REFER TO PLANS, DETAILS AND REPORTS PREPARED BY ALL-POINTS TECHNOLOGY CORPORATION FOR ADDITIONAL INFORMATION. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS IN THE FIELD AND CONTACT THE PROJECT DEVELOPER IF THERE ARE ANY QUESTIONS OR CONFLICTS REGARDING THE CONSTRUCTION DOCUMENTS AND/OR FIELD CONDITIONS SO THAT APPROPRIATE REVISIONS CAN BE MADE PRIOR TO BIDDING/CONSTRUCTION. ANY CONFLICT BETWEEN THE DRAWINGS AND SPECIFICATIONS SHALL BE CONFIRMED WITH THE PROJECT DEVELOPERS CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.
5. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL PRODUCTS, MATERIALS PER PLANS AND SPECIFICATIONS TO THE PROJECT DEVELOPER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION OR DELIVERY TO THE SITE. ALLOW A MINIMUM OF 14 WORKING DAYS FOR REVIEW.
6. SHOULD ANY UNKNOWN OR INCORRECTLY LOCATED EXISTING PIPING OR OTHER UTILITY BE UNCOVERED DURING EXCAVATION, CONSULT THE PROJECT DEVELOPER IMMEDIATELY FOR DIRECTIONS BEFORE PROCEEDING FURTHER WITH WORK IN THIS AREA.
7. DO NOT INTERRUPT EXISTING UTILITIES SERVICING FACILITIES OCCUPIED AND USED BY THE PROJECT DEVELOPER OR OTHERS DURING OCCUPIED HOURS, EXCEPT WHEN SUCH INTERRUPTIONS HAVE BEEN AUTHORIZED IN WRITING BY THE PROJECT DEVELOPER AND THE LOCAL MUNICIPALITY. INTERRUPTIONS SHALL ONLY OCCUR AFTER ACCEPTABLE TEMPORARY SERVICE HAS BEEN PROVIDED.
8. THE CONTRACT LIMIT IS THE PROPERTY LINE UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE CONTRACT DRAWINGS.
9. THE CONTRACTOR SHALL ABIDE BY ALL OSHA, FEDERAL, STATE AND LOCAL REGULATIONS WHEN OPERATING CRANES, BOOMS, HOISTS, ETC. IN CLOSE PROXIMITY TO OVERHEAD ELECTRIC LINES. IF CONTRACTOR MUST OPERATE EQUIPMENT CLOSE TO ELECTRIC LINES, CONTACT POWER COMPANY TO MAKE ARRANGEMENTS FOR PROPER SAFEGUARDS. ANY UTILITY COMPANY FEES SHALL BE PAID FOR BY THE CONTRACTOR.
10. THE CONTRACTOR SHALL COMPLY WITH OSHA CFR 29 PART 1926 FOR EXCAVATION TRENCHING AND TRENCH PROTECTION REQUIREMENTS.
11. THE ENGINEER IS NOT RESPONSIBLE FOR SITE SAFETY MEASURES TO BE EMPLOYED DURING CONSTRUCTION. THE ENGINEER HAS NO CONTRACTUAL DUTY TO CONTROL THE SAFEST METHODS OR MEANS OF THE WORK, JOB SITE RESPONSIBILITIES, SUPERVISION OF PERSONNEL OR TO SUPERVISE SAFETY AND DO NOT VOLUNTARILY ASSUME ANY SUCH DUTY OR RESPONSIBILITY.
12. THE CONTRACTOR SHALL RESTORE ANY DRAINAGE STRUCTURE, PIPE, CONDUIT, PAVEMENT, CURBING, SIDEWALKS, LANDSCAPED AREAS OR SIGNAGE DISTURBED DURING CONSTRUCTION TO THEIR ORIGINAL CONDITION OR BETTER, AS APPROVED BY THE PROJECT DEVELOPER OR TOWN OF EAST HAMPTON.
13. THE CONTRACTOR SHALL PROVIDE AS-BUILT RECORDS OF ALL CONSTRUCTION (INCLUDING UNDERGROUND UTILITIES) TO THE PROJECT DEVELOPER AT THE END OF CONSTRUCTION.
14. ALTERNATIVE METHODS AND PRODUCTS, OTHER THAN THOSE SPECIFIED, MAY BE USED IF REVIEWED AND APPROVED BY THE PROJECT DEVELOPER, ENGINEER, AND APPROPRIATE REGULATORY AGENCY PRIOR TO INSTALLATION DURING THE BIDDING/CONSTRUCTION PROCESS.
15. INFORMATION ON EXISTING UTILITIES AND STORM DRAINAGE SYSTEMS HAS BEEN COMPILED FROM AVAILABLE INFORMATION INCLUDING UTILITY PROVIDER AND MUNICIPAL RECORD MAPS AND/OR FIELD SURVEY AND IS NOT GUARANTEED CORRECT OR COMPLETE. UTILITIES AND STORM DRAINAGE SYSTEMS ARE SHOWN TO ALERT THE CONTRACTOR TO THEIR PRESENCE AND THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS AND ELEVATIONS OF ALL UTILITIES AND STORM DRAINAGE SYSTEMS INCLUDING SERVICES. PRIOR TO DEMOLITION OR CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG SAFE" 72 HOURS BEFORE COMMENCEMENT OF WORK AT "811" AND VERIFY ALL UTILITY AND STORM DRAINAGE SYSTEM LOCATIONS.
16. NO CONSTRUCTION OR DEMOLITION SHALL BEGIN UNTIL APPROVAL OF THE FINAL PLANS IS GRANTED BY ALL GOVERNING AND REGULATORY AGENCIES.

SITE PLAN NOTES

1. THE SURVEY WAS PROVIDED BY MARTIN SURVEYING ASSOCIATES, DATED JANUARY 15, 2020.
2. THERE ARE SVWS LOCATED ON THE SITE AS INDICATED ON THE PLANS. SVW BOUNDARIES WERE FLAGGED AND LOCATED BY ALL POINTS TECHNOLOGY, INC. IN JANUARY 2020.
3. THERE WILL BE MINIMAL GRADING ON SITE IN THE AREAS OF THE MINOR CLEARING, TO ENSURE THAT PROPER DRAINAGE IS MAINTAINED.
4. THE CONTRACTOR SHALL FOLLOW THE RECOMMENDED SEQUENCE OF CONSTRUCTION NOTES PROVIDED ON THE EROSION CONTROL PLAN OR SUBMIT AN ALTERNATE PLAN FOR APPROVAL BY THE ENGINEER AND/OR PERMITTING AGENCIES PRIOR TO THE START CONSTRUCTION. ALLOW A MINIMUM OF 14 WORKING DAYS FOR REVIEW.
5. PROPER CONSTRUCTION PROCEDURES SHALL BE FOLLOWED ON ALL IMPROVEMENTS WITHIN THIS PARCEL SO AS TO PREVENT THE SILTING OF ANY WATERCOURSE OR SVWS IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. IN ADDITION, THE CONTRACTOR SHALL ADHERE TO "EROSION CONTROL PLAN" CONTAINED HEREIN. THE CONTRACTOR SHALL BE RESPONSIBLE TO POST ALL BONDS AS REQUIRED BY GOVERNMENT AGENCIES WHICH WOULD GUARANTEE THE PROPER IMPLEMENTATION OF THE PLAN.
6. ALL SITE WORK, MATERIALS OF CONSTRUCTION, AND CONSTRUCTION METHODS FOR EARTHWORK AND STORM DRAINAGE WORK, SHALL CONFORM TO THE SPECIFICATIONS AND DETAILS AND APPLICABLE SECTIONS OF THE PROJECT SPECIFICATIONS MANUAL. OTHERWISE THIS WORK SHALL CONFORM TO THE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION AND PROJECT GEOTECHNICAL REPORT IF THERE IS NO PROJECT SPECIFICATIONS MANUAL. ALL FILL MATERIAL UNDER STRUCTURES AND PAVED AREAS SHALL BE PER THE ABOVE STATED APPLICABLE SPECIFICATIONS, AND/OR PROJECT GEOTECHNICAL REPORT, AND SHALL BE PLACED IN ACCORDANCE WITH THE APPLICABLE SPECIFICATIONS UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL ENGINEER. MATERIAL SHALL BE COMPACTED IN 8" LIFTS TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 1557 AT 95% PERCENT OF OPTIMUM MOISTURE CONTENT.
7. ALL DISTURBANCE INCURRED TO PUBLIC, MUNICIPAL, COUNTY, STATE PROPERTY DUE TO CONSTRUCTION SHALL BE RESTORED TO ITS PREVIOUS CONDITION OR BETTER, TO THE SATISFACTION OF THE TOWN OF EAST HAMPTON AND STATE OF CONNECTICUT.
8. IF IMPACTED OR CONTAMINATED SOIL IS ENCOUNTERED BY THE CONTRACTOR, THE CONTRACTOR SHALL SUSPEND EXCAVATION WORK OF IMPACTED SOIL AND NOTIFY THE PROJECT DEVELOPER AND/OR PROJECT DEVELOPERS ENVIRONMENTAL CONSULTANT PRIOR TO PROCEEDING WITH FURTHER WORK IN THE IMPACTED SOIL LOCATION UNTIL FURTHER INSTRUCTED BY THE PROJECT DEVELOPER AND/OR PROJECT DEVELOPERS ENVIRONMENTAL CONSULTANT.

UTILITY NOTES

1. CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE TOWN OF EAST HAMPTON TO SECURE CONSTRUCTION PERMITS AND FOR PAYMENT OF FEES FOR STREET CUTS AND CONNECTIONS TO EXISTING UTILITIES.
2. REFER TO DRAWINGS BY PROJECT DEVELOPER FOR THE ONSITE ELECTRICAL DRAWINGS AND INTERCONNECTION TO EXISTING ELECTRICAL GRID. SITE CONTRACTOR SHALL SUPPLY AND INSTALL PIPE ADAPTERS AS NECESSARY AT BUILDING CONNECTION POINT OR AT EXISTING UTILITY OR PIPE CONNECTION POINT. THESE DETAILS ARE NOT INCLUDED IN THESE PLANS.
3. UTILITY LOCATIONS AND PENETRATIONS ARE SHOWN FOR THE CONTRACTORS INFORMATION AND SHALL BE VERIFIED WITH THE ELECTRICAL ENGINEER AND THE PROJECT DEVELOPERS CONSTRUCTION MANAGER PRIOR TO THE START OF CONSTRUCTION.
4. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY THE ELEVATION AND LOCATION OF ALL UTILITIES BY VARIOUS MEANS PRIOR TO BEGINNING ANY EXCAVATION. TEST PITS SHALL BE DUG AT ALL LOCATIONS WHERE PROP. SANITARY SEWERS AND WHERE PROP. STORM PIPING WILL CROSS EXISTING UTILITIES, AND THE HORIZONTAL AND VERTICAL LOCATIONS OF THE UTILITIES SHALL BE DETERMINED. THE CONTRACTOR SHALL CONTACT THE PROJECT DEVELOPER IN THE EVENT OF ANY DISCOVERED OR UNFORESEEN CONFLICTS BETWEEN EXISTING AND PROPOSED SANITARY SEWERS, STORM PIPING AND UTILITIES SO THAT AN APPROPRIATE MODIFICATION MAY BE MADE.
5. UTILITY CONNECTION DESIGN AS REFLECTED ON THE PLAN MAY CHANGE SUBJECT TO UTILITY PROVIDER AND GOVERNING AUTHORITY STAFF REVIEW.
6. THE CONTRACTOR SHALL ENSURE THAT ALL UTILITY PROVIDERS AND GOVERNING AUTHORITY STANDARDS FOR MATERIALS AND CONSTRUCTION METHODS ARE MET. THE CONTRACTOR SHALL PERFORM PROPER COORDINATION WITH THE RESPECTIVE UTILITY PROVIDER.
7. THE CONTRACTOR SHALL ARRANGE FOR AND COORDINATE WITH THE RESPECTIVE UTILITY PROVIDERS FOR SERVICE INSTALLATIONS AND CONNECTIONS. THE CONTRACTOR SHALL COORDINATE WORK TO BE PERFORMED BY THE VARIOUS UTILITY PROVIDERS AND SHALL PAY ALL FEES FOR SERVICE INSTALLATIONS, DISCONNECTIONS, RELOCATIONS, INSPECTIONS, AND DEMOLITION UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATIONS MANUAL AND/OR GENERAL CONDITIONS OF THE CONTRACT.
8. ALL EXISTING PAVEMENT WHERE UTILITY PIPING IS TO BE INSTALLED SHALL BE SAW CUT. AFTER UTILITY INSTALLATION IS COMPLETED, THE CONTRACTOR SHALL INSTALL TEMPORARY AND/OR PERMANENT PAVEMENT REPAIR AS DETAILED ON THE DRAWINGS OR AS REQUIRED BY THE TOWN OF EAST HAMPTON.
9. ALL PIPES SHALL BE LAID ON STRAIGHT ALIGNMENTS AND EVEN GRADES USING A PIPE LASER OR OTHER ACCURATE METHOD.
10. RELOCATION OF UTILITY PROVIDER FACILITIES, SUCH AS POLES, SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY PROVIDER.
11. THE CONTRACTOR SHALL COMPACT PIPE BACKFILL IN 8" LIFTS ACCORDING TO THE PIPE BEDDING DETAILS. TRENCH BOTTOM SHALL BE STABLE IN HIGH GROUNDWATER AREAS. A PIPE FOUNDATION SHALL BE USED PER THE TRENCH DETAILS AND IN AREAS OF ROCK EXCAVATION.
12. CONTRACTOR TO PROVIDE STEEL SLEEVES AND ANNULAR SPACE SAND FILL FOR UTILITY PIPE AND CONDUIT CONNECTIONS UNDER FOOTINGS.
13. ALL UTILITY CONSTRUCTION IS SUBJECT TO INSPECTION FOR APPROVAL PRIOR TO BACKFILLING, IN ACCORDANCE WITH THE APPROPRIATE UTILITY PROVIDER REQUIREMENTS.
14. A ONE-FOOT MINIMUM VERTICAL CLEARANCE BETWEEN WATER, GAS, ELECTRICAL, AND TELEPHONE LINES AND STORM PIPING SHALL BE PROVIDED. A 36-INCH MINIMUM CLEARANCE SHALL BE MAINTAINED BETWEEN STORM PIPING AND SANITARY SEWER, A 6-INCH TO 18-INCH VERTICAL CLEARANCE BETWEEN SANITARY SEWER PIPING AND STORM PIPING SHALL REQUIRE CONCRETE ENCASEMENT OF THE PROP. SANITARY PIPING.
15. THE CONTRACTOR SHALL RESTORE ANY UTILITY STRUCTURE, PIPE, CONDUIT, PAVEMENT, CURBING, SIDEWALKS, DRAINAGE STRUCTURE, SWALE OR LANDSCAPED AREAS DISTURBED DURING CONSTRUCTION, TO THEIR ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE PROJECT DEVELOPER AND TOWN OF EAST HAMPTON.
16. INFORMATION ON EXISTING UTILITIES AND STORM DRAINAGE HAS BEEN COMPILED FROM AVAILABLE INFORMATION INCLUDING UTILITY PROVIDER AND MUNICIPAL RECORD MAPS AND/OR FIELD SURVEY, AND IS NOT GUARANTEED CORRECT OR COMPLETE. UTILITIES AND STORM DRAINAGE ARE SHOWN TO ALERT THE CONTRACTOR TO THEIR PRESENCE. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS AND ELEVATIONS OF ALL UTILITIES AND STORM DRAINAGE INCLUDING SERVICES. CONTACT "DIG SAFE" AT 811 72 HOURS PRIOR TO CONSTRUCTION AND VERIFY ALL UNDERGROUND AND OVERHEAD UTILITY AND STORM DRAINAGE LOCATIONS. THE CONTRACTOR SHALL EMPLOY THE USE OF A UTILITY LOCATING COMPANY TO PROVIDE SUBSURFACE UTILITY ENGINEERING CONSISTING OF DESIGNATING UTILITIES AND STORM PIPING ON PRIVATE PROPERTY WITHIN THE CONTRACT LIMIT AND CONSISTING OF DESIGNATING AND LOCATING WHERE PROP. UTILITIES AND STORM PIPING CROSS EXISTING UTILITIES AND STORM PIPING WITHIN THE CONTRACT LIMITS.
17. THE CONTRACTOR SHALL ARRANGE AND COORDINATE WITH UTILITY PROVIDERS FOR WORK TO BE PERFORMED BY UTILITY PROVIDERS. THE CONTRACTOR SHALL PAY ALL UTILITY FEES UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATION MANUAL AND GENERAL CONDITIONS, AND REPAIR PAVEMENTS AS NECESSARY.
18. ELECTRIC DRAWINGS AND REQUIREMENTS ARE NOT INCLUDED AS PART OF THIS DRAWING SET AND SHOULD BE OBTAINED FROM THE PROJECT DEVELOPER.
19. ALTERNATIVE METHODS AND PRODUCTS OTHER THAN THOSE SPECIFIED MAY BE USED IF REVIEWED AND APPROVED BY THE PROJECT DEVELOPER, ENGINEER, AND APPROPRIATE REGULATORY AGENCIES PRIOR TO INSTALLATION.
20. THE CONTRACTOR SHALL MAINTAIN ALL FLOWS AND UTILITY CONNECTIONS TO EXISTING BUILDINGS WITHOUT INTERRUPTION UNLESS/UNTIL AUTHORIZED TO DISCONNECT BY THE PROJECT DEVELOPER, TOWN OF EAST HAMPTON, UTILITY PROVIDERS AND GOVERNING AUTHORITIES.

CITRINE
55 GREENS FARMS ROAD
WESTPORT, CT 06880
OFFICE: (203)-557-5554

ALL-POINTS TECHNOLOGY CORPORATION
3 SADDLEBROOK DRIVE PHONE: (860)-663-1697
KILLINGWORTH, CT 06419 FAX: (860)-663-0935
WWW.ALL-POINTSTECH.COM

CSC PERMIT SET

NO	DATE	REVISION
0	02/14/20	FOR REVIEW: BJP
1	02/24/20	CSC SUBMISSION: BJP
2		
3		
4		
5		
6		

DESIGN PROFESSIONAL OF RECORD

PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 3 SADDLEBROOK DRIVE KILLINGWORTH, CT 06419

OWNER: SKINNER STREET PROPERTIES LLC
ADDRESS: 9 SEQUONNA TRAIL EAST HAMPTON, CT 06424

CP EAST HAMPTON SOLAR I & CP EAST HAMPTON SOLAR II

SITE ADDRESS: 8 SKINNER STREET EAST HAMPTON, CT 06424

APT FILING NUMBER: CT667110

DRAWN BY: CSH

DATE: 02/14/20 CHECKED BY: BJP

SHEET TITLE:

SITE NOTES

SHEET NUMBER:

DN-3

APPENDIX E

Construction Schedule and

Work Hours/Days Letter

CITRINE
55 Greens Farms Road, 200-78
Westport, CT 06880
203 557 5554
www.citrinepower.com

CONSTRUCTION HOURS/DAYS and CONSTRUCTION SCHEDULE

February 2020

Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

To Whom It May Concern:

For the construction of the solar array owned by CP East Hampton Solar I, LLC and CP East Hampton Solar II, LLC (collectively the "Petitioner") and its contractors plan to work the following hours during the proposed Construction Schedule attached hereto:

- Monday – Saturday: 7 am to 6 pm
- Sunday – 9 am to 6 pm
- Federal Holidays will be observed

Regards

Cela Sinay Bernie
Managing Partner
Citrine Power LLC
55 Greens Farms Road, Suite 200-78
Westport, CT 06880

CITRINE
55 Greens Farms Road, 200-78
Westport, CT 06880
203 557 5554
www.citrinepower.com

Construction Schedule

CONSTRUCTION SCHEDULE	EST. DAYS	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20
Approvals & Permitting	***90 days***									
Major Component Procurement	***60 days***									
Construction	***120 days***									
Site Prep	30 days									
Racking and Module Install	55 days									
Inverter & AC Install	45 days									
Finalize Fence and Landscaping	10 days									
Commissioning and Inspection	10 days									
Utility Close Out / PTO	5 days									
Final Completion	15 days									
TOTAL	**270 days**									

APPENDIX F

Wetland and Eastern Box Turtle Protection Program

WETLAND EASTERN BOX TURTLE PROTECTION PROGRAM

The project is located proximate to sensitive habitats including wetland resource areas and rare species. As a result, the following protective measures shall be followed to help avoid degradation of nearby wetland/watercourses.

In addition, Eastern box turtle (*Terrapenne carolina carolina*), a State Special Concern species afforded protection under the Connecticut Endangered Species Act, is known to occur within the vicinity of the project. The turtle protection measures included herein satisfy requirements from the Connecticut Department of Energy and Environmental Protection ("DEEP") Wildlife Division in accordance with their Natural Diversity Data Base ("NDDB") determination letter (No. 201913402) dated November 20, 2019; this determination is valid until February 8, 2021 provided the scope of the project has not changed and work has begun on the project prior to the expiration date.

It is of the utmost importance that the Contractor complies with the requirement for implementation of these protective measures and the education of its employees and subcontractors performing work on the project site. The wetland protection measures shall be implemented and maintained throughout the duration of construction activities until permanent stabilization of site soils has occurred. The turtle protection measures within this plan shall be implemented if work will occur during either the turtle's active period (April 1st to October 31st) or inactive period (November 1st through March 30th).

It is recommended that work should occur when these turtles are active (April through October), if possible. Conducting land clearing while turtles are active will allow the animal to move out of harm's way and minimize mortality to hibernating individuals; hibernation habitat typically includes woodlands, woodland edges and forested wetlands.

All-Points Technology Corporation, P.C. ("APT") will serve as the Environmental Monitor for this project to ensure that these protection measures are implemented properly. APT will provide an education session for the Contractor prior to the start of construction activities on eastern box turtle and nearby sensitive wetland resources that may be encountered due to the project's location within potentially sensitive habitat. The Contractor shall contact Dean Gustafson, Senior Biologist at APT, at least 5 business days prior to the start of any construction activities. Mr. Gustafson can be reached by phone at (860) 663-1697 ext. 201 or via email at dgustafson@allpointstech.com.

This protection program consists of several components: education of all contractors and sub-contractors prior to initiation of work on the site; protective measures; periodic inspection of the construction project; and, reporting.

1. Isolation Measures & Sedimentation and Erosion Controls

a. Plastic netting used in a variety of erosion control products (i.e., erosion control blankets, fiber rolls [wattles], reinforced silt fence) has been found to entangle wildlife, including reptiles, amphibians, birds and small mammals, but particularly snakes. No permanent erosion control products or reinforced silt fence will be used on the project. Temporary erosion control products will use either erosion control blankets and fiber rolls composed of processed fibers mechanically bound together to form a continuous matrix (netless) or netting composed of planar woven natural biodegradable fiber to avoid/minimize wildlife entanglement.

b. Installation of sedimentation and erosion controls, required for erosion control compliance and creation of a barrier to possible migrating/dispersing turtles, shall be performed by the Contractor following clearing activities and prior to any earthwork.

The Environmental Monitor will inspect the work zone area prior to and following erosion control barrier installation to ensure the area is free of eastern box turtle and document barriers have been satisfactorily installed. The intent of the barrier is to segregate the majority of the work zone and isolate it from foraging/migrating/dispersing turtles, snakes and other herpetofauna. Oftentimes complete isolation of a work zone is not feasible due to accessibility needs and locations of staging/material storage areas, etc. Although the barriers may not completely isolate the work zone, they will be positioned to deflect migrating/dispersal routes away from the work zone to minimize potential encounters with turtles, snakes and other herpetofauna.

c. The Contractor is responsible for daily inspections of the sedimentation and erosion controls for tears or breeches and accumulation levels of sediment, particularly following storm events that generate a discharge. APT will provide periodic inspections of the sedimentation and erosion controls throughout the duration of construction activities only as it pertains to their function as isolation measures for the protection of rare species. Third party monitoring of sedimentation and erosion controls will be performed by other parties, as necessary, under applicable local, state and/or federal regulations.

d. The extent of the sedimentation and erosion controls will be as shown on the site plans. The Contractor shall have additional sedimentation and erosion controls stockpiled on site should field or construction conditions warrant extending the controls as directed by APT or other regulatory agencies.

e. No equipment, vehicles or construction materials shall be stored outside of the sedimentation and erosion controls within 100 feet of wetlands or watercourses.

f. All sedimentation and erosion controls shall be removed within 30 days of completion of work and permanent stabilization of site soils so that reptile and amphibian movement between uplands and wetlands is not restricted.

2. Contractor Education

a. Prior to work on site, the Contractor shall attend an educational session at the pre-construction meeting with APT. This orientation and educational session will consist of an introductory meeting with APT providing photos of eastern box turtle emphasizing the non-aggressive nature of these species, the absence of need to destroy animals that might be encountered and the need to follow Protective Measures as described in Section 4 below. Workers will also be provided information regarding the identification of other turtles, snakes and common herpetofauna species that could be encountered. The importance of protecting nearby wetland resources will also be stressed as part of this educational session.

b. The education session will also focus on means to discriminate between the species of concern and other native species to avoid unnecessary "false alarms". Encounters with any species of turtles, snakes and amphibians will be documented.

c. The Contractor will be provided with cell phone and email contacts for APT personnel to immediately report any encounters with eastern box turtle or other species. Educational poster materials will be provided by APT and displayed on the job site to maintain worker awareness as the project progresses.

d. If an eastern box turtle is encountered, the Contractor shall immediately cease all work, avoid disturbance of the turtle and contact APT.

3. Petroleum Materials Storage and Spill Prevention

a. Certain precautions are necessary to store petroleum materials, refuel and contain and properly clean up any inadvertent fuel or petroleum (i.e., oil, hydraulic fluid, etc.) spill to avoid possible impact to nearby habitats.

b. A spill containment kit consisting of a sufficient supply of absorbent pads and absorbent material will be maintained by the Contractor at the construction site throughout the duration of the project. In addition, a waste drum will be kept on site to contain any used absorbent pads/material for proper and timely disposal off site in accordance with applicable local, state and federal laws.

c. The following petroleum and hazardous materials storage and refueling restrictions and spill response procedures will be adhered to by the Contractor.

   i. Petroleum and Hazardous Materials Storage and Refueling

      1. Refueling of vehicles or machinery shall occur a minimum of 100 feet from wetlands or watercourses and shall take place on an impervious pad with secondary containment designed to contain fuels.

      2. Any fuel or hazardous materials that must be kept on site shall be stored on an impervious surface utilizing secondary containment a minimum of 100 feet from wetlands or watercourses.

   ii. Initial Spill Response Procedures

      1. Stop operations and shut off equipment.

      2. Remove any sources of spark or flame.

      3. Contain the source of the spill.

      4. Determine the approximate volume of the spill.

      5. Identify the location of natural flow paths to prevent the release of the spill to sensitive nearby waterways or wetlands.

      6. Ensure that fellow workers are notified of the spill.

   iii. Spill Clean Up & Containment

      1. Obtain spill response materials from the on-site spill response kit. Place absorbent materials directly on the release area.

      2. Limit the spread of the spill by placing absorbent materials around the perimeter of the spill.

      3. Isolate and eliminate the spill source.

      4. Contact the appropriate local, state and/or federal agencies, as necessary.

      5. Contact a disposal company to properly dispose of contaminated materials in accordance with all local, state and federal regulations.

   iv. Reporting

      1. Complete an incident report.

2. Submit a completed incident report to the appropriate Town of Hamden, Connecticut Siting Council and other applicable local, state and federal officials.

4. Turtle Protective Measures during active period (April 1st through October 31st)

a. During the turtle active period and prior to the start of construction each day, the Contractor shall search the entire work area for turtles.

b. If a turtle is found during the active period, it shall be immediately moved, unharmed, by carefully grasped in both hands, one on each side of the shell, between the turtle's forelimbs and the hind limbs, and placed just outside of the isolation barrier in the same approximate direction it was walking.

c. During the active turtle period, special care shall be taken by the Contractor during early morning and evening hours so that possible basking or foraging turtles are not harmed by construction activities.

d. The Contractor shall be particularly diligent during the month of June when turtles are actively selecting nesting sites which results in an increase in turtle movement activity.

5. Turtle Protective Measures during inactive period (November 1st through March 30th)

a. Keep heavy equipment out of turtle hibernation habitat (e.g., woodlands and woodland edges) to the greatest extent possible and hand-fell trees to the greatest extent possible to minimize the potential for heavy machinery that may crush hibernating turtles.

b. Avoid and limit any equipment use within 50 feet of wetlands.

c. When felling trees adjacent to brooks and streams cut them to fall away from the waterway and do not drag trees across the waterway or remove stumps from stream banks.

d. No heavy machinery or vehicles may be parked in any turtle habitat.

6. Herbicide and Pesticide Restrictions

a. The use of herbicides and pesticides at the facility shall be avoided when possible. In the event herbicides and/or pesticides are required at the facility, their use will be used in accordance with Integrated Pest Management ("IPM") principles with particular attention to minimize applications within 100 feet of wetland or watercourse resources. No applications of herbicides or pesticides are allowed within actual wetland or watercourse resources.

7. Reporting

a. Daily Compliance Monitoring Reports (brief narrative and applicable photos) documenting each APT inspection will be submitted by APT to the Contractor and Citrine for compliance verification. Any observations of turtles, impacts, or corrective actions will be included in the reports.

b. Following completion of the construction project, APT will provide a Compliance Monitoring Summary Report to Citrine documenting implementation of this wetland and eastern box turtle protection program, monitoring and any species observations.

Citrine will provide a copy of the Compliance Monitoring Summary Report to the Connecticut Siting Council for compliance verification.

c. Any observations of eastern box turtle will be reported to CTDEEP by APT on the appropriate special animal reporting form, with photo-documentation (if possible) and specific information on the location and disposition of the animal.

APPENDIX G

USFWS

Compliance Statement

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To:
Consultation Code: 05E1NE00-2020-SLI-0933
Event Code: 05E1NE00-2020-E-02596
Project Name: Citrine Power East Hampton

January 07, 2020

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

To Whom It May Concern:

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

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

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

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

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

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

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

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

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

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2020-SLI-0933

Event Code: 05E1NE00-2020-E-02596

Project Name: Citrine Power East Hampton

Project Type: POWER GENERATION

Project Description: Citrine Power is proposing to construct a solar generation facility on a +/- 27 acre parcel at 46 Skinner Street, East Hampton, CT. The solar facility will be developed with a 2.0 megwatt (AC) ground mount solar photovoltaic electrical generating facility.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/41.56847390438761N72.50878621985484W

Counties: Middlesex, CT

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

IPaC Record Locator: 030-19752174 January 09, 2020

Subject: Consistency letter for the 'Citrine Power East Hampton' project indicating that any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Dear Deborah Gustafson:

The U.S. Fish and Wildlife Service (Service) received on January 09, 2020 your effects determination for the 'Citrine Power East Hampton' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. You indicated that no Federal agencies are involved in funding or authorizing this Action. This IPaC key assists users in determining whether a non-Federal action may cause "take"[1] of the northern long-eared bat that is prohibited under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the Action is not likely to result in unauthorized take of the northern long-eared bat.

Please report to our office any changes to the information about the Action that you entered into IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation.

If your Action proceeds as described and no additional information about the Action's effects on species protected under the ESA becomes available, no further coordination with the Service is required with respect to the northern long-eared bat.

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

Citrine Power East Hampton

2. Description

The following description was provided for the project 'Citrine Power East Hampton':

> Citrine Power is proposing to construct a solar generation facility on a +/- 27 acre parcel at 46 Skinner Street, East Hampton, CT. The solar facility will be developed with a 2.0 megwatt (AC) ground mount solar photovoltaic electrical generating facility.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/41.56847390438761N72.50878621985484W

Determination Key Result

This non-Federal Action may affect the northern long-eared bat; however, any take of this species that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o).

Determination Key Description: Northern Long-eared Bat 4(d) Rule
This key was last updated in IPaC on **May 15, 2017**. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for non-Federal actions is to assist determinations as to whether proposed actions are excepted from take prohibitions under the northern long-eared bat 4(d) rule.

If a non-Federal action may cause prohibited take of northern long-eared bats or other ESA-listed animal species, we recommend that you coordinate with the Service.

Determination Key Result

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   No

2. Will your activity purposefully **Take** northern long-eared bats?

   No

3. Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered

   No

4. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

   Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases is available at www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html.

   Yes

5. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

   No

6. Will the action involve Tree Removal?

   Yes

7. Will the action only remove hazardous trees for the protection of human life or property?

   No

8. Will the action remove trees within 0.25 miles of a known northern long-eared bat hibernaculum at any time of year?

   No

9. Will the action remove a known occupied northern long-eared bat maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31?

   No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

11.5

2. If known, estimated acres of forest conversion from April 1 to October 31

11.5

3. If known, estimated acres of forest conversion from June 1 to July 31

11.5

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?

0

APPENDIX H

Inverter and Solar Panel

Product Information Sheet

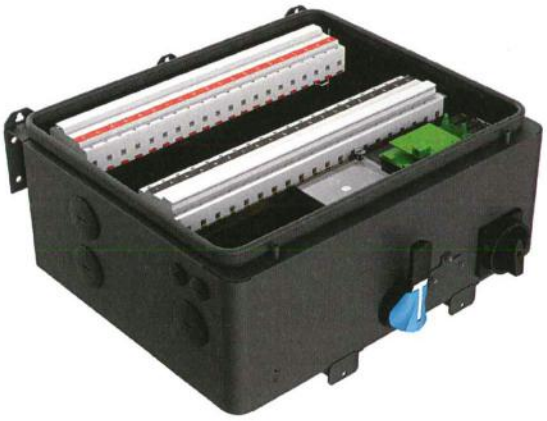
100/125kW, 1500Vdc String Inverters for North America

CPS SCH100/125KTL-DO/US-600

The 100 & 125kW medium power CPS three phase string inverters are designed for ground mount applications. The units are high performance, advanced and reliable inverters designed specifically for the North American environment and grid. High efficiency at 98.8% peak and 98.5% CEC, wide operating voltages, broad temperature ranges and a NEMA Type 4X enclosure enable this inverter platform to operate at high performance across many applications. The CPS 100/125kW products ship with the standard wire-box, each fully integrated and separable with touch safe fusing, monitoring, and AC and DC disconnect switches. The CPS Flex Gateway enables communication, controls and remote product upgrades.

Key Features

- NEC 2014/17 compliant & UL listed Arc-Fault circuit protection
- Touch safe DC Fuse holders adds convenience and safety
- CPS Flex Gateway enables remote FW upgrades
- Integrated AC & DC disconnect switches
- 1 MPPT with 16 and 20 inputs for maximum flexibility
- Copper and Aluminum compatible AC connections
- NEMA Type 4X outdoor rated, tough tested enclosure
- Advanced Smart-Grid features (CA Rule 21 compatible)
- kVA Headroom to deliver full Active Power @ 0.95PF
- Generous 1.5 DC/AC Inverter Load Ratio
- Separable wire-box design for fast service
- Standard 10 year warranty with extensions to 20 years



100/125kW Standard Wire-box

100/125kW Centralized Wire-box

Intertek 4004522
Conforms to UL Std. 1741
Cert.to CSA Std.C22.2 No.107.1-01

This device complies with part 15 of the FCC Rules

Chint Power Systems America
7060 Koll Center Parkway, Suite 318 Pleasanton, CA 94566
Tel: 855-584-7168 Mail: AmericaSales@chintpower.com Web: www.chintpowersystems.com

Model Name	CPS SCA100KTL-DO/US-600	CPS SCA125KTL-DO/US-600
DC Input		
Max. PV Power	150kW	187.5kW
Max. DC Input Voltage	1500V	
Operating DC Input Voltage Range	860-1450Vdc	
Start-up DC Input Voltage / Power	900V / 250W	
Number of MPP Trackers	1	
MPPT Voltage Range	870-1300Vdc	
Max. PV Input Current (Isc x1.25)	220A	275A
Number of DC Inputs	16 inputs / per MPPT	20 inputs / per MPPT
DC Disconnection Type	Load rated DC switch	
DC Surge Protection	Type II MOV, Up=2.5kV , In=20kA(8/20us)	
AC Output		
Rated AC Output Power	100kW	125kW
Max. AC Output Power[1]	100kVA (111KVA @ PF>0.9)	125kVA (132KVA @ PF>0.95)
Rated Output Voltage	600Vac	
Output Voltage Range[2]	528-660Vac	
Grid Connection Type[3]	3Φ / PE / (N optional) Wye or Delta	
Nominal AC Output Current @600Vac	106.9A	127.2A
Rated Output Frequency	60Hz	
Output Frequency Range[2]	57-63Hz	
Power Factor	>0.99 (±0.8 adjustable)	>0.99 (±0.8 adjustable)
Current THD	<3%	
AC Disconnection Type	Load rated AC switch	
AC Surge Protection	Type II MOV, Up=2.5kV , In=20kA(8/20us)	
System		
Topology	Transformerless	
Max. Efficiency	98.8%	
CEC Efficiency	98.5%	
Stand-by / Night Consumption	<2W	
Environment		
Enclosure Protection Degree	NEMA Type 4X	
Cooling Method	Variable speed cooling fans	
Operating Temperature Range	-22°F to +140°F / -30°C to +60°C (derating from +113°F / +45°C)	
Non-Operating Temperature Range[4]	-40°F to +158°F / -40°C to +70°C maximum[4]	
Operating Humidity	0-95%, non-condensing	
Operating Altitude	8202ft / 2500mm (no derating)	
Audible Noise	<65dBA@1m and 25°C	
Display and Communication		
User Interface and Display	LED, WiFi + APP	
Inverter Monitoring	Modbus RS485, PLC Option	
Site Level Monitoring	CPS Flex Gateway (1 per 32 inverters)	
Modbus Data Mapping	SunSpec/CPS	
Remote Diagnostics/FW Upgrade Functions	Standard	
Mechanical		
Dimensions (WxHxD)	45.28x24.25x9.84in (1150x616x250mm) with Standard Wire-box 39.37x24.25x9.84in (1000x616x250mm) with Centralized Wire-box	
Weight	Inverter: 121lbs / 55kg; Wire-box: 55lbs / 25kg (standard); 33lbs / 15kg (centralized)	
Mounting/Installation Angle	15 - 90 degrees from horizontal (vertical, angled)	
AC Termination[5]	M8 Stud Type Terminal Block (Wire range: #6 - 3/0AWG CU/AL[5], Lugs not supplied)	
DC Termination	Screw Clamp Fuse Holder (Wire range: 14AWG - 10AWG CU) - Standard Wire-box Screw Clamp Fuse Holder (Wire range: 1AWG - 250kcmil CU/AL, Lugs not supplied) - Centralized Wire-box	
Fused String Inputs (5 per MPPT)	15A fuses provided (Fuse values up to 30A acceptable)	
Safety		
Safety and EMC Standard	UL1741SA-2016[6], UL1699B, CSA-C22.2 NO.107.1-01, IEEE1547a-2014; FCC PART15	
Grid Standard[6]	IEEE 1547a-2014, CA Rule 21[6]	
Smart-Grid Features	Voltage-RideThru, Frequency-RideThru, Soft-Start, Volt-Var, Frequency-Watt	
Warranty		
Standard	10 years	
Extended Terms	15 and 20 years	

1) "Max. AC Apparent Power" rating valid within MPPT voltage range and temperature range of -30°C to +40°C (-22°F to +104°F) for 100KW PF ≥0.9 and 125KW PF ≥0.95
2) The "Output Voltage Range" and "Output Frequency Range" may differ according to the specific grid standard.
3) Wye neutral-grounded, Delta may not be corner-grounded.
4) See user manual for further requirements regarding non-operating conditions.
5) AL requires bi-metallic compression lug or bi-metallic adapter.
6) Certifications Pending.

MONO POLY

HELIENE

72M

72-CELL MONOCRYSTALLINE MODULE

370 Wp
MAX POWER OUTPUT

19.1%
MAX EFFICIENCY

10 YEAR
PRODUCT WARRANTY

25 YEAR
LINEAR PERFORMANCE GUARANTEE

MADE WITH PRIDE IN North America BUY LOCAL

- GUARANTEED POSITIVE POWER SORTING: [-0 : +4.99 WP]
- AVAILABLE IN 1000V OR 1500V SYSTEM VOLTAGE RATING
- MANUFACTURED ACCORDING TO INTERNATIONAL QUALITY SYSTEM STANDARDS: ISO9001
- H-BLACK INTEGRATION AVAILABLE (ALL-BLACK MODULE)

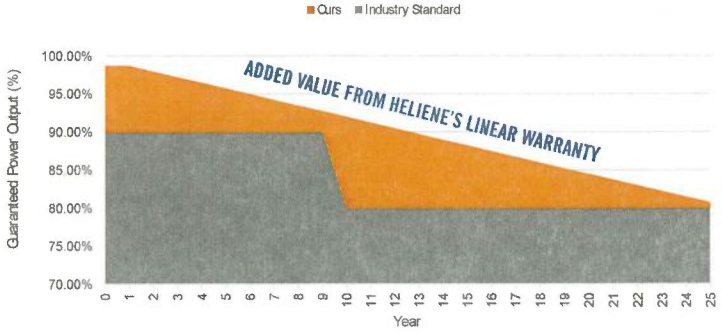
HELIENE INC. IS A PREMIER SOLAR MODULE MANUFACTURER, SERVICING THE GROWING SOLAR ENERGY MARKETS OF NORTH AMERICA.

COMBINING PROVEN EUROPEAN TECHNOLOGY WITH NORTH AMERICAN INGENUITY ALLOWS HELIENE TO MAKE A REAL COMMITMENT IN PROVIDING SMARTER ENERGY CHOICES FOR THE FUTURE.

HELIENE
www.heliene.com

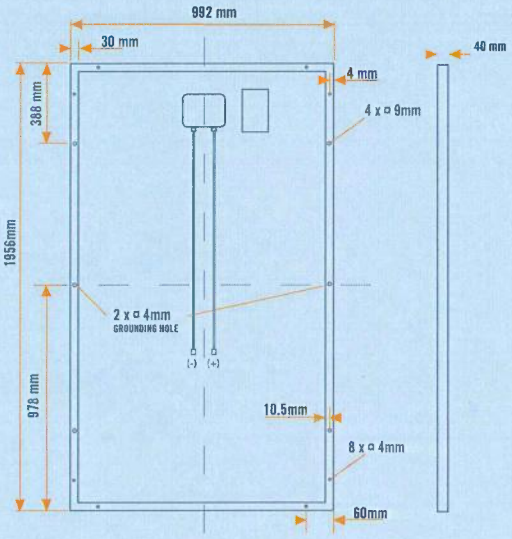
LINEAR PERFORMANCE GUARANTEE

10 YEAR WORKMANSHIP WARRANTY • 25 YEAR LINEAR PERFORMANCE GUARANTEE

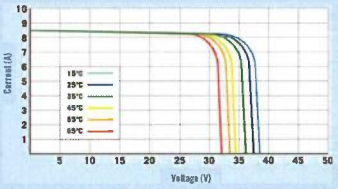


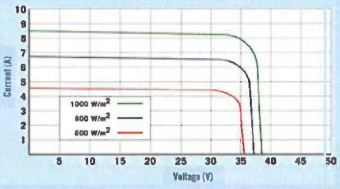
72M

DIMENSIONS FOR HELIENE 72M SERIES MODULES



I-V CURVE FOR HELIENE 72M SERIES





CERTIFICATIONS

ELECTRICAL DATA (STC)

Peak Rated Power	P_{mpp} (W)	370	365	360	350	345
Maximum Power Voltage	V_{mpp} (V)	40.23	39.90	39.71	39.13	38.84
Maximum Power Current	I_{mpp} (A)	9.26	9.20	9.13	9.01	8.95
Open Circuit Voltage	V_{oc} (V)	48.66	48.50	48.10	47.57	47.26
Short Circuit Current	Isc (A)	9.77	9.75	9.71	9.65	9.57
Module Efficiency *	Eff (%)	19.1	18.8	18.6	18.0	17.8
Maximum SeriesFuse Rating	MF (A)	20	20	20	20	15
Power Output Tolerance	[- 0 , + 4.99] Wp					

STC - Standard Test Conditions: Irradiation 1000 W/m2 - Air mass AM 1.5 - Cell temperature 25 °C
* Calculated using maximum power based on full positive output tolerance [-0 , +4.99] Wp

MECHANICAL DATA

Dimensions (L x W x D)	1956 x 992 x 40 mm (77 x 39 x 1.6 inch)
Weight	21.9 kg (48.28 lbs)
Output Cables	1.2 m (47.2 inch) symmetrical cables with MC4 type connectors
Junction Box	IP-67 rated with 3 bypass diodes
Frame	Double webbed 15 micron anodized aluminum alloy
Front Glass	Low-iron content, high-transmission PV solar glass
Solar Cells	72 Monocrystalline cells (156 x 156 mm)

CERTIFICATIONS

UL Certification	ULC/ORD-C1703-1, UL1703
IEC Certification	Optional

All Heliene modules are certified under the California Energy Commision (CEC) Listing Report

TEMPERATURE RATINGS

Nominal Operating Cell Temperature (NOCT)	+45°C (±2°C)
Temperature Coefficient of P_{max}	-0.39%/°C
Temperature Coefficient of V_{oc}	-0.31%/°C
Temperature Coefficient of I_{sc}	0.045%/°C

PACKAGING CONFIGURATION

Modules per box:	26 pieces
Modules per 53' trailer:	780 pieces

MAXIMUM RATINGS

Operational Temperature	-40°C - +85°C
Max System Voltage	1000V (*1500V) *Optional

WARRANTY

10 Year Manufacturer's Workmanship Warranty
25 Year Linear Power Guarantee

(Refer to product warranty page for details)

HELIENE72M_IFD_1701-Rev.03

HELIENE

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

Tab 2

CITRINE
55 Greens Farms Road, 200-78
Westport, CT 06880
203 557 5554
www.citrinepower.com

OPERATIONS & MAINTENANCE PLAN & ANNUAL INSPECTION PROTOCOL

INTRODUCTION

Citrine Power, LLC ("Citrine") and its affiliates, CP East Hampton Solar I, LLC and CP East Hampton Solar II, LLC, will enter into a third-party Operations and Maintenance Contract conterminous with the term of the lease with our landlord, with a reputable solar third-party operations and maintenance contractor ("O&M Contractor"). The O&M Contractor works diligently to ensure that any concerns are addressed quickly to minimize any downtime of the proposed PV Facilities. For each Facility, an owner's Operations Project Manager will be assigned responsibility for all operations and maintenance activities required at that Site to ensure that the PV Facilities continue operating as expected.

Prior to beginning operation of each PV Facility, our O&M Contractor and the Operations Project Manager for the overall project will conduct detailed training on system emergency procedures for the Town of East Hampton's public safety personnel and first responders.

Our O&M Contractors maintains staff and a fleet of vehicles supplied with tools and equipment. They also maintain and stock replacement parts in warehouse facilities. In addition, we enter into extended warranty programs. At project completion, Citrine will present the municipalities with sets of as built drawings for each of the completed installations. Although Citrine will be responsible for ongoing operations of the equipment, we will train local maintenance personnel on the equipment that has been installed and where it is located. We will also train staff on the actions to take in the event of an emergency.

In addition, Citrine enters into extended warranty programs, and contracts. This provides our customers with long-term, worry-free service and assurance that the PV Facilities will be in continuous operation. Each PV Facility will be installed with an internet-based data acquisition system (DAS). The DAS will have the capability to send alarms identifying communication and power generation issues.

SERVICES

During the operation of the PV Facilities, our O&M Contractor shall perform the following services on each PV Facility:

- On Call System Service → Per request
- Annual Full System Electrical Inspection and Maintenance → One time a year
- Vegetation Management & Landscaping → Minimum once per year
- Stormwater Controls → Minimum once per year
- Module Washing → Optional (maximum once per year)

SCOPE OF WORK

Daily Monitoring, Annual inspection and Preventative Maintenance

To maintain the PV Facilities at optimal operation, our team and our O&M Contractor and our Operations Project Manager manage the following:

- **Daily Monitoring; Responsiveness to Service Alerts and Alarms:** For each project, assigned O&M Contractor and Operations Project Manager receive alerts, alarms, and reports from the DAS, notifying the manager of any fault(s) or performance problems. When an alert from the DAS occurs, the Operation Project Manager assesses the cause and severity of the alert – dispatching, as required, service technicians or engineers to access the on-site problem and repair or replace equipment.
- **Annual Inspection and Maintenance:** The Operations Project Manager is also responsible for scheduling the annual evaluation and preventative maintenance of the PV Facility. We will require our O&M Contractor conduct a full system electrical inspection once a year. This procedure will include the following:
    - Electrical Inspection
        - Perform a visual inspection of PV modules and array wiring, strain relief, mounting system, inverters, switchgear, transformers, combiner boxes, wireways and conduit, data acquisition system, weather sensors and outdoor lighting.
        - Check pyranometers and reference cells.
        - Record operational data from inverters and meters.
        - IR Thermography may be used as part of the visual inspection process.
    - Inspect External and/or Internal DC Disconnects and Combiner Boxes
        - Ensure all Imp testing is performed on all DC strings, and values are logged
        - Spot check torque values and tighten loose electrical connections
    - Inverter and Transformer
        - Clean out all electrical enclosures
        - Clean inverter air filters
        - Perform Preventive Maintenance per manufacturer protocol as required to maintain inverter manufacturer's warranty.
    - AC Disconnects
        - The technician will check for proper operation.
    - DAS
        - Verify with Citrine before leaving site that the DAS system is functioning properly.
    - Fencing, Gates, Civil
        - Annual visit will include a visual inspection of any fences, gates, equipment pads, etc.
    - Service Report
        - A report must be filed with Citrine noting results of the annual inspection.

- **Vegetation Management & Landscaping:** The Site shall be inspected for evidence of erosion and rilling in any slopes. Any such conditions shall be noted in the annual report for re-vegetating and

depending on the severity of erosion and rilling, the area will be repaired as soon as practicable. Growth of trees or other vegetation resulting in shade impact on the arrays should be noted in the annual report. Vegetation growth (saplings, bush, large weeds etc.) within any array fences or inverter enclosures shall be removed.

During PV Facility operation, Citrine will maintain the vegetation within the leased areas, consisting of mowing at least one (1) time(s) per growing season, depending on yearly conditions.

- **Stormwater Management:** There are five (5) stormwater management basins and two (2) pipe culverts on site that will require inspection at least once per year. The following are the maintenance requirements:
    - Stormwater Management Basins
        - Inspect for damage, including erosion and rilling
        - Monitor sediment accumulation
        - Ensure that the basin and the outlet control are free of debris and operational
        - Mow the basin
    - Pipe Culverts
        - Inspect for damage
        - Ensure that the pipes are free of debris and operational
- **Module Washing & Snow Removal:** Module washing and snow removal are only required if system outputs dictate, i.e. pollen build up or excessive amount of snow reduce power output. At a maximum, modules might be washed once per year with clean water and no chemicals or additives will be used.

CONTACT INFORMATION

Cela Sinay Bernie
Managing Partner
Citrine Power, LLC
55 Greens Farms Road, Westport, CT 06880
203 557 5554 / 917 345 8371

Our final O&M Contractor's information will be provided after the Systems are operational.

EMERGENCY RESPONSE PROCEDURE

PV Facilities in East Hampton CT

1. Ascertain the Nature of the Emergency
    - Police
        - Trespassing
        - Theft
        - Vandalism / Physical Damage
        - Other Crime
    - Fire
        - Injury
        - Fire
        - Smoke
        - Electrical Arcing
        - Hazardous Materials
    - Electrical
        - Damaged Wires
        - Damaged Inverters
        - Damaged Transfers
        - Grid Related Issues
2. Contact appropriate responder below
3. Notify East Hampton Police Departments and Citrine Power, LLC
4. If required initiate emergency shutdown with the assistance of Police and Fire Department representatives

Contact Information

Police

- East Hampton Police Department: 20 E High St # 2, East Hampton, CT 06424
- Emergency Contact: 911 // (860) 267-9544

Fire

- Contact East Hampton Fire Department: Contact East Hampton Fire Department: (860) 267-2198 (3 Barton Hill Rd, East Hampton, CT 06424)

Electrical
Eversource CT
800-286-2000
24-Hour Assistance

Owner's Contact Information
Citrine Power, LLC
55 Greens Farms Road Suite 200-78
Westport, CT 06880
Phone: 203 557 5554
Email: cela@citrinepower.com

O&M Provider
To be provided when selected

Emergency Shut Down Procedure

1. Contact East Hampton Fire Department: (860) 267-2198 (3 Barton Hill Rd, East Hampton, CT 06424)
2. Open visible disconnect located in array field next to the solar inverter equipment
3. Turn the DC disconnects located at the inverters to the off position
4. Citrine Power LLC at (203) 557-5554

Tab 3

CITRINE
55 Greens Farms Road, 200-78
Westport, CT 06880
203 557 5554
www.citrinepower.com

DECOMMISSIONING PLAN

EXECUTIVE SUMMARY

Citrine Power LLC and its affiliates, CP East Hampton Solar I, LLC and CP East Hampton Solar II, LLC (each and collectively the "Petitioner") submit this Decommissioning Plan (the "Plan") to the Connecticut Siting Council ("Council") in conjunction with its Petition for two adjacent ground mounted solar photovoltaic electric generating facilities ("PV Facilities"), 1 MW AC and 0.975 MW AC respectively, to be located in the Town of East Hampton. This Plan establishes the decommissioning activities for the permanent removal of the solar panels and appurtenant equipment at the end of the PV Facilities' useful life or the permanent cessation of their operation, whichever comes first. The PV Facilities are designed for a useful life of at least twenty five (25) years. The Plan describes the approach for removal of the PV Facilities and associated equipment and describes anticipated land-restoration activities. This Plan is valid for each and both of the PV Facilities.

Decommissioning and restoration activities will be in accordance with all applicable federal, state and local laws, as well as local permitting requirements. As with the construction phase, an on-site manager responsible for safety will be present while decommissioning activities take place.

This Plan is based on current procedures and experience. These procedures may be subject to revision over time based on then prevailing industry standards. At the time of decommissioning, various options and procedures will be re-evaluated to ensure that decommissioning is safe and minimizes the potential for impacts to the environment. Decommissioning and site restoration activities will be undertaken with the input of the landowner and will be carried out in accordance with the commitments made in this report or the prevailing industry standards.

1. Decommissioning Sequence

In the event of a decommissioning, the following sequence for removal will be used:

- Decommissioning preparation
- Remove solar panel modules and other PV equipment
- Remove structural steel racking
- Remove concrete foundations
- Remove cables and interconnection lines & poles
- Remove above and below ground conduit and cable
- Remove fence
- Remove access road
- Restoration of site
- Monitor

2. Decommissioning Preparation

The first step is Site preparation. Site decommissioning, equipment removal, and reclamation of the Site can require between four to eight weeks for PV Facilities of this size (*i.e.,* 1-2 MW AC). Therefore, access roads, fencing, and electrical power will temporarily remain in place for use by the decommissioning and site restoration workers until no longer needed. Demolition debris will be placed in temporary on-site storage areas pending final transportation and disposal/recycling according to the procedures discussed in this Plan. All recyclable materials will be transported to the appropriate nearby recycling facilities as 95 percent or greater of the PV Facilities' components will be recyclable. Any non-recyclable materials will be properly disposed of at a nearby landfill in accordance with State and Federal law.

3. Equipment Removal & Recycling

Equipment removal will include all pad-mounted cabinets, internal power systems, solar modules, solar module racking, inverters, transformers and switchgear/panel boards. The solar panels might be salvageable for reuse or resale on other solar energy projects; the panels are under warranty to generate electricity at 80 percent of their original capacity after twenty (25) years. The panels will be collected, hauled to a storage yard and assessed for value at the time of decommissioning. Inverters, transformers, and the switchgear may also retain value for reuse on other power generating projects and will be hauled to a storage facility for assessed value, functionality and potential reuse. If the Petitioner determines that, the solar panels and other PV equipment need to be discarded, all such material will be transported to and recycled at the nearest appropriate facility. Minimal non-recyclable materials are anticipated, of which will be disposed at the nearest qualified disposal facility.

Steel posts that supported the module racking will be removed and any resulting holes, if any, will be backfilled with locally imported soil to match existing site soil conditions. The majority of copper, steel and aluminum will be processed for transportation and delivery to a licensed off-site recycling center if they are deemed to be unsalvageable by the Petitioner.

The concrete foundation designs for each PV Facility consists of one (2) Equipment Pad switchboard slabs (each 10' x 20' x 1') amounting to 400 cubic yards of concrete. The foundation can be removed by a jackhammer mounted on either a skid loader or excavator. There is no salvage value to the foundations and slabs. The equipment pads and supports will be broken up and removed. The demolition debris may be cut or dismantled into pieces that can be safely lifted or carried with the on-site decommissioning equipment. Such debris will be completely removed and hauled off site to an approved landfill site or recycling center.

4. Cables, Conduit, Interconnection Lines & Poles

The PV Facilities will have cable both above ground and placed in below the ground surface. In all cable locations the trenches are backfilled with on-site earthen materials with topsoil. All conduit and cabling that is removed will be recycled.

The underground interconnection cabling that connects the PV Facilities to The Connecticut Light and Power Company *d/b/a* Eversource Energy's ("Eversource") local distribution system will remain in place during decommissioning activities to provide electric service onsite during decommissioning. At the time of decommissioning, if the landowner determines that this electric service line will be beneficial for the future use of the site, the line may remain after decommissioning. If the line is not used, the conductors will be removed and transported offsite to the nearest recycling facility. The associated poles owned by the Petitioner but not owned by Eversource will be removed and recycled. Similar on-site earthen materials with topsoil will be used to backfill pole locations after removal. If poles owned by Eversource on the landlord's site and access road need to be removed, cable disconnect and pole removal will be coordinated with Eversource at the expense of the Petitioner.

5. Security Fence

The 7-foot high chain link perimeter security fence will remain in place during decommissioning activities for site safety and security purposes. At the time of decommissioning, if the landowner determines that this fence will be beneficial for the future use of the site, the fence may remain after decommissioning. The future use of the site is undetermined at this time. If the fence will not be used, it will be removed and transported to the nearest recycling facility. Holes left behind by the fence support posts will be backfilled with locally imported soil to match existing onsite soils, and hydroseeded with a seed mix to match existing onsite groundcover.

6. Access Road

The onsite access road is existing and will remain in place to accomplish decommissioning at the end of the Facility's life. After decommissioning is complete the access will remain for the landowner's future use.

7. Site Restoration Process

After the PV Facilities are completely decommissioned, and all equipment has been removed from the site, additional activities will be performed to restore the site, excepting ordinary wear and tear.

Site restoration activities are anticipated to be limited, because Petitioners do not anticipate altering the pre-construction conditions during construction. The initial site disturbance during the construction of the PV Facilities is designed to maintain much of the site's original topography and limit mass earth moving. Any modified landform features or physical site alterations, including stormwater swales and basins, can be left in place as they will continue to function adequately. After the PV Facilities are completely decommissioned, and all equipment has been removed from the site, the areas disturbed by the equipment removal (and ordinary wear and tear) will be reseeded.

Any excavated areas remaining after removal of equipment pads or base material, will be backfilled and compacted with locally imported soil to match existing onsite soils. Areas affected by these modifications would be spread with topsoil where necessary and hydroseeded with a seed mix to match existing onsite groundcover.

If any soils are compacted at levels that would affect successful re-vegetation, they will be de-compacted. The method of de-compaction (i.e. aeration, tilling, etc.) will depend on how compacted the soil has become over the life of the Project.

Any remaining bare earth areas will be hydroseeded with a seed mix to match existing onsite groundcover.

If not managed otherwise, the site would revert to successional forest over time.

8. Monitoring Activities

The Site will be monitored by the Petitioner after Site restoration activities are complete to confirm that any earthwork and re-vegetation were performed correctly. The Site will be periodically inspected (at least quarterly) to check for any eroded earthwork or failed vegetation. Any deficiencies will be promptly corrected. This monitoring will continue for a period of one year, or until the site is re-developed for another future purpose, whichever comes first.

Tab 4

CITRINE
55 Greens Farms Road, 200-78
Westport, CT 06880
203 557 5554
www.citrinepower.com

Carbon Debt Analysis of East Hampton Photovoltaic Systems

Citrine Power LLC and its project affiliates CP East Hampton Solar I, LLC and CP East Hampton Solar II, LLC (collectively the "Petitioner") have performed a carbon debt analysis for the PV Facilities proposed in the Town of East Hampton. The purpose of this analysis is to determine whether the PV Facilities can have a net improvement in carbon reduction compared to the loss of approximately 14.27 acres of trees. The Project will require the removal of 14.27 acres of trees representing 100% percent of the project Site. None of the trees being removed are in the wetlands areas.

The analysis relied upon a United States Environmental Protection Agency ("EPA") conversion factor to identify the amount of carbon sequestered in one year by one (1) acre of average U.S. forest: 0.85 metric tons (MT) CO2 (EPA, 2017). As the PV Facilities together require the removal of approximately 14.27 acres of trees, the associated "carbon debt" is estimated to be 12.1 MT CO2 per year. Over twenty (20) years, this would equate to the sequestration of 242.6 MT CO2.

Each PV Facility is expected to produce approximately 1,613 MWh of energy in its first year of operation for a total of about 3,227 MWh between the two (2) PV Facilities. Using the EPA Greenhouse Gas Equivalencies Calculator, the estimated annual carbon offset of the Project is 2,282 MT CO2. Attachment A provides greenhouse gas equivalencies for this estimated offset, examples of which include:

- 484 passenger vehicles driven for one year;
- 256,737 gallons of gasoline consumed; and
- 263 homes' energy use for one year.

Anticipating an annual "carbon debt" of 12.1 MT CO2 and an annual carbon offset of 2,282 MT CO2, Petitioner performed the following calculation to determine the duration of time to offset the carbon debt of the tree clearing:

Offset Time in Days= Annual Carbon Debt/(Annual MT CO2 Offset/days per year)

Using this formula, Petitioner has determined that it would take approximately 1.94 days/ annum to produce a net improvement in carbon reduction. It would take approximately 38.8 days to recover the loss of carbon sequestration by the 14.27 acres of cleared trees over 20 years.

This analysis does not account for energy used as part of material extraction; solar panel manufacturing and production; manufacturing of balance of system components or project installation. It also does not include the carbon dioxide that is expected to be released from the tree removal.

References

United States Environmental Protection Agency (EPA). (2017). Greenhouse Gases Equivalencies Calculator - Calculations and References. Retrieved 02/29/2019. from https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references

Equivalency Results

How are they calculated?

The sum of the greenhouse gas emissions you entered above is of Carbon Dioxide Equivalent. This is equivalent to:

2,282 **Metric Tons**

Greenhouse gas emissions from

484

Passenger vehicles driven for one year

-or-

5,661,583

Miles driven by an average passenger vehicle

CO_2 emissions from

256,737

gallons of gasoline consumed

-or-

224,128

gallons of diesel consumed

-or-

2,514,030

Pounds of coal burned

-or-

30.2

tanker trucks' worth of gasoline

-or-

263

homes' energy use for one year

-or-

386

homes' electricity use for one year

-or-

12.5

railcars' worth of coal burned

-or-

5,282

barrels of oil consumed

-or-

93,272

propane cylinders used for home barbeques

-or-

0.0006

coal-fired power plants in one year

-or-

290,979,824

number of smartphones charged

Greenhouse gas emissions avoided by

776

Tons of waste recycled instead of landfilled

-or-

111

Garbage trucks of waste recycled instead of landfilled

-or-

97,082

trash bags of waste recycled instead of landfilled

-or-

0.493

Wind turbines running for a year

-or-

86,678

Incandescent lamps switched to LEDs

Carbon sequestered by

37,727

tree seedlings grown for 10 years

-or-

2,980

acres of U.S. forests in one year

-or-

15.4

acres of U.S. forests preserved from conversion to cropland in one year

Tab 5a

CERTIFICATION OF SERVICE

I hereby certify that on the 6th day of March, 2020, CP East Hampton Solar I, LLC and CP East Hampton Solar II, LLC provided notice of its Petition For A Declaratory Ruling That A Certificate of Environmental Compatibility And Public Need Is Not Required for the installation of an alternating current and a ground mounted solar photovoltaic electric generating facility proposed to be situated on land located off of Skinner Street (CT Route 196) in the Town of East Hampton, Connecticut, to the following:

Abutters

Skinner Street Properties LLC
9 Sequonia Trail
East Hampton, CT 06424

50 Skinner St LLC
PO Box 25
East Hampton, CT 06424

State of Connecticut
Forest Street Vacant Land
79 Elm Street
Hartford, CT 06106

State of Connecticut
Department of Transportation
Barton Hill
PO Box 317546
Newington, CT 06131

Joseph Fazzino Jr.
76 Middletown Ave
East Hampton, CT 06424

Fog Plain Associates
33 Old Canton Road
Canton, CT 06019

Jefferson LLC
PO Box 141
Middle Haddam, CT 06456

Shaun M. Kelly & Sharon M. Kelly
30 Skinner St
East Hampton, CT 06424

Angel M. Marston
Michael Spitzmacher
68 Skinner St
East Hampton, CT 06424

Thomas E. Marston
Elaine B. Marston
PO Box 42
East Hampton, CT 06424

McLaughin Properties LLC
PO Box 28
East Hampton, CT 06424

Mark A. Pellegrini
Kimberly Samson
40 Skinner St
East Hampton, CT 06424

Owners

Skinner Street Properties LLC
9 Sequonia Trail
East Hampton, CT 06424

Respectfully submitted by,

Jesse A. Langer

Tab 5b

Jesse A. Langer
(t) 203.786.8317
(f) 203.772.2037

March 6, 2020

VIA CERTIFIED MAIL

Skinner Street Properties LLC
9 Sequonia Trail
East Hampton, CT 06424

RE: Proposed installation of solar electric generating facility to be located off of Skinner Street (CT Route 196) in East Hampton, Connecticut with reference to your abutting property

To Whom It May Concern:

I write on behalf of CP East Hampton Solar I, LLC and CP East Hampton Solar II, LLC, wholly owned subsidiaries of Citrine Power, LLC (collectively "Citrine"). Citrine intends to file with the Connecticut Siting Council ("Council") a petition for declaratory ruling ("Petition") that a Certificate of Environmental Compatibility and Public Need is not required.

The Petition addresses the construction, operation and maintenance of a 1.0 megawatt ("MW") alternating current ("AC") and a 0.975 MW AC ground mounted solar photovoltaic electric generating facility, both of which would be located off of Skinner Street (CT Route 196) in East Hampton, Connecticut ("Project"). The Project would be located behind 46 Skinner Street in an industrial zone. The Project area is undeveloped, privately owned, and totals approximately 14.93 acres. The Project would include the installation of photovoltaic modules, inverters and transformers, electrical lines and a perimeter fence.

As a developer of and investor in renewable power facilities, Citrine seeks out sites that are environmentally responsible and will meet its renewable energy generation objectives. Citrine has identified the Project to further such initiatives.

This letter serves as notice to you as an abutting property owner pursuant to § 16-50j-40 of the Regulations of Connecticut State Agencies. Citrine will file the Petition on or about March 6, 2020, and will request that the Council place the Petition on some future agenda.

You may review the Application at the office of the Council, which is located at Ten Franklin Square, New Britain, Connecticut, 06051, or at the Town Clerk's Office at the Town Hall in the Town of East Hampton. If you have any questions or concerns regarding this matter, please contact the undersigned at (203) 786-8317, or the Council at (860) 827-2935.

Very truly yours,

Jesse A. Langer

Tab 6a

CERTIFICATION OF SERVICE

I hereby certify that on the 6th day of March, 2020, CP East Hampton Solar I, LLC and CP East Hampton Solar II, LLC provided notice of its Petition For A Declaratory Ruling That A Certificate of Environmental Compatibility And Public Need Is Not Required for the installation of an alternating current and a ground mounted solar photovoltaic electric generating facility proposed to be situated on land located off of Skinner Street (CT Route 196) in the Town of East Hampton, Connecticut, to the following:

Town of East Hampton

Town of East Hampton
Pete Brown, Chairman
Town Council
20 East High Street
East Hampton, CT 06424

Town of East Hampton
Planning & Zoning Commission
Kevin Kuhr, Chair
20 East High Street
East Hampton, CT 06424

Town of East Hampton
Kelly Bilodeau
Town Clerk
20 East High Street
East Hampton, CT 06424

Town of East Hampton
Zoning Board of Appeals
Matthew Walton, Chair
20 East High Street
East Hampton, CT 06424

Town of East Hampton
Inland Wetlands and Watercourses Agency
Jeff Foran, Chair
20 East High Street
East Hampton, CT 06424

Town of East Hampton
Conservation – Lake Commission
Peter Zawisza, Chair
20 East High Street
East Hampton, CT 06424

State and Regional

The Honorable William Tong
Attorney General, State of Connecticut
Office of the Attorney General
55 Elm Street
Hartford, CT 06106

Connecticut Department of Emergency Services
and Public Protection
Division of Emergency Management
and Homeland Security
c/o James C. Rovella, Commissioner
1111 Country Club Road
Middletown, CT 06457

Connecticut Department of Public Health
c/o Renee Coleman-Mitchell, MPH
Commissioner
410 Capital Avenue
Hartford, CT 06106

Connecticut Public Utilities Regulatory Authority
c/o Marissa Paslick Gillett, Chairman
Ten Franklin Square
New Britain, CT 06051

Connecticut Council on Environmental Quality
c/o Susan D. Merrow, Chair
79 Elm Street
Hartford, CT 06106

Connecticut Department of Economic
and Community Development
c/o David Lehman, Commissioner
450 Columbus Boulevard, Suite 5
Hartford, CT 06103

Connecticut Department of Energy
& Environmental Protection
c/o Katie Dykes, Commissioner
79 Elm Street
Hartford, CT 06106

Connecticut Department of Agriculture
c/o Bryan P. Hurlburt, Commissioner
450 Columbus Boulevard, Suite 701
Hartford, CT 06103

Connecticut Office of Policy and Management
c/o Melissa McCaw, Secretary
450 Capitol Avenue
Hartford, CT 06106

Connecticut Department of Transportation
c/o Joseph Giulietti, Commissioner
2800 Berlin Turnpike
Newington, CT 06131

Connecticut Department of Economic and
Community Development
State Historic Preservation Office
c/o Elizabeth Shapiro, Director
450 Columbus Boulevard, Suite 5
Hartford, CT 06103

Lower Connecticut River Valley Council of
Governments
c/o Michael Maniscalco, Chairman
145 Dennison Road
Essex, CT 06426

Norm Needleman
Connecticut State Senate; 33rd District
Legislative Office Building, Room 3900
300 Capitol Avenue
Hartford, CT 06106

Irene Haines
Connecticut State Representative; 34th District
Legislative Office Building, Room 4200
300 Capitol Avenue
Hartford, CT 06106

Federal

U.S. Department of Transportation
Federal Aviation Administration
c/o Steve Dickson, Administrator
800 Independence Avenue, SW
Washington, DC 20591

U.S. Representative Joe Courtney
Connecticut 2nd District
101 Water Street, Suite 301
Norwich, CT 06360

U.S. Senator Christopher Murphy
Colt Gateway, Suite 401
120 Huyshope Avenue
Hartford, CT 06106

U.S. Representative Joe Courtney
Connecticut 2nd District
77 Hazard Ave, Unit J
Enfield, CT 06082

Federal Communications Commission
c/o Ajit Pai, Chairman
445 12th Street SW
Washington, DC 20554

U.S. Senator Richard Blumenthal
90 State House Square, 10th Floor
Hartford, CT 06103

Respectfully submitted by,

Jesse A. Langer

2382223

Tab 6b

MERITAS LAW FIRMS WORLDWIDE

Jesse A. Langer
(t) 203.786.8317
(f) 203.772.2037
jlanger@uks.com

March 6, 2020

VIA CERTIFIED MAIL

Town of East Hampton
Pete Brown, Chairman
Town Council
20 East High Street
East Hampton, CT 06424

RE: Proposed installation of solar electric generating facility to be located off of Skinner Street (CT Route 196) in East Hampton, Connecticut

The Honorable Pete Brown:

I write on behalf of CP East Hampton Solar I, LLC and CP East Hampton Solar II, LLC, wholly owned subsidiaries of Citrine Power, LLC (collectively "Citrine"). Citrine intends to file with the Connecticut Siting Council ("Council") a petition for declaratory ruling ("Petition") that a Certificate of Environmental Compatibility and Public Need is not required.

The Petition addresses the construction, operation and maintenance of a 1.0 megawatt ("MW") alternating current ("AC") and a 0.975 MW AC ground mounted solar photovoltaic electric generating facility, both of which would be located off of Skinner Street (CT Route 196) in East Hampton, Connecticut ("Project"). The Project would be located behind 46 Skinner Street in an industrial zone. The Project area is undeveloped, privately owned, and totals approximately 14.93 acres. The Project would include the installation of photovoltaic modules, inverters and transformers, electrical lines and a perimeter fence.

As a developer of and investor in renewable power facilities, Citrine seeks out sites that are environmentally responsible and will meet its renewable energy generation objectives. Citrine has identified the Project to further such initiatives.

This letter serves as notice to you as an "appropriate municipal official and government agenc[y]" as that term is defined under § 16-50j-40 of the Regulations of Connecticut State Agencies. Citrine will file the Petition on or about March 6, 2020, and will request that the Council place the Petition on some future agenda.

Attached please find a copy of the Petition. If you have any questions or concerns regarding this matter, please contact the undersigned at (203) 786-8317, or the Council at (860) 827-2935.

Very truly yours,

Jesse A. Langer

MERITAS LAW FIRMS WORLDWIDE

Jesse A. Langer
(t) 203.786.8317
(f) 203.772.2037
jlanger@uks.com

March 6, 2020

VIA CERTIFIED MAIL

Town of East Hampton
Kelly Bilodeau
Town Clerk
20 East High Street
East Hampton, CT 06424

RE: Proposed installation of solar electric generating facility to be located off of Skinner Street (CT Route 196) in East Hampton, Connecticut

Ms. Bilodeau:

I write on behalf of CP East Hampton Solar I, LLC and CP East Hampton Solar II, LLC, wholly owned subsidiaries of Citrine Power, LLC (collectively "Citrine"). Citrine intends to file with the Connecticut Siting Council ("Council") a petition for declaratory ruling ("Petition") that a Certificate of Environmental Compatibility and Public Need is not required.

The Petition addresses the construction, operation and maintenance of a 1.0 megawatt ("MW") alternating current ("AC") and a 0.975 MW AC ground mounted solar photovoltaic electric generating facility, both of which would be located off of Skinner Street (CT Route 196) in East Hampton, Connecticut ("Project"). The Project would be located behind 46 Skinner Street in an industrial zone. The Project area is undeveloped, privately owned, and totals approximately 14.93 acres. The Project would include the installation of photovoltaic modules, inverters and transformers, electrical lines and a perimeter fence.

As a developer of and investor in renewable power facilities, Citrine seeks out sites that are environmentally responsible and will meet its renewable energy generation objectives. Citrine has identified the Project to further such initiatives.

This letter serves as notice to you as an "appropriate municipal official and government agenc[y]" as that term is defined under § 16-50j-40 of the Regulations of Connecticut State Agencies. Citrine will file the Petition on or about March 6, 2020, and will request that the Council place the Petition on some future agenda.

Attached please find a copy of the Petition. If you have any questions or concerns regarding this matter, please contact the undersigned at (203) 786-8317, or the Council at (860) 827-2935.

Very truly yours,

Jesse A. Langer

Tab 7a

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-428-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 1
Location:	East Hampton, CT
Latitude:	41-34-08.38N NAD 83
Longitude:	72-30-35.28W
Heights:	422 feet site elevation (SE)
	22 feet above ground level (AGL)
	444 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-428-OE

Signature Control No: 428323737-429891967 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-428-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 444 feet above mean sea level.

Location: The structure will be located 3.28 nautical miles west of 9B8 Airport reference point.

Case Description for ASN 2020-ANE-428-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

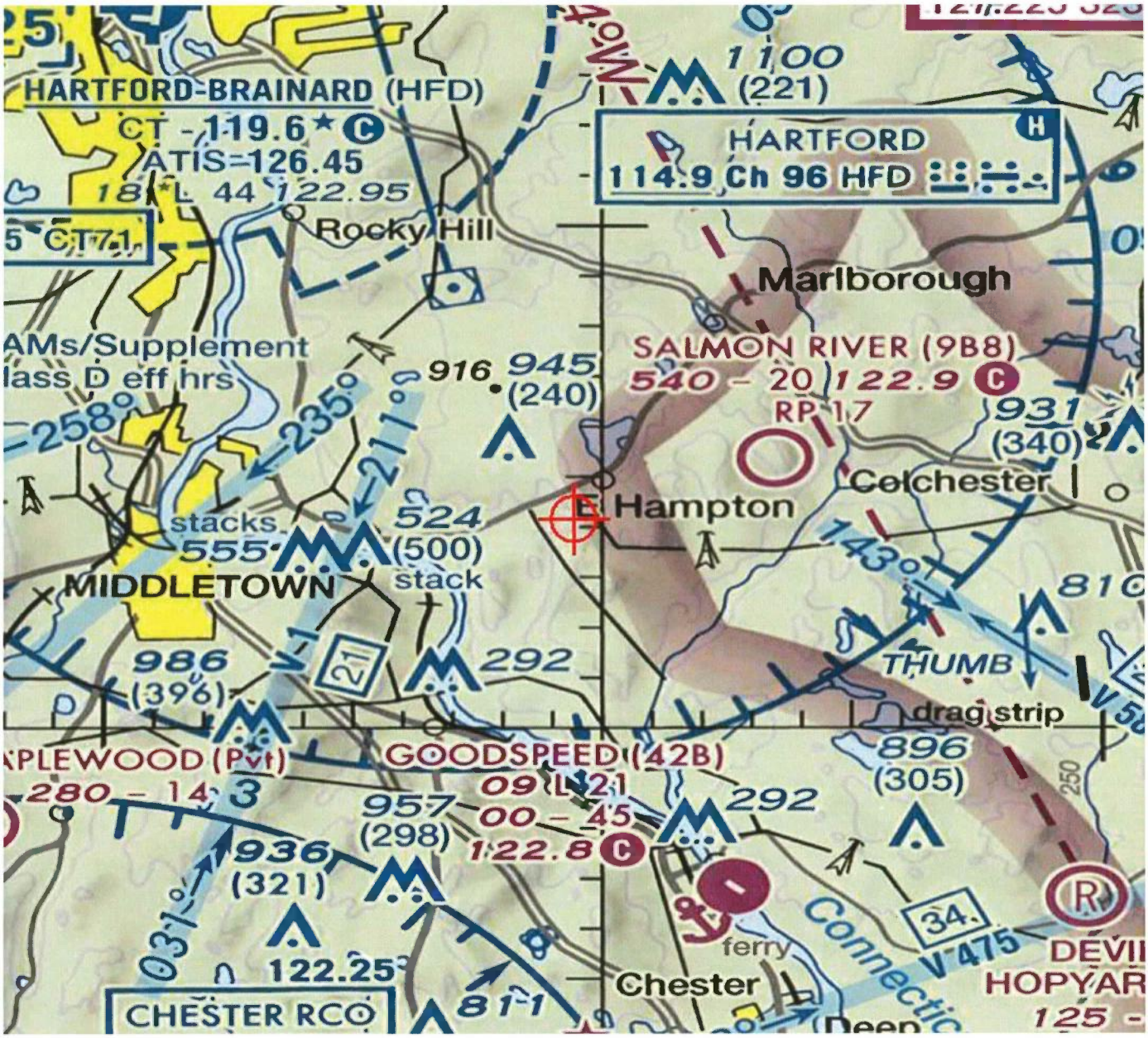
Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/ VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 10/05/2020 unless extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.


HARTFORD-BRAINARD (HFD)
CT 119.6
ATIS 126.45
122.95
Rocky Hill
HARTFORD
114.9 Ch 96 HFD
1100
(221)
Marlborough
SALMON RIVER (9B8)
540 – 20 122.9
RP 17
916
945
(240)
931
(340)
Colchester
Hampton
235°
211°
258°
143°
stacks
555
524
(500)
stack
MIDDLETOWN
986
(396)
292
THUMB
drag strip
896
(305)
GOODSPEED (42B)
09 (L) 21
957
(298)
00 – 45
122.8
936
(321)
031°
122.25
CHESTER RCO
Chester
ferry
Connecticut
34
475
DEVIL
HOPYARD
125

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-429-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 2
Location:	East Hampton, CT
Latitude:	41-34-07.87N NAD 83
Longitude:	72-30-33.59W
Heights:	422 feet site elevation (SE)
	22 feet above ground level (AGL)
	444 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-429-OE

Signature Control No: 428323810-429891962 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-429-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 444 feet above mean sea level.

Location: The structure will be located 3.28 nautical miles west of 9B8 Airport reference point.

Case Description for ASN 2020-ANE-429-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/ VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

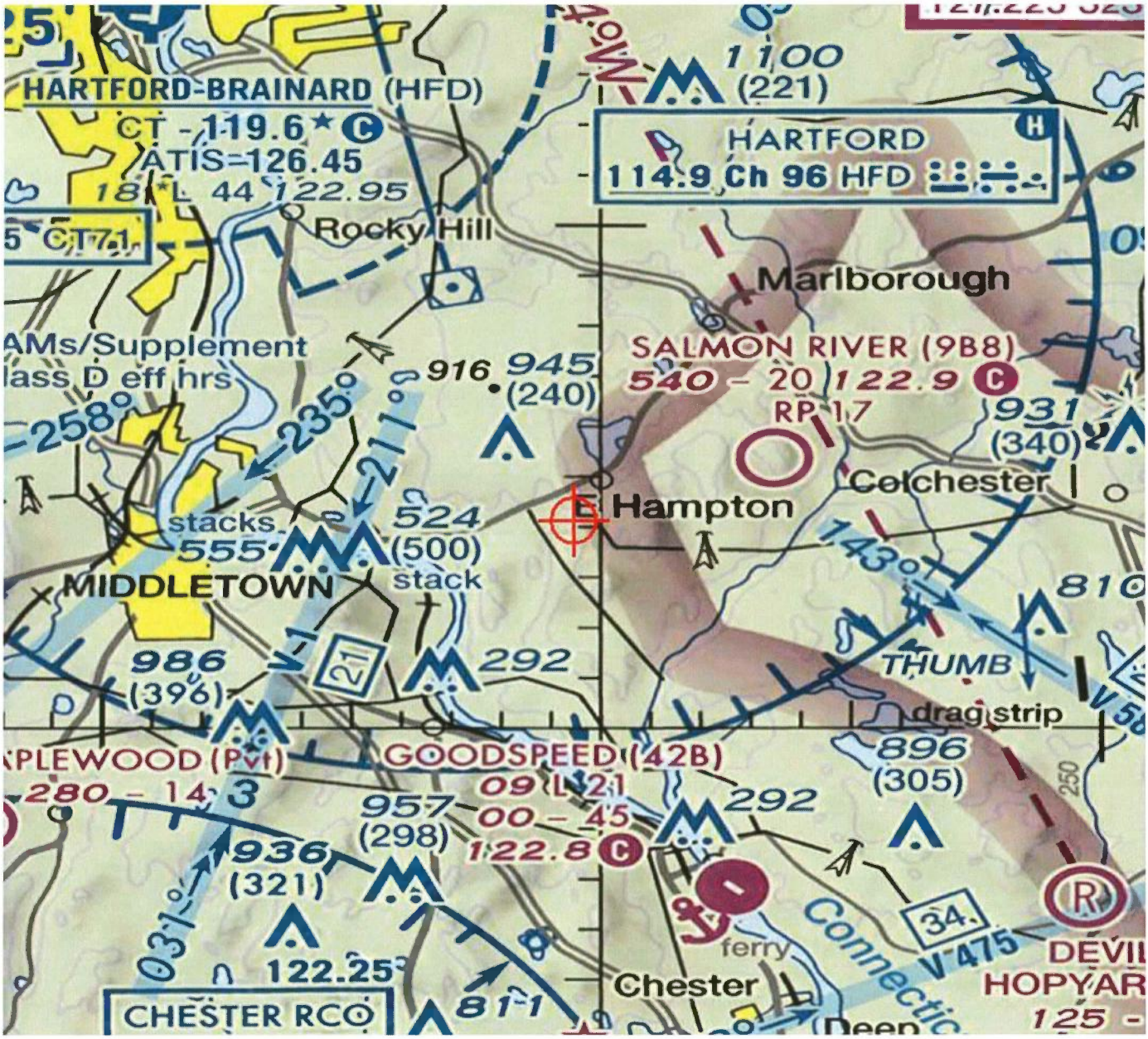
Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 10/05/2020 unless extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-429-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-430-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 3
Location:	East Hampton, CT
Latitude:	41-34-06.37N NAD 83
Longitude:	72-30-30.12W
Heights:	416 feet site elevation (SE)
	22 feet above ground level (AGL)
	438 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-430-OE

Signature Control No: 428323811-429891968 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-430-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 444 feet above mean sea level.

Location: The structure will be located 3.28 nautical miles west of 9B8 Airport reference point.

Case Description for ASN 2020-ANE-430-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/ VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

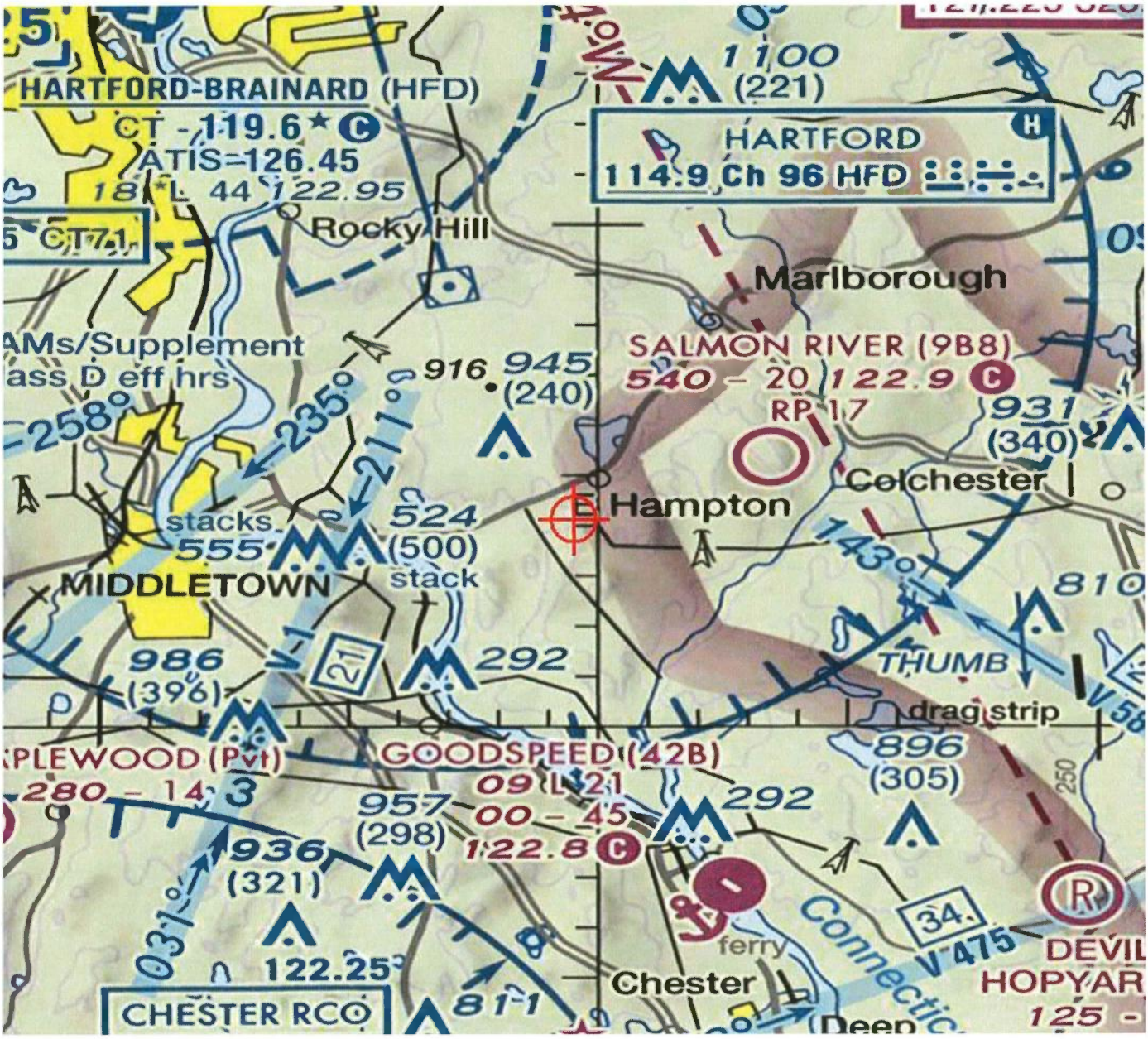
Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 10/05/2020 unless extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-430-OE



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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-431-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 4
Location:	East Hampton, CT
Latitude:	41-34-04.63N NAD 83
Longitude:	72-30-29.09W
Heights:	414 feet site elevation (SE)
	22 feet above ground level (AGL)
	436 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-431-OE

Signature Control No: 428323812-429891961 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-431-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 444 feet above mean sea level.

Location: The structure will be located 3.28 nautical miles west of 9B8 Airport reference point.

Case Description for ASN 2020-ANE-431-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/ VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

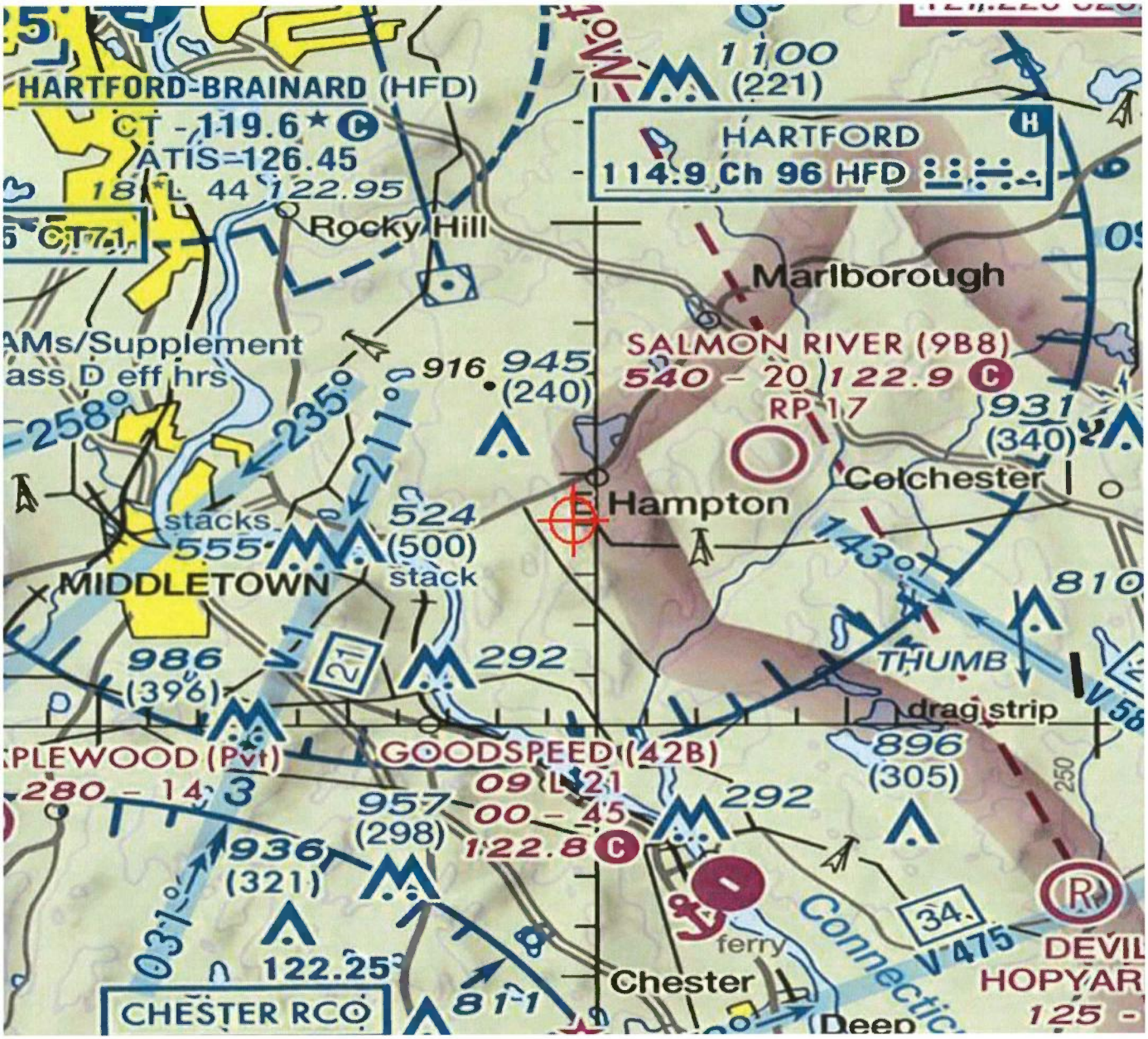
Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 10/05/2020 unless extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-431-OE



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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-432-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
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Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 5
Location:	East Hampton, CT
Latitude:	41-34-03.64N NAD 83
Longitude:	72-30-28.84W
Heights:	408 feet site elevation (SE)
	22 feet above ground level (AGL)
	430 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-432-OE

Signature Control No: 428323813-429891966 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-432-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 444 feet above mean sea level.

Location: The structure will be located 3.28 nautical miles west of 9B8 Airport reference point.

Case Description for ASN 2020-ANE-432-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

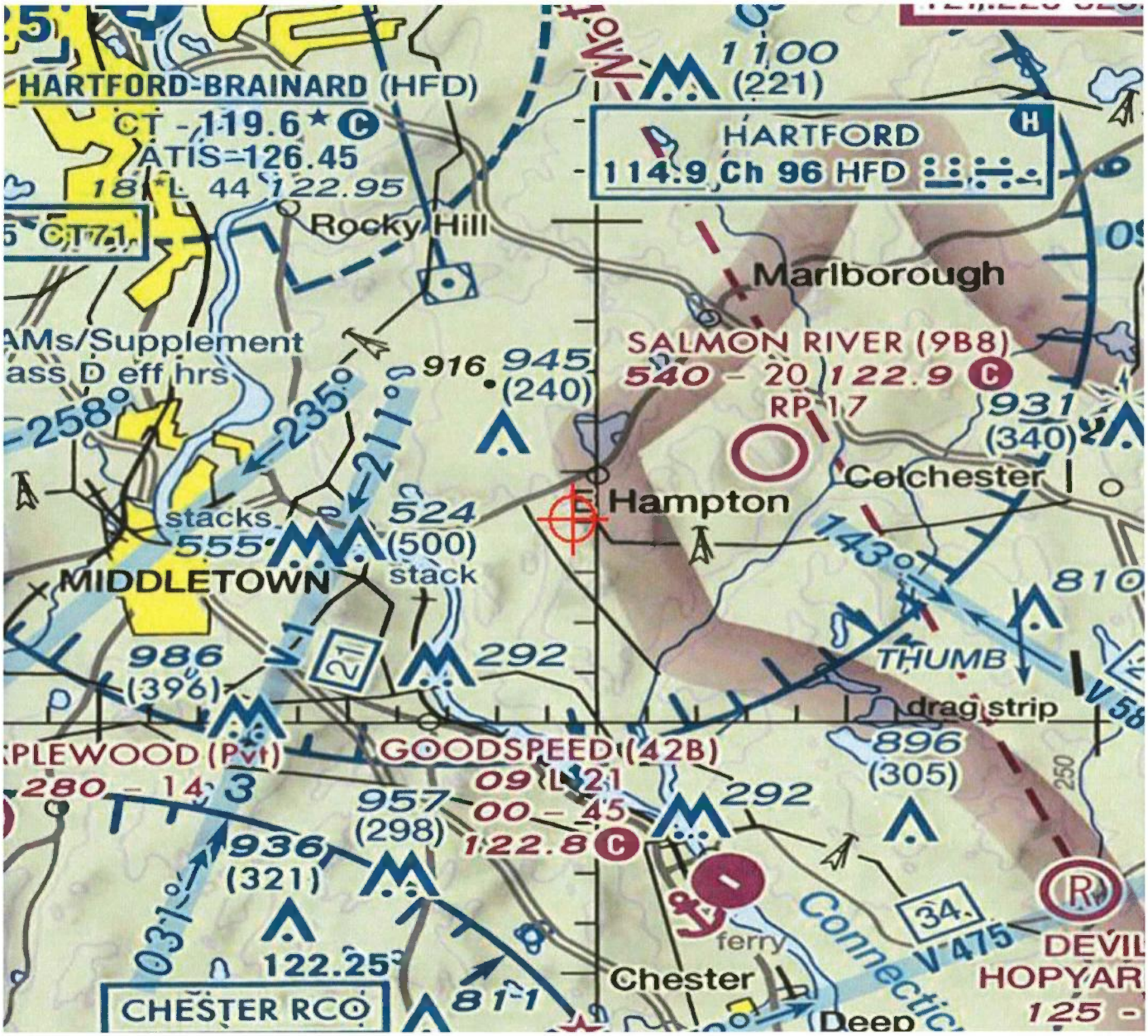
Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 10/05/2020 unless extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-432-OE



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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-433-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
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Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 6
Location:	East Hampton, CT
Latitude:	41-34-02.52N NAD 83
Longitude:	72-30-28.87W
Heights:	404 feet site elevation (SE)
	22 feet above ground level (AGL)
	426 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-433-OE

Signature Control No: 428323814-429891963 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-433-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 444 feet above mean sea level.

Location: The structure will be located 3.28 nautical miles west of 9B8 Airport reference point.

Case Description for ASN 2020-ANE-433-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

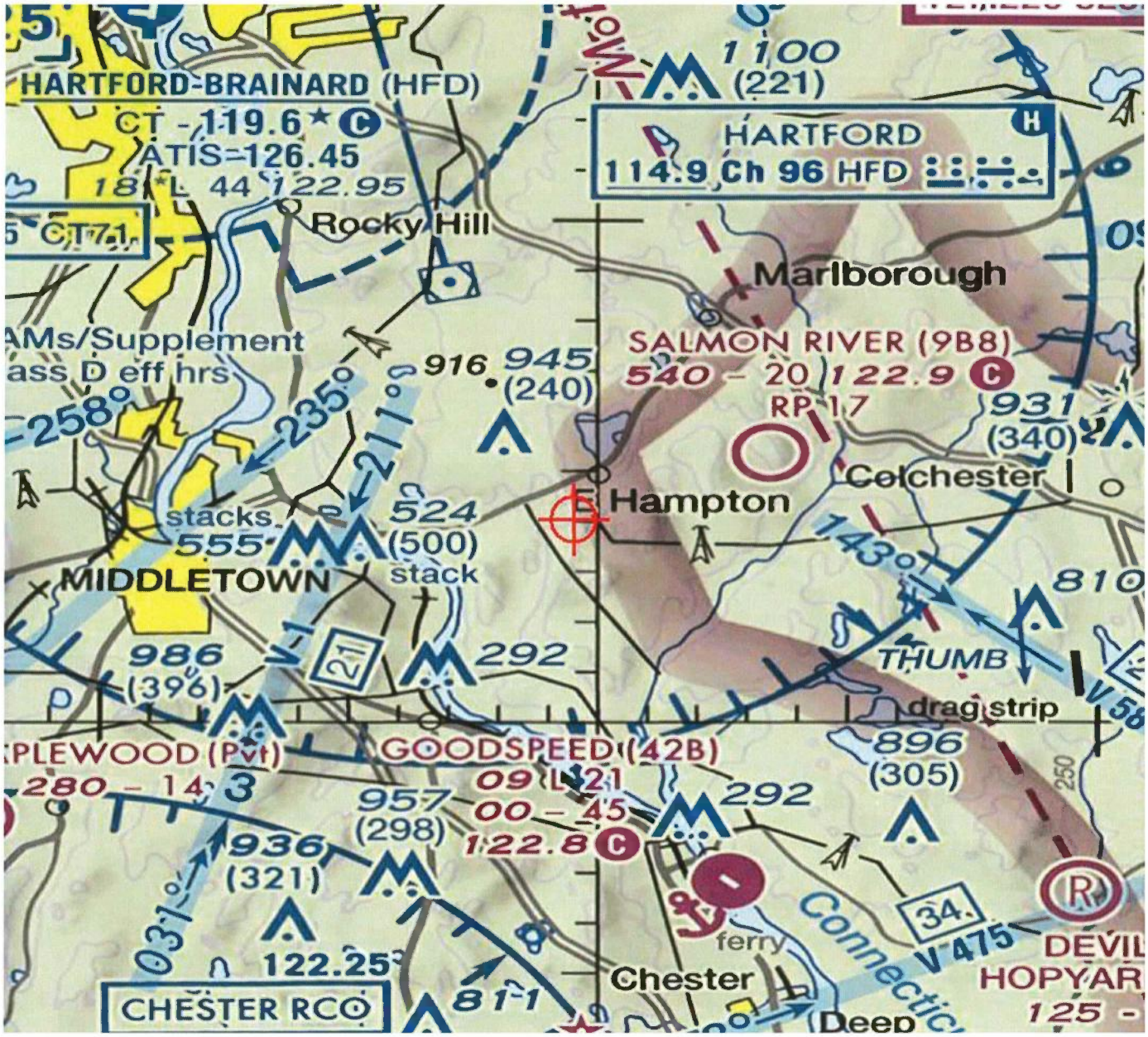
Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 10/05/2020 unless extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-433-OE



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Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-434-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 7
Location:	East Hampton, CT
Latitude:	41-34-02.55N NAD 83
Longitude:	72-30-34.51W
Heights:	416 feet site elevation (SE)
	22 feet above ground level (AGL)
	438 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-434-OE

Signature Control No: 428323815-429891958 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-434-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 444 feet above mean sea level.

Location: The structure will be located 3.28 nautical miles west of 9B8 Airport reference point.

Case Description for ASN 2020-ANE-434-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

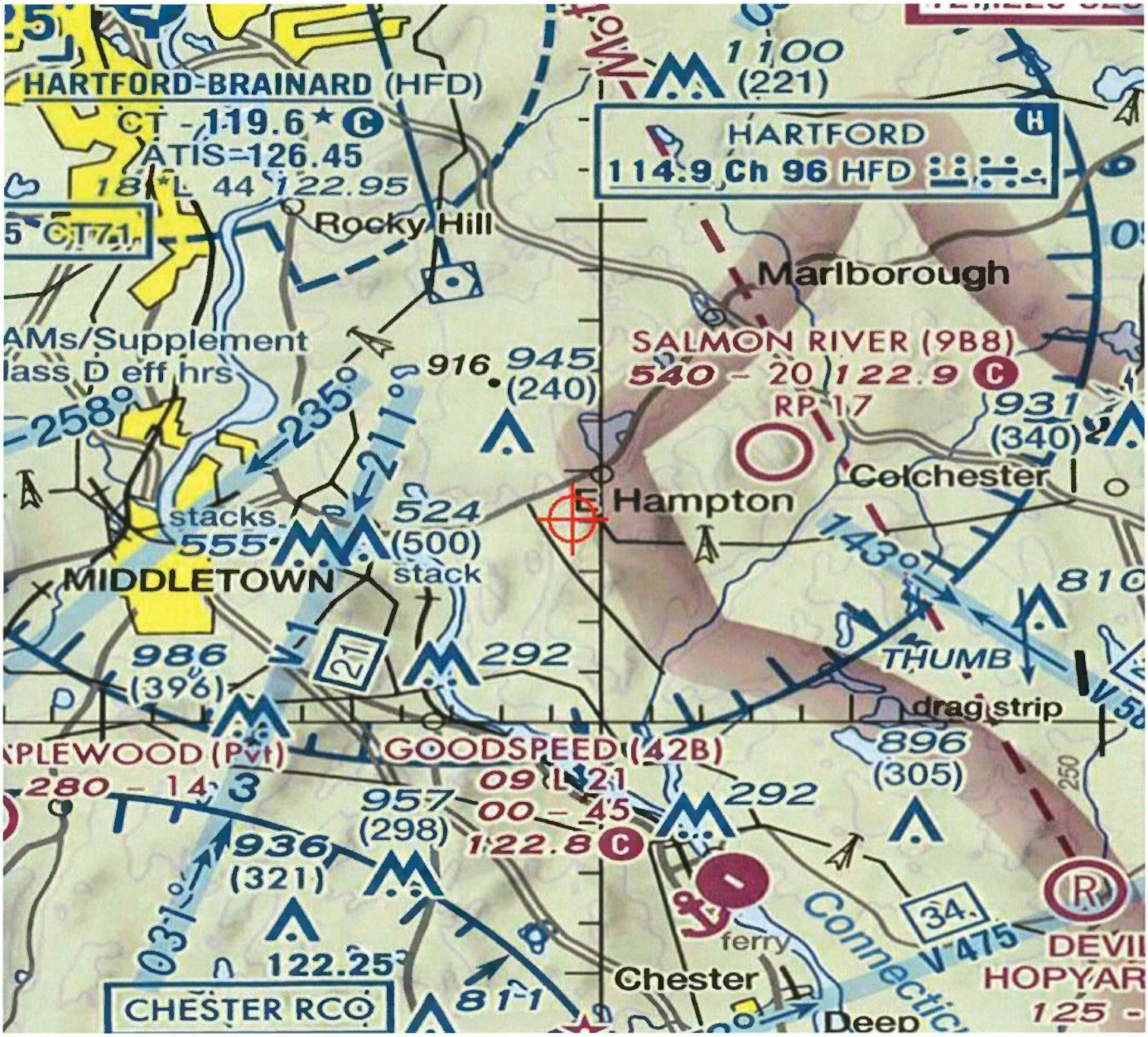
Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 10/05/2020 unless extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-434-OE



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Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-436-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 9
Location:	East Hampton, CT
Latitude:	41-34-06.31N NAD 83
Longitude:	72-30-37.45W
Heights:	416 feet site elevation (SE)
	22 feet above ground level (AGL)
	438 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-436-OE

Signature Control No: 428323817-429891960 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-436-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 444 feet above mean sea level.

Location: The structure will be located 3.28 nautical miles west of 9B8 Airport reference point.

Case Description for ASN 2020-ANE-436-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/ VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

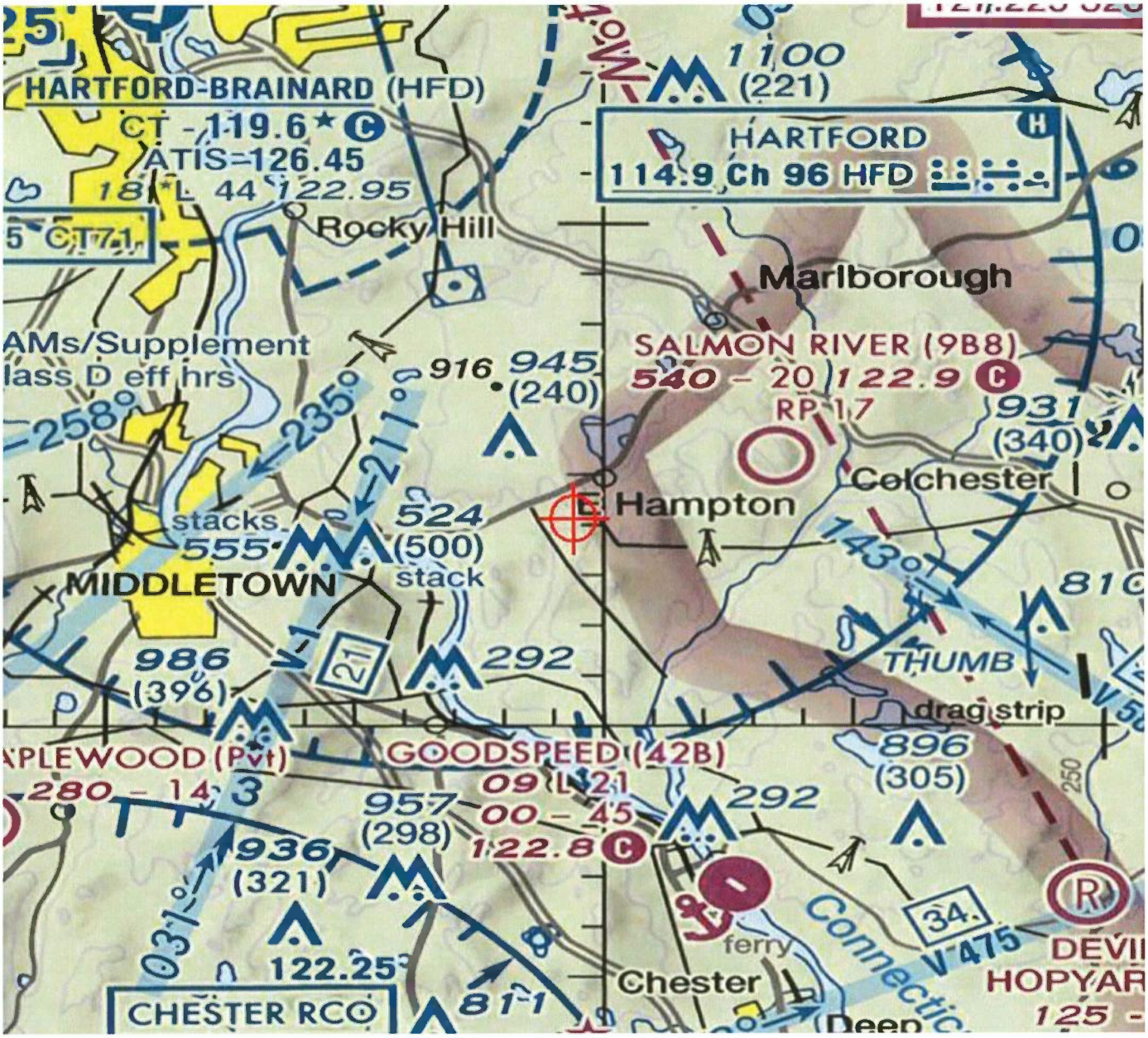
Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 10/05/2020 unless extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-436-OE



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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-436-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 9
Location:	East Hampton, CT
Latitude:	41-34-06.31N NAD 83
Longitude:	72-30-37.45W
Heights:	416 feet site elevation (SE)
	22 feet above ground level (AGL)
	438 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-436-OE

Signature Control No: 428323817-429891960 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-436-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 444 feet above mean sea level.

Location: The structure will be located 3.28 nautical miles west of 9B8 Airport reference point.

Case Description for ASN 2020-ANE-436-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/ VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

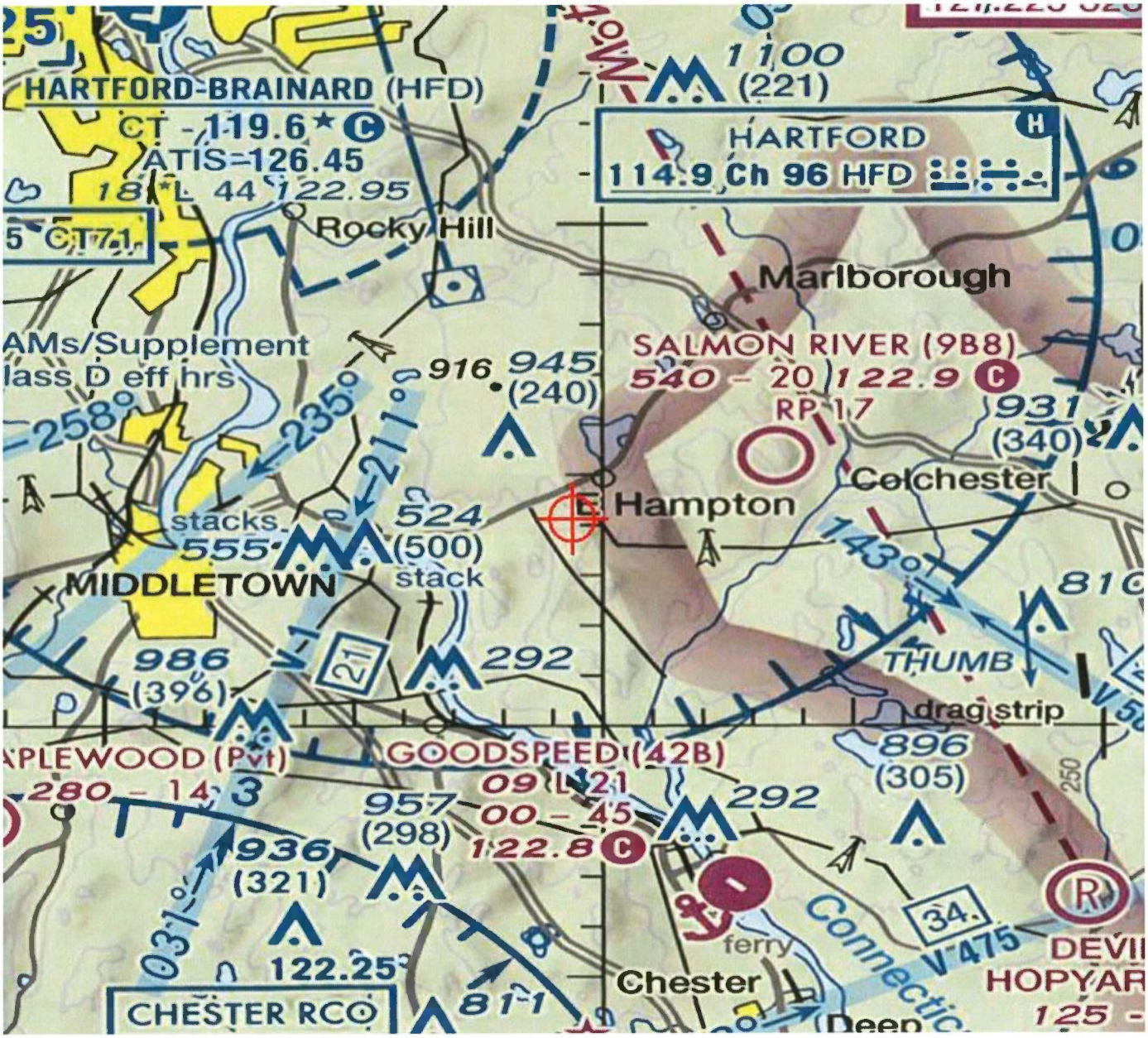
Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 10/05/2020 unless extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-436-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-437-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 10
Location:	East Hampton, CT
Latitude:	41-34-08.37N NAD 83
Longitude:	72-30-37.54W
Heights:	420 feet site elevation (SE)
	22 feet above ground level (AGL)
	442 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-437-OE

Signature Control No: 428323818-429891964 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-437-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 444 feet above mean sea level.

Location: The structure will be located 3.28 nautical miles west of 9B8 Airport reference point.

Case Description for ASN 2020-ANE-437-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/ VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

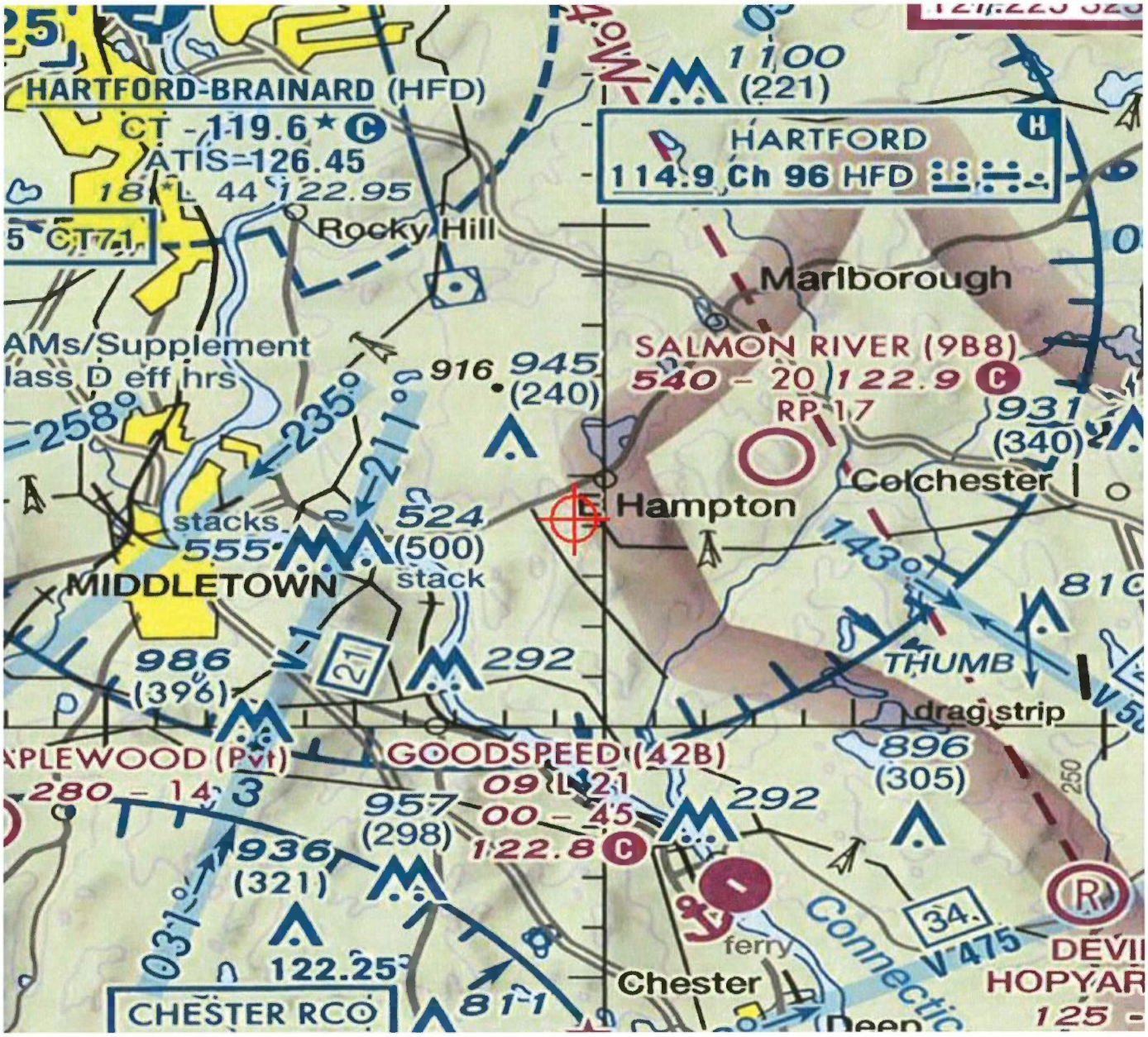
Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 10/05/2020 unless extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-437-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-438-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane HP
Location:	East Hampton, CT
Latitude:	41-34-05.36N NAD 83
Longitude:	72-30-32.08W
Heights:	426 feet site elevation (SE)
	22 feet above ground level (AGL)
	448 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-438-OE

Signature Control No: 428323819-429891959 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-438-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 444 feet above mean sea level.

Location: The structure will be located 3.28 nautical miles west of 9B8 Airport reference point.

Case Description for ASN 2020-ANE-438-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/ VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

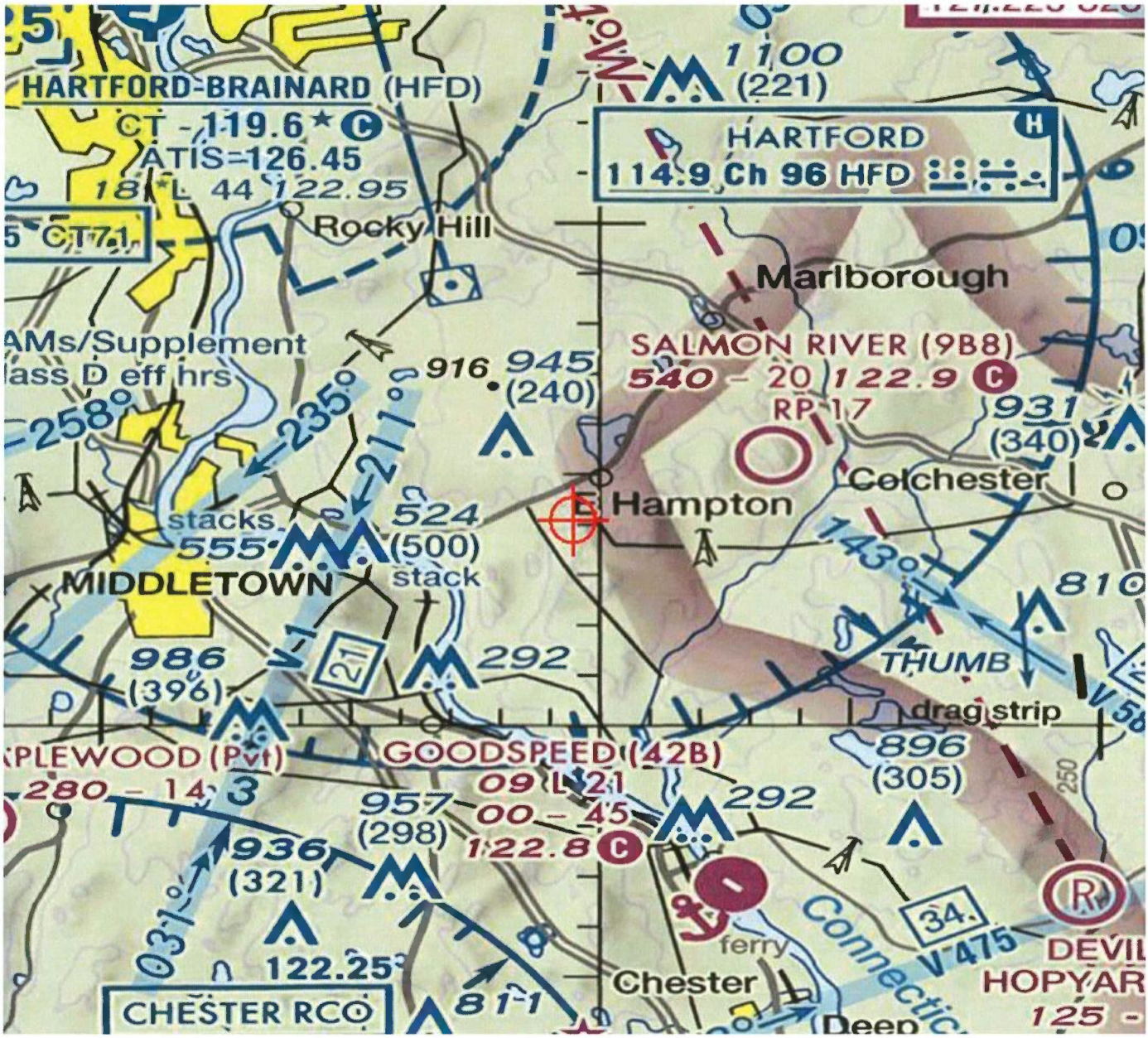
Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 10/05/2020 unless extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-438-OE



Tab 7b

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-439-OE

Issued Date: 02/28/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 1
Location:	East Hampton, CT
Latitude:	41-34-08.38N NAD 83
Longitude:	72-30-35.28W
Heights:	422 feet site elevation (SE)
	10 feet above ground level (AGL)
	432 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 08/28/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-439-OE.

Signature Control No: 428330187-432049735 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Frequency Data
Map(s)

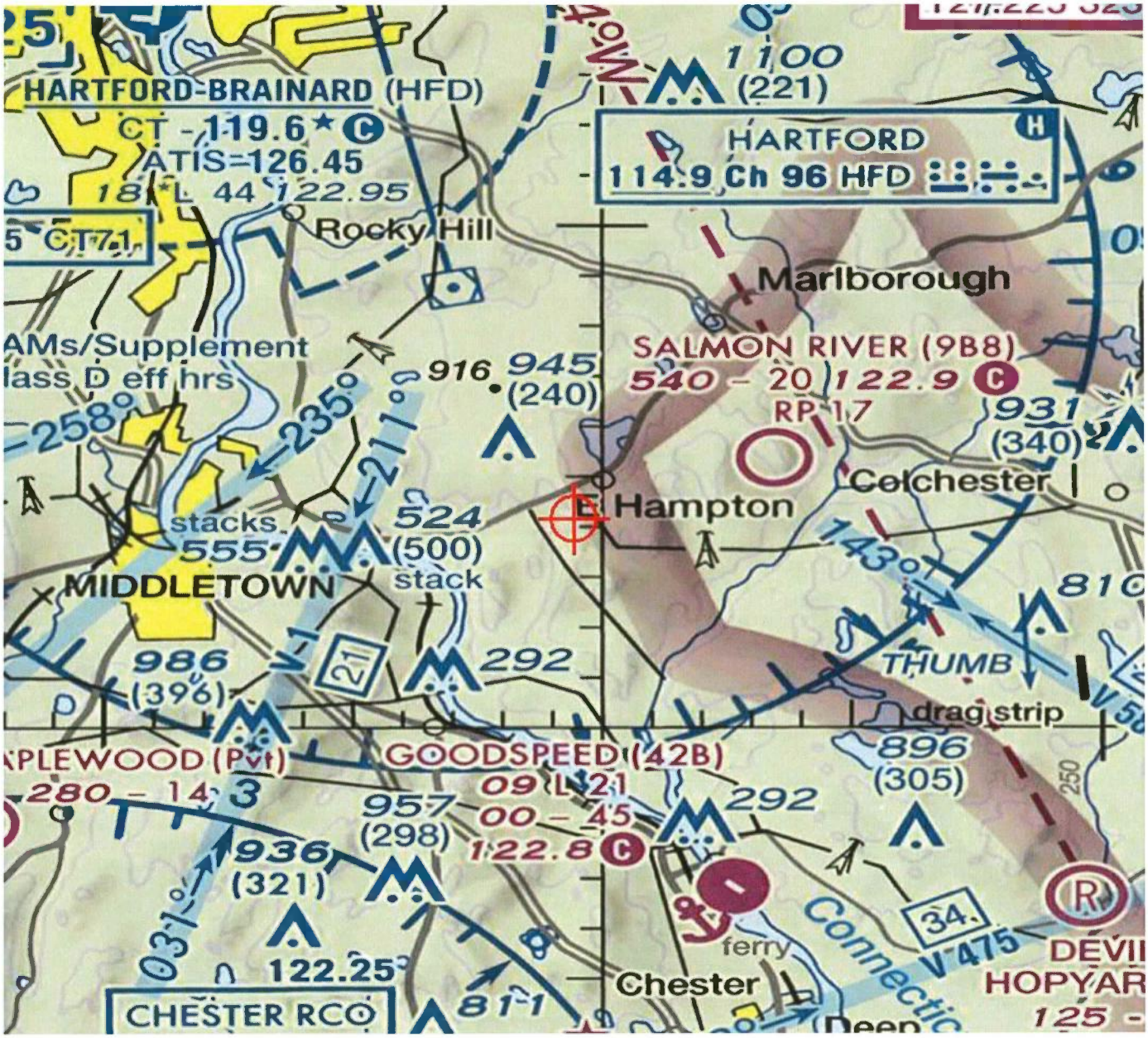
Case Description for ASN 2020-ANE-439-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Frequency Data for ASN 2020-ANE-439-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
6	7	GHz	55	dBW
6	7	GHz	42	dBW
10	11.7	GHz	55	dBW
10	11.7	GHz	42	dBW
17.7	19.7	GHz	55	dBW
17.7	19.7	GHz	42	dBW
21.2	23.6	GHz	55	dBW
21.2	23.6	GHz	42	dBW
614	698	MHz	1000	W
614	698	MHz	2000	W
698	806	MHz	1000	W
806	901	MHz	500	W
806	824	MHz	500	W
824	849	MHz	500	W
851	866	MHz	500	W
869	894	MHz	500	W
896	901	MHz	500	W
901	902	MHz	7	W
929	932	MHz	3500	W
930	931	MHz	3500	W
931	932	MHz	3500	W
932	932.5	MHz	17	dBW
935	940	MHz	1000	W
940	941	MHz	3500	W
1670	1675	MHz	500	W
1710	1755	MHz	500	W
1850	1910	MHz	1640	W
1850	1990	MHz	1640	W
1930	1990	MHz	1640	W
1990	2025	MHz	500	W
2110	2200	MHz	500	W
2305	2360	MHz	2000	W
2305	2310	MHz	2000	W
2345	2360	MHz	2000	W
2496	2690	MHz	500	W

Sectional Map for ASN 2020-ANE-439-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-440-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 3
Location:	East Hampton, CT
Latitude:	41-34-06.37N NAD 83
Longitude:	72-30-30.12W
Heights:	416 feet site elevation (SE)
	10 feet above ground level (AGL)
	426 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 08/05/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-440-OE.

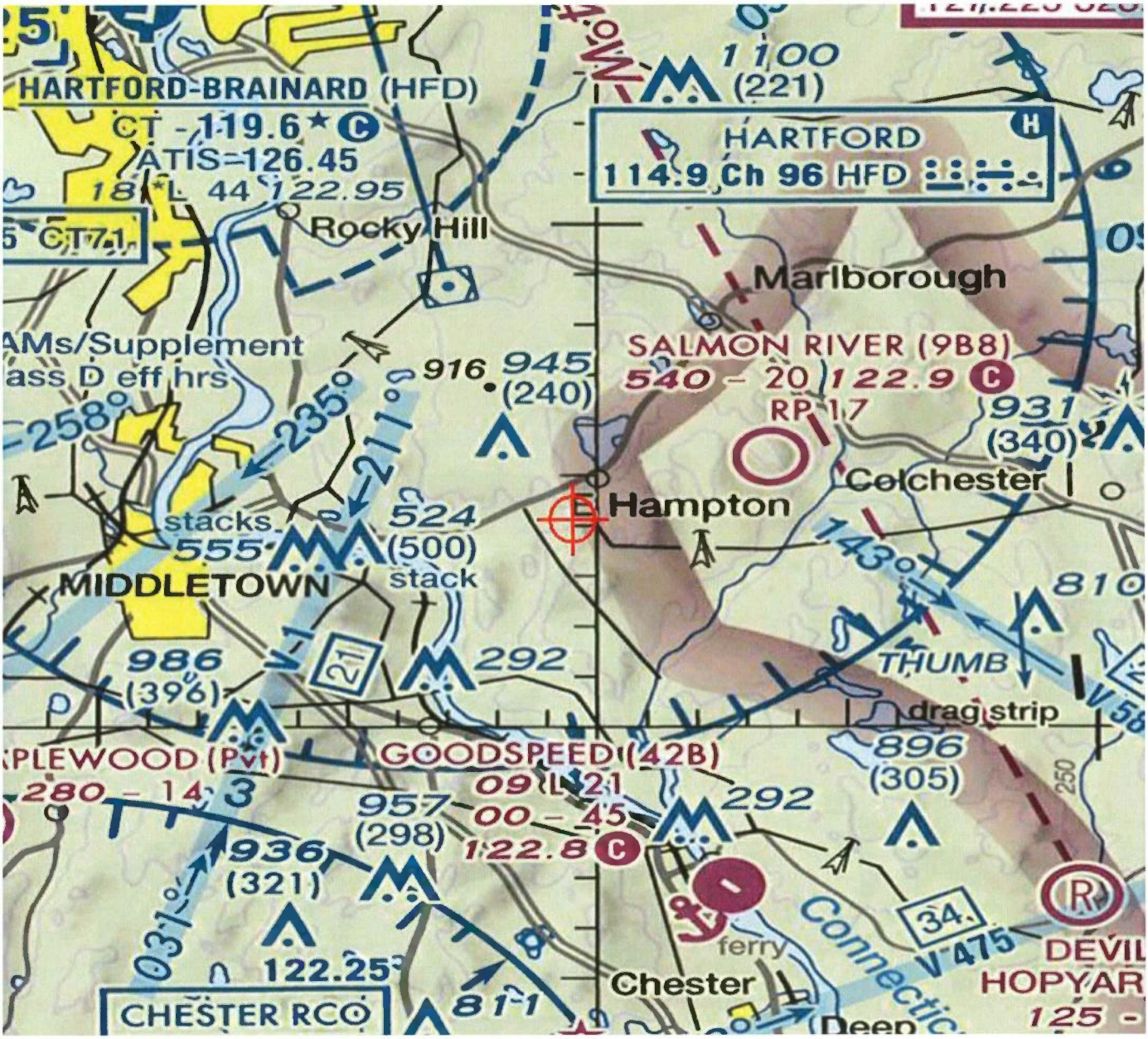
Signature Control No: 428330258-429892008 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Case Description for ASN 2020-ANE-440-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-440-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-441-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 4
Location:	East Hampton, CT
Latitude:	41-34-04.63N NAD 83
Longitude:	72-30-29.09W
Heights:	414 feet site elevation (SE)
	10 feet above ground level (AGL)
	424 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 08/05/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-441-OE.

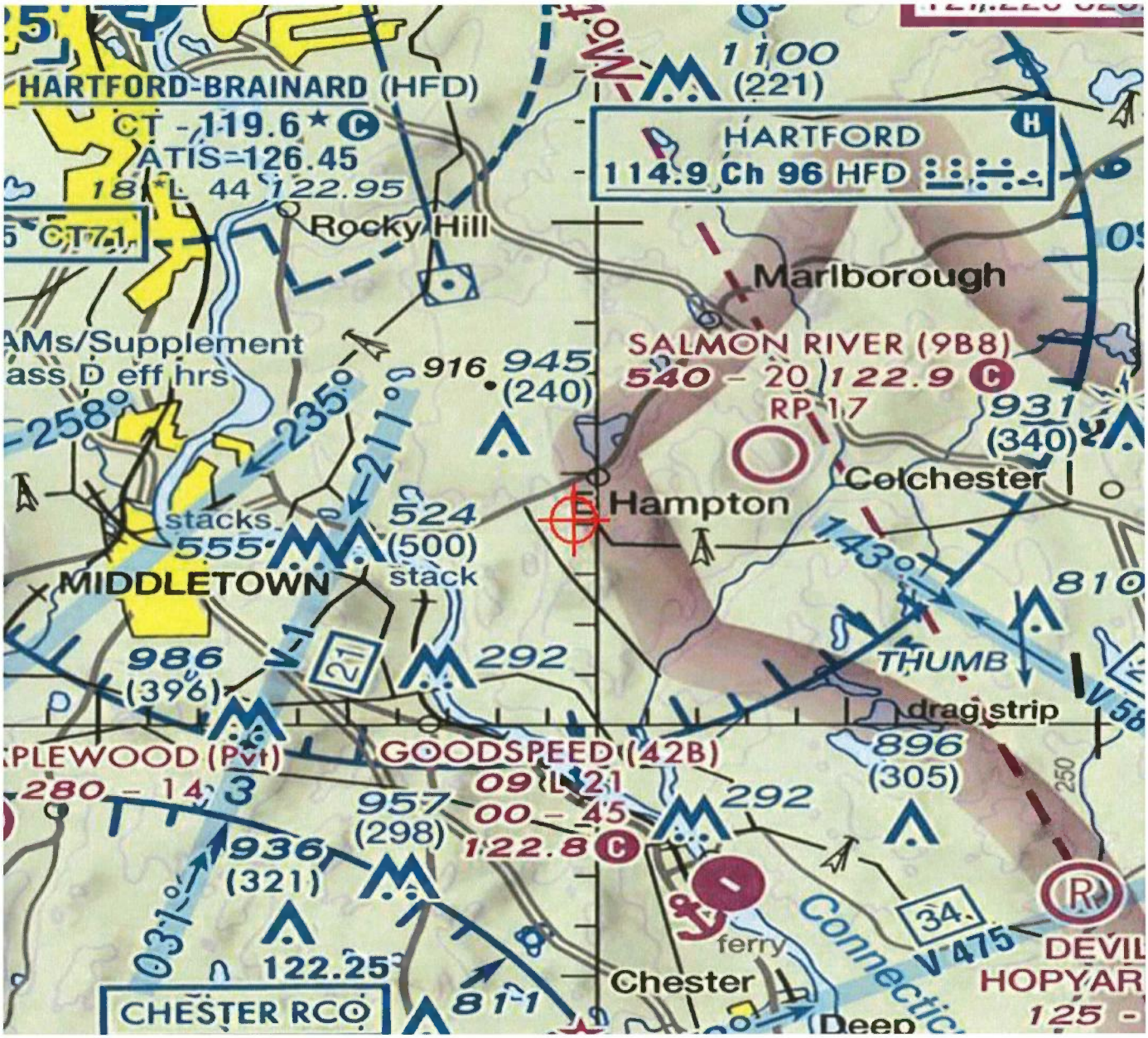
Signature Control No: 428330259-429892011 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Case Description for ASN 2020-ANE-441-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-441-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-442-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 5
Location:	East Hampton, CT
Latitude:	41-34-03.64N NAD 83
Longitude:	72-30-28.84W
Heights:	408 feet site elevation (SE)
	10 feet above ground level (AGL)
	418 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 08/05/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-442-OE.

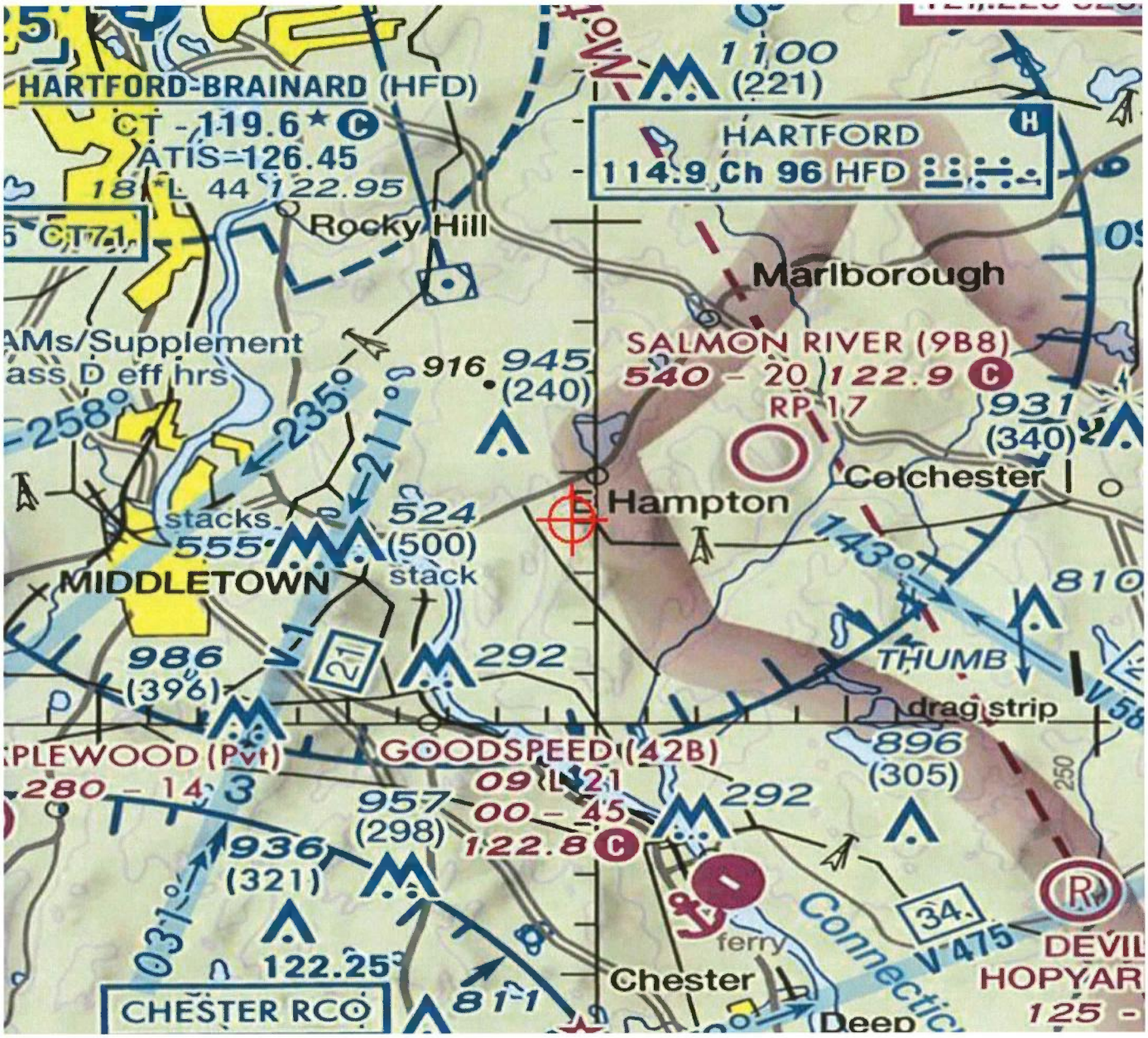
Signature Control No: 428330260-429892009 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Case Description for ASN 2020-ANE-442-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-442-OE



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Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-443-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 6
Location:	East Hampton, CT
Latitude:	41-34-02.52N NAD 83
Longitude:	72-30-28.87W
Heights:	404 feet site elevation (SE)
	10 feet above ground level (AGL)
	414 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 08/05/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

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If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-443-OE.

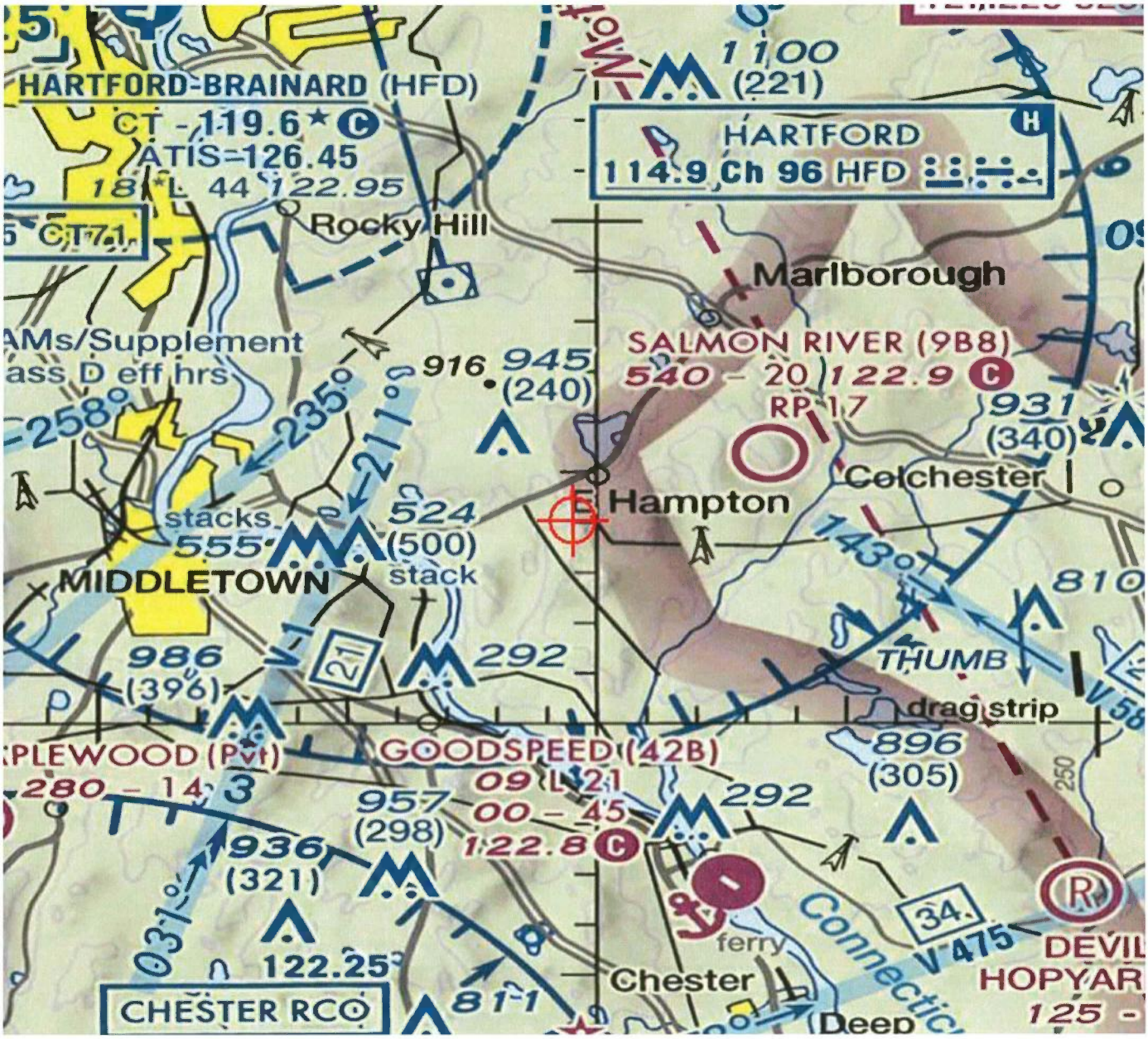
Signature Control No: 428330263-429892014 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Case Description for ASN 2020-ANE-443-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-443-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-444-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
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Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 7
Location:	East Hampton, CT
Latitude:	41-34-02.55N NAD 83
Longitude:	72-30-34.51W
Heights:	416 feet site elevation (SE)
	10 feet above ground level (AGL)
	426 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 08/05/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
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This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-444-OE.

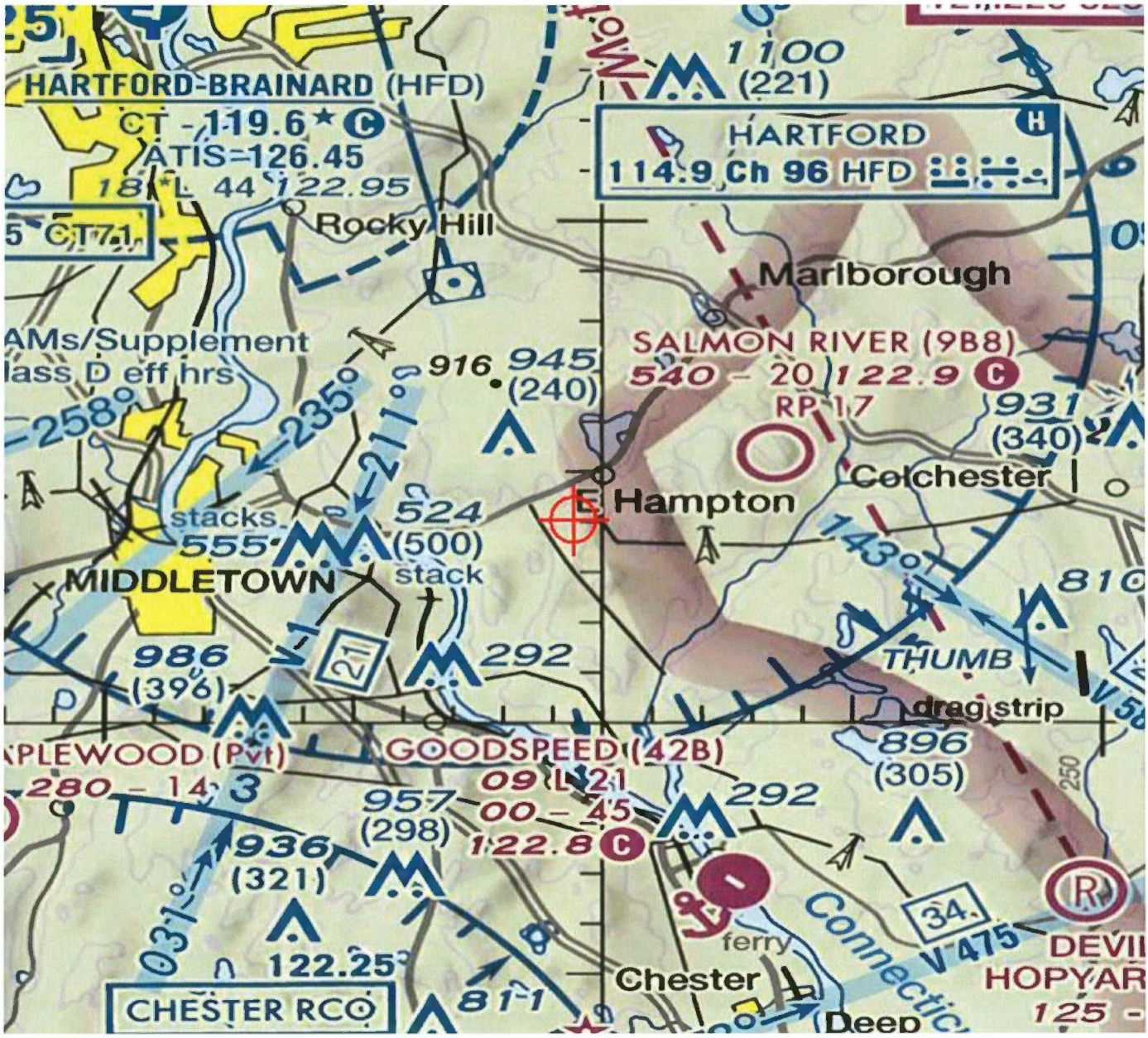
Signature Control No: 428330264-429892006 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Case Description for ASN 2020-ANE-444-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-444-OE



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Southwest Regional Office
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Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-445-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
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**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 8
Location:	East Hampton, CT
Latitude:	41-34-04.04N NAD 83
Longitude:	72-30-36.13W
Heights:	416 feet site elevation (SE)
	10 feet above ground level (AGL)
	426 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 08/05/2021 unless:

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If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-445-OE.

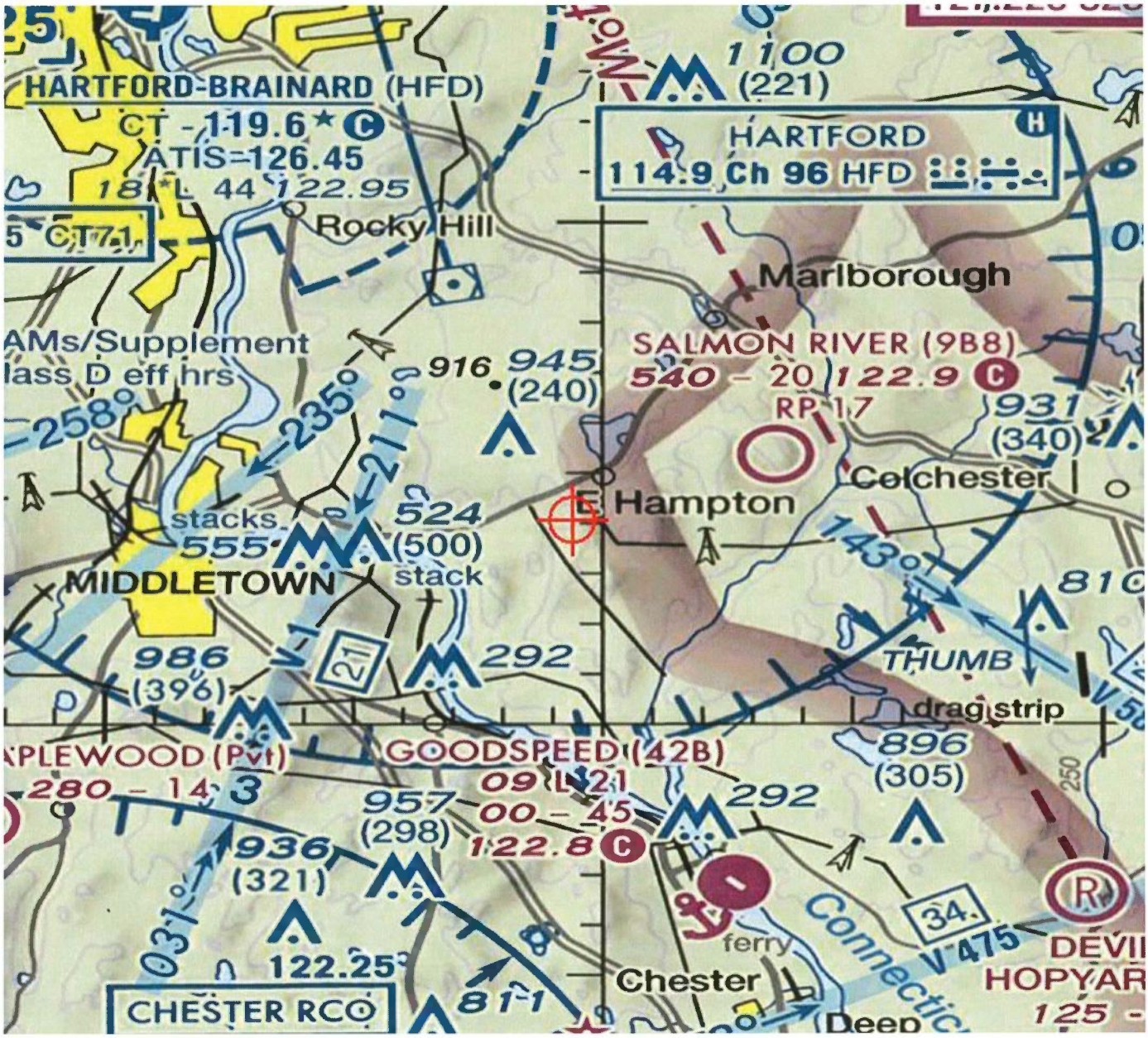
Signature Control No: 428330265-429892013 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Case Description for ASN 2020-ANE-445-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-445-OE



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Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-446-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 9
Location:	East Hampton, CT
Latitude:	41-34-06.31N NAD 83
Longitude:	72-30-37.45W
Heights:	416 feet site elevation (SE)
	10 feet above ground level (AGL)
	426 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 08/05/2021 unless:

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(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

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If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-446-OE.

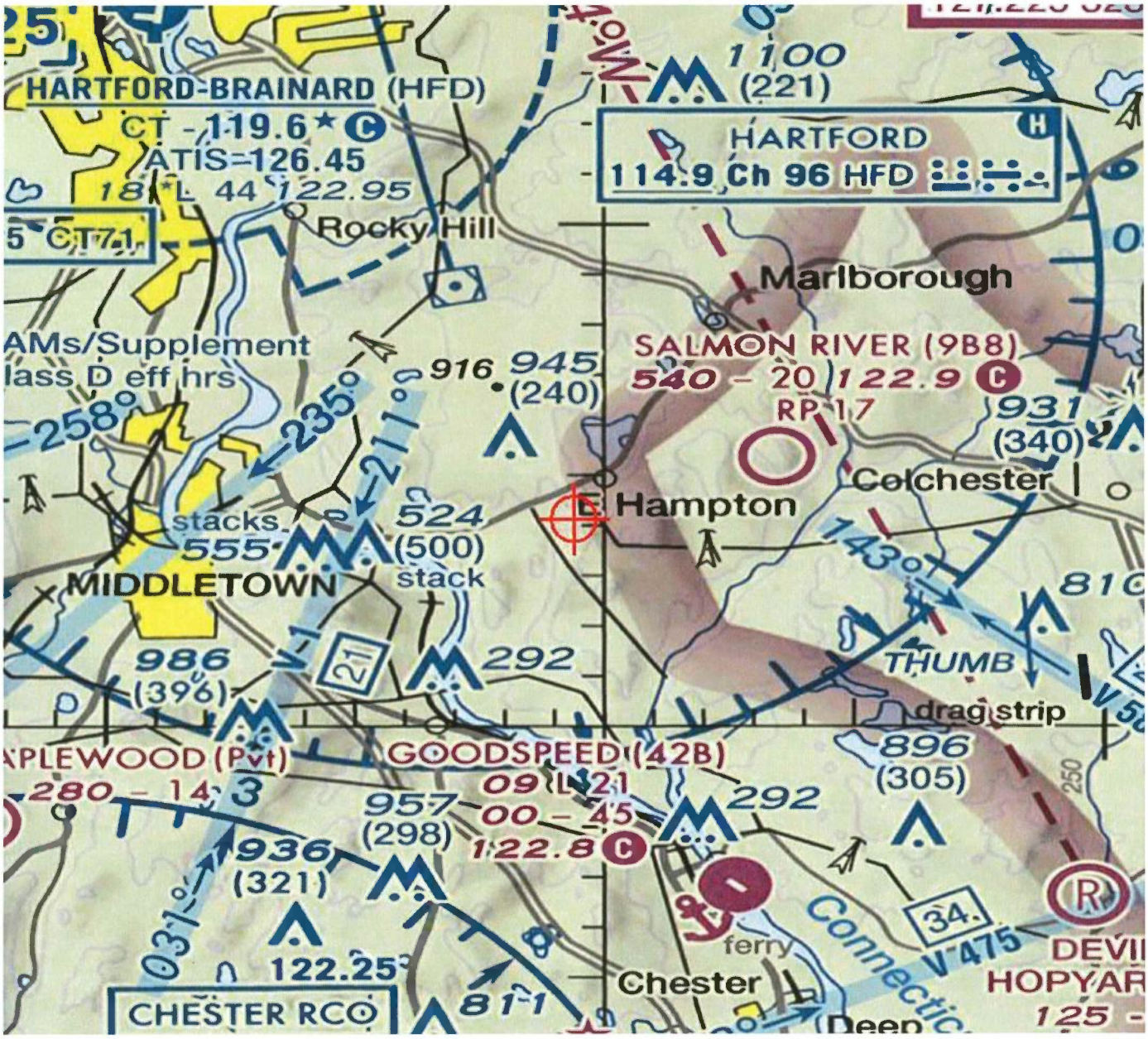
Signature Control No: 428330266-429892007 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Case Description for ASN 2020-ANE-446-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-446-OE



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Federal Aviation Administration
Southwest Regional Office
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Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-447-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 10
Location:	East Hampton, CT
Latitude:	41-34-08.37N NAD 83
Longitude:	72-30-37.54W
Heights:	420 feet site elevation (SE)
	10 feet above ground level (AGL)
	430 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

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If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-447-OE.

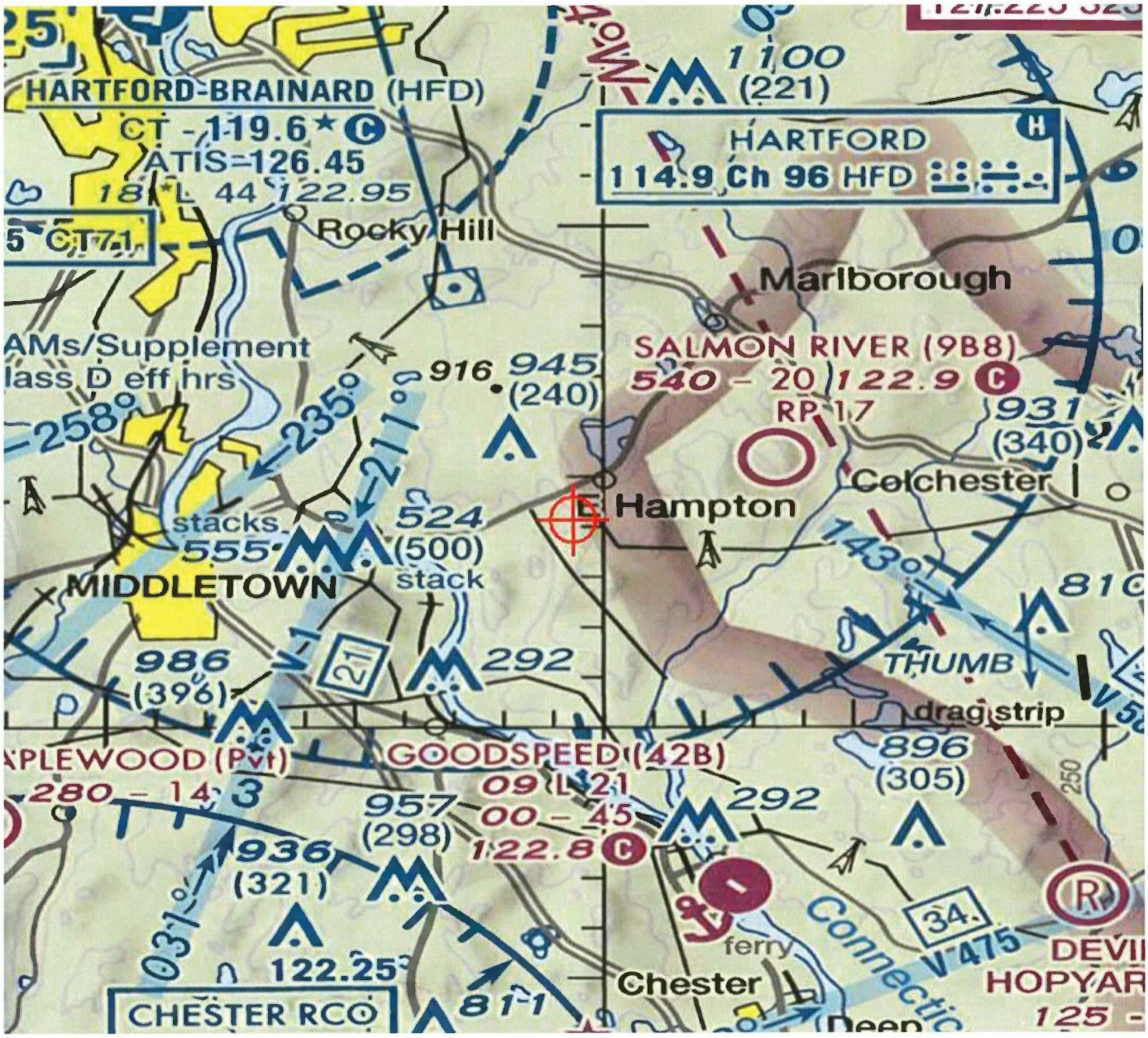
Signature Control No: 428330268-429892010 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Case Description for ASN 2020-ANE-447-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-447-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-448-OE

Issued Date: 02/05/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel HP
Location:	East Hampton, CT
Latitude:	41-34-05.36N NAD 83
Longitude:	72-30-32.08W
Heights:	426 feet site elevation (SE)
	10 feet above ground level (AGL)
	436 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

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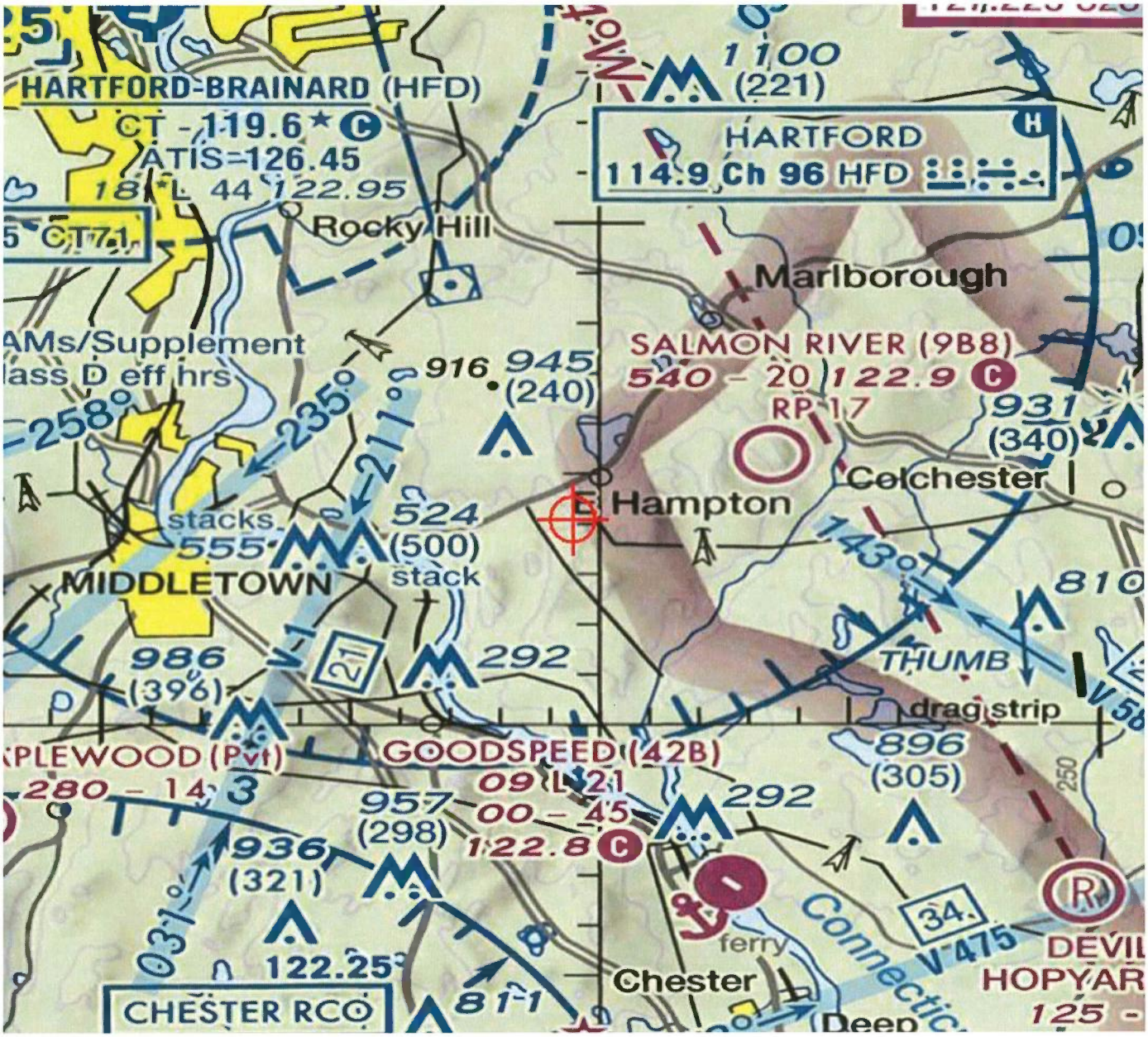
If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-448-OE.

Signature Control No: 428330269-429892012 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Case Description for ASN 2020-ANE-448-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.


HARTFORD-BRAINARD (HFD)
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ATIS-126.45
122.95
Rocky Hill
HARTFORD
114.9 Ch 96 HFD
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(221)
Marlborough
SALMON RIVER (9B8)
540 - 20 122.9
RP-17
931
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Colchester
Hampton
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DEVIL
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Tab 8

STORMWATER MANAGEMENT REPORT

PROPOSED

CP EAST HAMPTON SOLAR I & II

SOLAR PROJECTS

SKINNER STREET

(VOL. 437 PG. 989)

EAST HAMPTON, CONNECTICUT

MIDDLESEX COUNTY

Prepared for:

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&
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February, 2020

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Introduction

At the request of CP East Hampton Solar I, LLC & CP East Hampton Solar II, LLC, All-Points Technology Corporation, P.C. ("APT") has undertaken the analysis of and design to address stormwater impacts resulting from the development of two (2) proposed solar-based electric generating facilities, one having an output of ±1.0 megawatt and the second having an output of ±0.975 megawatt in East Hampton, Connecticut (collectively, the "Project"). The Project, known as the CP East Hampton Solar I & II, involves the installation of solar panels and associated equipment at a property located behind 46 Skinner Street (Route 196)[1] in East Hampton, Connecticut ("Site").

The purpose of this report is to provide an analysis of the potential stormwater drainage impacts associated with the Project, as well as a description of the design to mitigate such potential stormwater drainage impacts. The design is intended to be in full compliance with the State and Town regulations while taking prevailing site conditions and practical factors into account.

Existing Site Conditions

The Site is a privately-owned and industrially zoned parcel located behind 46 Skinner Street (Route 196) in East Hampton, Connecticut, that consists of approximately 27.42± acres of undeveloped, wooded land. The property has an existing gravel drive off of Skinner Street and is partially cleared.

The Site's existing topography generally slopes downward from the center to the west, east and south. Slopes throughout the Project area range from approximately 0 to 15 percent. Elevations within the Site range from approximately 427 feet AMSL in the middle of the site side to approximately 405 feet AMSL on the western side, 395 feet AMSL on the south side, and 357 feet AMSL at the existing gravel drive at Skinner Street.

Developed Site Conditions

The Project will be constructed in the center of the Site, west of the existing gravel drive; access to the site will be provided via the existing gravel drive. The Project includes the installation of 6,994 solar panels and associated fencing, access drive extension, utility and stormwater management features. Of the ±27.42 acres, ±14.27 acres will require clearing and ±11.09 acres of that cleared area will require grubbing for the Project.

The proposed solar panels will be installed on a post driven ground mounted racking system, with minimal changes to the existing grades. As a result, the post-development site conditions will mimic the pre-developed site conditions. Areas of clearing and grubbing and any existing ground cover that is disturbed during construction will be reseeded with a low growth seed mix. In order to account for the change in ground cover, time of concentration, and the reduction of hydrologic soil group, five (5) grass lined stormwater management basins are proposed along the extents of the proposed Project area.

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[1] Town of East Hampton Land Records – Vol. 437 PG. 989

Stormwater Management

Analysis Methodology

The hydrologic analysis was performed using the HydroCAD stormwater modeling system computer program developed by HydroCAD Software Solutions, LLC.

Hydrographs for each watershed were developed using the SCS Synthetic Unit Hydrograph Method with a Type III rainfall distribution. Hydrographs were developed for the NOAA Atlas 14, Volume 10, Version 2 Precipitation 2-, 25-, 50-, and 100-year storm event with rainfall depths of 3.39, 6.33, 7.16, and 8.07 inches respectively.

The existing and proposed drainage areas used in the calculations are illustrated on the Existing and Proposed Drainage Area Plans (EDA-1 & PDA-1). These maps and the corresponding HydroCAD output are attached.

Utilizing Appendix I, Stormwater Management at Solar Array Construction Projects, provided by Connecticut Department of Energy & Environmental Projection ("CT DEEP"), this hydrologic analysis will reflect a reduction of the Hydrologic Soil Group ("HSG") present on-site by one (1) step (e.g. soils of HSG B shall be considered HSG C). This reduction, as indicated by CT DEEP, is intended to account for the compaction of soils that results from extensive machinery traffic during construction of the array. The Water Quality Volume ("WQV") for the site will be calculated assuming that the solar panels, roadways, gravel surfaces, and transformer pads are effectively impervious cover. See Appendix F.

Existing Drainage Patterns

The proposed Project area drains from a high point in the middle of the site to the west, east & south. The majority of the site ultimately drains to Skinner Street (Route 196).

The Site was modeled at four (4) Analysis Points ("AP-1", "AP-2", "AP-3" and "AP-4"). AP-1 & AP-3 are along the western clearing limits, which drain onto the adjacent property. AP-2 drains to an existing wetland and ultimately an intermittent watercourse along the existing site access drive. AP-4 is the southern & eastern clearing limits, which ultimately drain to Skinner Street. Peak discharges have been computed at the points of study for the 2-, 25-, 50-, and 100-year storm events.

The intermittent watercourse currently crosses the existing access drive at two locations via hard bottom crossings and provides conveyance from AP-2. The watercourse is approximately 1 to 3 feet wide with a sandy/stone bottom and drains from north to southeast/east before finally terminating at a catch basin associated with the Skinner Street closed drainage system.

The project site soils identified by the United States Department of Agriculture (USDA) Natural Resources Conservation Service consist of Map Unit Symbol 61B, named "Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony"; 71C, named "Nipmuck-Brimfield-Rock outcrop complex, 3 to 15 percent slopes"; 308, named "Udorthents, smoothed"; and 71E, named "Nipmuck-Brimfield-Rock outcrop complex, 15 to 45 percent slopes". Map Unit Symbols 61B and 71C are classified in the "B" hydrologic soil group rating. Map Unit Symbol 308 is classified in the "C" hydrologic soil group rating. Map Unit Symbol 71E is classified in the "D" hydrologic soil group rating.

The pre-developed discharges at the Analysis Point are tabulated in Table 1-1.

Table 1-1

Analysis Point	**Pre-developed Peak Storm Runoff (Q), cubic feet per second (cfs)**			
	2-year	**25-year**	**50-year**	**100-year**
AP-1	0.80	4.89	6.33	7.99
AP-2	1.52	6.41	8.01	9.83
AP-3	0.40	3.11	4.10	5.27
AP-4	5.01	14.35	17.14	20.22

Proposed Drainage Patterns

The Project will require clearing and grubbing in the immediate area for the proposed solar installation, including the necessary utilities, access drive extension, and stormwater management features, resulting in approximately ±14.93 acres of disturbance. Overall, hydrologically, through the addition of catchment areas associated with the individual drainage areas of each proposed basin, the post-developed condition is designed to mimic the pre-developed condition.

To manage the increase in post-development runoff due to the change in cover type associated with converting woods to meadow and the reductions in one full HSG within the proposed limit of disturbance, five (5) grass-lined stormwater management basins are proposed along the edges of the project area. The basins manage the stormwater runoff through a combination of infiltration and a broad crested overflow weir. These basins also provide the necessary water quality treatment volume for the additional impervious area, as recommended by Appendix I. See Appendix C for post-construction stormwater calculations.

Infiltration rates for the four (4) western and northern grass-lined stormwater management basins are modeled with a maximum rate of 5.00 inches/hour as allowed under the 2004 Stormwater Quality Manual; the southeastern grass-lined infiltration basin is modeled with a rate of 0.80 inches/hour. The infiltration rates were determined from infiltration testing conducted by GeoInsight, Inc, on January 10, 2020. The results table and test pit results are included in Appendix E. Each basin is designed with a rip-rap overflow weir and level spreader.

Swales are proposed along the eastern and southern limits of disturbance to facilitate all the flow reaching the southeastern basin. The swales are designed to convey the 100-year storm event without overtopping. A biodegradable erosion control blanket will be installed within the swales to protect against erosion until turf has been established.

Since the proposed development mimics the existing conditions, the post-development condition was modeled using the same Analysis Point. Peak discharges have been computed at the point of study for the 2-year, 25-year, 50-year, and 100-year storm events. The post-development discharges at each point of study are tabulated in Table 1-2.

Table 1-2

Analysis Point	**Post-developed Peak Storm Runoff (Q), cubic feet per second (cfs)**			
	2-year	**25-year**	**50-year**	**100-year**
AP-1	0.01	1.34	3.94	6.91
AP-2	0.90	2.31	2.75	4.48
AP-3	0.03	1.22	1.78	3.30
AP-4	1.74	5.59	6.77	12.70

Driveway Pipe Crossings

The Project will require two driveway crossings of an existing intermittent water course. Each proposed crossing is a 24" RCP pipe which will be embedded 6" to provide a natural stream bottom. The pipes were designed to convey the 50-year storm event. The crossings were also checked to make sure they can convey the 100-year storm event without overtopping.

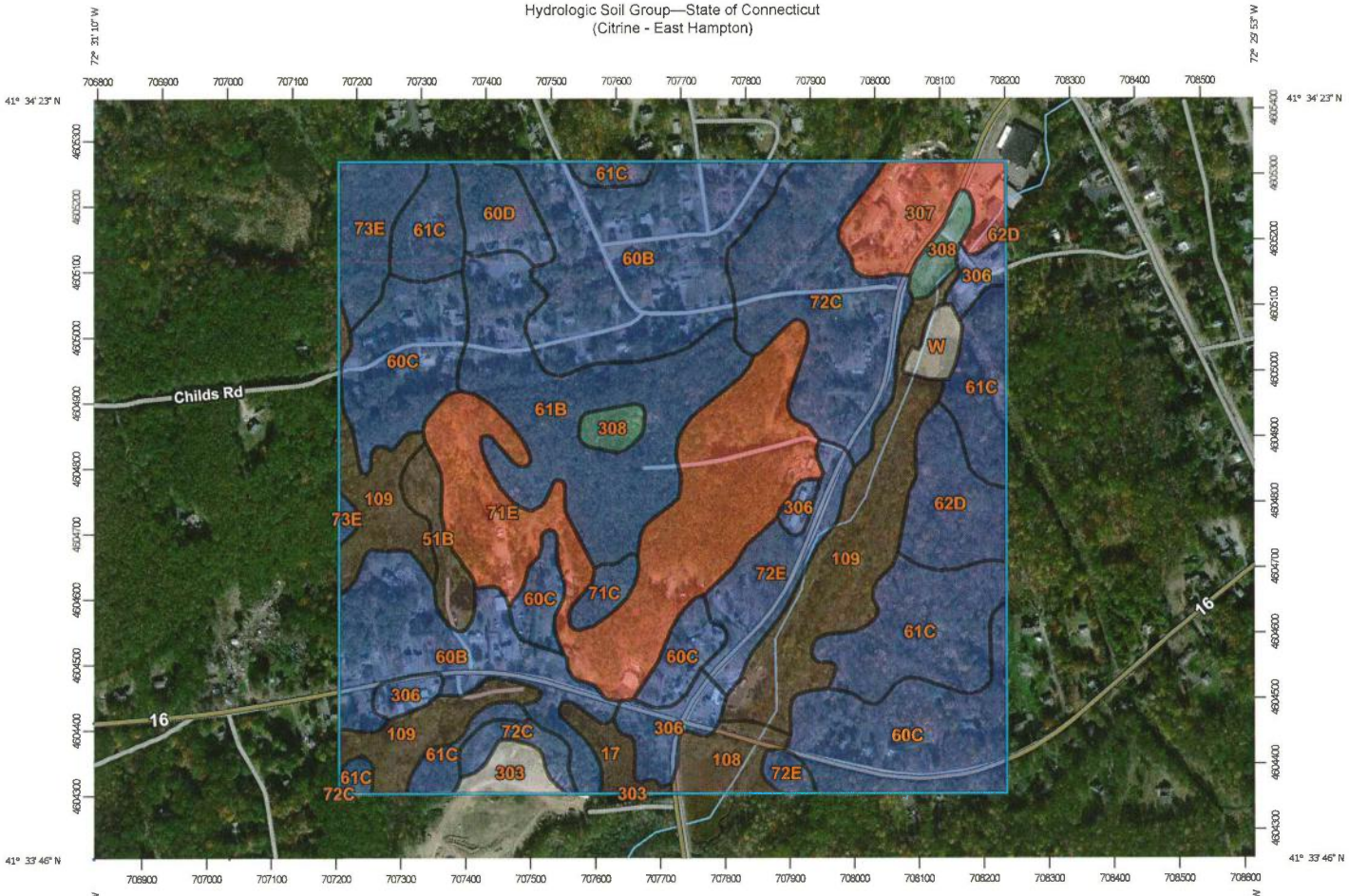
The new culverts will comply with the requirements of the New England District of the Corps General Permit 19 Stream, River & Brook Crossing and therefore shall be eligible as a Self-Verification Project. These requirements include: the tributary watershed to the culvert does not exceed 1 sq. mile; for a crossing constructed using a pipe culvert, the inverts are set such that not less than 25% of the pipe diameter or 12 inches, whichever is less, is set below the streambed elevation; their gradient no steeper than the streambed gradient upstream or downstream of the existing crossing structures; the culvert is backfilled with natural substrate material matching upstream and downstream streambed substrate; the structure, including inlet and outlet protection measures, does not otherwise impede the passage of fish and other aquatic organisms; and, the structure allows for continuous flow of the 50-year frequency storm flows.

Conclusion

The stormwater management for the proposed site has been designed such that the post-development peak discharges to the waters of the State of Connecticut for the 2-, 25-, 50-, and 100- year storm events are less than the pre-development peak discharges. As a result, the proposed solar array will not result in any adverse conditions to the surrounding areas and properties.

APPENDIX A: NRCS SOIL SURVEY

Hydrologic Soil Group—State of Connecticut
(Citrine - East Hampton)



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 19, Sep 13, 2019

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

Date(s) aerial images were photographed: Aug 27, 2016—Oct 30, 2017

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
17	Timakwa and Natchaug soils, 0 to 2 percent slopes	B/D	2.1	0.9%
51B	Sutton fine sandy loam, 0 to 8 percent slopes, very stony	B/D	3.1	1.2%
60B	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	B	37.8	15.3%
60C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes	B	28.3	11.5%
60D	Canton and Charlton soils, 15 to 25 percent slopes	B	4.1	1.7%
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	B	23.0	9.3%
61C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony	B	23.3	9.5%
62D	Canton and Charlton fine sandy loams, 15 to 35 percent slopes, extremely stony	B	6.9	2.8%
71C	Nipmuck-Brimfield-Rock outcrop complex, 3 to 15 percent slopes	B	1.6	0.7%
71E	Nipmuck-Brimfield-Rock outcrop complex, 15 to 45 percent slopes	D	30.3	12.3%
72C	Nipmuck-Brookfield complex, 3 to 15 percent slopes, very rocky	B	21.0	8.5%
72E	Nipmuck-Brookfield complex, 15 to 45 percent slopes, very rocky	B	8.1	3.3%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	B	5.7	2.3%
108	Saco silt loam	B/D	3.8	1.5%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
109	Fluvaquents-Udifluvents complex, frequently flooded	B/D	25.3	10.3%
303	Pits, quarries		2.2	0.9%
306	Udorthents-Urban land complex	B	7.3	2.9%
307	Urban land	D	7.8	3.2%
308	Udorthents, smoothed	C	3.2	1.3%
W	Water		1.7	0.7%
Totals for Area of Interest			**246.5**	**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.

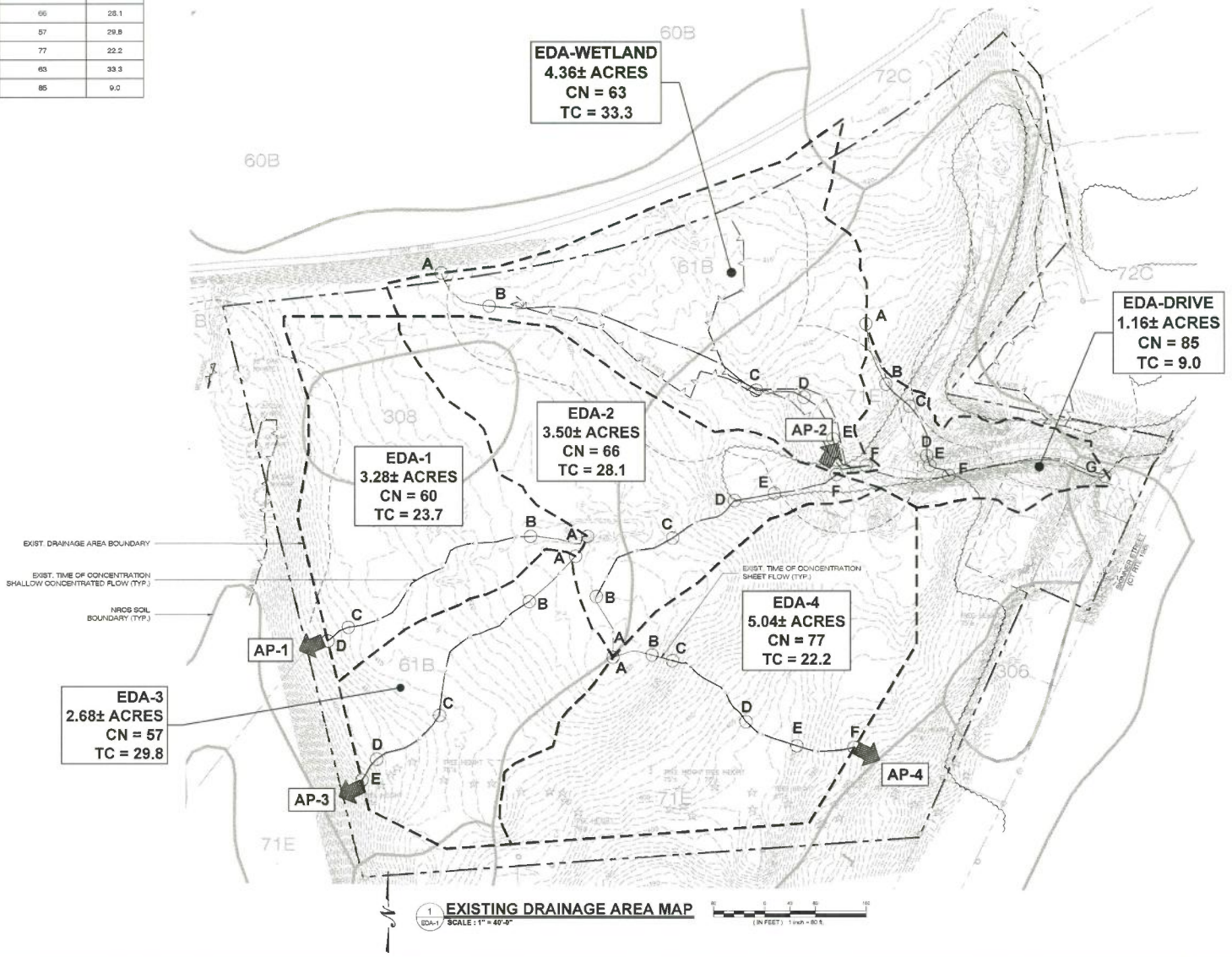
Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over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

APPENDIX B: EXISTING DRAINAGE AREA MAP (EDA-1) & HYDROLOGIC COMPUTATION (HYDROCAD)

EXISTING DRAINAGE AREAS

	TOTAL AREA (ACRES)	COMPOSITE CN	TC (MINS.)
EDA-1	3.28±	60	23.7
EDA-2	3.50±	66	28.1
EDA-3	2.68±	57	29.8
EDA-4	5.04±	77	22.2
EDA-WETLAND	4.36±	63	33.3
EDA-DRIVE	1.16±	85	9.0



1 EDA-1 **EXISTING DRAINAGE AREA MAP**
SCALE : 1" = 40'-0"

(IN FEET) 1 inch = 80 ft.

CITRINE
55 GREENS FARMS ROAD
WESTPORT, CT 06880
OFFICE: (203)-557-5554

ALL-POINTS TECHNOLOGY CORPORATION
3 SADDLEBROOK DRIVE PHONE (860)-663-1697
KILLINGWORTH, CT 06419 FAX: (860)-663-0935
WWW.ALLPOINTSTECH.COM

CONCEPT

NO	DATE	REVISION
0	02/14/20	FOR REVIEW: BJP
1		
2		
3		
4		
5		
6		

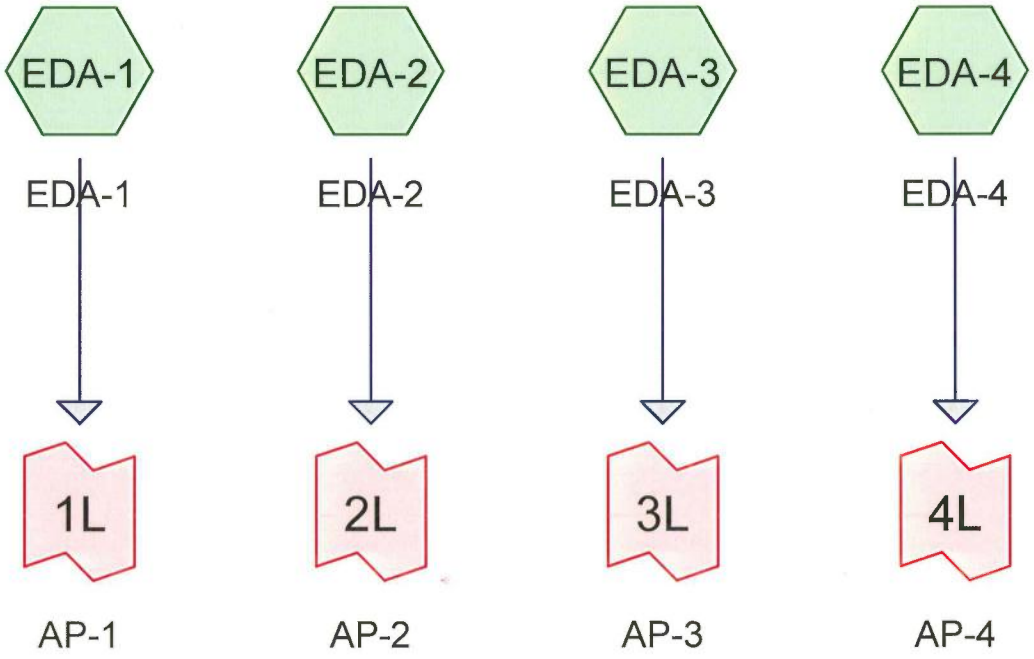
DESIGN PROFESSIONAL OF RECORD
PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 3 SADDLEBROOK DRIVE KILLINGWORTH, CT 06419

OWNER: SKINNER STREET PROPERTIES LLC
ADDRESS: 9 SEQUOIA TRAIL EAST HAMPTON, CT 06424

EAST HAMPTON INDUSTRIAL PARK GROUND MOUNT
SITE ADDRESS: 46 SKINNER STREET EAST HAMPTON, CT 06424
APT FILING NUMBER: CT567110
DRAWN BY: CSH
DATE: 02/14/20 CHECKED BY: BJP

SHEET TITLE:
EXISTING DRAINAGE AREA MAP

SHEET NUMBER:
EDA-1



Subcat Reach Pond Link

Routing Diagram for CT567110_EastHampton-EX
Prepared by {enter your company name here}, Printed 2/14/2020

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.271	73	Brush, Good, HSG D (EDA-2)
6.346	55	Woods, Good, HSG B (EDA-1, EDA-2, EDA-3)
1.444	70	Woods, Good, HSG C (EDA-1, EDA-2)
6.499	77	Woods, Good, HSG D (EDA-2, EDA-3, EDA-4)
14.559	**67**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
6.346	HSG B	EDA-1, EDA-2, EDA-3
1.444	HSG C	EDA-1, EDA-2
6.769	HSG D	EDA-2, EDA-3, EDA-4
0.000	Other	
14.559		**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	0.000	0.000	0.271	0.000	0.271	Brush, Good	EDA-2
0.000	6.346	1.444	6.499	0.000	14.288	Woods, Good	EDA-1, EDA-2, EDA-3, EDA-4
0.000	**6.346**	**1.444**	**6.769**	**0.000**	**14.559**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 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 EDA-1: EDA-1 Runoff Area=142,743 sf 0.00% Impervious Runoff Depth=0.48"
Flow Length=483' Tc=23.7 min CN=60 Runoff=0.80 cfs 0.132 af

Subcatchment EDA-2: EDA-2 Runoff Area=154,894 sf 0.00% Impervious Runoff Depth=0.74"
Flow Length=569' Tc=28.1 min CN=66 Runoff=1.52 cfs 0.220 af

Subcatchment EDA-3: EDA-3 Runoff Area=116,873 sf 0.00% Impervious Runoff Depth=0.38"
Flow Length=516' Tc=29.8 min CN=57 Runoff=0.40 cfs 0.084 af

Subcatchment EDA-4: EDA-4 Runoff Area=219,666 sf 0.00% Impervious Runoff Depth=1.35"
Flow Length=439' Tc=22.2 min CN=77 Runoff=5.01 cfs 0.567 af

Link 1L: AP-1 Inflow=0.80 cfs 0.132 af
Primary=0.80 cfs 0.132 af

Link 2L: AP-2 Inflow=1.52 cfs 0.220 af
Primary=1.52 cfs 0.220 af

Link 3L: AP-3 Inflow=0.40 cfs 0.084 af
Primary=0.40 cfs 0.084 af

Link 4L: AP-4 Inflow=5.01 cfs 0.567 af
Primary=5.01 cfs 0.567 af

Total Runoff Area = 14.559 ac Runoff Volume = 1.003 af Average Runoff Depth = 0.83"
100.00% Pervious = 14.559 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment EDA-1: EDA-1

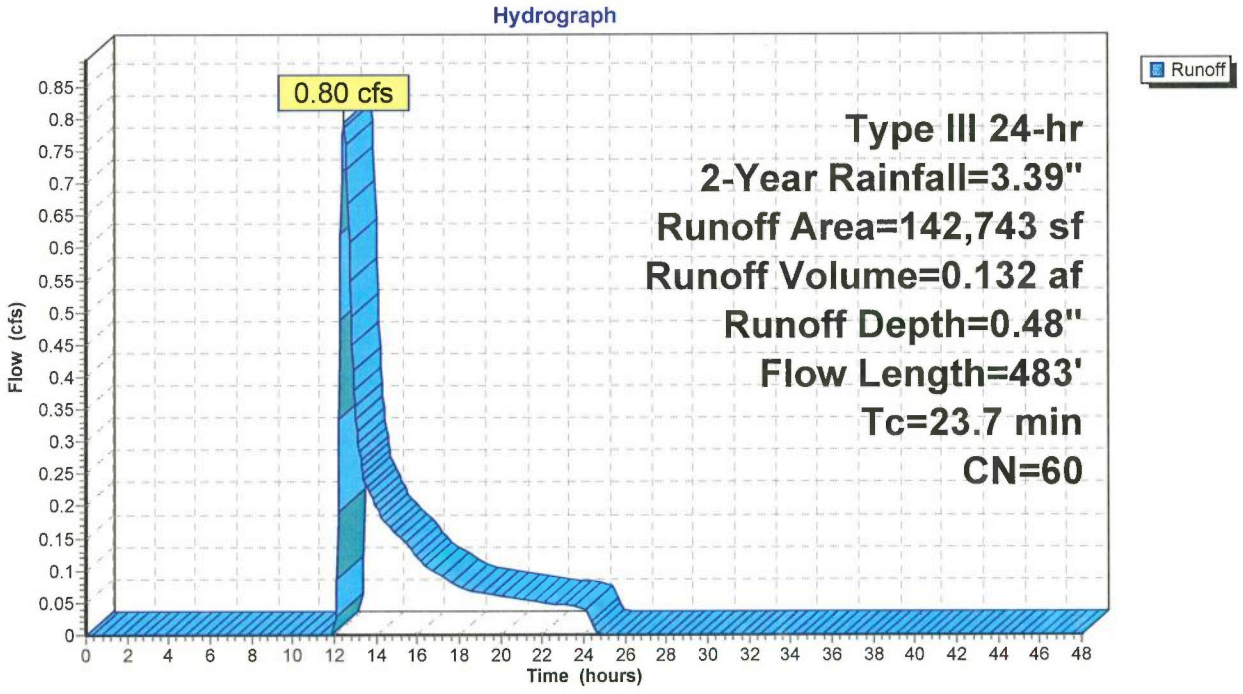
Runoff = 0.80 cfs @ 12.46 hrs, Volume= 0.132 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
95,903	55	Woods, Good, HSG B
46,840	70	Woods, Good, HSG C
142,743	60	Weighted Average
142,743		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0350	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
6.5	343	0.0306	0.87		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.5	40	0.0750	1.37		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
23.7	483	Total			

Subcatchment EDA-1: EDA-1



Summary for Subcatchment EDA-2: EDA-2

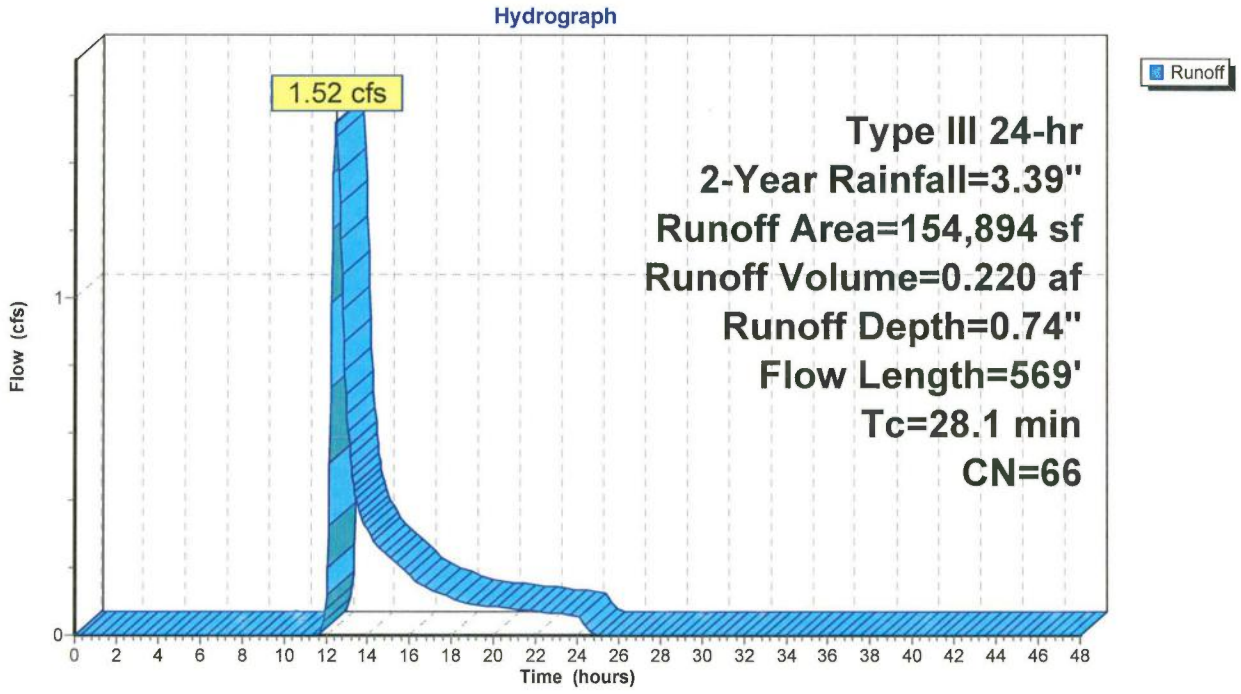
Runoff = 1.52 cfs @ 12.46 hrs, Volume= 0.220 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
72,319	55	Woods, Good, HSG B
16,039	70	Woods, Good, HSG C
54,741	77	Woods, Good, HSG D
11,795	73	Brush, Good, HSG D
154,894	66	Weighted Average
154,894		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	100	0.0200	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
4.0	163	0.0184	0.68		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.3	117	0.0855	1.46		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.9	63	0.0300	1.21		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
1.0	126	0.0873	2.07		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
28.1	569	Total			

Subcatchment EDA-2: EDA-2



Summary for Subcatchment EDA-3: EDA-3

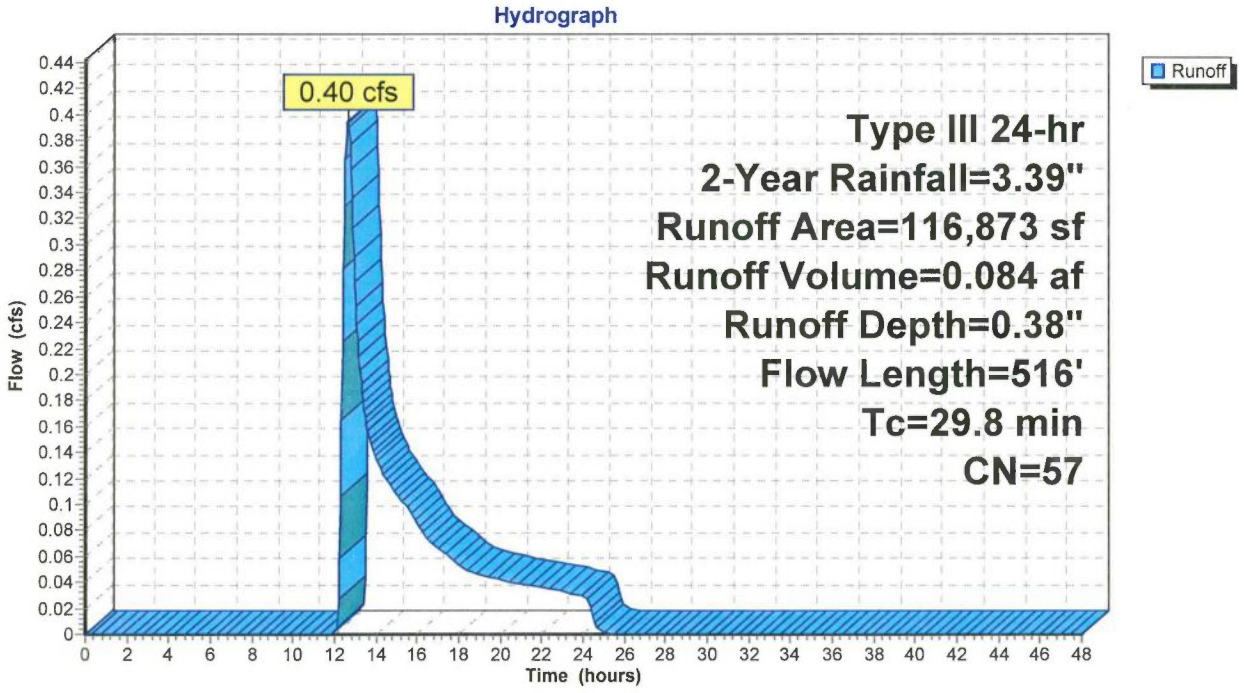
Runoff = 0.40 cfs @ 12.61 hrs, Volume= 0.084 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
108,205	55	Woods, Good, HSG B
8,668	77	Woods, Good, HSG D
116,873	57	Weighted Average
116,873		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0150	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
4.1	252	0.0417	1.02		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.9	124	0.0480	1.10		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.4	40	0.1250	1.77		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
29.8	516	Total			

Subcatchment EDA-3: EDA-3



Summary for Subcatchment EDA-4: EDA-4

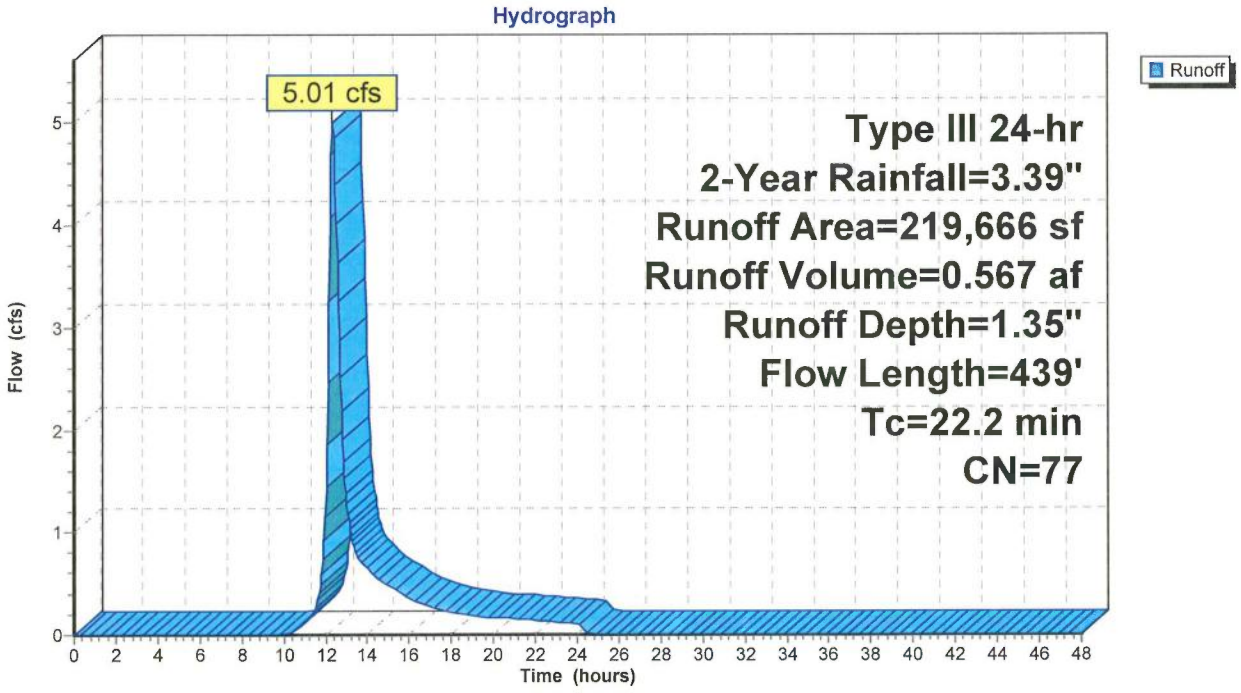
Runoff = 5.01 cfs @ 12.32 hrs, Volume= 0.567 af, Depth= 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
219,666	77	Woods, Good, HSG D
219,666		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	67	0.0224	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
3.8	33	0.1515	0.14		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.39"
1.7	157	0.0955	1.55		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
1.3	90	0.0550	1.17		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.9	92	0.1087	1.65		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
22.2	439	Total			

Subcatchment EDA-4: EDA-4

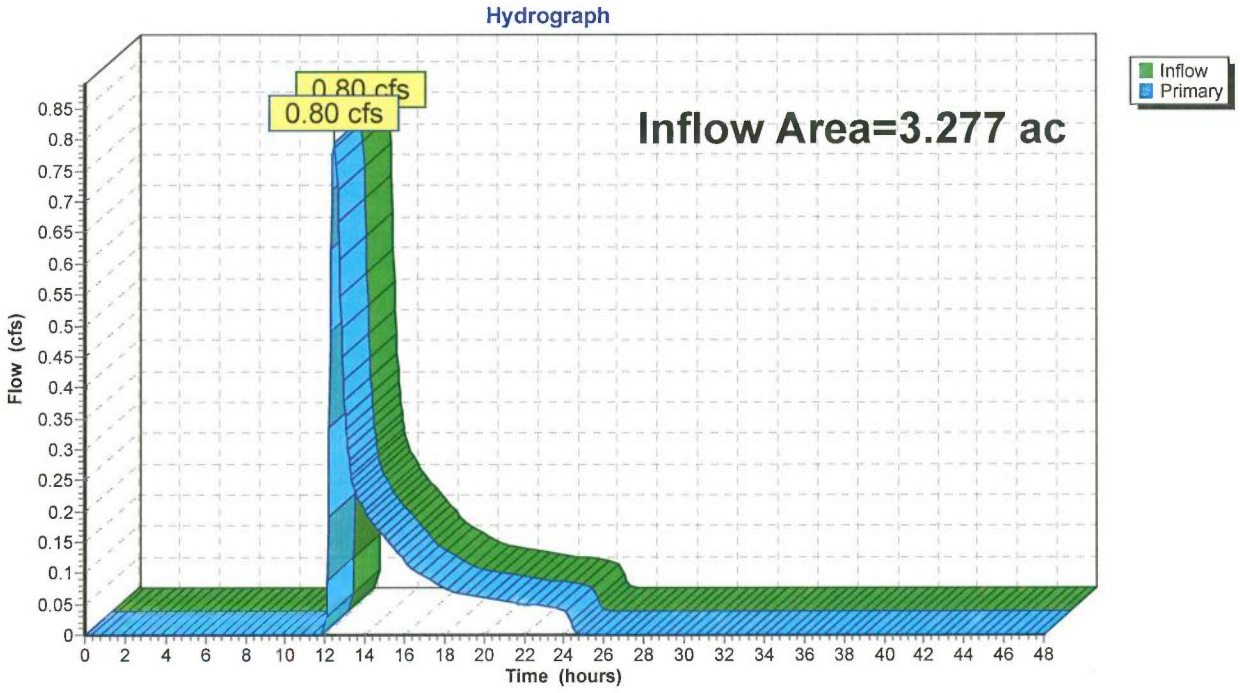


Summary for Link 1L: AP-1

Inflow Area = 3.277 ac, 0.00% Impervious, Inflow Depth = 0.48" for 2-Year event
Inflow = 0.80 cfs @ 12.46 hrs, Volume= 0.132 af
Primary = 0.80 cfs @ 12.46 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: AP-1

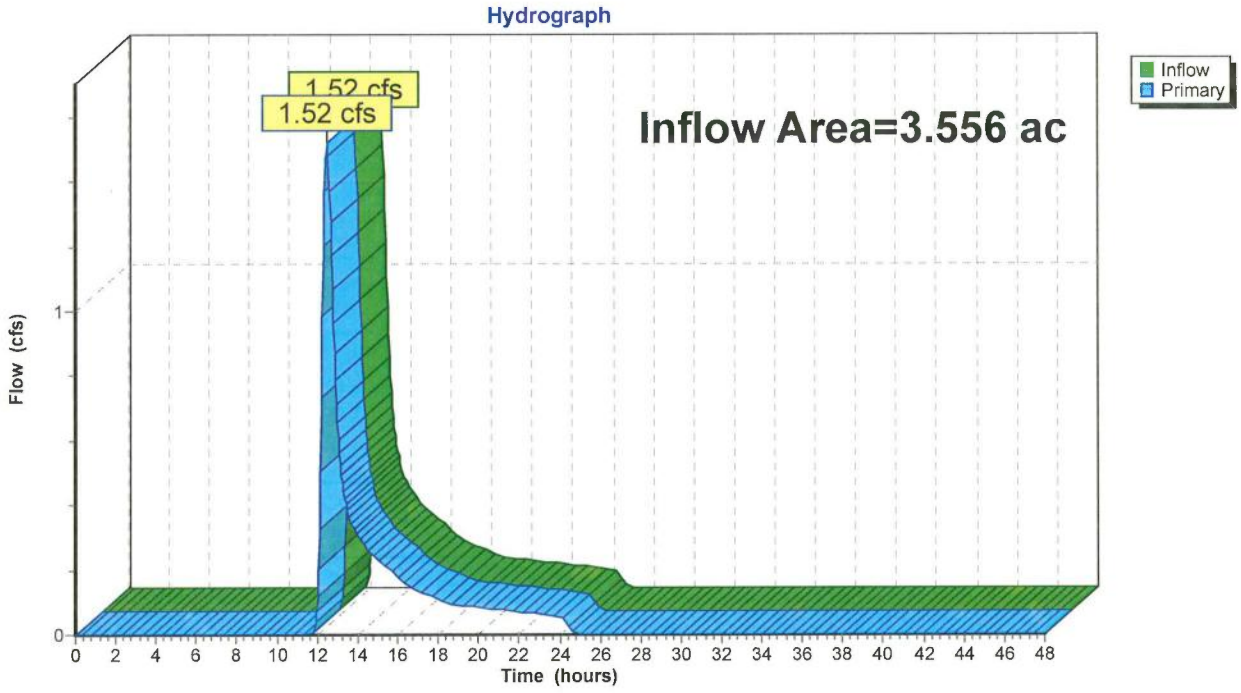


Summary for Link 2L: AP-2

Inflow Area = 3.556 ac, 0.00% Impervious, Inflow Depth = 0.74" for 2-Year event
Inflow = 1.52 cfs @ 12.46 hrs, Volume= 0.220 af
Primary = 1.52 cfs @ 12.46 hrs, Volume= 0.220 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: AP-2

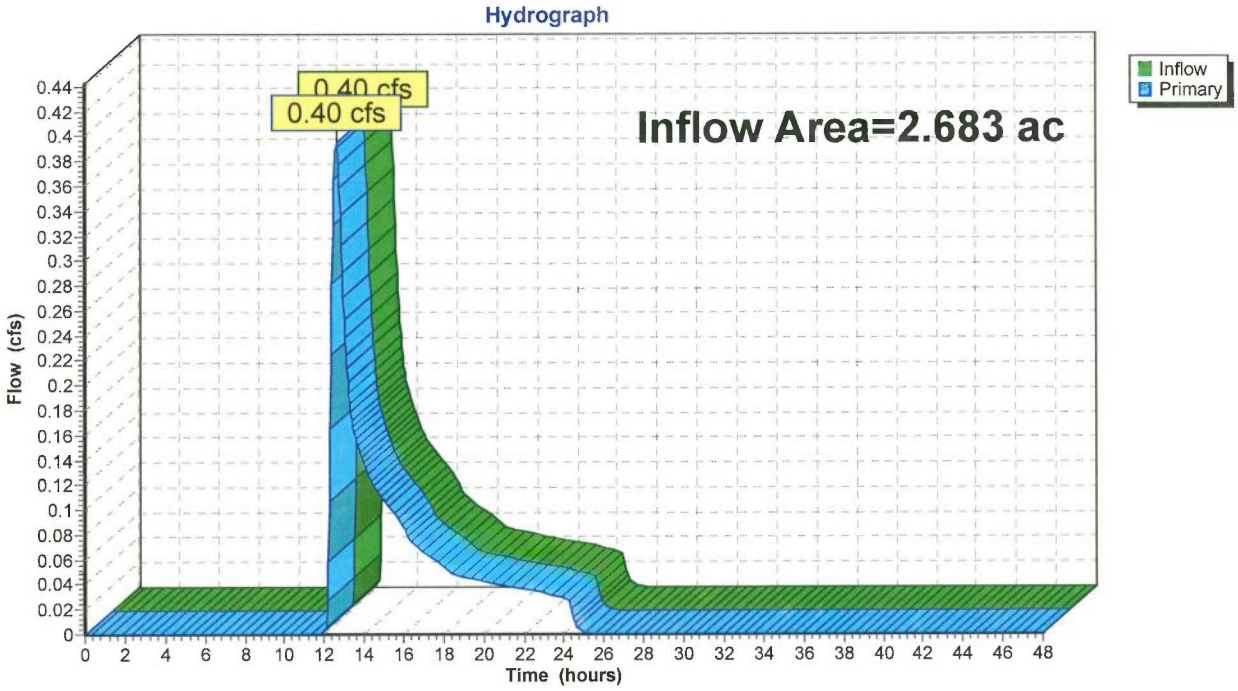


Summary for Link 3L: AP-3

Inflow Area = 2.683 ac, 0.00% Impervious, Inflow Depth = 0.38" for 2-Year event
Inflow = 0.40 cfs @ 12.61 hrs, Volume= 0.084 af
Primary = 0.40 cfs @ 12.61 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 3L: AP-3

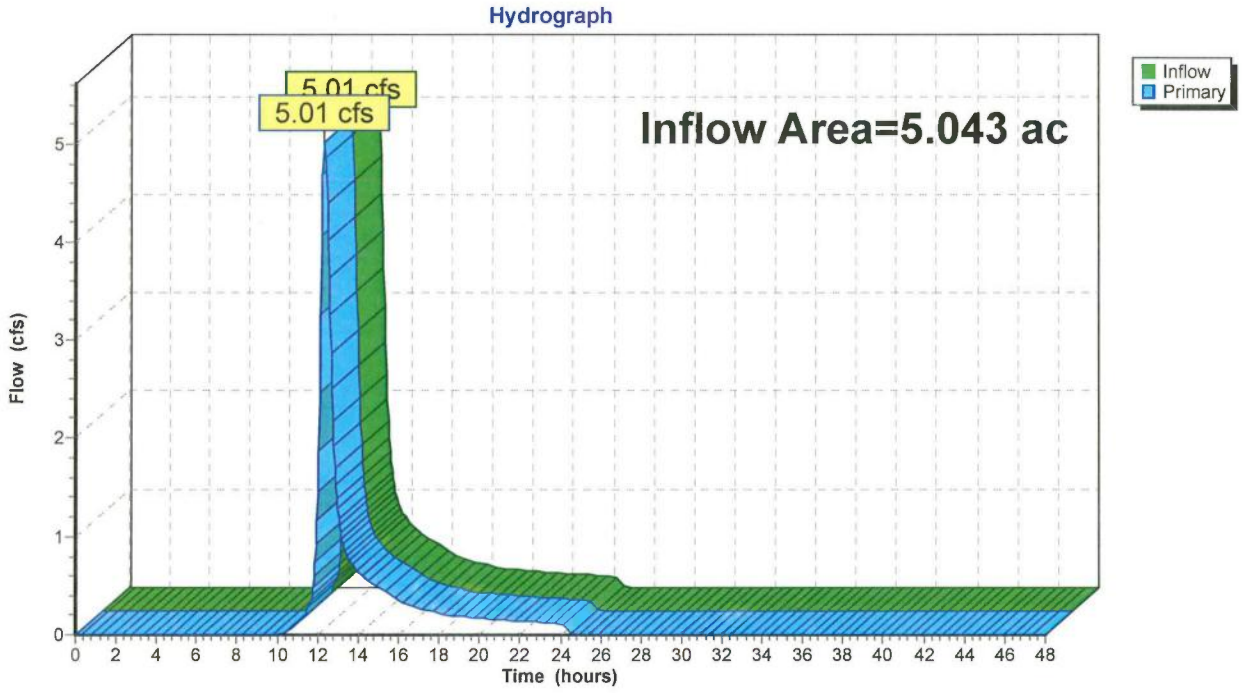


Summary for Link 4L: AP-4

Inflow Area = 5.043 ac, 0.00% Impervious, Inflow Depth = 1.35" for 2-Year event
Inflow = 5.01 cfs @ 12.32 hrs, Volume= 0.567 af
Primary = 5.01 cfs @ 12.32 hrs, Volume= 0.567 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 4L: AP-4



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 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 EDA-1: EDA-1 Runoff Area=142,743 sf 0.00% Impervious Runoff Depth=2.14"
Flow Length=483' Tc=23.7 min CN=60 Runoff=4.89 cfs 0.585 af

Subcatchment EDA-2: EDA-2 Runoff Area=154,894 sf 0.00% Impervious Runoff Depth=2.69"
Flow Length=569' Tc=28.1 min CN=66 Runoff=6.41 cfs 0.796 af

Subcatchment EDA-3: EDA-3 Runoff Area=116,873 sf 0.00% Impervious Runoff Depth=1.88"
Flow Length=516' Tc=29.8 min CN=57 Runoff=3.11 cfs 0.420 af

Subcatchment EDA-4: EDA-4 Runoff Area=219,666 sf 0.00% Impervious Runoff Depth=3.77"
Flow Length=439' Tc=22.2 min CN=77 Runoff=14.35 cfs 1.584 af

Link 1L: AP-1 Inflow=4.89 cfs 0.585 af
Primary=4.89 cfs 0.585 af

Link 2L: AP-2 Inflow=6.41 cfs 0.796 af
Primary=6.41 cfs 0.796 af

Link 3L: AP-3 Inflow=3.11 cfs 0.420 af
Primary=3.11 cfs 0.420 af

Link 4L: AP-4 Inflow=14.35 cfs 1.584 af
Primary=14.35 cfs 1.584 af

Total Runoff Area = 14.559 ac Runoff Volume = 3.385 af Average Runoff Depth = 2.79"
100.00% Pervious = 14.559 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment EDA-1: EDA-1

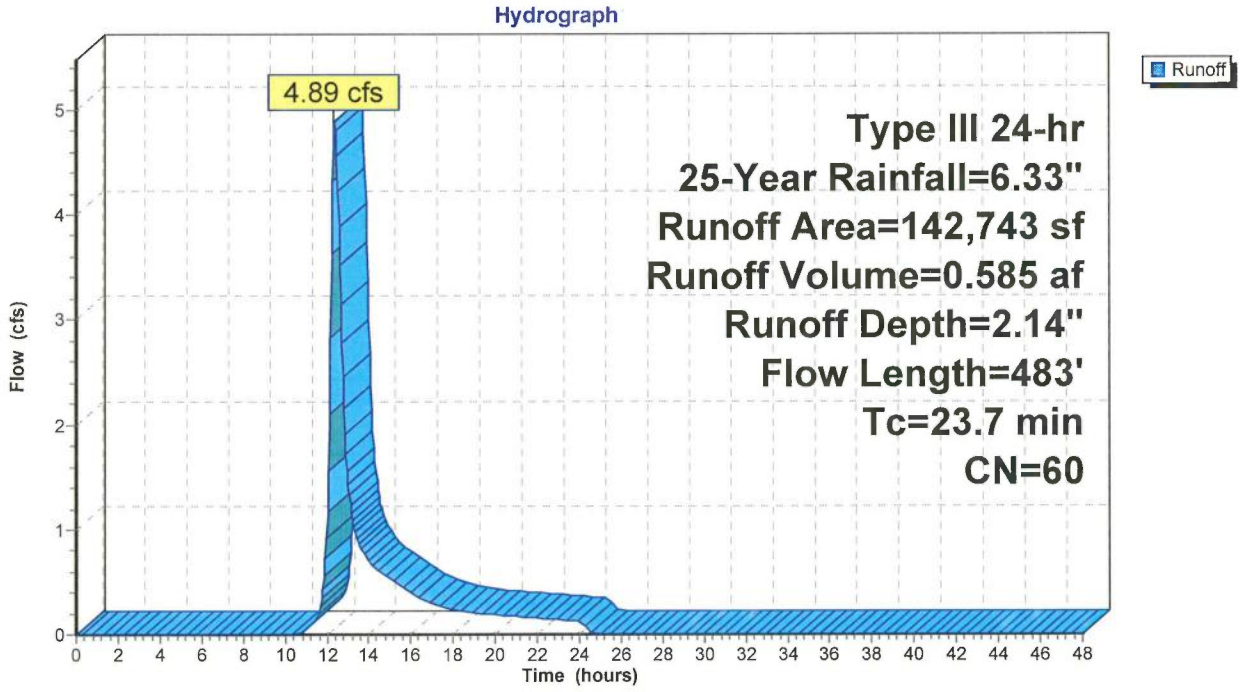
Runoff = 4.89 cfs @ 12.36 hrs, Volume= 0.585 af, Depth= 2.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
95,903	55	Woods, Good, HSG B
46,840	70	Woods, Good, HSG C
142,743	60	Weighted Average
142,743		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0350	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
6.5	343	0.0306	0.87		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.5	40	0.0750	1.37		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
23.7	483	Total			

Subcatchment EDA-1: EDA-1



Summary for Subcatchment EDA-2: EDA-2

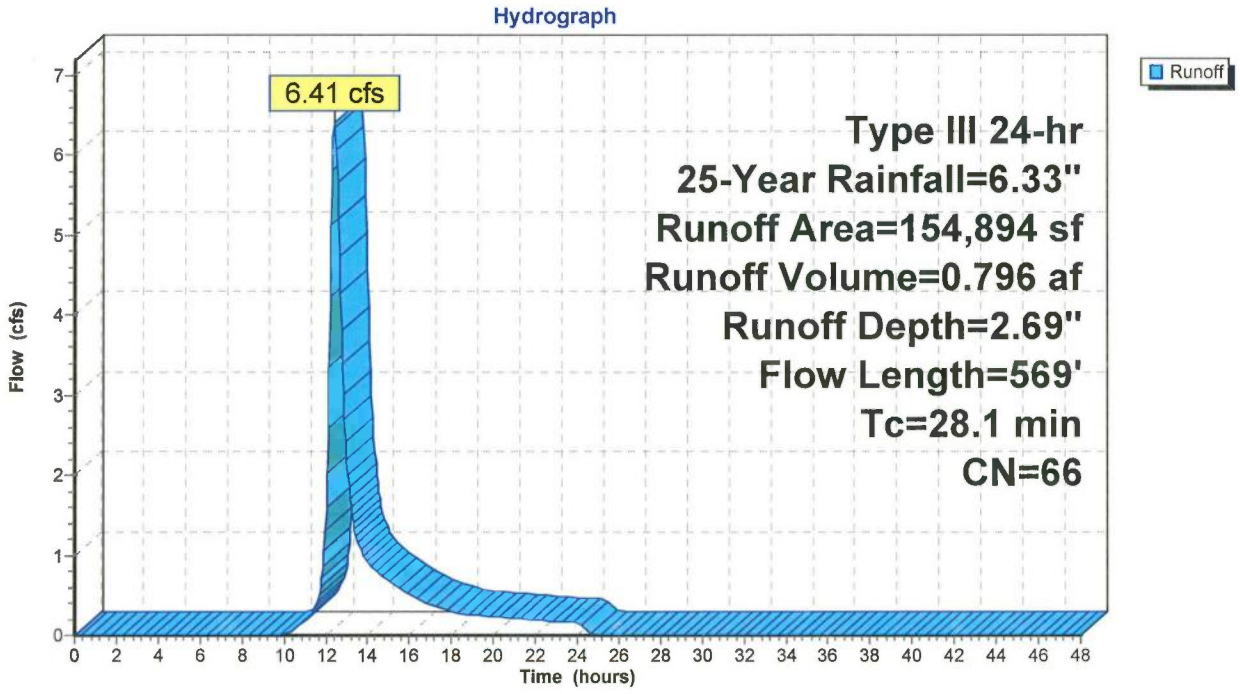
Runoff = 6.41 cfs @ 12.41 hrs, Volume= 0.796 af, Depth= 2.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
72,319	55	Woods, Good, HSG B
16,039	70	Woods, Good, HSG C
54,741	77	Woods, Good, HSG D
11,795	73	Brush, Good, HSG D
154,894	66	Weighted Average
154,894		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	100	0.0200	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
4.0	163	0.0184	0.68		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.3	117	0.0855	1.46		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.9	63	0.0300	1.21		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
1.0	126	0.0873	2.07		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
28.1	569	Total			

Subcatchment EDA-2: EDA-2



Summary for Subcatchment EDA-3: EDA-3

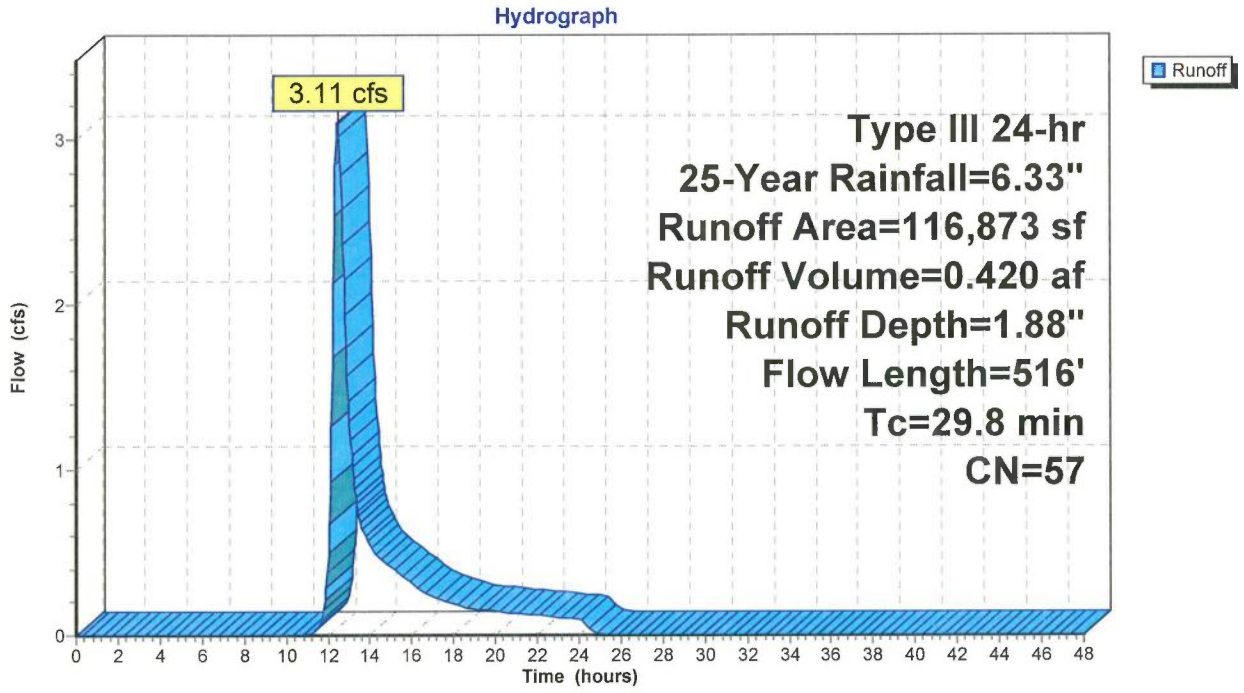
Runoff = 3.11 cfs @ 12.46 hrs, Volume= 0.420 af, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
108,205	55	Woods, Good, HSG B
8,668	77	Woods, Good, HSG D
116,873	57	Weighted Average
116,873		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0150	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
4.1	252	0.0417	1.02		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.9	124	0.0480	1.10		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.4	40	0.1250	1.77		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
29.8	516	Total			

Subcatchment EDA-3: EDA-3



Summary for Subcatchment EDA-4: EDA-4

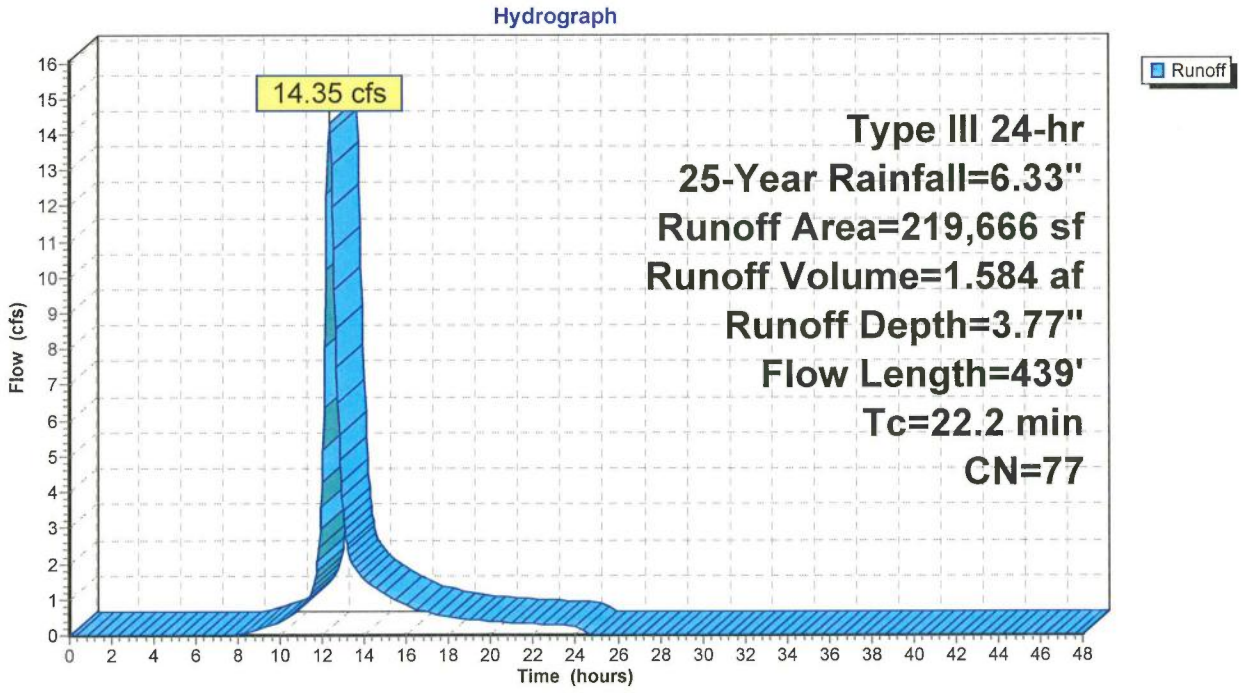
Runoff = 14.35 cfs @ 12.31 hrs, Volume= 1.584 af, Depth= 3.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
219,666	77	Woods, Good, HSG D
219,666		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	67	0.0224	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
3.8	33	0.1515	0.14		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.39"
1.7	157	0.0955	1.55		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
1.3	90	0.0550	1.17		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.9	92	0.1087	1.65		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
22.2	439	Total			

Subcatchment EDA-4: EDA-4

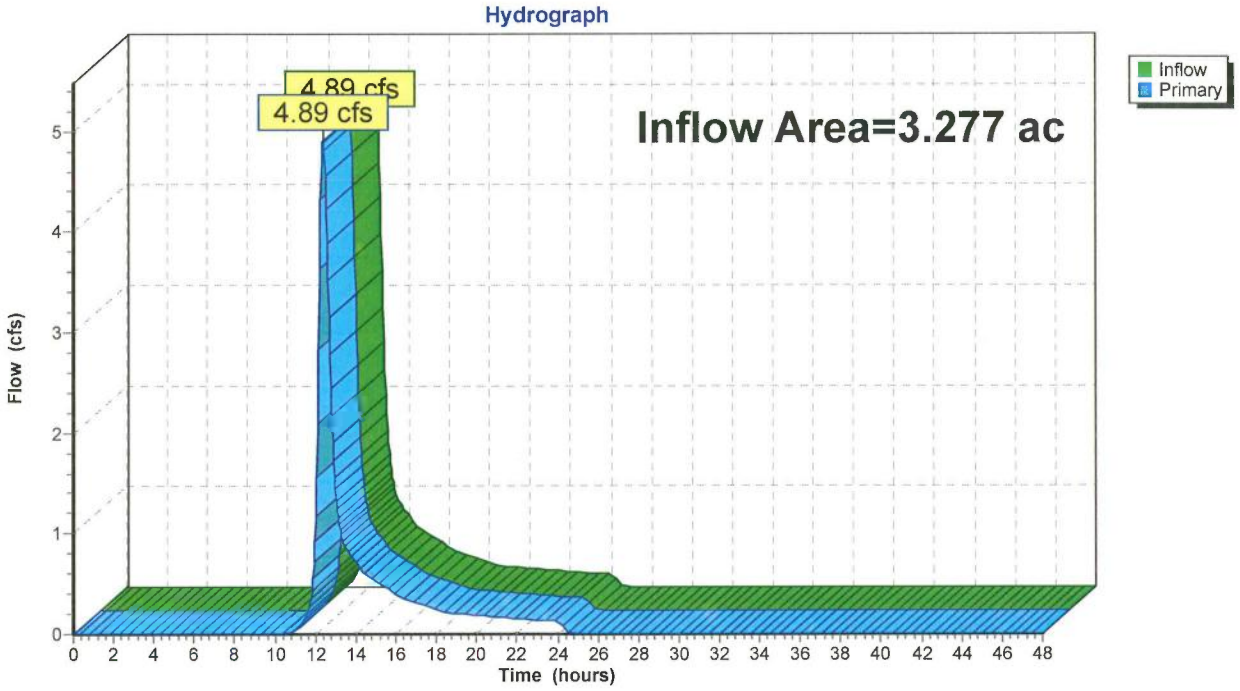


Summary for Link 1L: AP-1

Inflow Area = 3.277 ac, 0.00% Impervious, Inflow Depth = 2.14" for 25-Year event
Inflow = 4.89 cfs @ 12.36 hrs, Volume= 0.585 af
Primary = 4.89 cfs @ 12.36 hrs, Volume= 0.585 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: AP-1

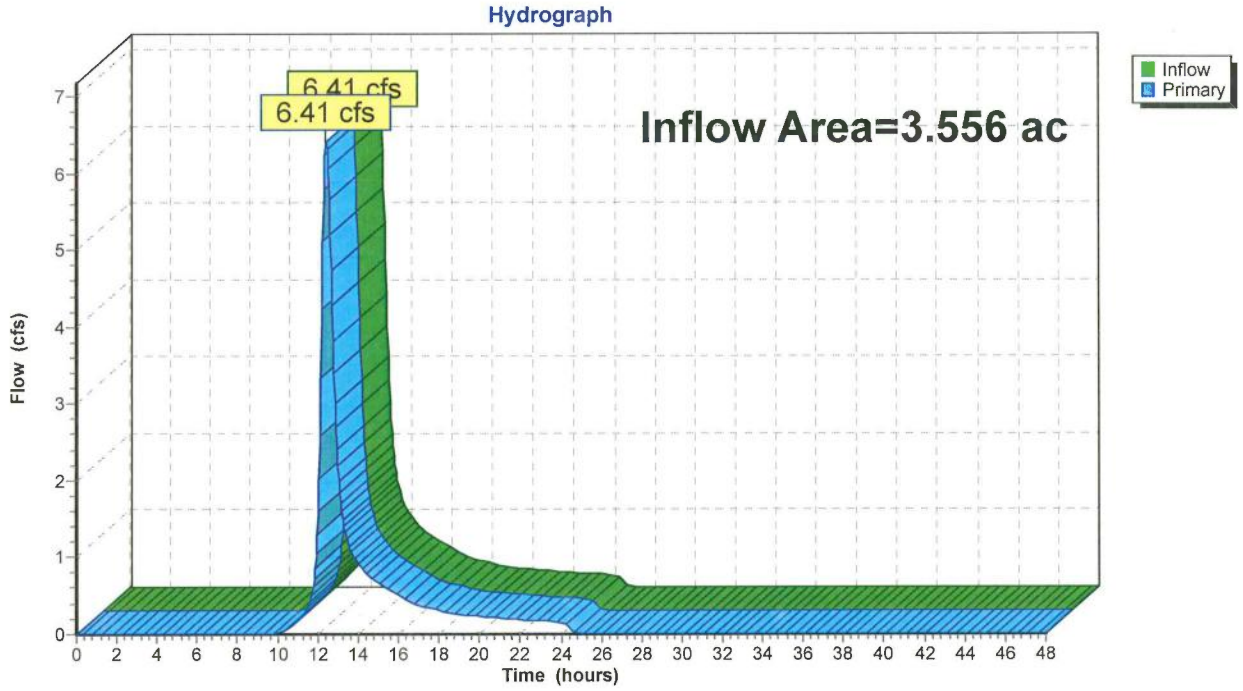


Summary for Link 2L: AP-2

Inflow Area = 3.556 ac, 0.00% Impervious, Inflow Depth = 2.69" for 25-Year event
Inflow = 6.41 cfs @ 12.41 hrs, Volume= 0.796 af
Primary = 6.41 cfs @ 12.41 hrs, Volume= 0.796 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: AP-2

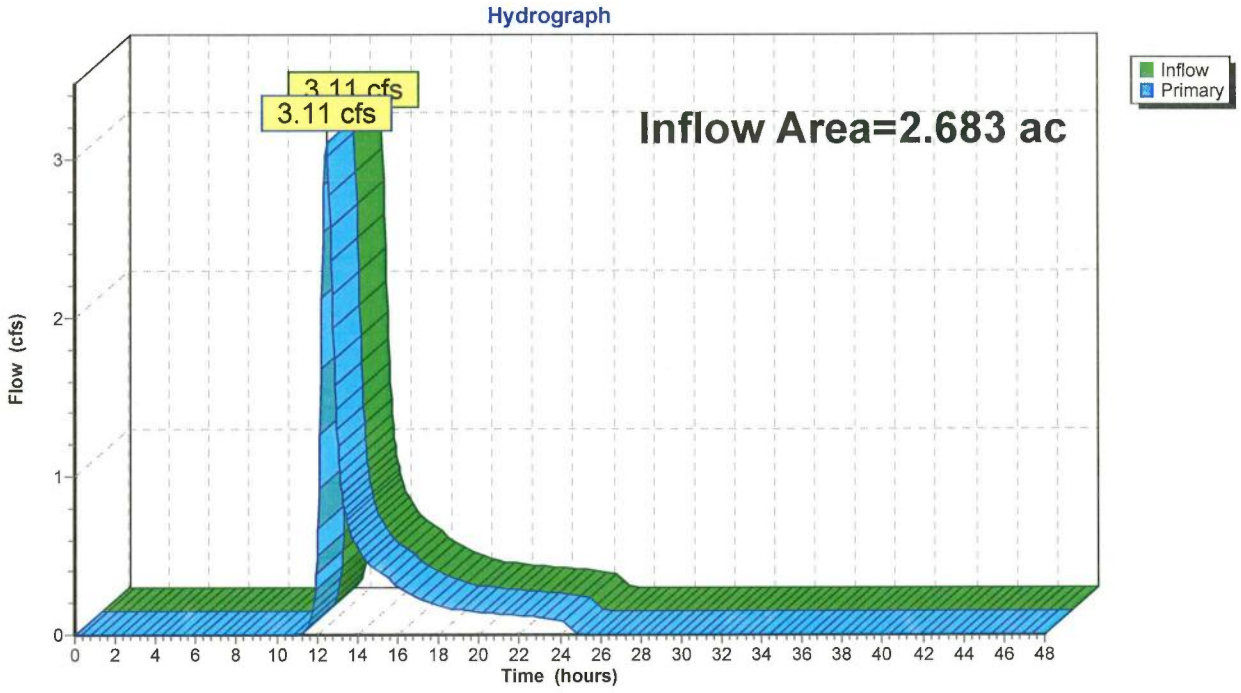


Summary for Link 3L: AP-3

Inflow Area = 2.683 ac, 0.00% Impervious, Inflow Depth = 1.88" for 25-Year event
Inflow = 3.11 cfs @ 12.46 hrs, Volume= 0.420 af
Primary = 3.11 cfs @ 12.46 hrs, Volume= 0.420 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 3L: AP-3

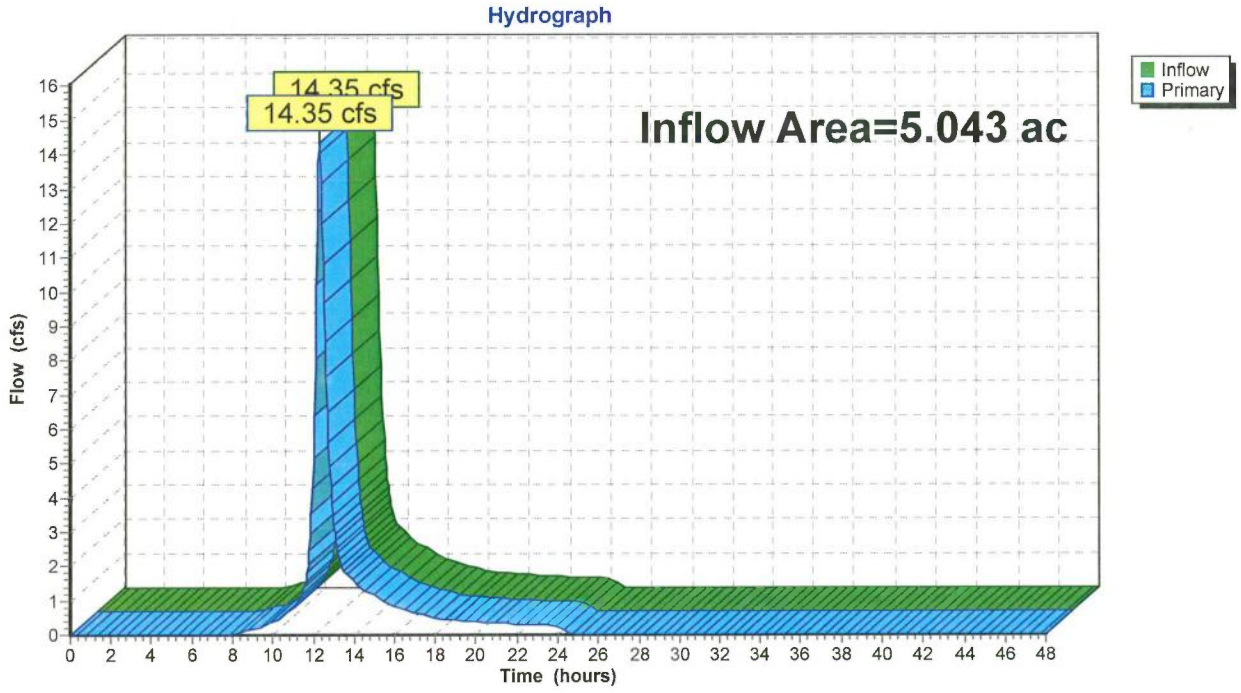


Summary for Link 4L: AP-4

Inflow Area = 5.043 ac, 0.00% Impervious, Inflow Depth = 3.77" for 25-Year event
Inflow = 14.35 cfs @ 12.31 hrs, Volume= 1.584 af
Primary = 14.35 cfs @ 12.31 hrs, Volume= 1.584 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 4L: AP-4



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 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 EDA-1: EDA-1 Runoff Area=142,743 sf 0.00% Impervious Runoff Depth=2.72"
Flow Length=483' Tc=23.7 min CN=60 Runoff=6.33 cfs 0.742 af

Subcatchment EDA-2: EDA-2 Runoff Area=154,894 sf 0.00% Impervious Runoff Depth=3.33"
Flow Length=569' Tc=28.1 min CN=66 Runoff=8.01 cfs 0.987 af

Subcatchment EDA-3: EDA-3 Runoff Area=116,873 sf 0.00% Impervious Runoff Depth=2.42"
Flow Length=516' Tc=29.8 min CN=57 Runoff=4.10 cfs 0.541 af

Subcatchment EDA-4: EDA-4 Runoff Area=219,666 sf 0.00% Impervious Runoff Depth=4.51"
Flow Length=439' Tc=22.2 min CN=77 Runoff=17.14 cfs 1.895 af

Link 1L: AP-1 Inflow=6.33 cfs 0.742 af
Primary=6.33 cfs 0.742 af

Link 2L: AP-2 Inflow=8.01 cfs 0.987 af
Primary=8.01 cfs 0.987 af

Link 3L: AP-3 Inflow=4.10 cfs 0.541 af
Primary=4.10 cfs 0.541 af

Link 4L: AP-4 Inflow=17.14 cfs 1.895 af
Primary=17.14 cfs 1.895 af

Total Runoff Area = 14.559 ac Runoff Volume = 4.165 af Average Runoff Depth = 3.43"
100.00% Pervious = 14.559 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment EDA-1: EDA-1

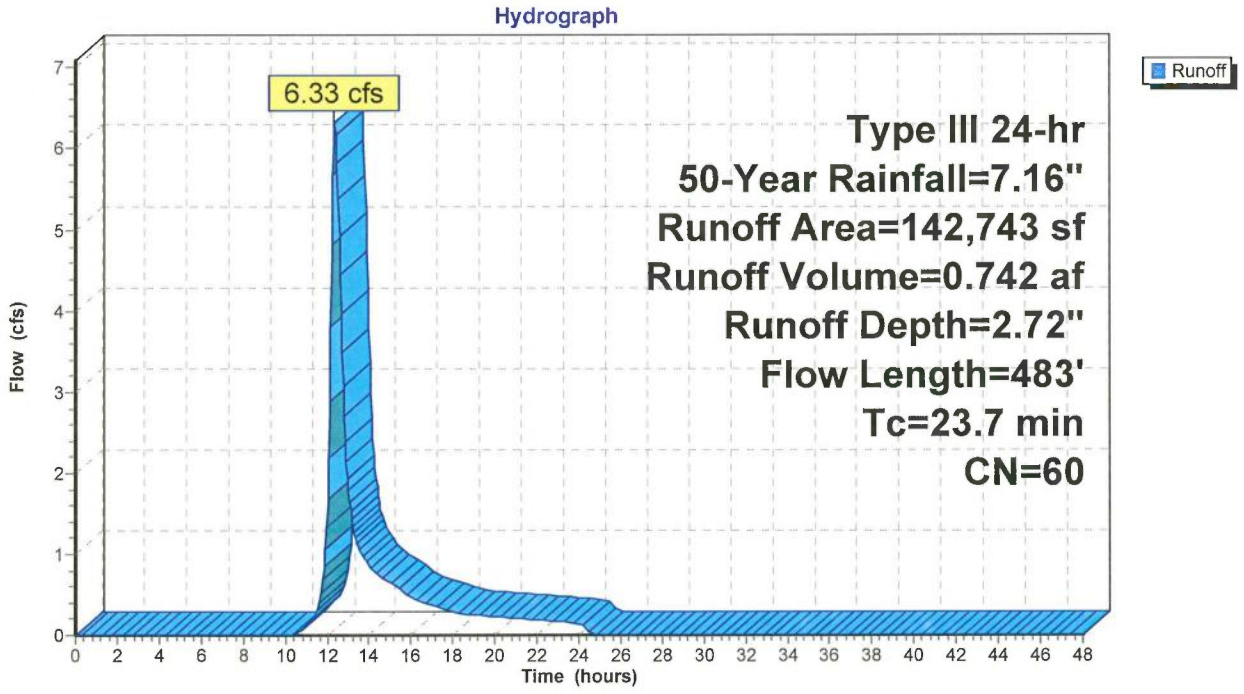
Runoff = 6.33 cfs @ 12.35 hrs, Volume= 0.742 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
95,903	55	Woods, Good, HSG B
46,840	70	Woods, Good, HSG C
142,743	60	Weighted Average
142,743		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0350	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
6.5	343	0.0306	0.87		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.5	40	0.0750	1.37		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
23.7	483	Total			

Subcatchment EDA-1: EDA-1



Summary for Subcatchment EDA-2: EDA-2

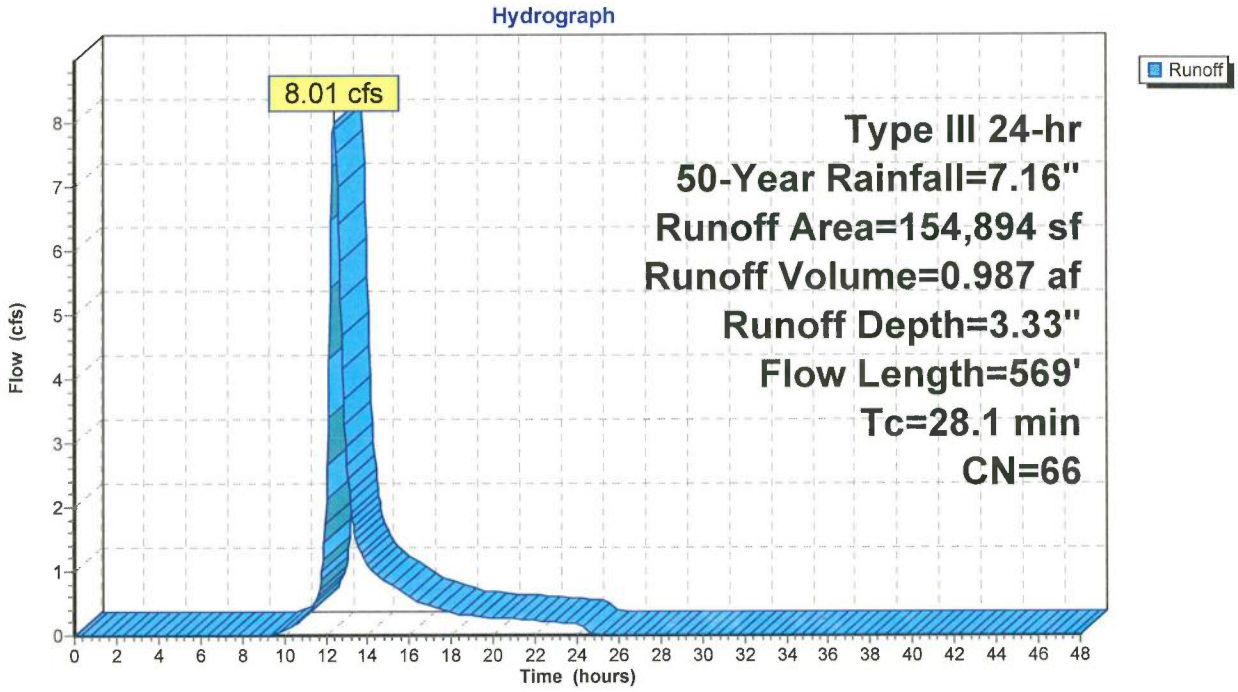
Runoff = 8.01 cfs @ 12.40 hrs, Volume= 0.987 af, Depth= 3.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
72,319	55	Woods, Good, HSG B
16,039	70	Woods, Good, HSG C
54,741	77	Woods, Good, HSG D
11,795	73	Brush, Good, HSG D
154,894	66	Weighted Average
154,894		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	100	0.0200	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
4.0	163	0.0184	0.68		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.3	117	0.0855	1.46		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.9	63	0.0300	1.21		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
1.0	126	0.0873	2.07		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
28.1	569	Total			

Subcatchment EDA-2: EDA-2



Summary for Subcatchment EDA-3: EDA-3

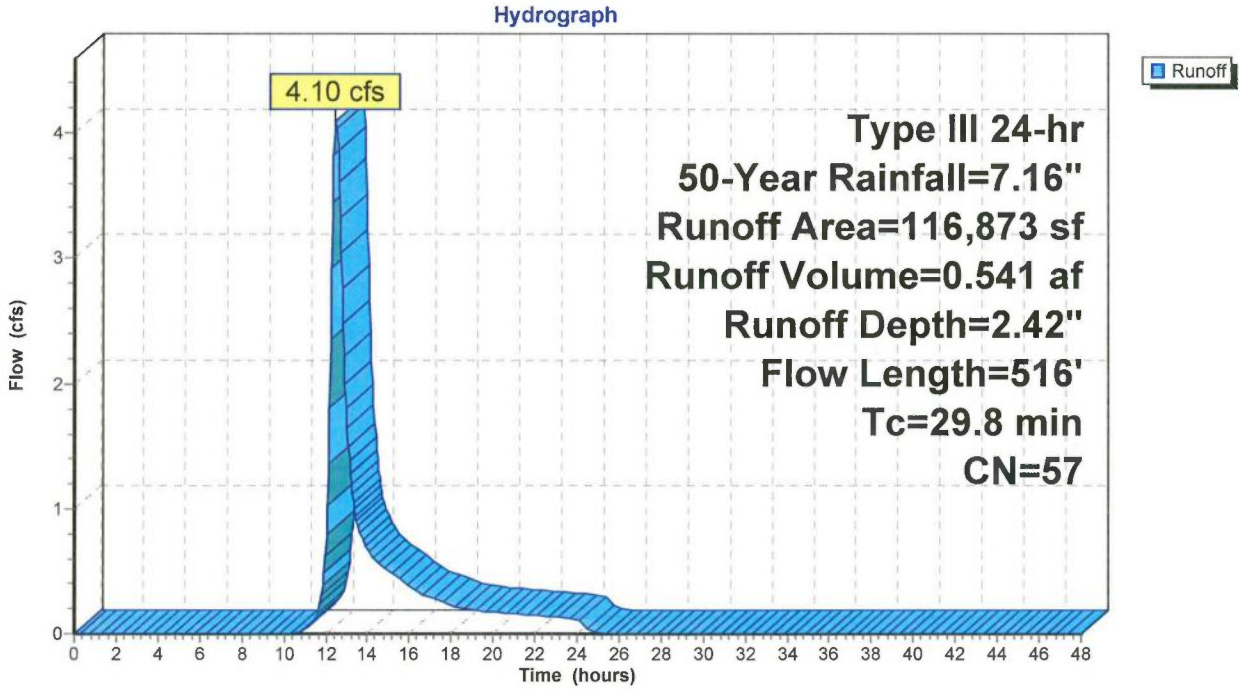
Runoff = 4.10 cfs @ 12.45 hrs, Volume= 0.541 af, Depth= 2.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
108,205	55	Woods, Good, HSG B
8,668	77	Woods, Good, HSG D
116,873	57	Weighted Average
116,873		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0150	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
4.1	252	0.0417	1.02		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.9	124	0.0480	1.10		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.4	40	0.1250	1.77		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
29.8	516	Total			

Subcatchment EDA-3: EDA-3



Summary for Subcatchment EDA-4: EDA-4

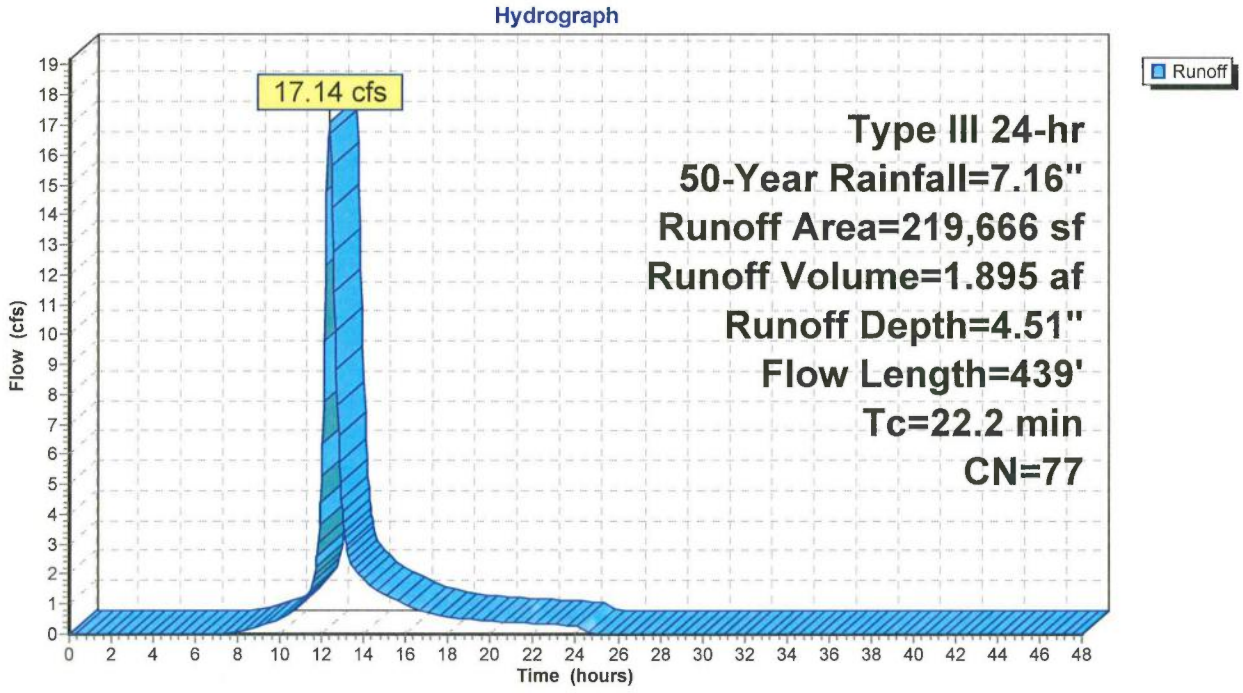
Runoff = 17.14 cfs @ 12.30 hrs, Volume= 1.895 af, Depth= 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
219,666	77	Woods, Good, HSG D
219,666		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	67	0.0224	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
3.8	33	0.1515	0.14		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.39"
1.7	157	0.0955	1.55		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
1.3	90	0.0550	1.17		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.9	92	0.1087	1.65		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
22.2	439	Total			

Subcatchment EDA-4: EDA-4

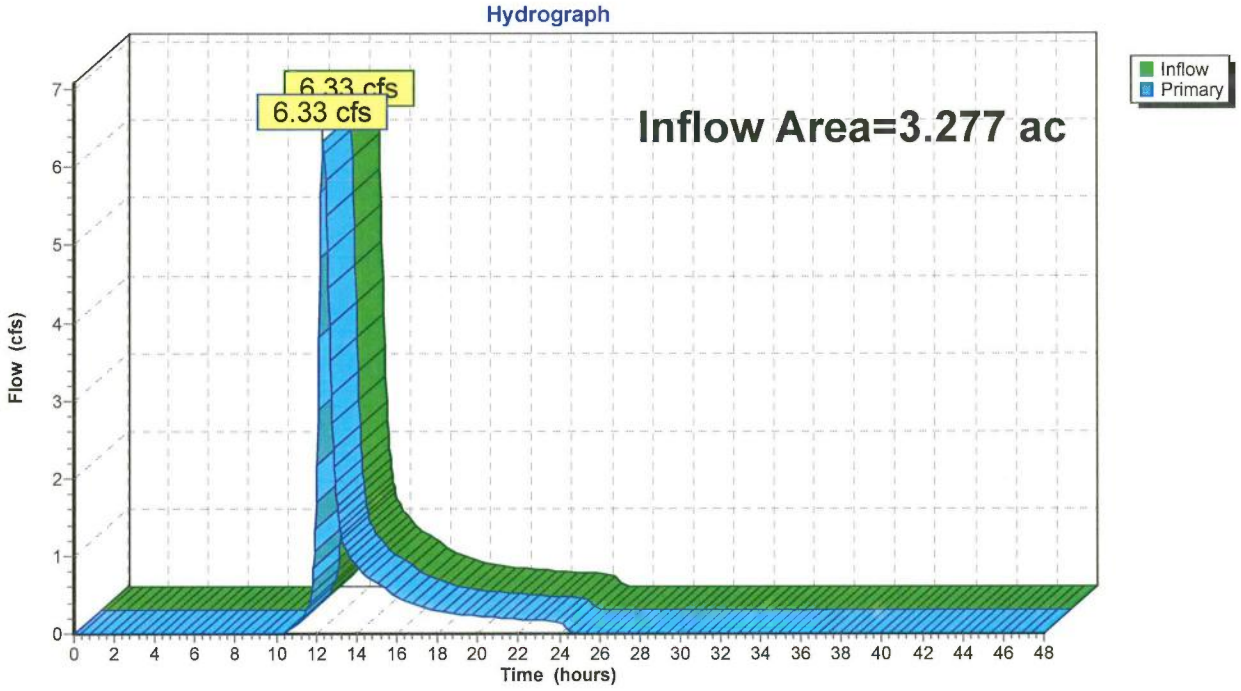


Summary for Link 1L: AP-1

Inflow Area = 3.277 ac, 0.00% Impervious, Inflow Depth = 2.72" for 50-Year event
Inflow = 6.33 cfs @ 12.35 hrs, Volume= 0.742 af
Primary = 6.33 cfs @ 12.35 hrs, Volume= 0.742 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: AP-1

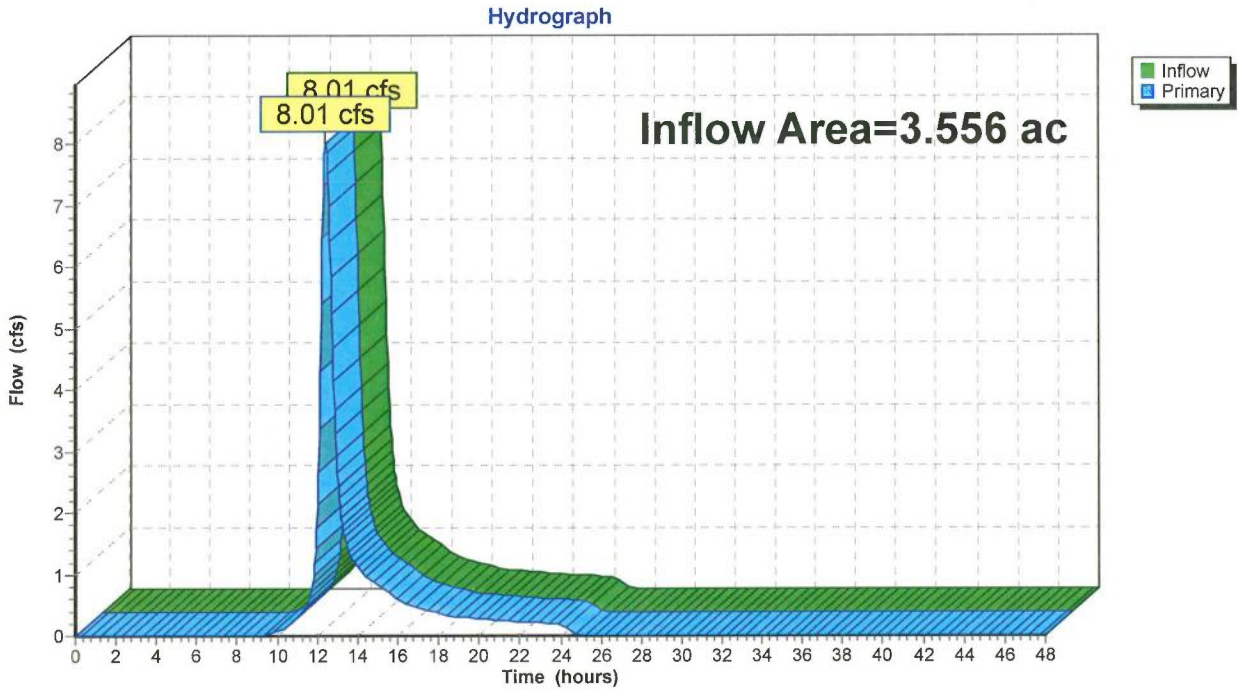


Summary for Link 2L: AP-2

Inflow Area = 3.556 ac, 0.00% Impervious, Inflow Depth = 3.33" for 50-Year event
Inflow = 8.01 cfs @ 12.40 hrs, Volume= 0.987 af
Primary = 8.01 cfs @ 12.40 hrs, Volume= 0.987 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: AP-2

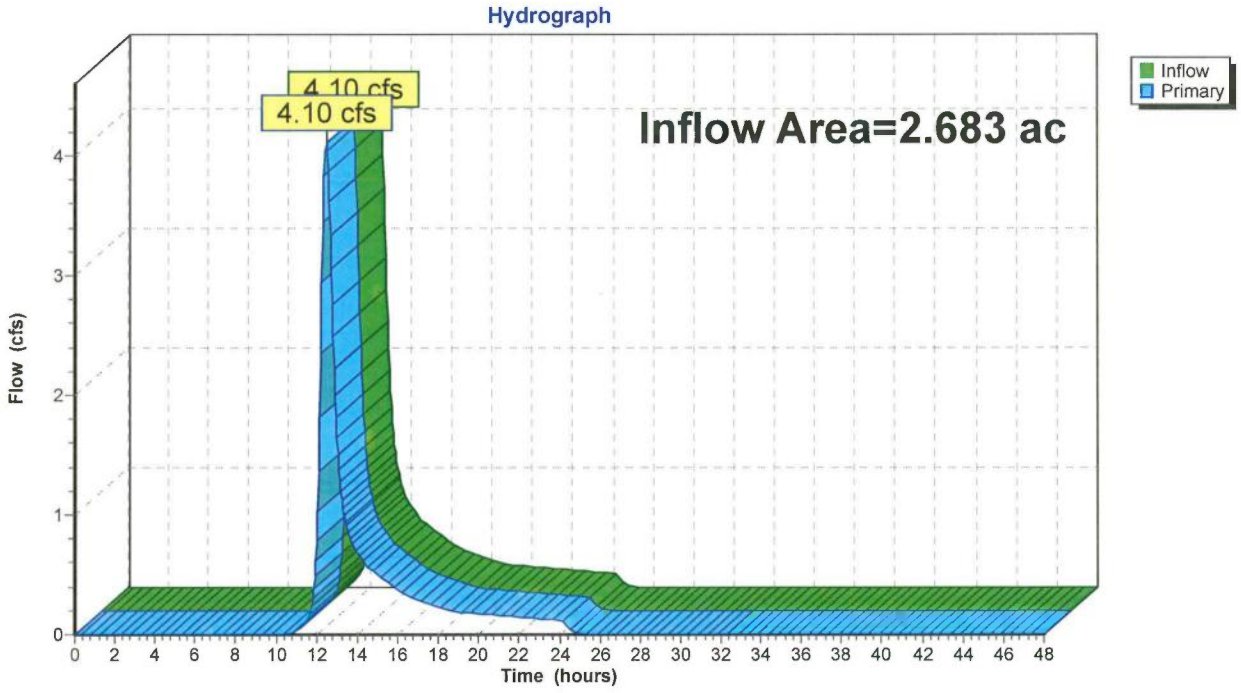


Summary for Link 3L: AP-3

Inflow Area = 2.683 ac, 0.00% Impervious, Inflow Depth = 2.42" for 50-Year event
Inflow = 4.10 cfs @ 12.45 hrs, Volume= 0.541 af
Primary = 4.10 cfs @ 12.45 hrs, Volume= 0.541 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 3L: AP-3

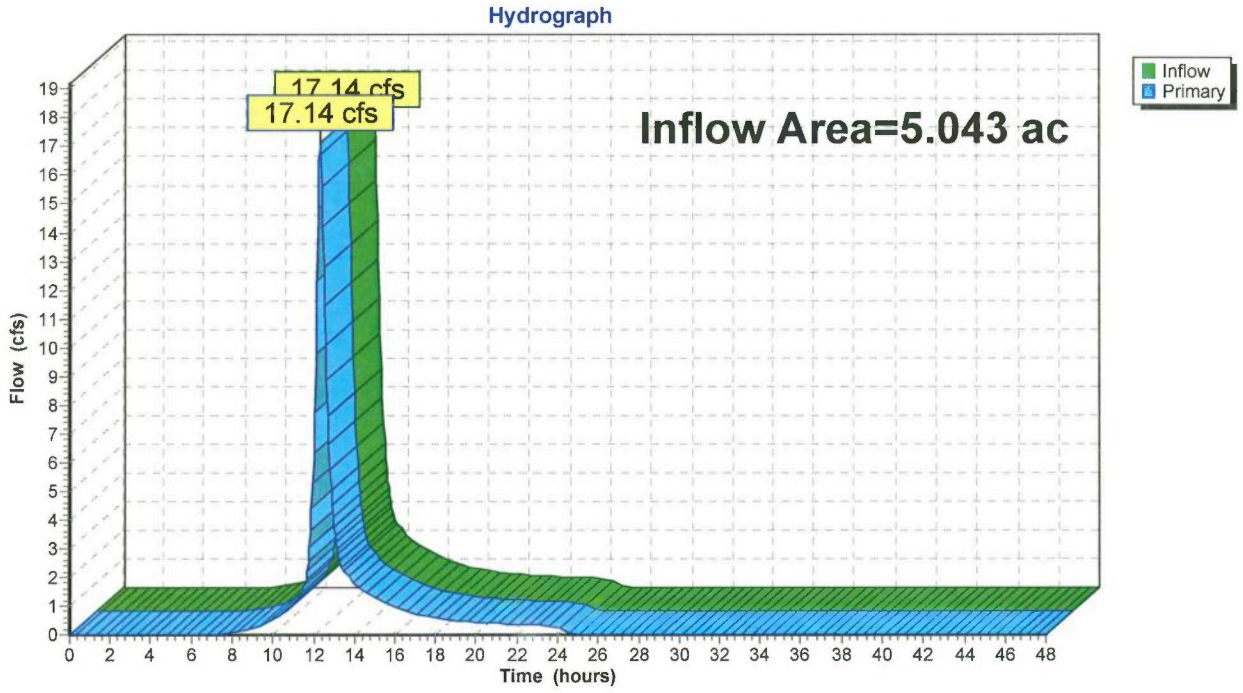


Summary for Link 4L: AP-4

Inflow Area = 5.043 ac, 0.00% Impervious, Inflow Depth = 4.51" for 50-Year event
Inflow = 17.14 cfs @ 12.30 hrs, Volume= 1.895 af
Primary = 17.14 cfs @ 12.30 hrs, Volume= 1.895 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 4L: AP-4



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 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 EDA-1: EDA-1 Runoff Area=142,743 sf 0.00% Impervious Runoff Depth=3.39"
Flow Length=483' Tc=23.7 min CN=60 Runoff=7.99 cfs 0.925 af

Subcatchment EDA-2: EDA-2 Runoff Area=154,894 sf 0.00% Impervious Runoff Depth=4.07"
Flow Length=569' Tc=28.1 min CN=66 Runoff=9.83 cfs 1.205 af

Subcatchment EDA-3: EDA-3 Runoff Area=116,873 sf 0.00% Impervious Runoff Depth=3.05"
Flow Length=516' Tc=29.8 min CN=57 Runoff=5.27 cfs 0.682 af

Subcatchment EDA-4: EDA-4 Runoff Area=219,666 sf 0.00% Impervious Runoff Depth=5.34"
Flow Length=439' Tc=22.2 min CN=77 Runoff=20.22 cfs 2.243 af

Link 1L: AP-1 Inflow=7.99 cfs 0.925 af
Primary=7.99 cfs 0.925 af

Link 2L: AP-2 Inflow=9.83 cfs 1.205 af
Primary=9.83 cfs 1.205 af

Link 3L: AP-3 Inflow=5.27 cfs 0.682 af
Primary=5.27 cfs 0.682 af

Link 4L: AP-4 Inflow=20.22 cfs 2.243 af
Primary=20.22 cfs 2.243 af

Total Runoff Area = 14.559 ac Runoff Volume = 5.055 af Average Runoff Depth = 4.17"
100.00% Pervious = 14.559 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment EDA-1: EDA-1

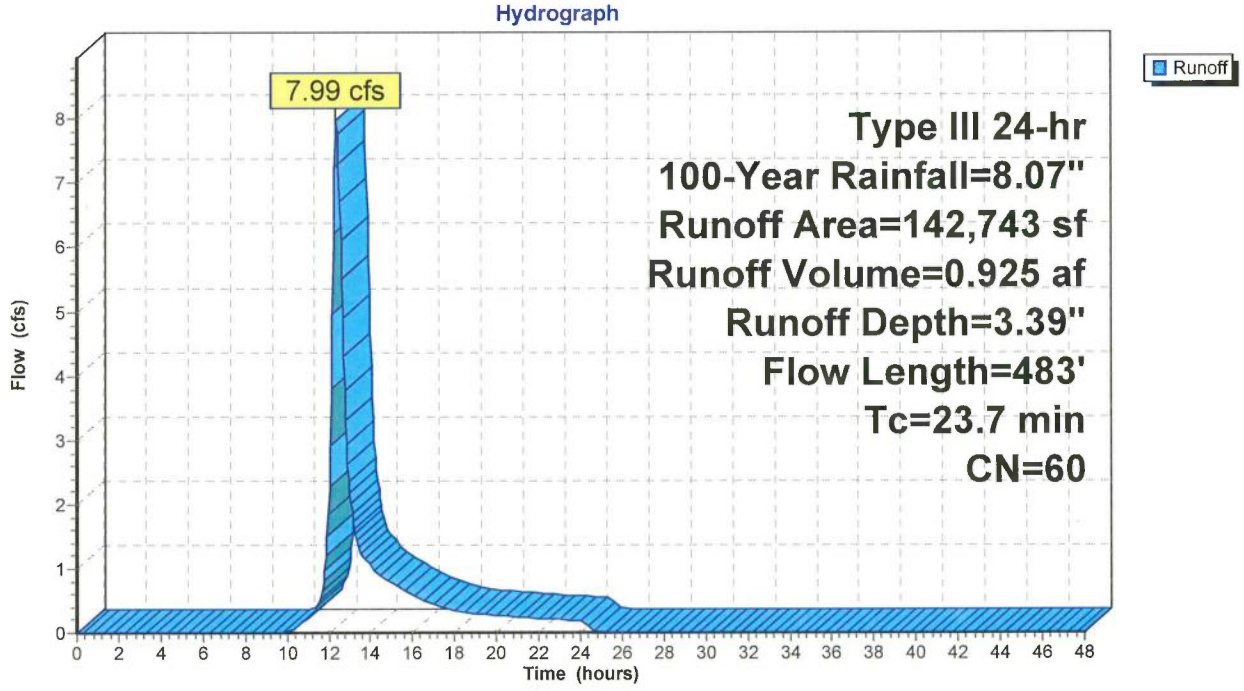
Runoff = 7.99 cfs @ 12.34 hrs, Volume= 0.925 af, Depth= 3.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
95,903	55	Woods, Good, HSG B
46,840	70	Woods, Good, HSG C
142,743	60	Weighted Average
142,743		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.7	100	0.0350	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
6.5	343	0.0306	0.87		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.5	40	0.0750	1.37		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
23.7	483	Total			

Subcatchment EDA-1: EDA-1



Summary for Subcatchment EDA-2: EDA-2

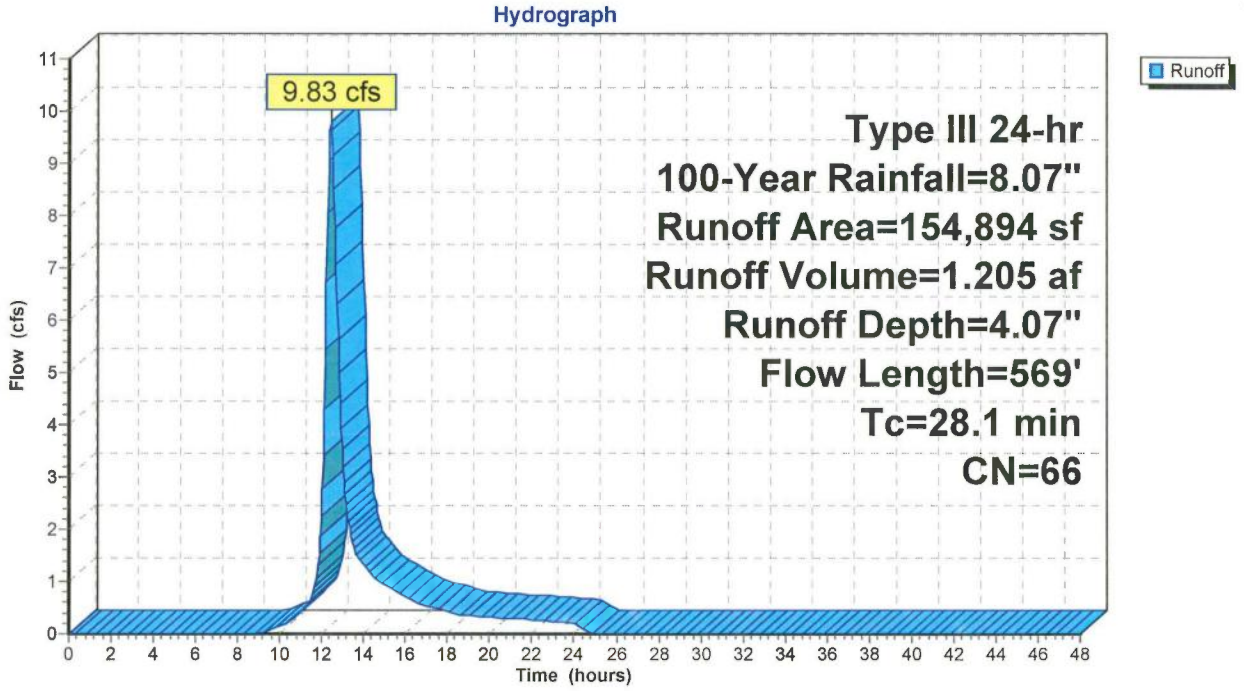
Runoff = 9.83 cfs @ 12.40 hrs, Volume= 1.205 af, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
72,319	55	Woods, Good, HSG B
16,039	70	Woods, Good, HSG C
54,741	77	Woods, Good, HSG D
11,795	73	Brush, Good, HSG D
154,894	66	Weighted Average
154,894		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	100	0.0200	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
4.0	163	0.0184	0.68		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.3	117	0.0855	1.46		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.9	63	0.0300	1.21		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
1.0	126	0.0873	2.07		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
28.1	569	Total			

Subcatchment EDA-2: EDA-2



Summary for Subcatchment EDA-3: EDA-3

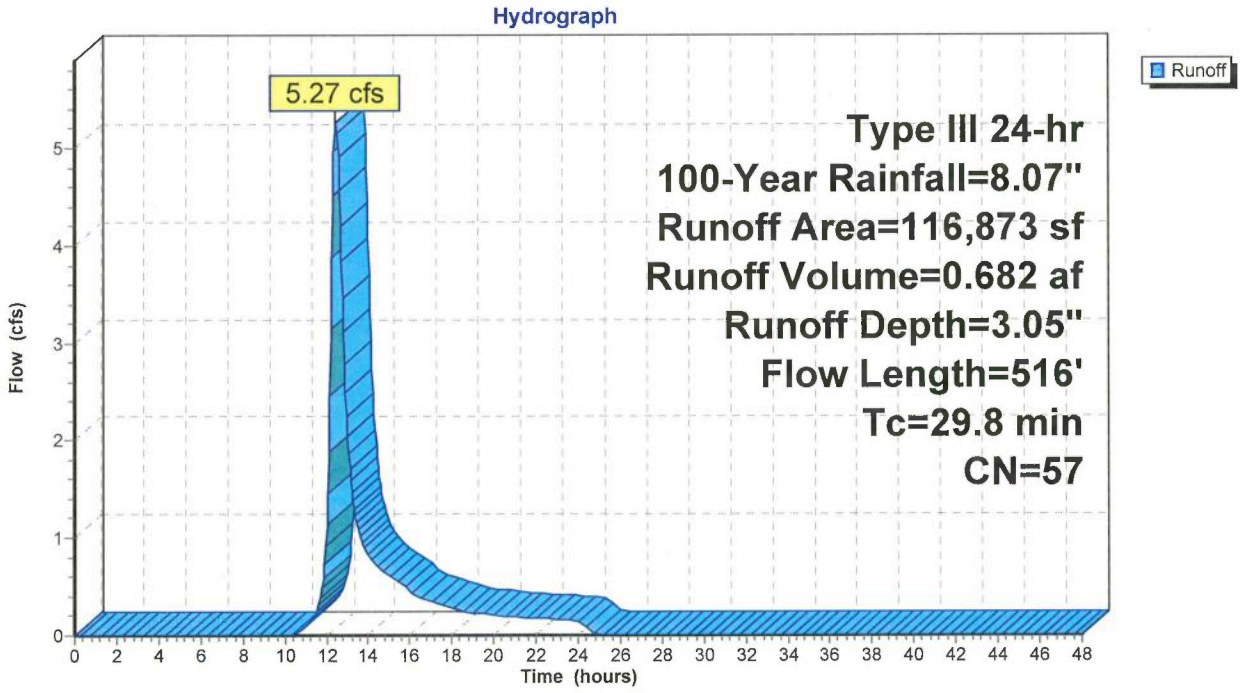
Runoff = 5.27 cfs @ 12.44 hrs, Volume= 0.682 af, Depth= 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
108,205	55	Woods, Good, HSG B
8,668	77	Woods, Good, HSG D
116,873	57	Weighted Average
116,873		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.4	100	0.0150	0.07		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
4.1	252	0.0417	1.02		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.9	124	0.0480	1.10		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
0.4	40	0.1250	1.77		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
29.8	516	Total			

Subcatchment EDA-3: EDA-3



Summary for Subcatchment EDA-4: EDA-4

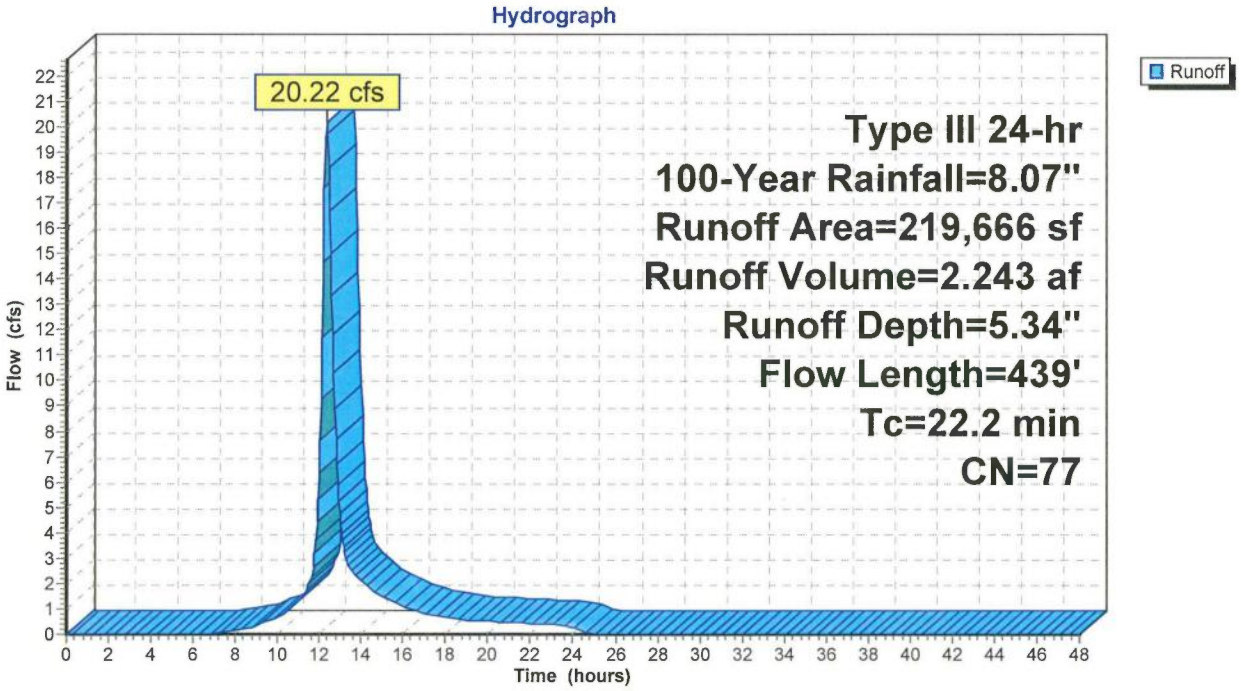
Runoff = 20.22 cfs @ 12.30 hrs, Volume= 2.243 af, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
219,666	77	Woods, Good, HSG D
219,666		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	67	0.0224	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
3.8	33	0.1515	0.14		**Sheet Flow, B-C** Woods: Light underbrush n= 0.400 P2= 3.39"
1.7	157	0.0955	1.55		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
1.3	90	0.0550	1.17		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
0.9	92	0.1087	1.65		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
22.2	439	Total			

Subcatchment EDA-4: EDA-4

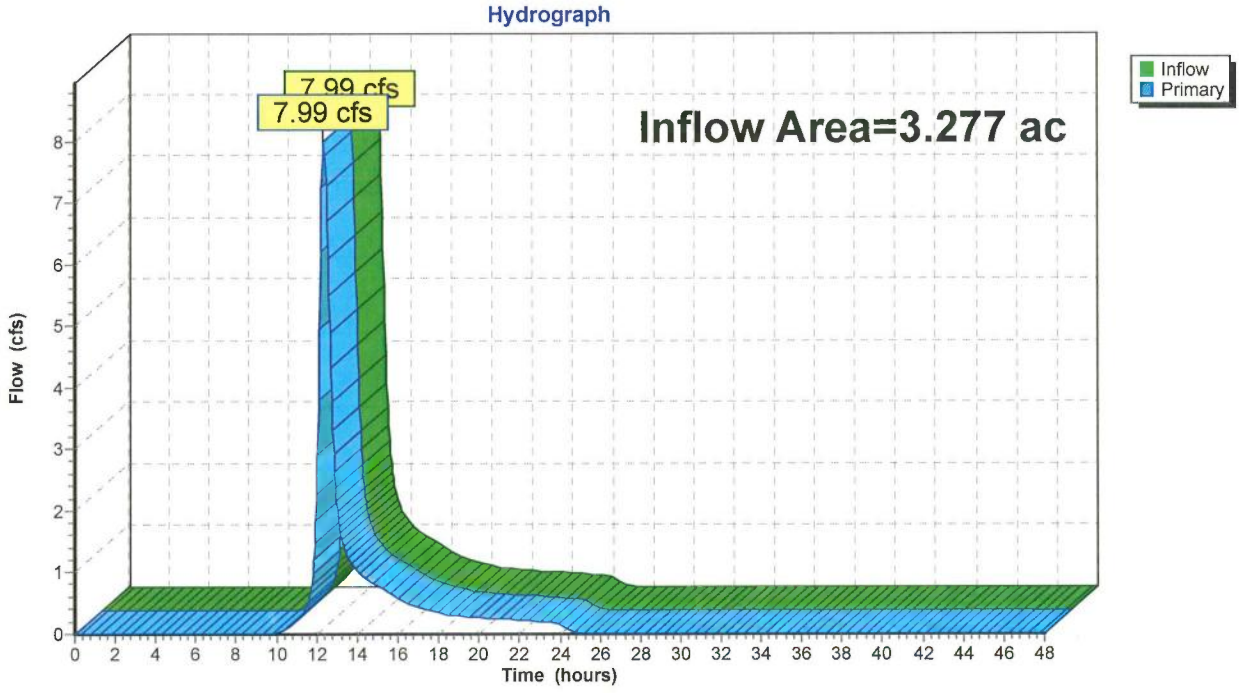


Summary for Link 1L: AP-1

Inflow Area = 3.277 ac, 0.00% Impervious, Inflow Depth = 3.39" for 100-Year event
Inflow = 7.99 cfs @ 12.34 hrs, Volume= 0.925 af
Primary = 7.99 cfs @ 12.34 hrs, Volume= 0.925 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: AP-1

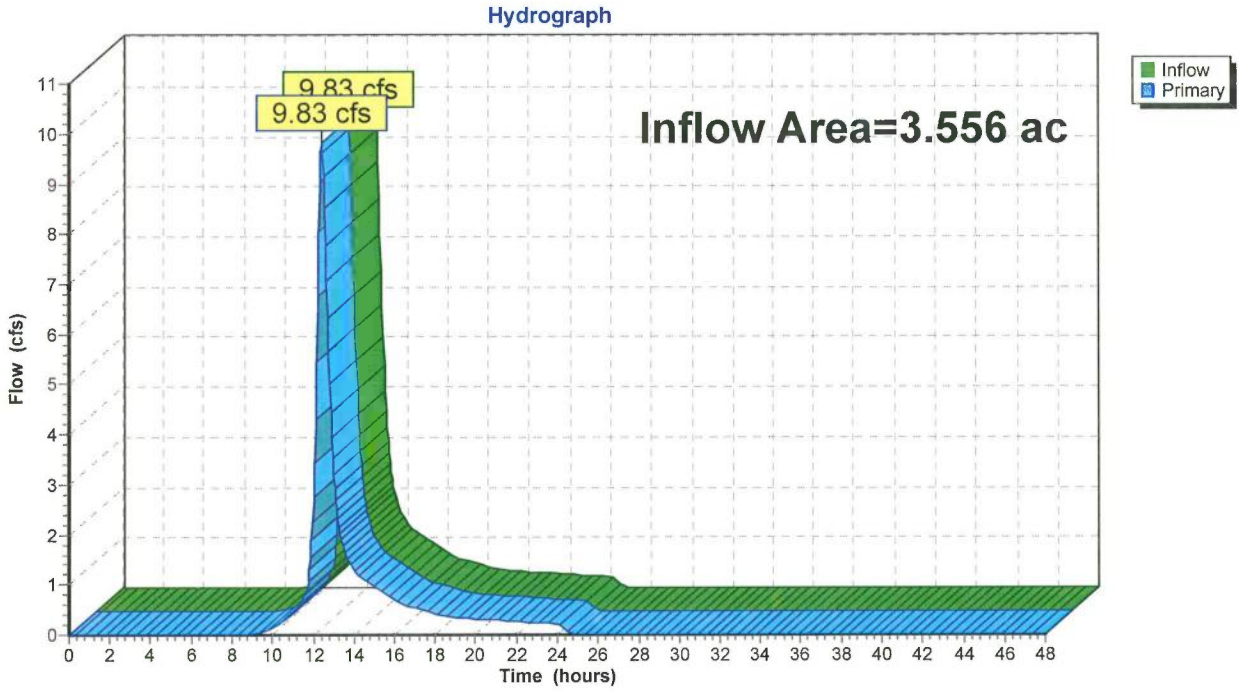


Summary for Link 2L: AP-2

Inflow Area = 3.556 ac, 0.00% Impervious, Inflow Depth = 4.07" for 100-Year event
Inflow = 9.83 cfs @ 12.40 hrs, Volume= 1.205 af
Primary = 9.83 cfs @ 12.40 hrs, Volume= 1.205 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: AP-2

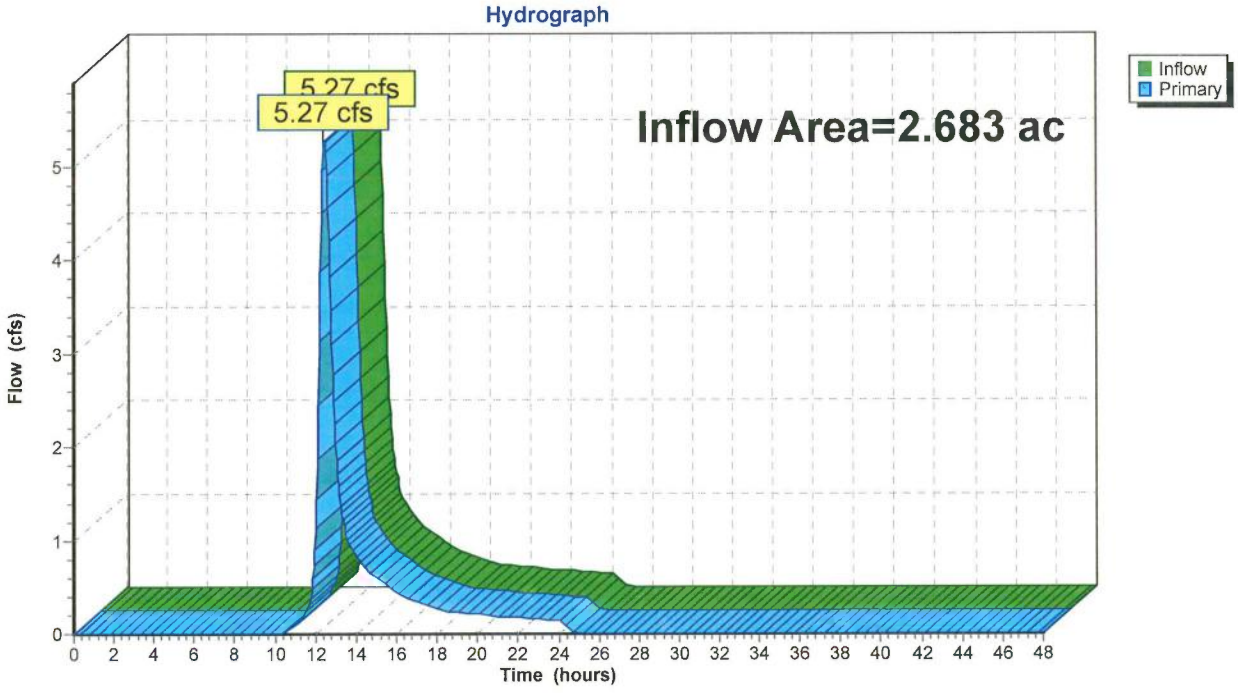


Summary for Link 3L: AP-3

Inflow Area = 2.683 ac, 0.00% Impervious, Inflow Depth = 3.05" for 100-Year event
Inflow = 5.27 cfs @ 12.44 hrs, Volume= 0.682 af
Primary = 5.27 cfs @ 12.44 hrs, Volume= 0.682 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 3L: AP-3

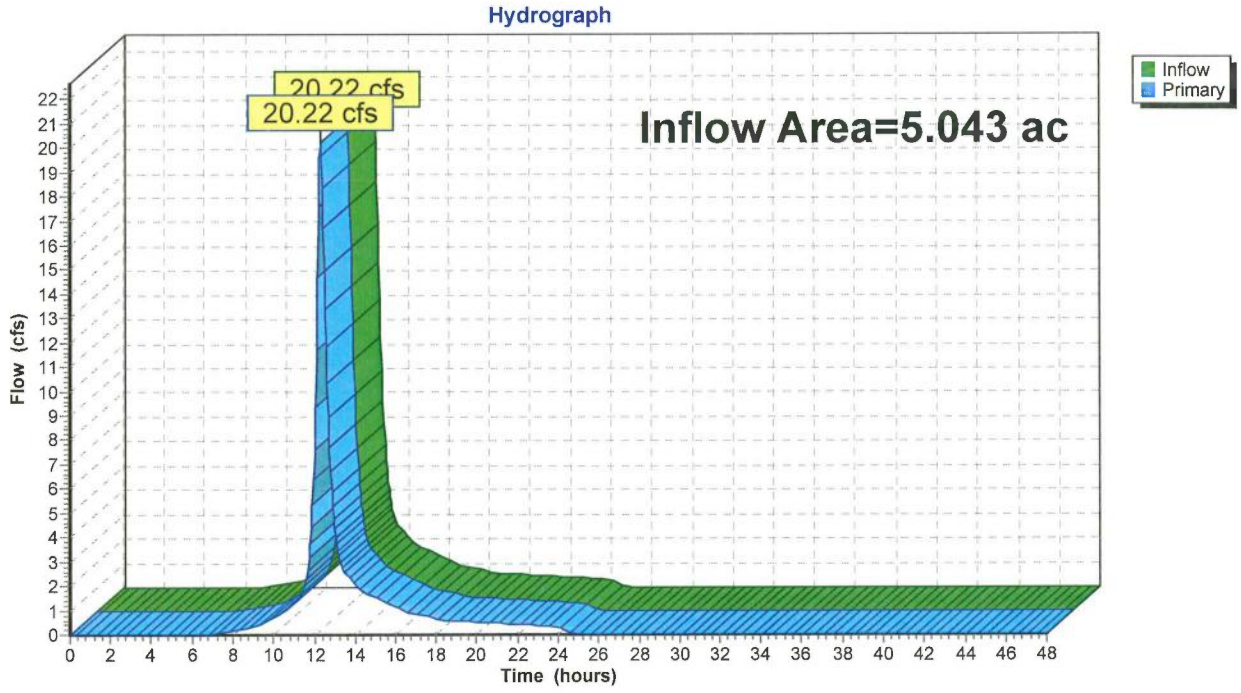


Summary for Link 4L: AP-4

Inflow Area = 5.043 ac, 0.00% Impervious, Inflow Depth = 5.34" for 100-Year event
Inflow = 20.22 cfs @ 12.30 hrs, Volume= 2.243 af
Primary = 20.22 cfs @ 12.30 hrs, Volume= 2.243 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

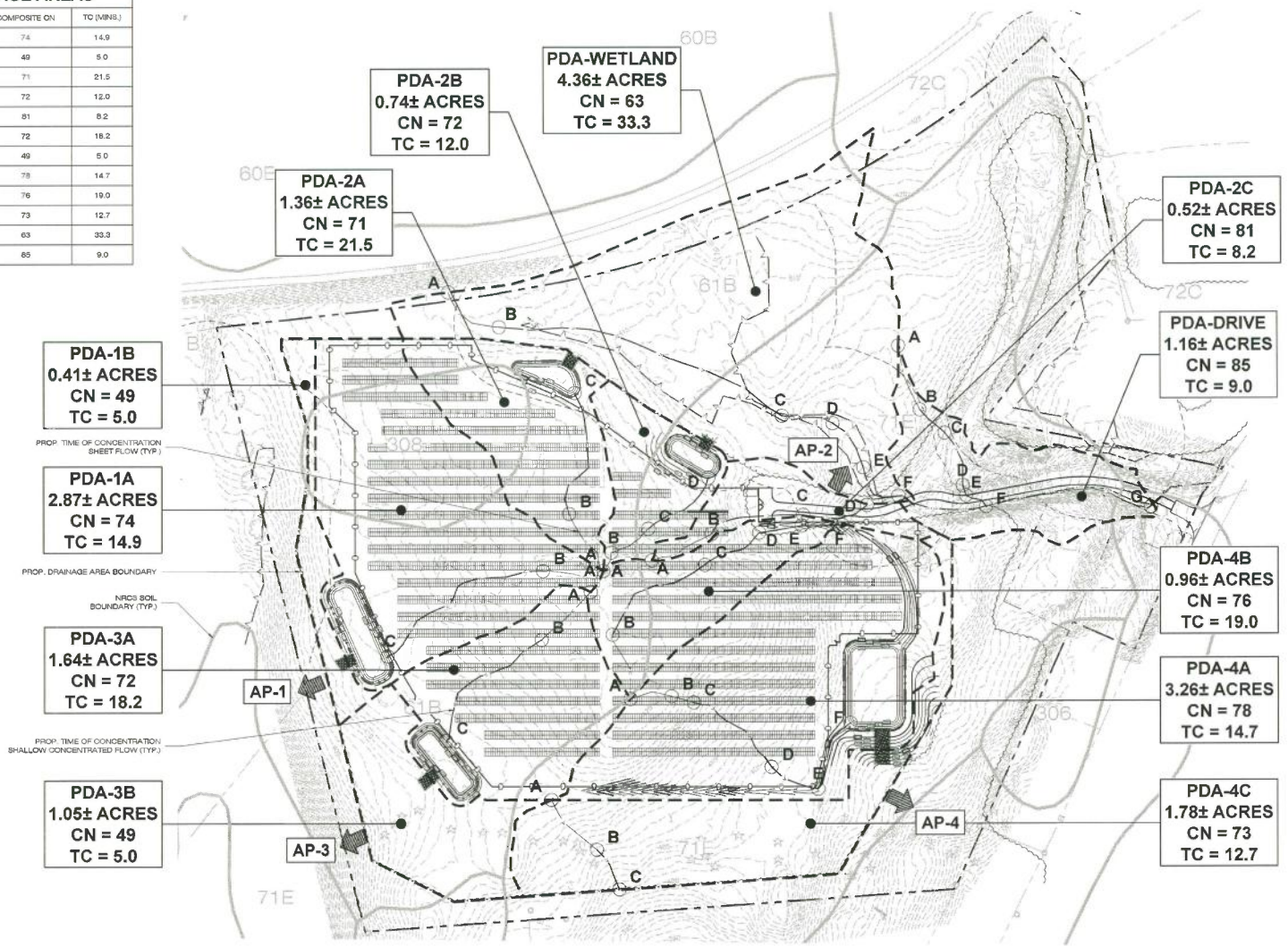
Link 4L: AP-4



APPENDIX C: PROPOSED DRAINAGE AREA MAP (PDA-1) & HYDROLOGIC COMPUTATION (HYDROCAD)

PROPOSED DRAINAGE AREAS

	TOTAL AREA (ACRES)	COMPOSITE CN	TC (MINS.)
PDA-1A	2.87±	74	14.9
PDA-1B	0.41±	49	5.0
PDA-2A	1.36±	71	21.5
PDA-2B	0.74±	72	12.0
PDA-2C	0.52±	81	8.2
PDA-3A	1.64±	72	18.2
PDA-3B	1.05±	49	5.0
PDA-4A	3.26±	78	14.7
PDA-4B	0.96±	76	19.0
PDA-4C	1.78±	73	12.7
PDA-WETLAND	4.36±	63	33.3
PDA-DRIVE	1.16±	85	9.0



1 PDA-1 **PROPOSED DRAINAGE AREA MAP**
SCALE : 1" = 80'-0"

(IN FEET) 1 inch = 80 ft.

CITRINE
55 GREENS FARMS ROAD
WESTPORT, CT 06880
OFFICE: (203)-557-5554

ALL-POINTS TECHNOLOGY CORPORATION
3 SADDLEBROOK DRIVE PHONE (860)-663-1697
KILLINGWORTH, CT 06419 FAX: (860)-663-0935
WWW.ALLPOINTSTECH.COM

CONCEPT

NO	DATE	REVISION
0	02/14/20	FOR REVIEW: BJP
1		
2		
3		
4		
5		
6		

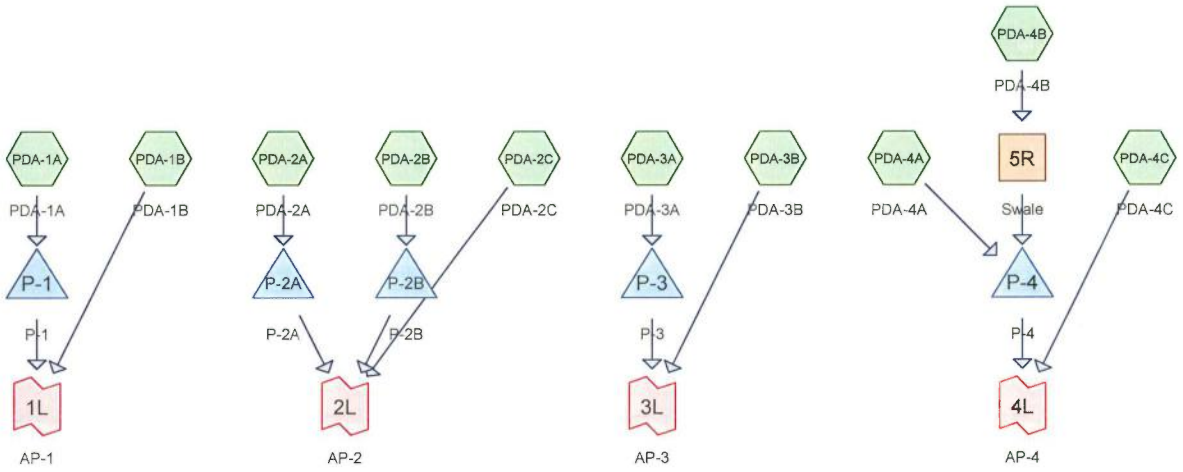
DESIGN PROFESSIONAL OF RECORD
PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 3 SADDLEBROOK DRIVE KILLINGWORTH, CT 06419

OWNER: SKINNER STREET PROPERTIES LLC
ADDRESS: 9 SEQUONIA TRAIL EAST HAMPTON, CT 06424

EAST HAMPTON INDUSTRIAL PARK GROUND MOUNT
SITE ADDRESS: 46 SKINNER STREET EAST HAMPTON, CT 06424
APT FILING NUMBER: CT567110
DRAWN BY: CSH
DATE: 02/14/20 CHECKED BY: BJP

SHEET TITLE:
PROPOSED DRAINAGE AREA MAP

SHEET NUMBER:
PDA-1



Subcat Reach Pond Link

Routing Diagram for CT567110_EastHampton-PR
Prepared by {enter your company name here}, Printed 2/14/2020

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.558	48	Brush, Good, HSG B (PDA-1B, PDA-2A, PDA-2B, PDA-3B)
0.033	65	Brush, Good, HSG C (PDA-1B)
1.949	73	Brush, Good, HSG D (PDA-2B, PDA-3B, PDA-4A, PDA-4C)
0.081	96	Gravel surface, HSG D (PDA-2C, PDA-4B)
4.788	71	Meadow, non-grazed, HSG C (PDA-1A, PDA-2A, PDA-2B, PDA-3A, PDA-4B)
6.114	78	Meadow, non-grazed, HSG D (PDA-1A, PDA-2A, PDA-2B, PDA-2C, PDA-3A, PDA-4A, PDA-4B)
0.045	77	Woods, Good, HSG D (PDA-2C)
14.567	**72**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
1.558	HSG B	PDA-1B, PDA-2A, PDA-2B, PDA-3B
4.821	HSG C	PDA-1A, PDA-1B, PDA-2A, PDA-2B, PDA-3A, PDA-4B
8.189	HSG D	PDA-1A, PDA-2A, PDA-2B, PDA-2C, PDA-3A, PDA-3B, PDA-4A, PDA-4B, PDA-4C
0.000	Other	
14.567		**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	1.558	0.033	1.949	0.000	3.540	Brush, Good	PDA-1B, PDA-2A, PDA-2B, PDA-3B, PDA-4A, PDA-4C
0.000	0.000	0.000	0.081	0.000	0.081	Gravel surface	PDA-2C, PDA-4B
0.000	0.000	4.788	6.114	0.000	10.901	Meadow, non-grazed	PDA-1A, PDA-2A, PDA-2B, PDA-2C, PDA-3A, PDA-4A, PDA-4B
0.000	0.000	0.000	0.045	0.000	0.045	Woods, Good	PDA-2C
0.000	**1.558**	**4.821**	**8.189**	**0.000**	**14.567**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 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 PDA-1A: PDA-1A Runoff Area=124,842 sf 0.00% Impervious Runoff Depth=1.16"
Flow Length=381' Tc=14.9 min CN=74 Runoff=2.81 cfs 0.278 af

Subcatchment PDA-1B: PDA-1B Runoff Area=17,880 sf 0.00% Impervious Runoff Depth=0.15"
Tc=5.0 min CN=49 Runoff=0.01 cfs 0.005 af

Subcatchment PDA-2A: PDA-2A Runoff Area=59,006 sf 0.00% Impervious Runoff Depth=0.99"
Flow Length=275' Tc=21.5 min CN=71 Runoff=0.95 cfs 0.112 af

Subcatchment PDA-2B: PDA-2B Runoff Area=32,304 sf 0.00% Impervious Runoff Depth=1.05"
Flow Length=219' Tc=12.0 min CN=72 Runoff=0.69 cfs 0.065 af

Subcatchment PDA-2C: PDA-2C Runoff Area=22,584 sf 0.00% Impervious Runoff Depth=1.62"
Flow Length=346' Tc=8.2 min CN=81 Runoff=0.90 cfs 0.070 af

Subcatchment PDA-3A: PDA-3A Runoff Area=71,342 sf 0.00% Impervious Runoff Depth=1.05"
Flow Length=322' Tc=18.2 min CN=72 Runoff=1.31 cfs 0.143 af

Subcatchment PDA-3B: PDA-3B Runoff Area=45,532 sf 0.00% Impervious Runoff Depth=0.15"
Tc=5.0 min CN=49 Runoff=0.03 cfs 0.013 af

Subcatchment PDA-4A: PDA-4A Runoff Area=141,773 sf 0.00% Impervious Runoff Depth=1.41"
Flow Length=432' Tc=14.7 min CN=78 Runoff=4.02 cfs 0.384 af

Subcatchment PDA-4B: PDA-4B Runoff Area=41,704 sf 0.00% Impervious Runoff Depth=1.29"
Flow Length=487' Tc=19.0 min CN=76 Runoff=0.96 cfs 0.103 af

Subcatchment PDA-4C: PDA-4C Runoff Area=77,592 sf 0.00% Impervious Runoff Depth=1.11"
Flow Length=168' Tc=12.7 min CN=73 Runoff=1.74 cfs 0.164 af

Reach 5R: Swale Avg. Flow Depth=0.21' Max Vel=2.80 fps Inflow=0.96 cfs 0.103 af
n=0.025 L=280.0' S=0.0286 '/' Capacity=26.85 cfs Outflow=0.94 cfs 0.103 af

Pond P-1: P-1 Peak Elev=411.81' Storage=3,660 cf Inflow=2.81 cfs 0.278 af
Discarded=0.57 cfs 0.278 af Primary=0.00 cfs 0.000 af Outflow=0.57 cfs 0.278 af

Pond P-2A: P-2A Peak Elev=417.86' Storage=1,443 cf Inflow=0.95 cfs 0.112 af
Discarded=0.22 cfs 0.112 af Primary=0.00 cfs 0.000 af Outflow=0.22 cfs 0.112 af

Pond P-2B: P-2B Peak Elev=412.48' Storage=696 cf Inflow=0.69 cfs 0.065 af
Discarded=0.18 cfs 0.065 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.065 af

Pond P-3: P-3 Peak Elev=409.61' Storage=1,664 cf Inflow=1.31 cfs 0.143 af
Discarded=0.34 cfs 0.143 af Primary=0.00 cfs 0.000 af Outflow=0.34 cfs 0.143 af

Pond P-4: P-4 Peak Elev=397.73' Storage=14,233 cf Inflow=4.77 cfs 0.486 af
Discarded=0.17 cfs 0.478 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.478 af

Link 1L: AP-1 Inflow=0.01 cfs 0.005 af
Primary=0.01 cfs 0.005 af

Link 2L: AP-2 Inflow=0.90 cfs 0.070 af
Primary=0.90 cfs 0.070 af

Link 3L: AP-3 Inflow=0.03 cfs 0.013 af
Primary=0.03 cfs 0.013 af

Link 4L: AP-4 Inflow=1.74 cfs 0.164 af
Primary=1.74 cfs 0.164 af

Total Runoff Area = 14.567 ac Runoff Volume = 1.337 af Average Runoff Depth = 1.10"
100.00% Pervious = 14.567 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment PDA-1A: PDA-1A

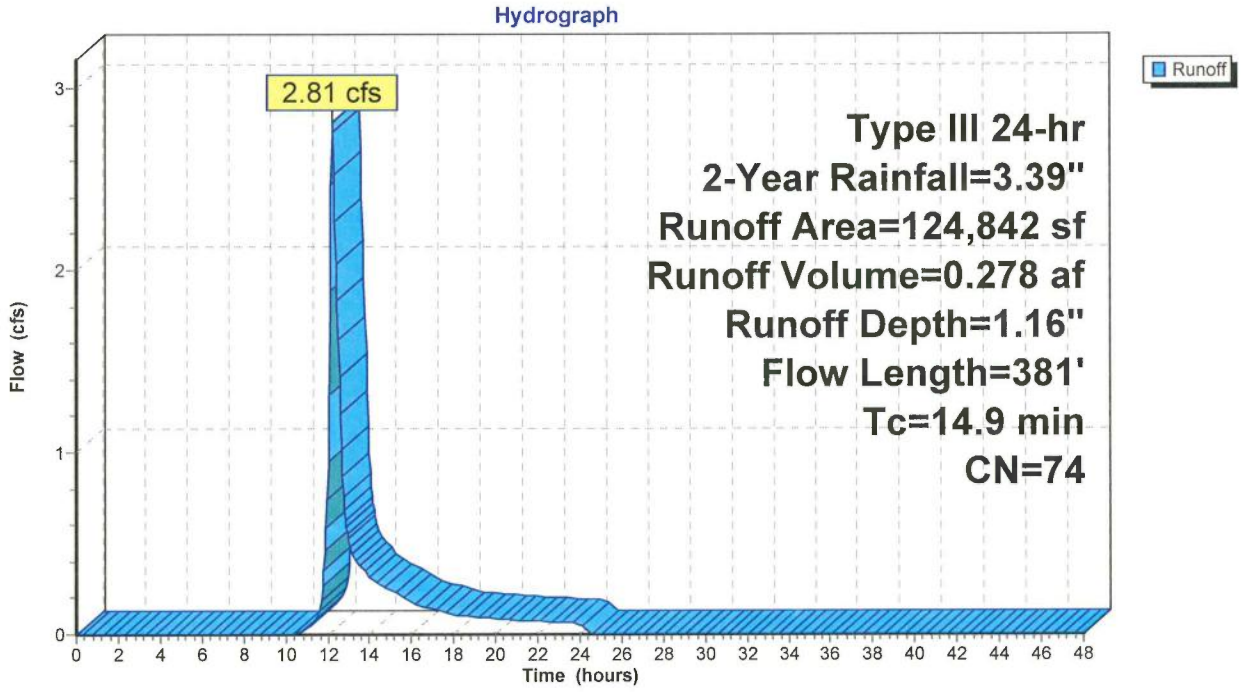
Runoff = 2.81 cfs @ 12.22 hrs, Volume= 0.278 af, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
79,434	71	Meadow, non-grazed, HSG C
45,408	78	Meadow, non-grazed, HSG D
124,842	74	Weighted Average
124,842		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.0350	0.15		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
3.8	281	0.0306	1.22		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
14.9	381	Total			

Subcatchment PDA-1A: PDA-1A



Summary for Subcatchment PDA-1B: PDA-1B

[49] Hint: Tc<2dt may require smaller dt

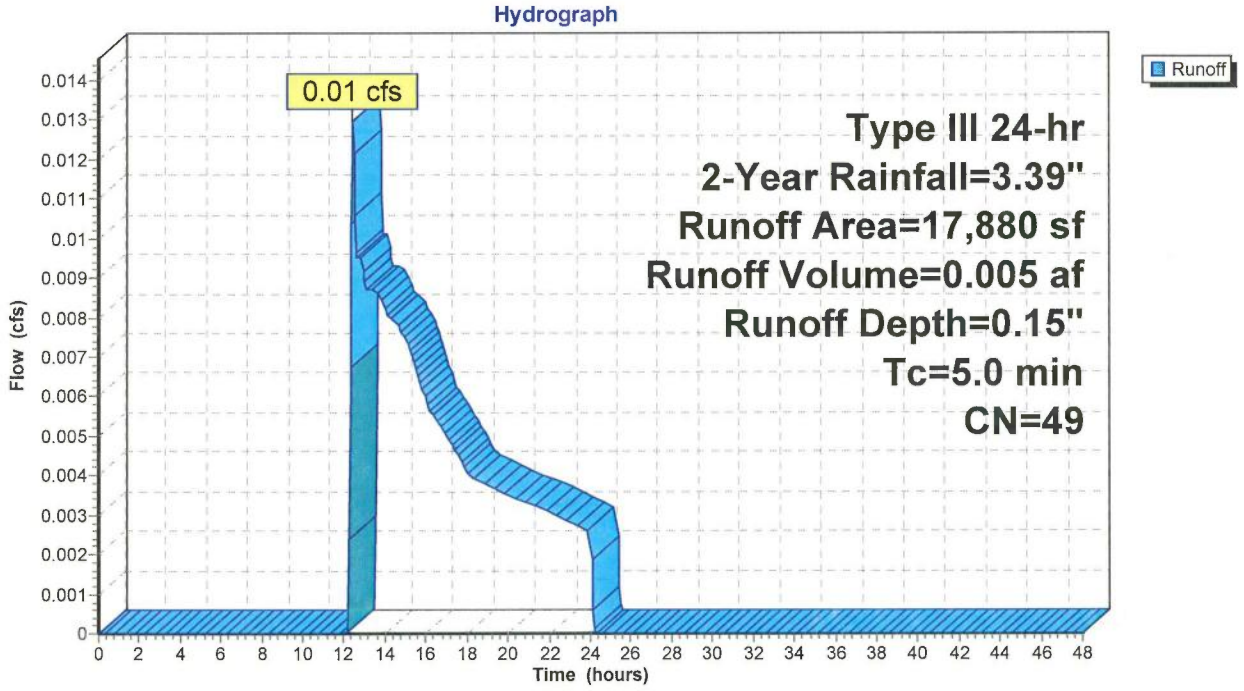
Runoff = 0.01 cfs @ 12.44 hrs, Volume= 0.005 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
16,448	48	Brush, Good, HSG B
1,432	65	Brush, Good, HSG C
17,880	49	Weighted Average
17,880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PDA-1B: PDA-1B



Summary for Subcatchment PDA-2A: PDA-2A

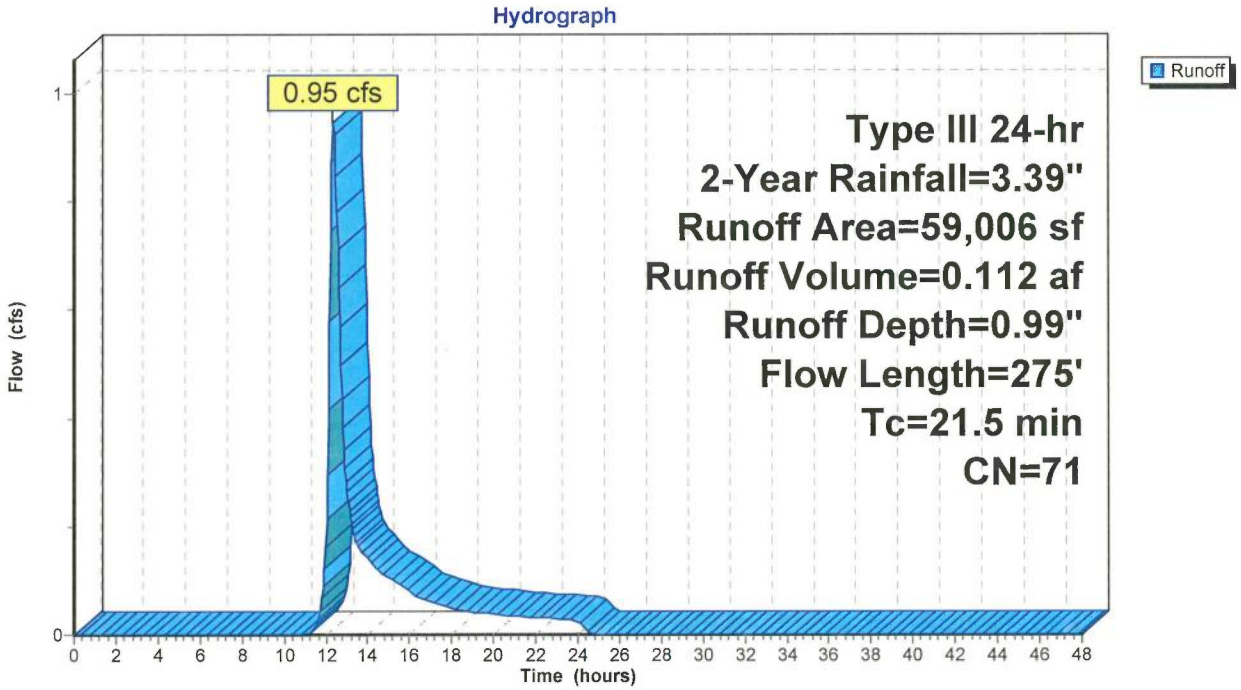
Runoff = 0.95 cfs @ 12.33 hrs, Volume= 0.112 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
39,007	71	Meadow, non-grazed, HSG C
16,039	78	Meadow, non-grazed, HSG D
3,960	48	Brush, Good, HSG B
59,006	71	Weighted Average
59,006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
16.0	70	0.0069	0.07		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
2.9	175	0.0211	1.02		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
21.5	275	Total			

Subcatchment PDA-2A: PDA-2A



Summary for Subcatchment PDA-2B: PDA-2B

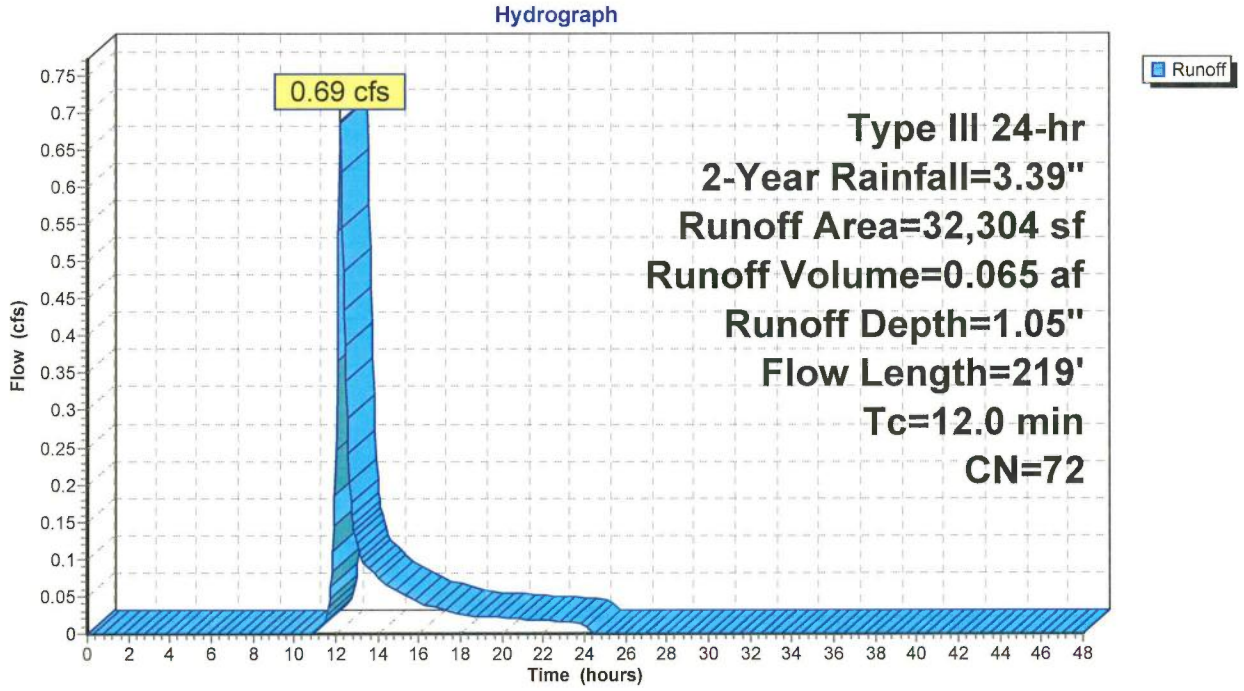
Runoff = 0.69 cfs @ 12.18 hrs, Volume= 0.065 af, Depth= 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
12,043	71	Meadow, non-grazed, HSG C
16,171	78	Meadow, non-grazed, HSG D
4,020	48	Brush, Good, HSG B
70	73	Brush, Good, HSG D
32,304	72	Weighted Average
32,304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
8.3	70	0.0357	0.14		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
1.1	119	0.0630	1.76		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
12.0	219	Total			

Subcatchment PDA-2B: PDA-2B



Summary for Subcatchment PDA-2C: PDA-2C

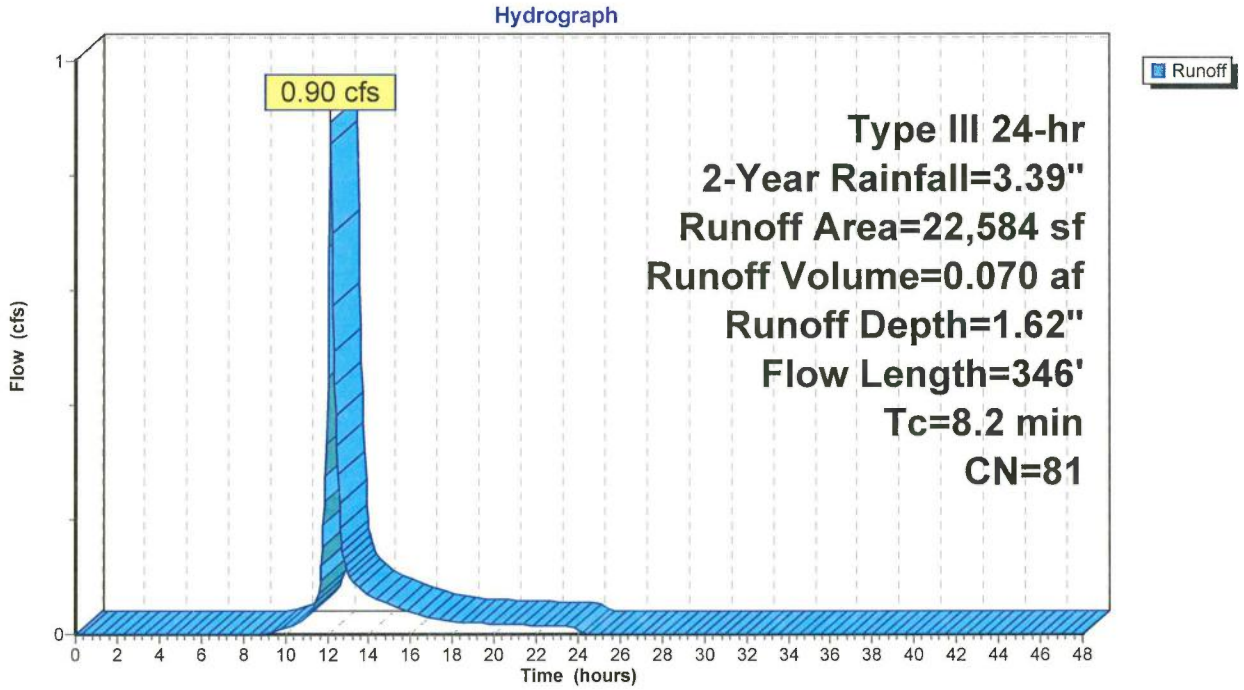
Runoff = 0.90 cfs @ 12.12 hrs, Volume= 0.070 af, Depth= 1.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
1,977	77	Woods, Good, HSG D
3,486	96	Gravel surface, HSG D
17,121	78	Meadow, non-grazed, HSG D
22,584	81	Weighted Average
22,584		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0600	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.39"
1.3	146	0.0684	1.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.8	100	0.0854	2.05		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
8.2	346	Total			

Subcatchment PDA-2C: PDA-2C



Summary for Subcatchment PDA-3A: PDA-3A

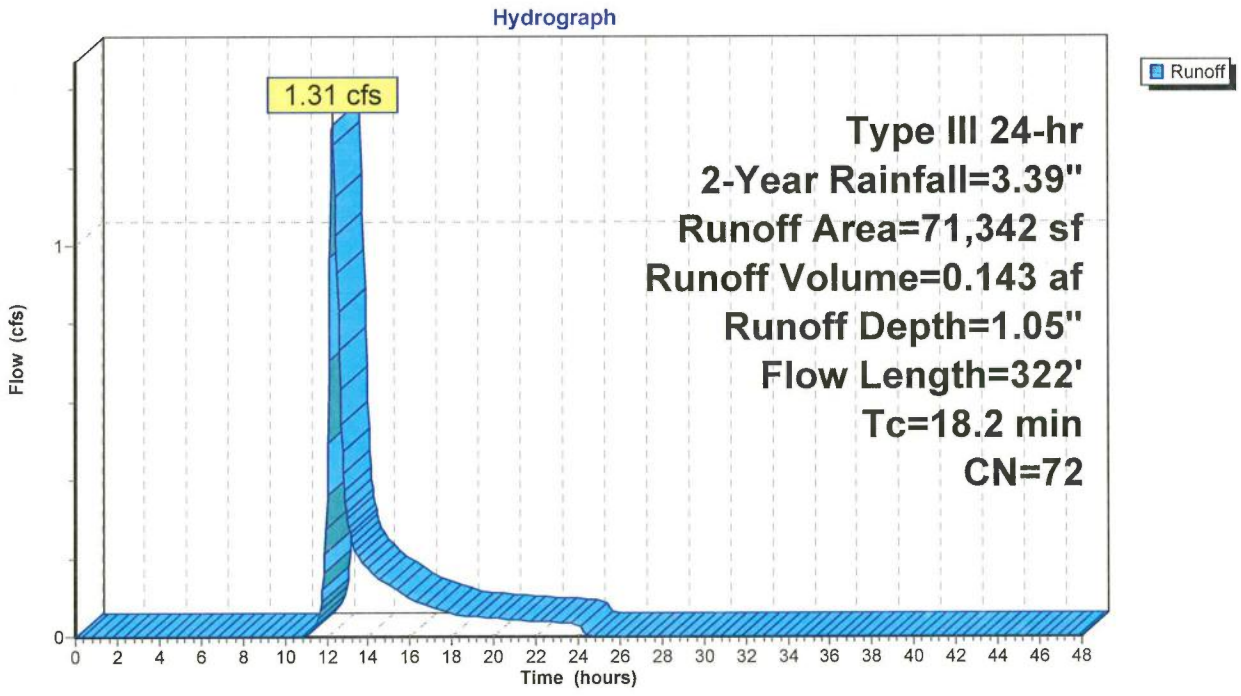
Runoff = 1.31 cfs @ 12.27 hrs, Volume= 0.143 af, Depth= 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
64,777	71	Meadow, non-grazed, HSG C
6,565	78	Meadow, non-grazed, HSG D
71,342	72	Weighted Average
71,342		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0150	0.11		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
2.6	222	0.0417	1.43		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
18.2	322	Total			

Subcatchment PDA-3A: PDA-3A



Summary for Subcatchment PDA-3B: PDA-3B

[49] Hint: Tc<2dt may require smaller dt

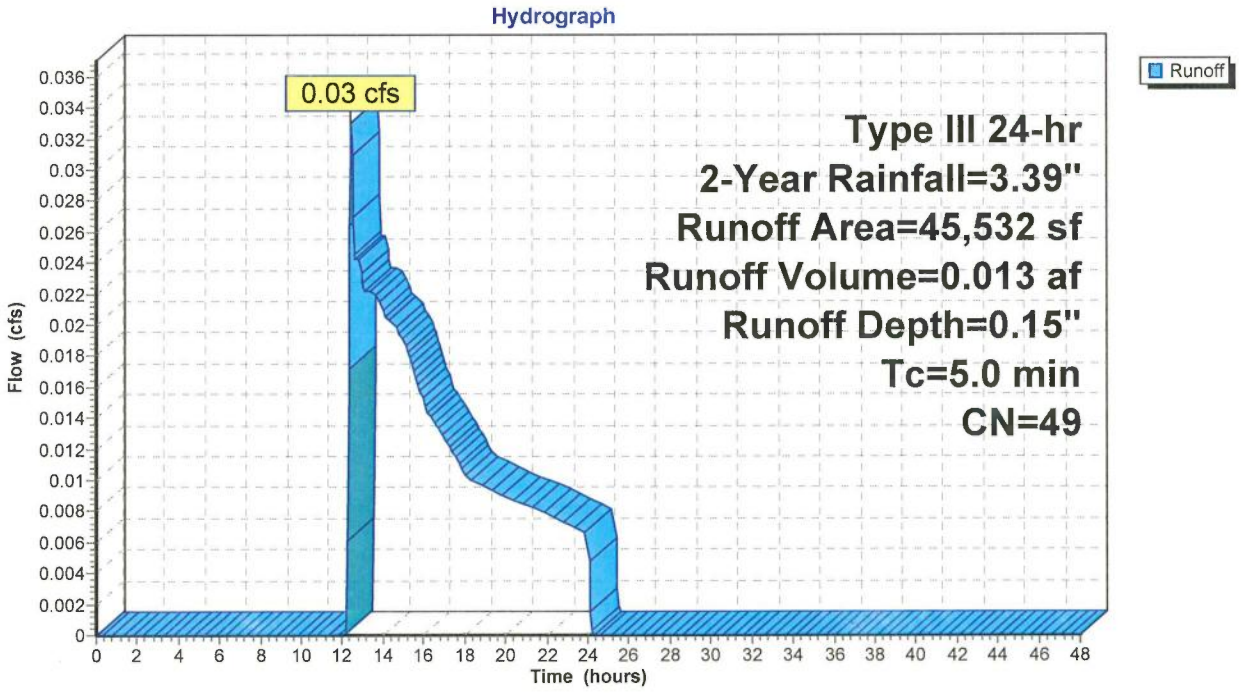
Runoff = 0.03 cfs @ 12.44 hrs, Volume= 0.013 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
43,429	48	Brush, Good, HSG B
2,103	73	Brush, Good, HSG D
45,532	49	Weighted Average
45,532		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PDA-3B: PDA-3B



Summary for Subcatchment PDA-4A: PDA-4A

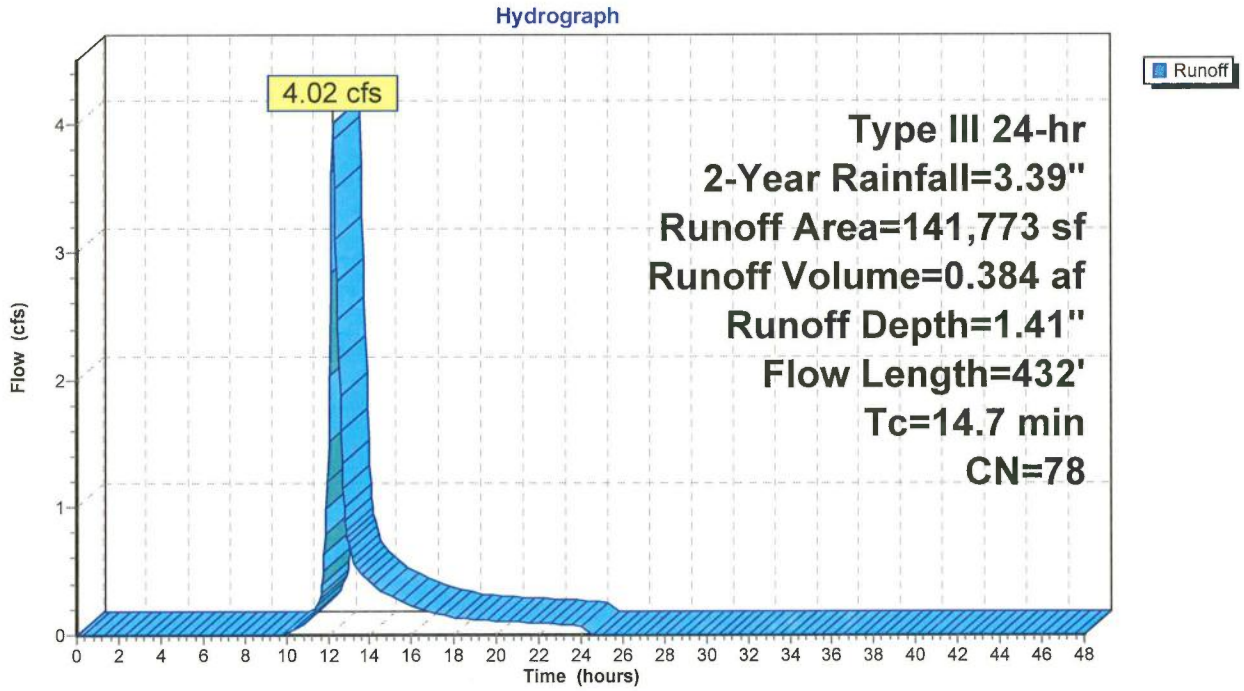
Runoff = 4.02 cfs @ 12.21 hrs, Volume= 0.384 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
136,646	78	Meadow, non-grazed, HSG D
5,127	73	Brush, Good, HSG D
141,773	78	Weighted Average
141,773		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	67	0.0224	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
2.5	33	0.1515	0.22		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
1.2	157	0.0955	2.16		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
1.0	82	0.0366	1.34		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.4	93	0.0550	3.52		**Shallow Concentrated Flow, E-F** Grassed Waterway Kv= 15.0 fps
14.7	432	Total			

Subcatchment PDA-4A: PDA-4A



Summary for Subcatchment PDA-4B: PDA-4B

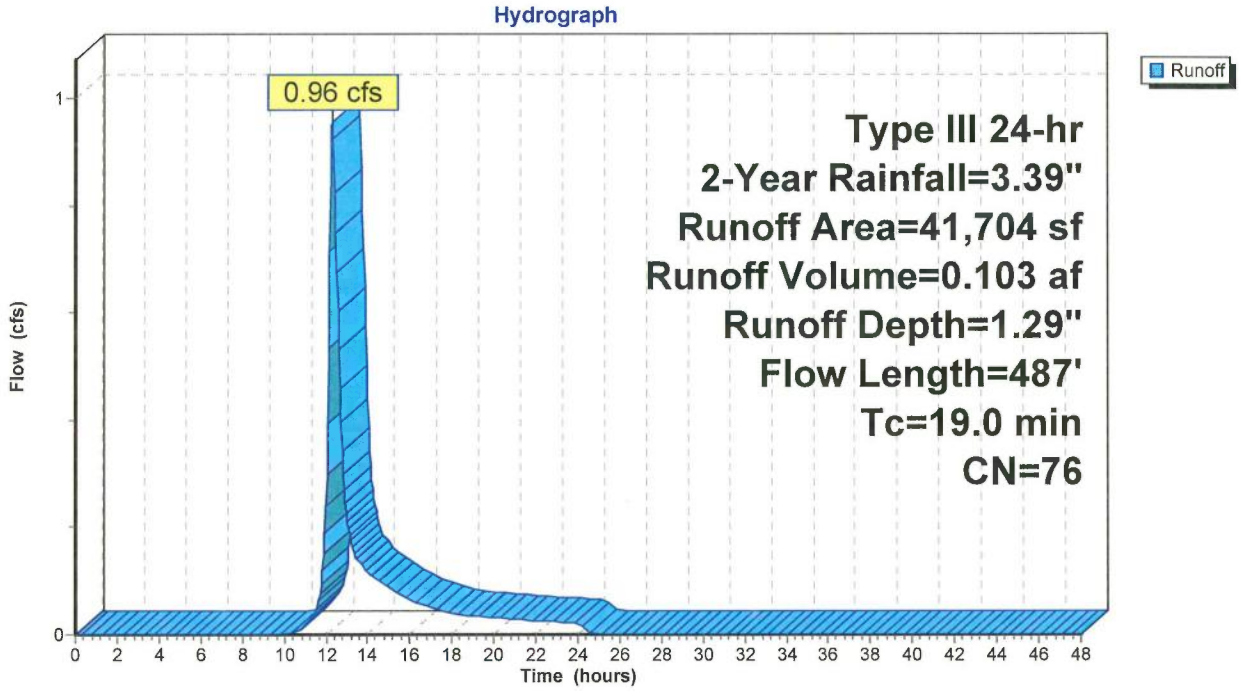
Runoff = 0.96 cfs @ 12.28 hrs, Volume= 0.103 af, Depth= 1.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
13,291	71	Meadow, non-grazed, HSG C
28,356	78	Meadow, non-grazed, HSG D
57	96	Gravel surface, HSG D
41,704	76	Weighted Average
41,704		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	100	0.0200	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
2.9	163	0.0184	0.95		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.0	117	0.0855	2.05		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.8	63	0.0317	1.25		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.4	44	0.0682	1.83		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
19.0	487	Total			

Subcatchment PDA-4B: PDA-4B



Summary for Subcatchment PDA-4C: PDA-4C

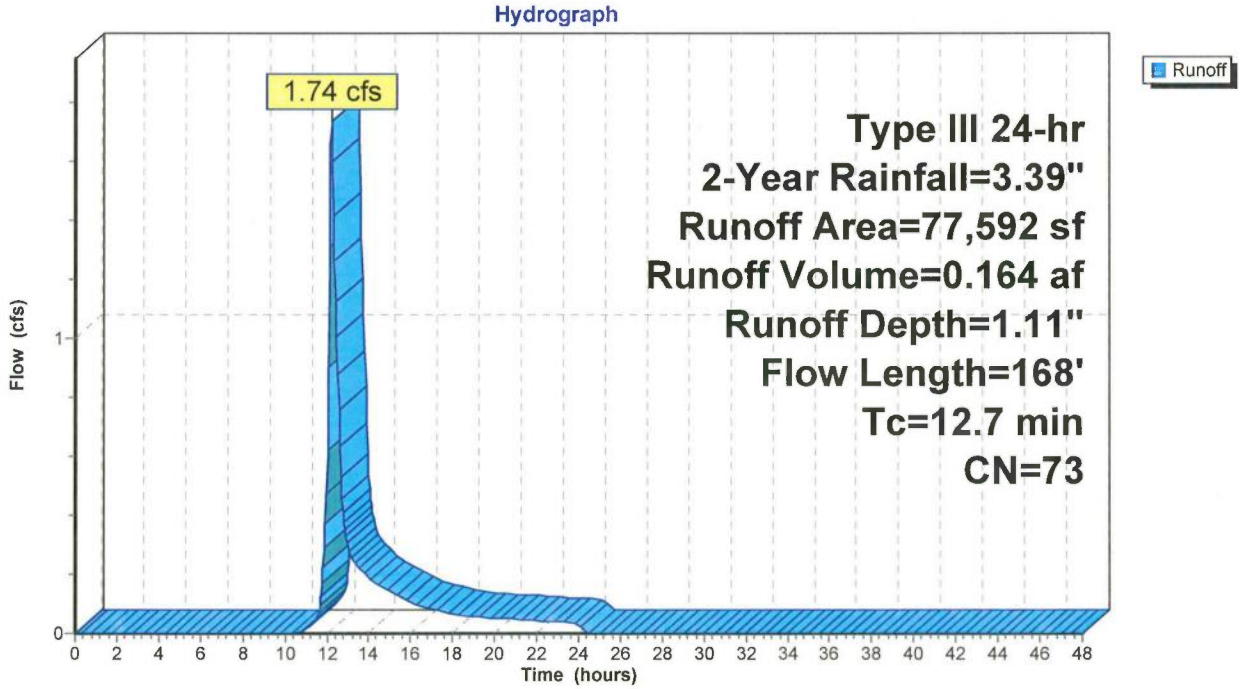
Runoff = 1.74 cfs @ 12.19 hrs, Volume= 0.164 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
77,592	73	Brush, Good, HSG D
77,592		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.0800	0.14		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
0.7	68	0.1029	1.60		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
12.7	168	Total			

Subcatchment PDA-4C: PDA-4C



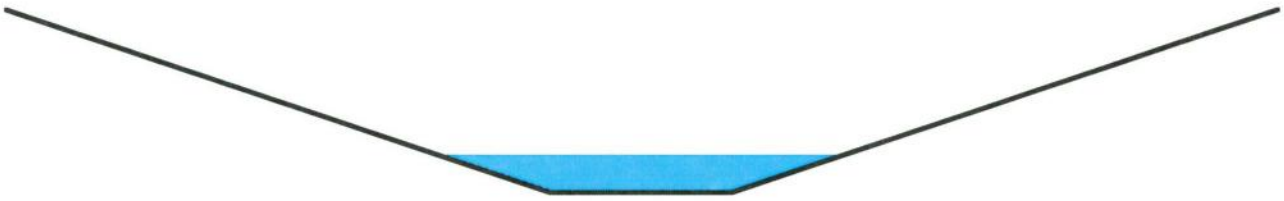
Summary for Reach 5R: Swale

Inflow Area = 0.957 ac, 0.00% Impervious, Inflow Depth = 1.29" for 2-Year event
Inflow = 0.96 cfs @ 12.28 hrs, Volume= 0.103 af
Outflow = 0.94 cfs @ 12.33 hrs, Volume= 0.103 af, Atten= 1%, Lag= 3.2 min

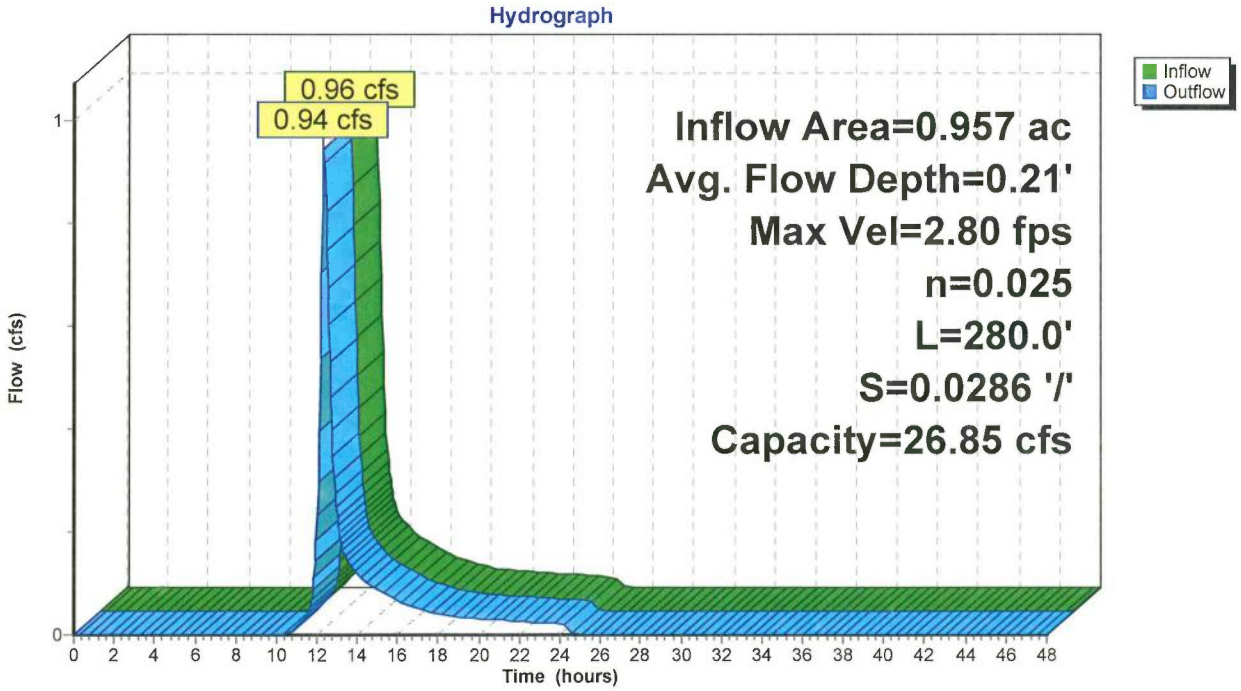
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.80 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.09 fps, Avg. Travel Time= 4.3 min

Peak Storage= 96 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 26.85 cfs

1.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 280.0' Slope= 0.0286 '/'
Inlet Invert= 408.00', Outlet Invert= 400.00'



Reach 5R: Swale



Summary for Pond P-1: P-1

Inflow Area = 2.866 ac, 0.00% Impervious, Inflow Depth = 1.16" for 2-Year event
Inflow = 2.81 cfs @ 12.22 hrs, Volume= 0.278 af
Outflow = 0.57 cfs @ 12.93 hrs, Volume= 0.278 af, Atten= 80%, Lag= 42.4 min
Discarded = 0.57 cfs @ 12.93 hrs, Volume= 0.278 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 411.81' @ 12.93 hrs Surf.Area= 4,921 sf Storage= 3,660 cf

Plug-Flow detention time= 52.7 min calculated for 0.278 af (100% of inflow)
Center-of-Mass det. time= 52.7 min (919.4 - 866.8)

Volume	Invert	Avail.Storage	Storage Description
#1	411.00'	16,968 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

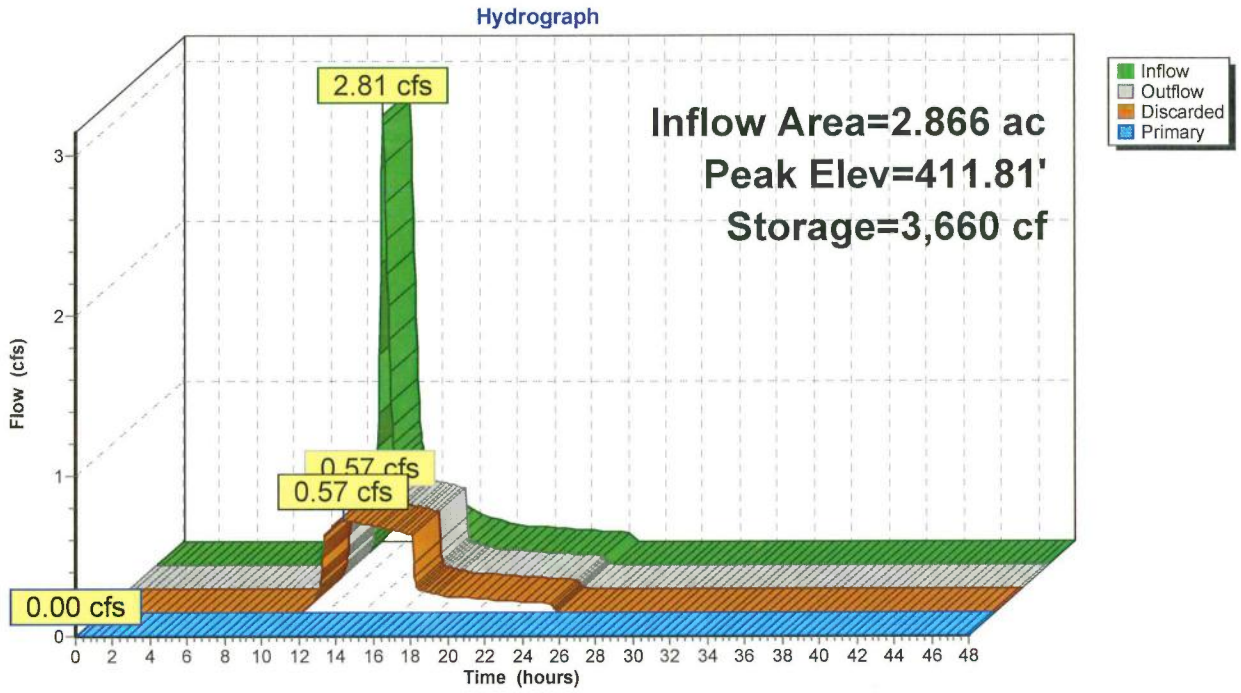
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
411.00	4,114	0	0
412.00	5,110	4,612	4,612
413.00	6,164	5,637	10,249
414.00	7,274	6,719	16,968

Device	Routing	Invert	Outlet Devices
#1	Discarded	411.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	413.50'	**10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.57 cfs @ 12.93 hrs HW=411.81' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.57 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=411.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-1: P-1


Hydrograph
Inflow
Outflow
Discarded
Primary
2.81 cfs
0.57 cfs
0.57 cfs
0.00 cfs
Inflow Area=2.866 ac
Peak Elev=411.81'
Storage=3,660 cf
Flow (cfs)
Time (hours)
0 1 2 3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond P-2A: P-2A

Inflow Area = 1.355 ac, 0.00% Impervious, Inflow Depth = 0.99" for 2-Year event
Inflow = 0.95 cfs @ 12.33 hrs, Volume= 0.112 af
Outflow = 0.22 cfs @ 13.12 hrs, Volume= 0.112 af, Atten= 76%, Lag= 47.6 min
Discarded = 0.22 cfs @ 13.12 hrs, Volume= 0.112 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 417.86' @ 13.12 hrs Surf.Area= 1,935 sf Storage= 1,443 cf

Plug-Flow detention time= 56.3 min calculated for 0.112 af (100% of inflow)
Center-of-Mass det. time= 56.3 min (938.8 - 882.5)

Volume	Invert	Avail.Storage	Storage Description
#1	417.00'	7,116 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

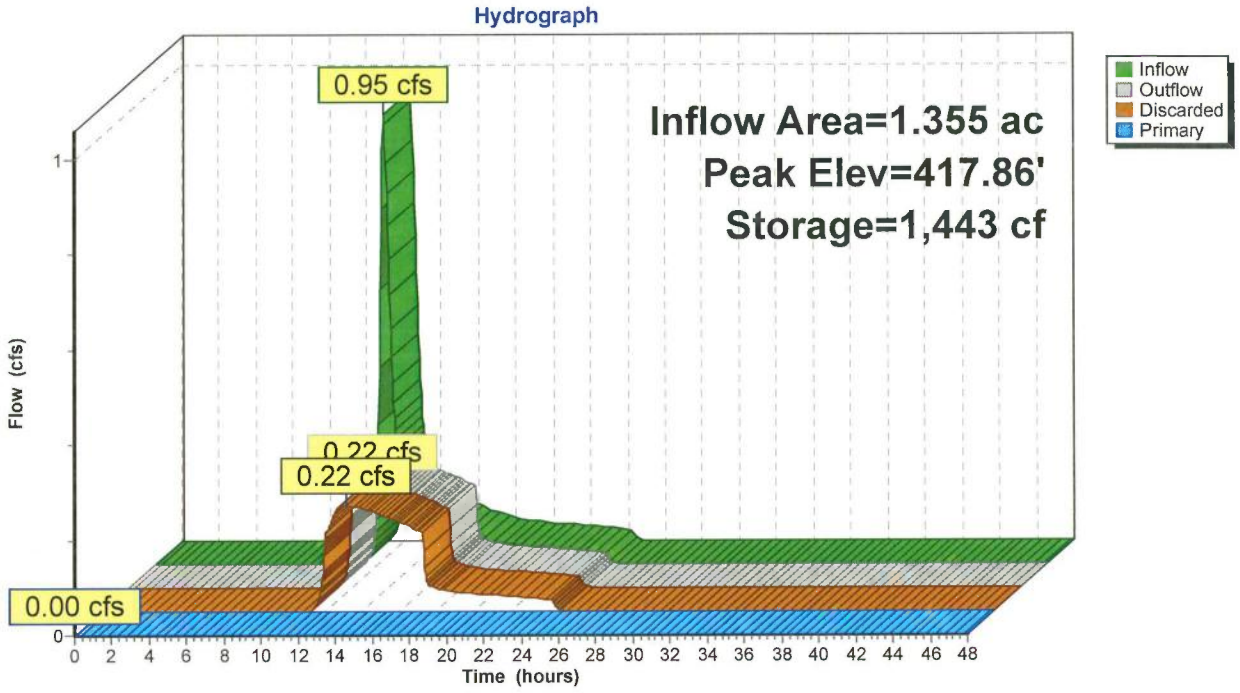
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
417.00	1,405	0	0
418.00	2,018	1,712	1,712
419.00	2,688	2,353	4,065
420.00	3,415	3,052	7,116

Device	Routing	Invert	Outlet Devices
#1	Discarded	417.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	419.50'	**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

Discarded OutFlow Max=0.22 cfs @ 13.12 hrs HW=417.86' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=417.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2A: P-2A


Hydrograph
0.95 cfs
Inflow Area=1.355 ac
Peak Elev=417.86'
Storage=1,443 cf
0.22 cfs
0.22 cfs
0.00 cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond P-2B: P-2B

Inflow Area = 0.742 ac, 0.00% Impervious, Inflow Depth = 1.05" for 2-Year event
Inflow = 0.69 cfs @ 12.18 hrs, Volume= 0.065 af
Outflow = 0.18 cfs @ 12.69 hrs, Volume= 0.065 af, Atten= 73%, Lag= 30.4 min
Discarded = 0.18 cfs @ 12.69 hrs, Volume= 0.065 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 412.48' @ 12.69 hrs Surf.Area= 1,580 sf Storage= 696 cf

Plug-Flow detention time= 27.1 min calculated for 0.065 af (100% of inflow)
Center-of-Mass det. time= 27.1 min (897.5 - 870.5)

Volume	Invert	Avail.Storage	Storage Description
#1	412.00'	6,481 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

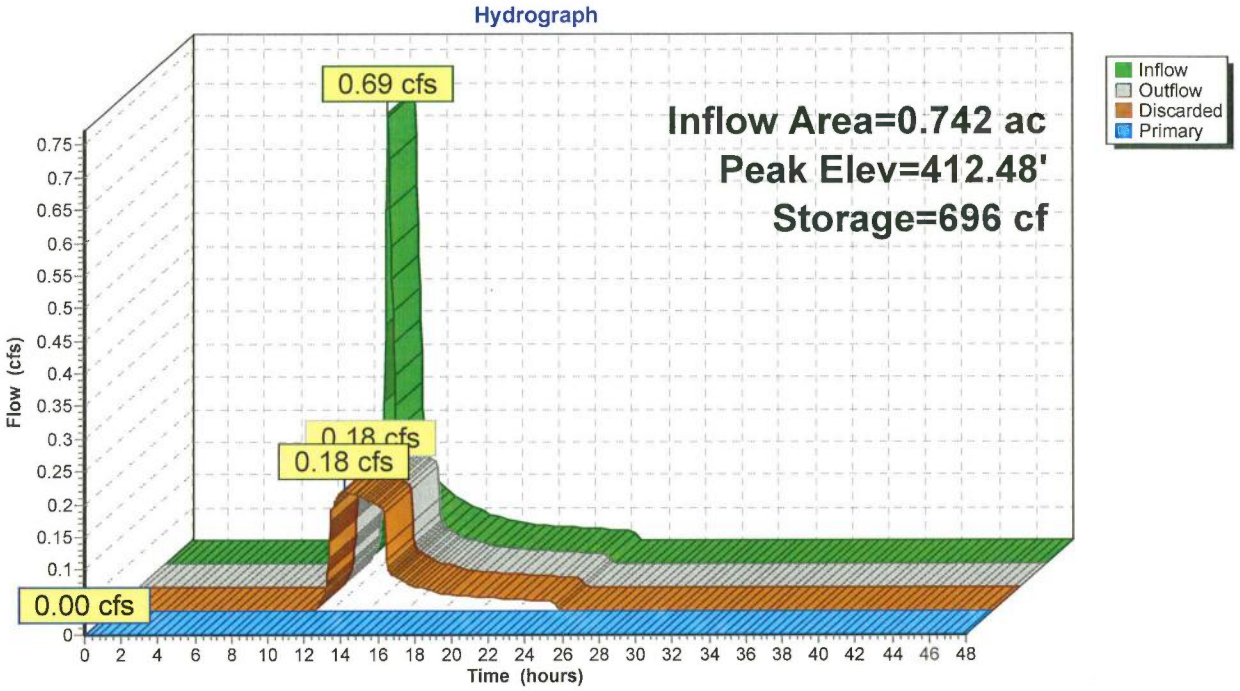
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
412.00	1,330	0	0
413.00	1,852	1,591	1,591
414.00	2,431	2,142	3,733
415.00	3,065	2,748	6,481

Device	Routing	Invert	Outlet Devices
#1	Discarded	412.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	414.50'	**10.0' long x 15.0' 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=0.18 cfs @ 12.69 hrs HW=412.48' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=412.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2B: P-2B


Hydrograph
0.69 cfs
0.18 cfs
0.18 cfs
0.00 cfs
Inflow Area=0.742 ac
Peak Elev=412.48'
Storage=696 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)

Summary for Pond P-3: P-3

Inflow Area = 1.638 ac, 0.00% Impervious, Inflow Depth = 1.05" for 2-Year event
Inflow = 1.31 cfs @ 12.27 hrs, Volume= 0.143 af
Outflow = 0.34 cfs @ 12.91 hrs, Volume= 0.143 af, Atten= 74%, Lag= 38.3 min
Discarded = 0.34 cfs @ 12.91 hrs, Volume= 0.143 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 409.61' @ 12.91 hrs Surf.Area= 2,941 sf Storage= 1,664 cf

Plug-Flow detention time= 37.5 min calculated for 0.143 af (100% of inflow)
Center-of-Mass det. time= 37.5 min (913.7 - 876.2)

Volume	Invert	Avail.Storage	Storage Description
#1	409.00'	10,964 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

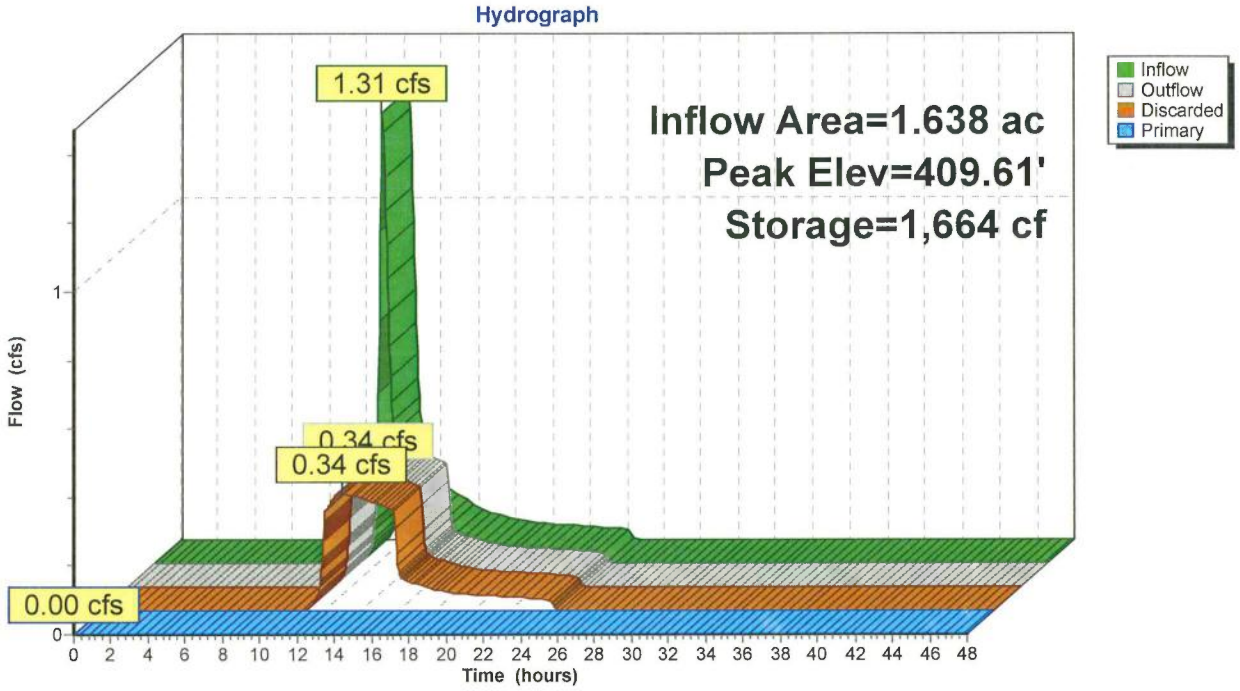
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
409.00	2,479	0	0
410.00	3,231	2,855	2,855
411.00	4,040	3,636	6,491
412.00	4,906	4,473	10,964

Device	Routing	Invert	Outlet Devices
#1	Discarded	409.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	411.50'	**10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.34 cfs @ 12.91 hrs HW=409.61' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=409.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-3: P-3


Hydrograph
1.31 cfs
0.34 cfs
0.34 cfs
0.00 cfs
Inflow Area=1.638 ac
Peak Elev=409.61'
Storage=1,664 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
0
1
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Pond P-4: P-4

Inflow Area = 4.212 ac, 0.00% Impervious, Inflow Depth = 1.39" for 2-Year event
Inflow = 4.77 cfs @ 12.23 hrs, Volume= 0.486 af
Outflow = 0.17 cfs @ 18.21 hrs, Volume= 0.478 af, Atten= 96%, Lag= 358.6 min
Discarded = 0.17 cfs @ 18.21 hrs, Volume= 0.478 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 397.73' @ 18.21 hrs Surf.Area= 9,138 sf Storage= 14,233 cf

Plug-Flow detention time= 889.2 min calculated for 0.477 af (98% of inflow)
Center-of-Mass det. time= 879.7 min (1,737.0 - 857.3)

Volume	Invert	Avail.Storage	Storage Description
#1	396.00'	37,885 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

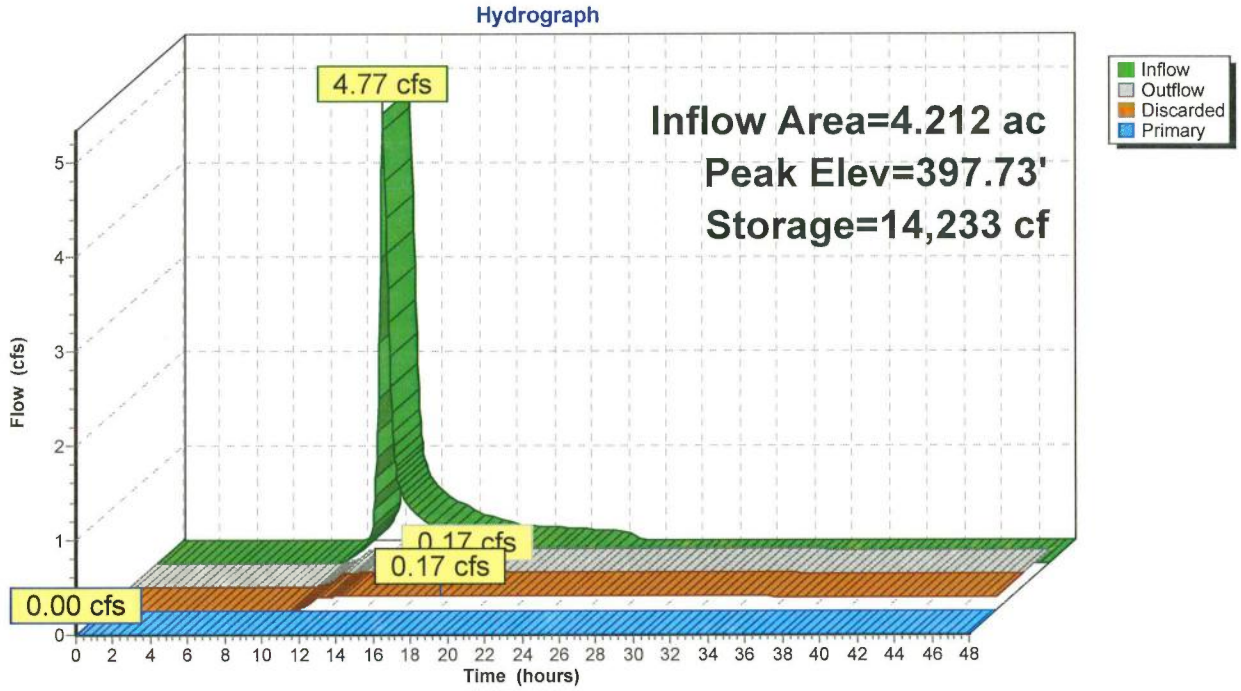
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
396.00	7,294	0	0
397.00	8,333	7,814	7,814
398.00	9,429	8,881	16,695
399.00	10,581	10,005	26,700
400.00	11,790	11,186	37,885

Device	Routing	Invert	Outlet Devices
#1	Discarded	396.00'	**0.800 in/hr Exfiltration over Surface area**
#2	Primary	399.50'	**15.0' long x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.17 cfs @ 18.21 hrs HW=397.73' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=396.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-4: P-4

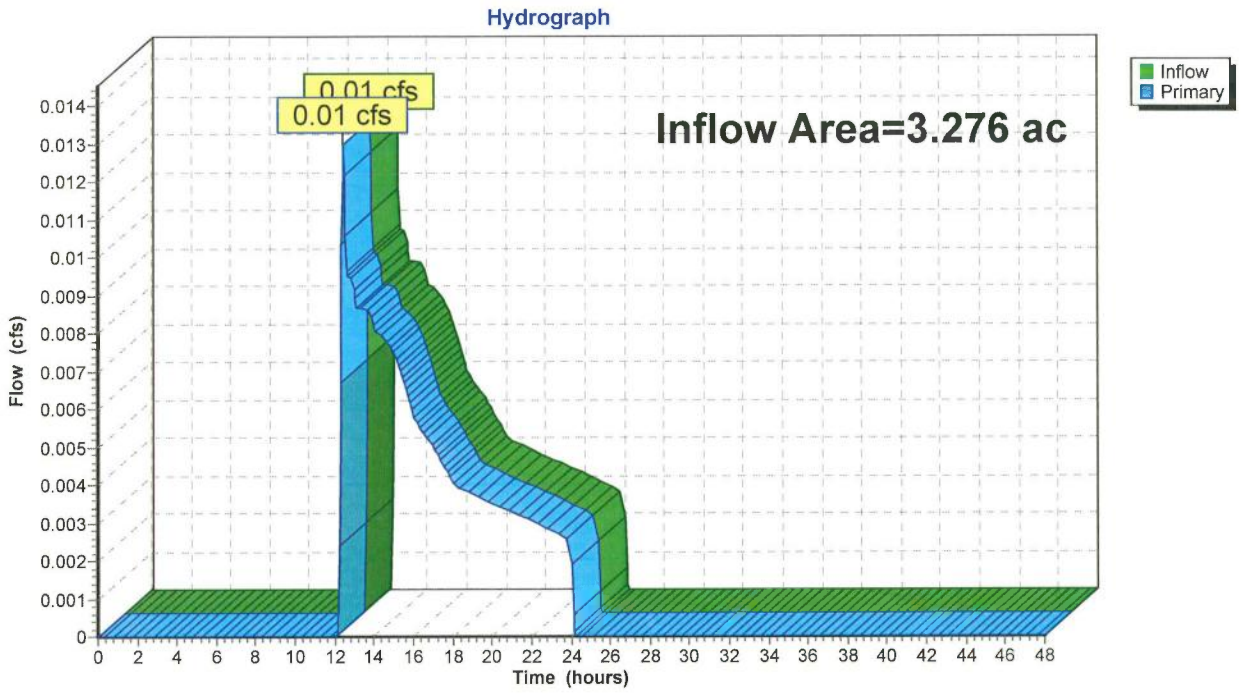

Hydrograph
4.77 cfs
Inflow Area=4.212 ac
Peak Elev=397.73'
Storage=14,233 cf
Inflow
Outflow
Discarded
Primary
0.17 cfs
0.17 cfs
0.00 cfs
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
0 1 2 3 4 5

Summary for Link 1L: AP-1

Inflow Area = 3.276 ac, 0.00% Impervious, Inflow Depth = 0.02" for 2-Year event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 0.005 af
Primary = 0.01 cfs @ 12.44 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: AP-1

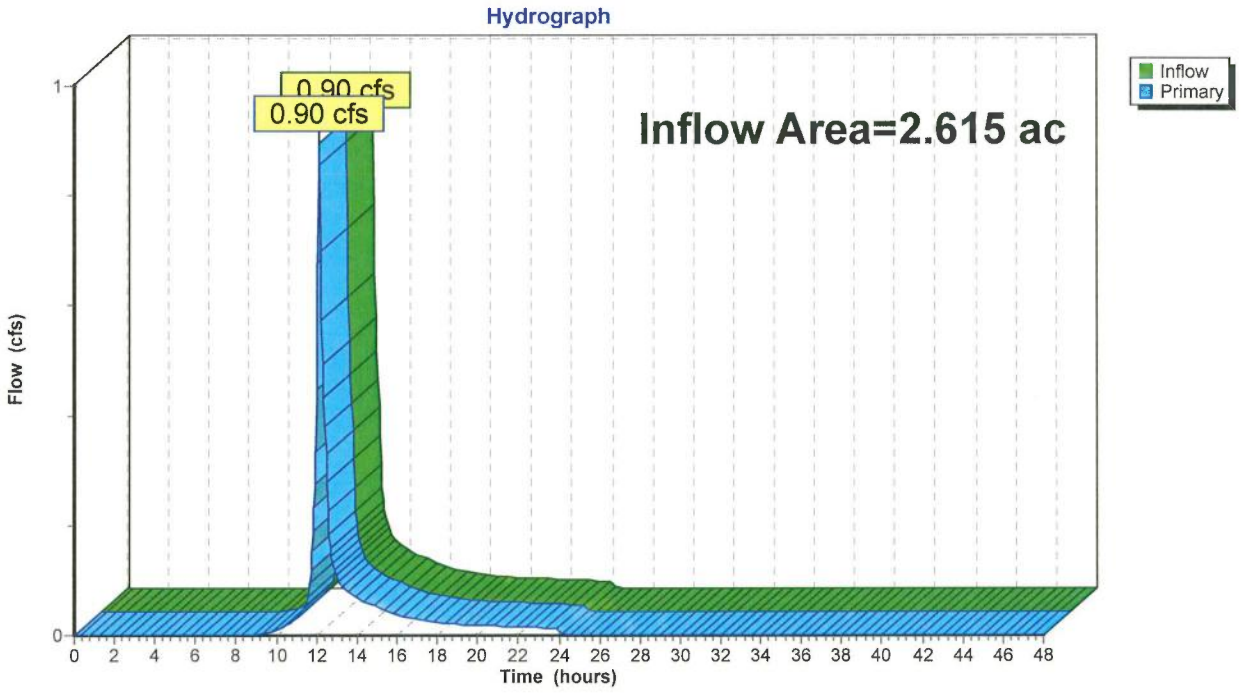


Summary for Link 2L: AP-2

Inflow Area = 2.615 ac, 0.00% Impervious, Inflow Depth = 0.32" for 2-Year event
Inflow = 0.90 cfs @ 12.12 hrs, Volume= 0.070 af
Primary = 0.90 cfs @ 12.12 hrs, Volume= 0.070 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: AP-2

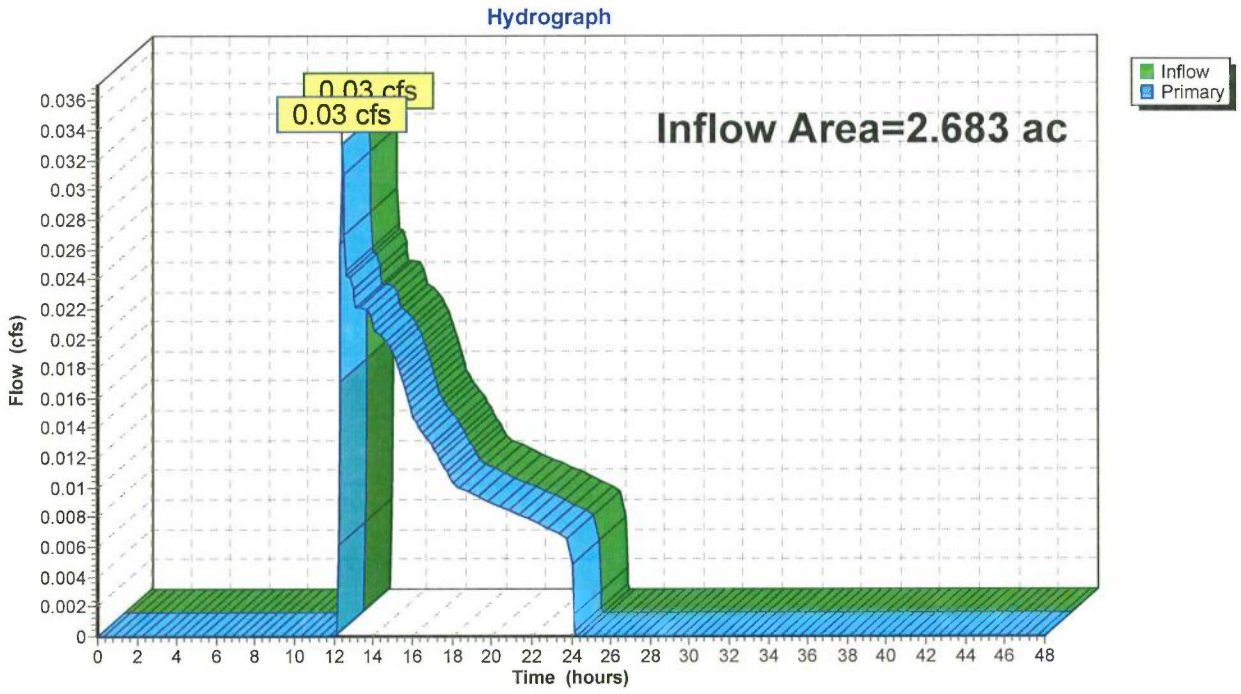


Summary for Link 3L: AP-3

Inflow Area = 2.683 ac, 0.00% Impervious, Inflow Depth = 0.06" for 2-Year event
Inflow = 0.03 cfs @ 12.44 hrs, Volume= 0.013 af
Primary = 0.03 cfs @ 12.44 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 3L: AP-3

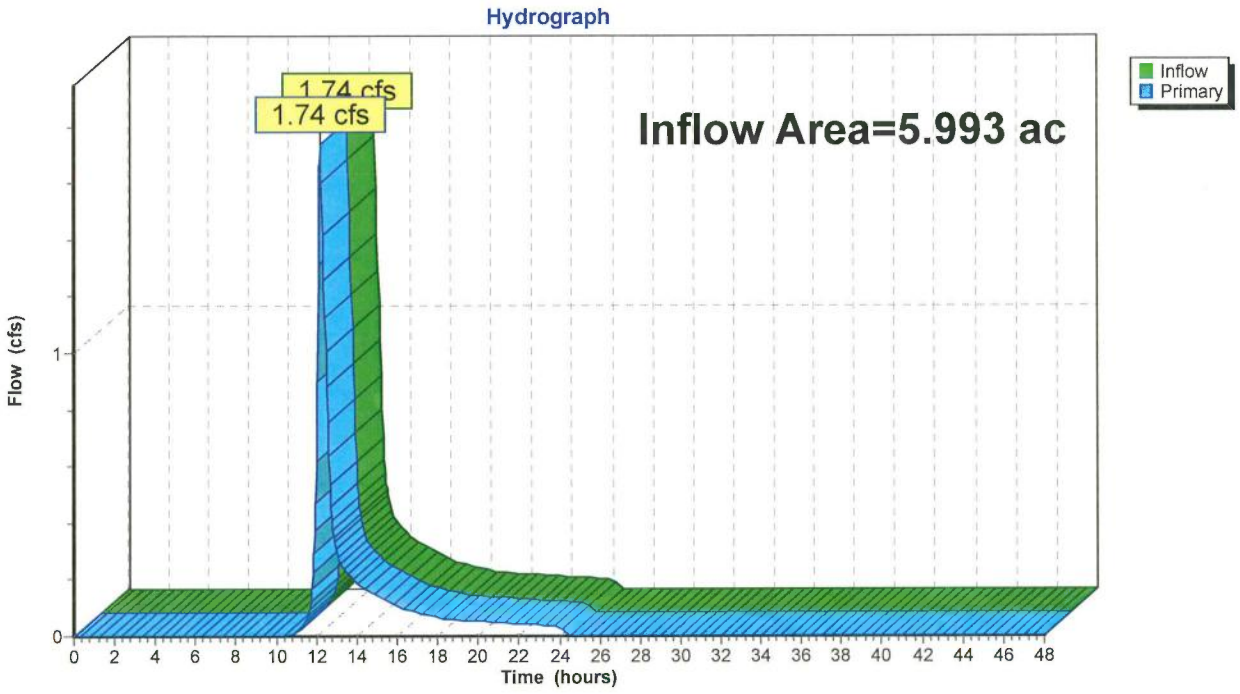


Summary for Link 4L: AP-4

Inflow Area = 5.993 ac, 0.00% Impervious, Inflow Depth = 0.33" for 2-Year event
Inflow = 1.74 cfs @ 12.19 hrs, Volume= 0.164 af
Primary = 1.74 cfs @ 12.19 hrs, Volume= 0.164 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 4L: AP-4



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 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 PDA-1A: PDA-1A Runoff Area=124,842 sf 0.00% Impervious Runoff Depth=3.46"
Flow Length=381' Tc=14.9 min CN=74 Runoff=8.79 cfs 0.827 af

Subcatchment PDA-1B: PDA-1B Runoff Area=17,880 sf 0.00% Impervious Runoff Depth=1.23"
Tc=5.0 min CN=49 Runoff=0.48 cfs 0.042 af

Subcatchment PDA-2A: PDA-2A Runoff Area=59,006 sf 0.00% Impervious Runoff Depth=3.17"
Flow Length=275' Tc=21.5 min CN=71 Runoff=3.27 cfs 0.357 af

Subcatchment PDA-2B: PDA-2B Runoff Area=32,304 sf 0.00% Impervious Runoff Depth=3.27"
Flow Length=219' Tc=12.0 min CN=72 Runoff=2.31 cfs 0.202 af

Subcatchment PDA-2C: PDA-2C Runoff Area=22,584 sf 0.00% Impervious Runoff Depth=4.19"
Flow Length=346' Tc=8.2 min CN=81 Runoff=2.31 cfs 0.181 af

Subcatchment PDA-3A: PDA-3A Runoff Area=71,342 sf 0.00% Impervious Runoff Depth=3.27"
Flow Length=322' Tc=18.2 min CN=72 Runoff=4.37 cfs 0.446 af

Subcatchment PDA-3B: PDA-3B Runoff Area=45,532 sf 0.00% Impervious Runoff Depth=1.23"
Tc=5.0 min CN=49 Runoff=1.22 cfs 0.107 af

Subcatchment PDA-4A: PDA-4A Runoff Area=141,773 sf 0.00% Impervious Runoff Depth=3.87"
Flow Length=432' Tc=14.7 min CN=78 Runoff=11.20 cfs 1.050 af

Subcatchment PDA-4B: PDA-4B Runoff Area=41,704 sf 0.00% Impervious Runoff Depth=3.67"
Flow Length=487' Tc=19.0 min CN=76 Runoff=2.83 cfs 0.293 af

Subcatchment PDA-4C: PDA-4C Runoff Area=77,592 sf 0.00% Impervious Runoff Depth=3.36"
Flow Length=168' Tc=12.7 min CN=73 Runoff=5.59 cfs 0.499 af

Reach 5R: Swale Avg. Flow Depth=0.36' Max Vel=3.75 fps Inflow=2.83 cfs 0.293 af
n=0.025 L=280.0' S=0.0286 '/' Capacity=26.85 cfs Outflow=2.79 cfs 0.293 af

Pond P-1: P-1 Peak Elev=413.64' Storage=14,433 cf Inflow=8.79 cfs 0.827 af
Discarded=0.80 cfs 0.759 af Primary=1.25 cfs 0.069 af Outflow=2.05 cfs 0.827 af

Pond P-2A: P-2A Peak Elev=419.61' Storage=5,825 cf Inflow=3.27 cfs 0.357 af
Discarded=0.36 cfs 0.320 af Primary=0.92 cfs 0.037 af Outflow=1.28 cfs 0.357 af

Pond P-2B: P-2B Peak Elev=413.92' Storage=3,533 cf Inflow=2.31 cfs 0.202 af
Discarded=0.28 cfs 0.202 af Primary=0.00 cfs 0.000 af Outflow=0.28 cfs 0.202 af

Pond P-3: P-3 Peak Elev=411.44' Storage=8,348 cf Inflow=4.37 cfs 0.446 af
Discarded=0.51 cfs 0.446 af Primary=0.00 cfs 0.000 af Outflow=0.51 cfs 0.446 af

Pond P-4: P-4 Peak Elev=399.62' Storage=33,462 cf Inflow=13.63 cfs 1.343 af
Discarded=0.21 cfs 0.621 af Primary=1.52 cfs 0.356 af Outflow=1.73 cfs 0.977 af

Link 1L: AP-1
Inflow=1.34 cfs 0.111 af
Primary=1.34 cfs 0.111 af

Link 2L: AP-2
Inflow=2.31 cfs 0.218 af
Primary=2.31 cfs 0.218 af

Link 3L: AP-3
Inflow=1.22 cfs 0.107 af
Primary=1.22 cfs 0.107 af

Link 4L: AP-4
Inflow=5.59 cfs 0.856 af
Primary=5.59 cfs 0.856 af

Total Runoff Area = 14.567 ac Runoff Volume = 4.005 af Average Runoff Depth = 3.30"
100.00% Pervious = 14.567 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment PDA-1A: PDA-1A

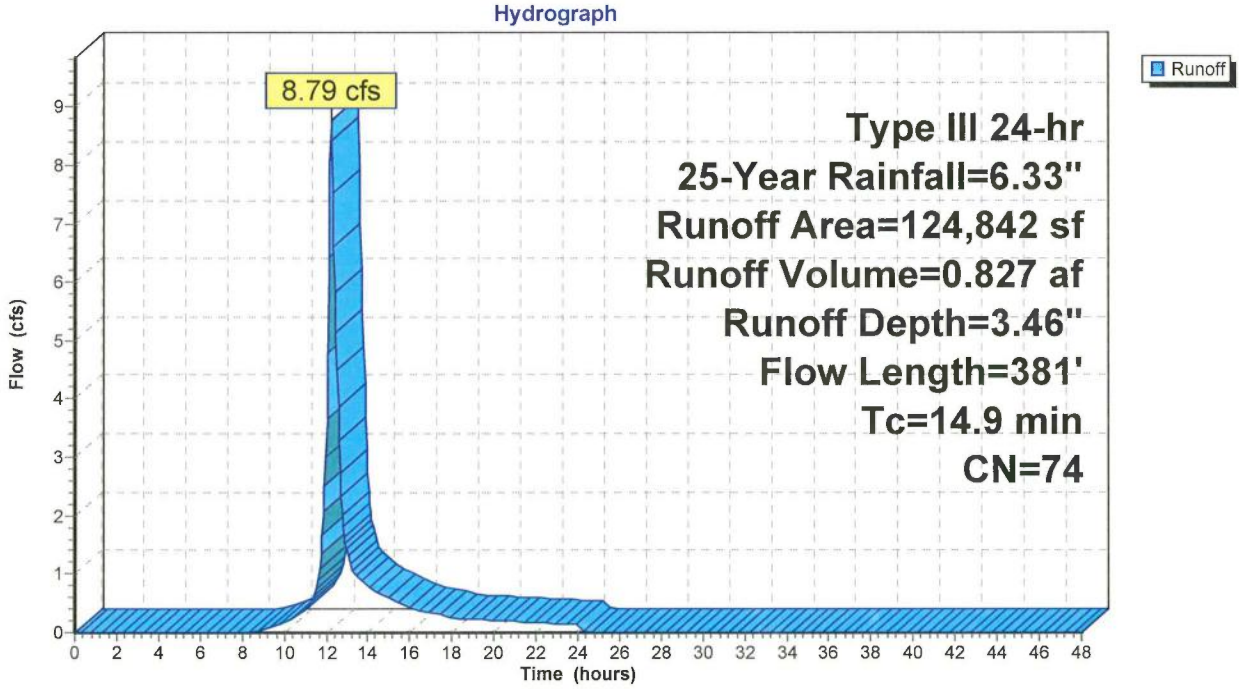
Runoff = 8.79 cfs @ 12.21 hrs, Volume= 0.827 af, Depth= 3.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
79,434	71	Meadow, non-grazed, HSG C
45,408	78	Meadow, non-grazed, HSG D
124,842	74	Weighted Average
124,842		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.0350	0.15		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
3.8	281	0.0306	1.22		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
14.9	381	Total			

Subcatchment PDA-1A: PDA-1A



Summary for Subcatchment PDA-1B: PDA-1B

[49] Hint: Tc<2dt may require smaller dt

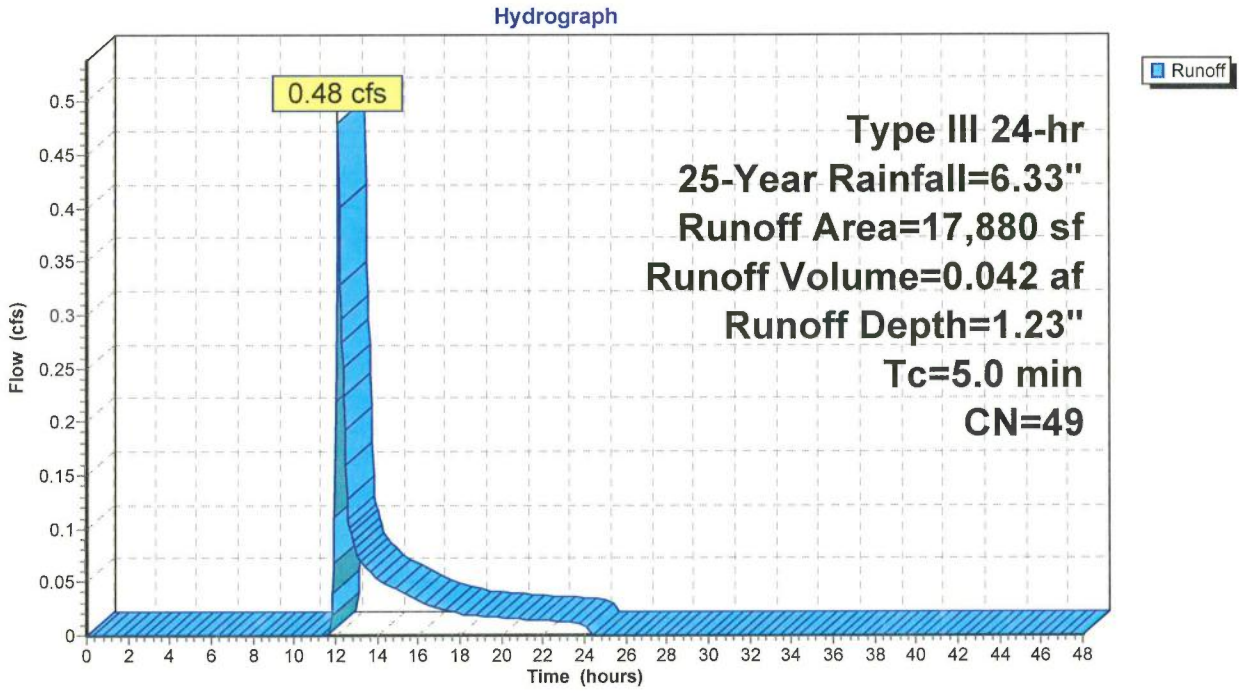
Runoff = 0.48 cfs @ 12.10 hrs, Volume= 0.042 af, Depth= 1.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
16,448	48	Brush, Good, HSG B
1,432	65	Brush, Good, HSG C
17,880	49	Weighted Average
17,880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PDA-1B: PDA-1B



Summary for Subcatchment PDA-2A: PDA-2A

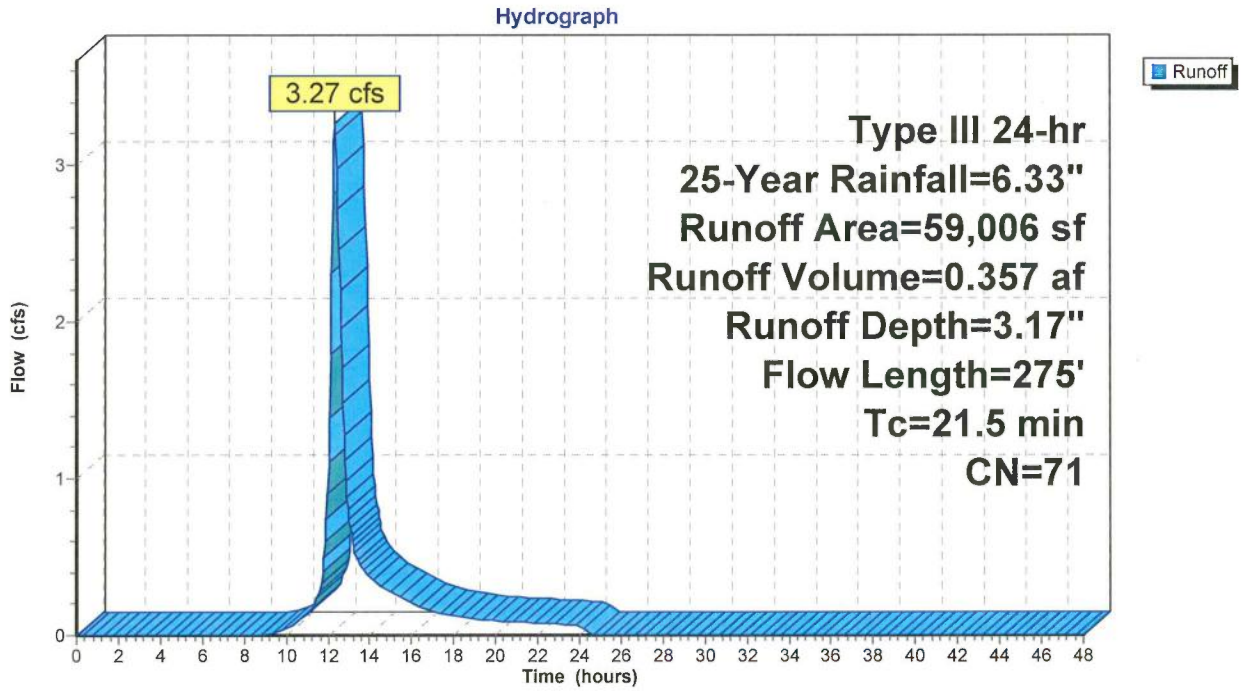
Runoff = 3.27 cfs @ 12.30 hrs, Volume= 0.357 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
39,007	71	Meadow, non-grazed, HSG C
16,039	78	Meadow, non-grazed, HSG D
3,960	48	Brush, Good, HSG B
59,006	71	Weighted Average
59,006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
16.0	70	0.0069	0.07		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
2.9	175	0.0211	1.02		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
21.5	275	Total			

Subcatchment PDA-2A: PDA-2A



Summary for Subcatchment PDA-2B: PDA-2B

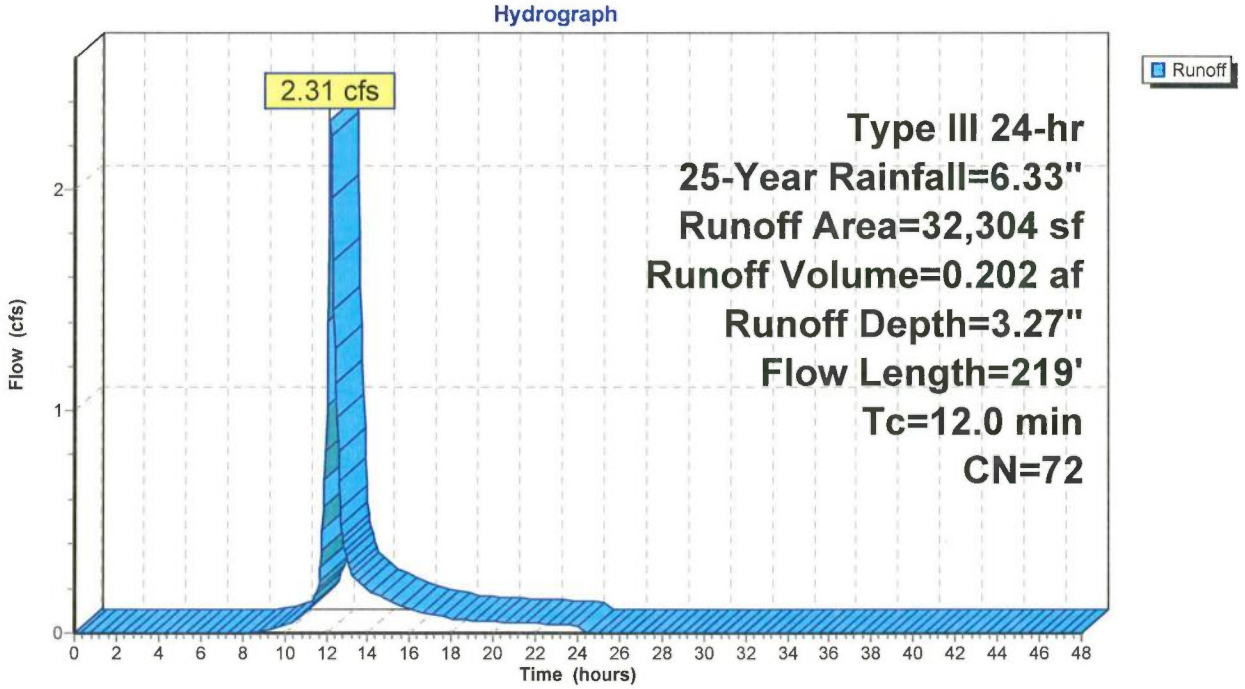
Runoff = 2.31 cfs @ 12.17 hrs, Volume= 0.202 af, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
12,043	71	Meadow, non-grazed, HSG C
16,171	78	Meadow, non-grazed, HSG D
4,020	48	Brush, Good, HSG B
70	73	Brush, Good, HSG D
32,304	72	Weighted Average
32,304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
8.3	70	0.0357	0.14		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
1.1	119	0.0630	1.76		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
12.0	219	Total			

Subcatchment PDA-2B: PDA-2B



Summary for Subcatchment PDA-2C: PDA-2C

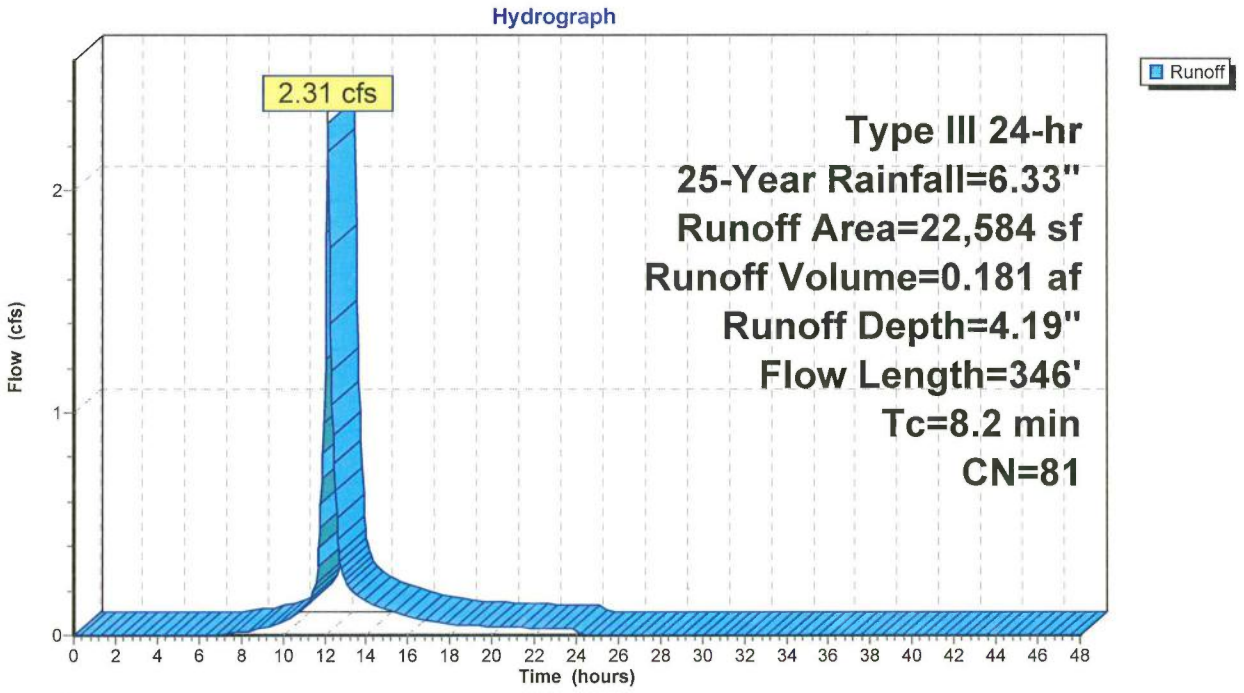
Runoff = 2.31 cfs @ 12.12 hrs, Volume= 0.181 af, Depth= 4.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
1,977	77	Woods, Good, HSG D
3,486	96	Gravel surface, HSG D
17,121	78	Meadow, non-grazed, HSG D
22,584	81	Weighted Average
22,584		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0600	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.39"
1.3	146	0.0684	1.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.8	100	0.0854	2.05		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
8.2	346	Total			

Subcatchment PDA-2C: PDA-2C



Summary for Subcatchment PDA-3A: PDA-3A

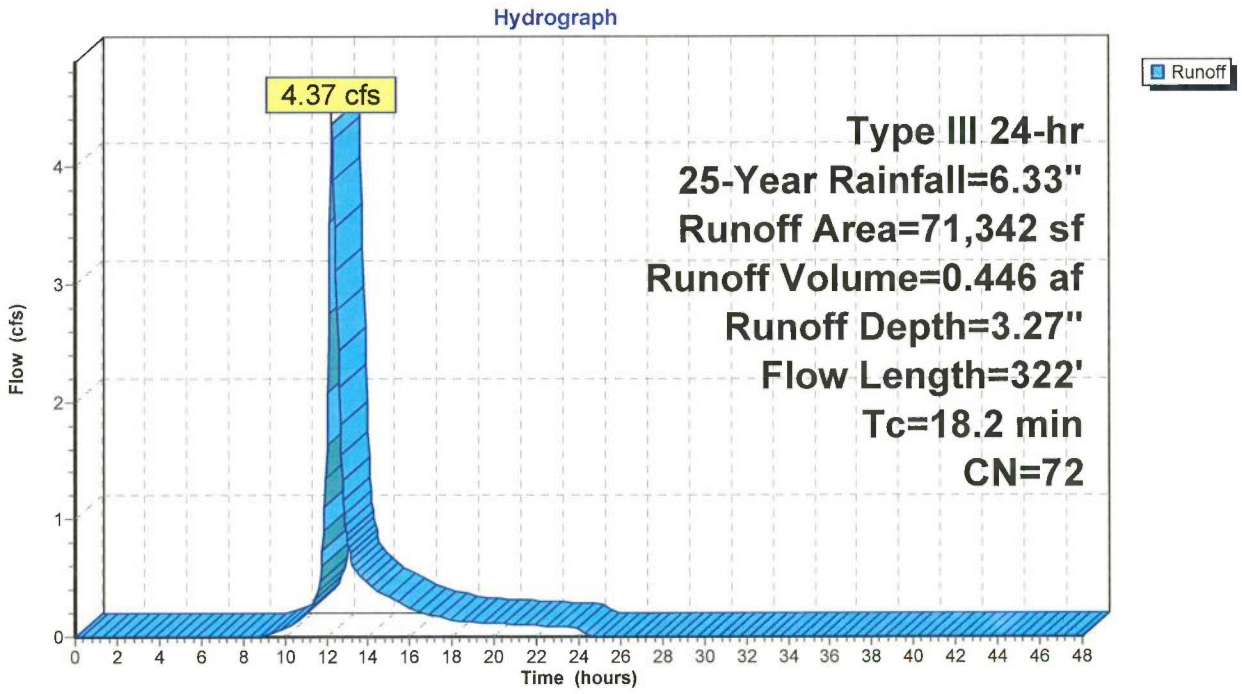
Runoff = 4.37 cfs @ 12.26 hrs, Volume= 0.446 af, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
64,777	71	Meadow, non-grazed, HSG C
6,565	78	Meadow, non-grazed, HSG D
71,342	72	Weighted Average
71,342		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0150	0.11		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
2.6	222	0.0417	1.43		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
18.2	322	Total			

Subcatchment PDA-3A: PDA-3A



Summary for Subcatchment PDA-3B: PDA-3B

[49] Hint: Tc<2dt may require smaller dt

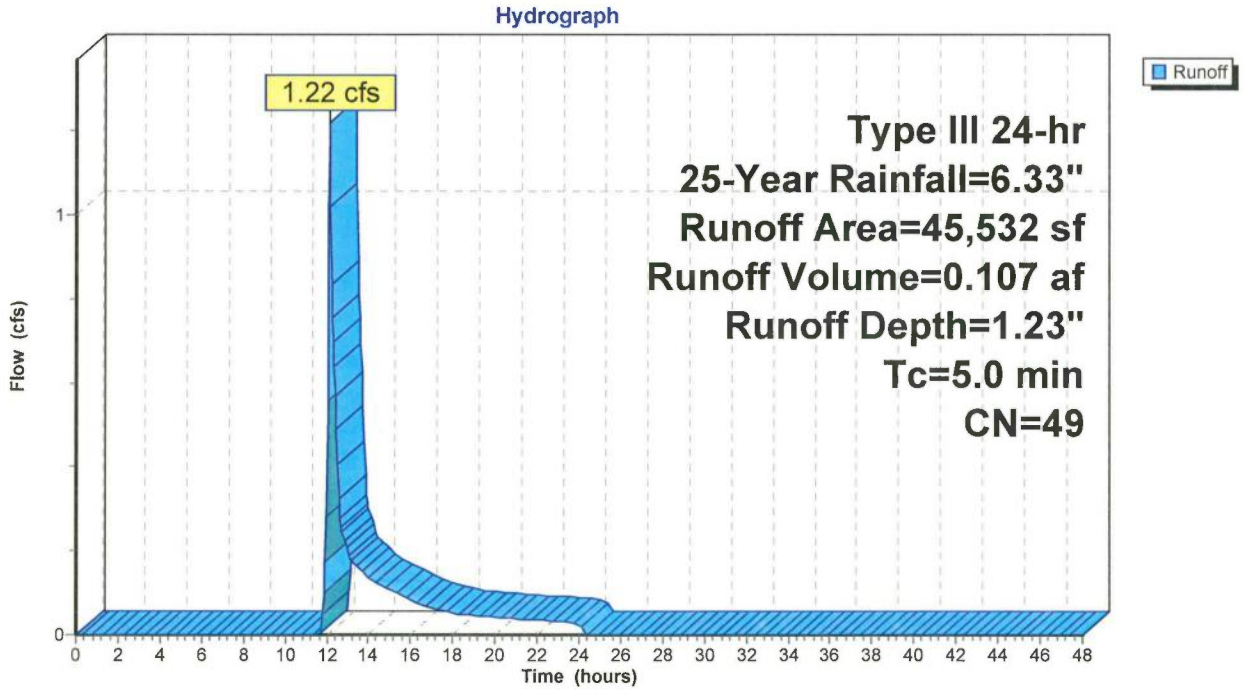
Runoff = 1.22 cfs @ 12.10 hrs, Volume= 0.107 af, Depth= 1.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
43,429	48	Brush, Good, HSG B
2,103	73	Brush, Good, HSG D
45,532	49	Weighted Average
45,532		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PDA-3B: PDA-3B



Summary for Subcatchment PDA-4A: PDA-4A

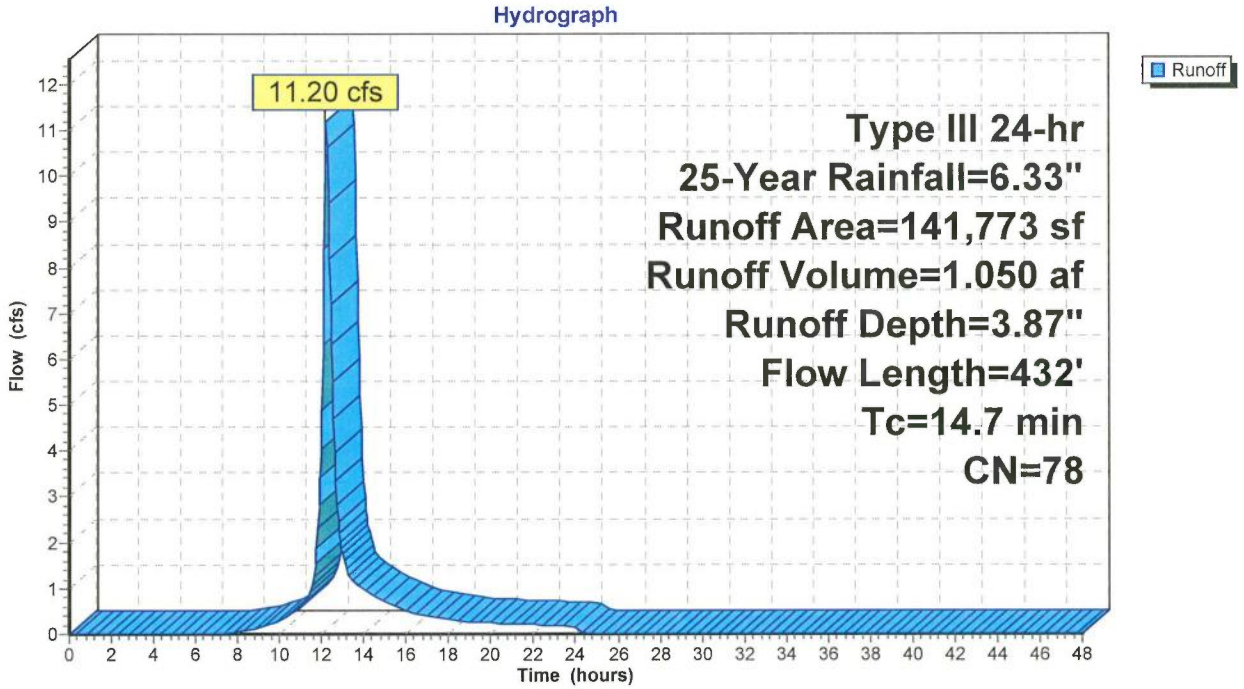
Runoff = 11.20 cfs @ 12.20 hrs, Volume= 1.050 af, Depth= 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
136,646	78	Meadow, non-grazed, HSG D
5,127	73	Brush, Good, HSG D
141,773	78	Weighted Average
141,773		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	67	0.0224	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
2.5	33	0.1515	0.22		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
1.2	157	0.0955	2.16		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
1.0	82	0.0366	1.34		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.4	93	0.0550	3.52		**Shallow Concentrated Flow, E-F** Grassed Waterway Kv= 15.0 fps
14.7	432	Total			

Subcatchment PDA-4A: PDA-4A



Summary for Subcatchment PDA-4B: PDA-4B

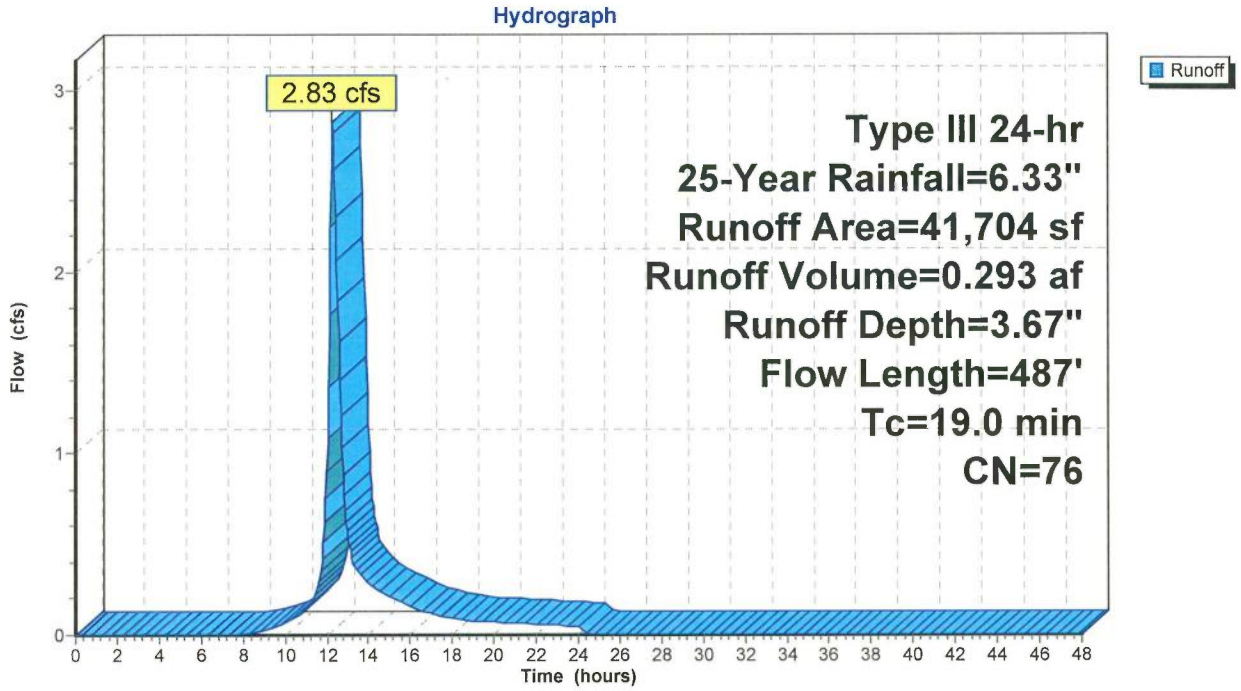
Runoff = 2.83 cfs @ 12.26 hrs, Volume= 0.293 af, Depth= 3.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
13,291	71	Meadow, non-grazed, HSG C
28,356	78	Meadow, non-grazed, HSG D
57	96	Gravel surface, HSG D
41,704	76	Weighted Average
41,704		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	100	0.0200	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
2.9	163	0.0184	0.95		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.0	117	0.0855	2.05		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.8	63	0.0317	1.25		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.4	44	0.0682	1.83		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
19.0	487	Total			

Subcatchment PDA-4B: PDA-4B



Summary for Subcatchment PDA-4C: PDA-4C

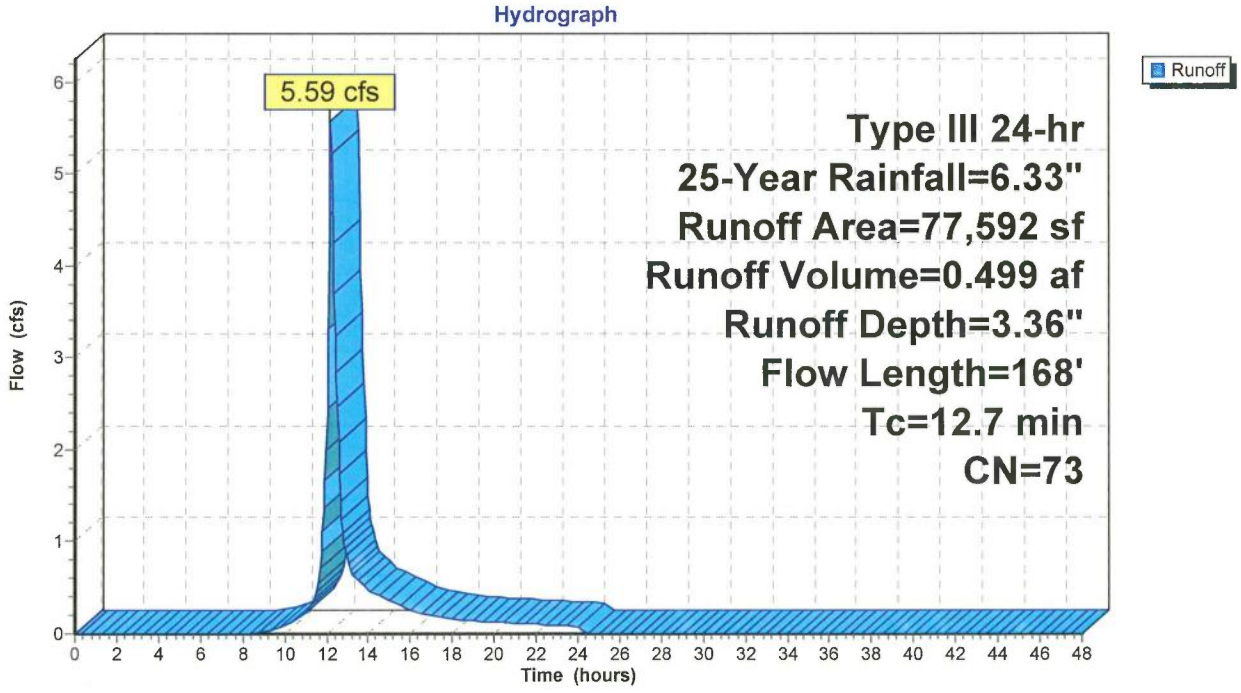
Runoff = 5.59 cfs @ 12.18 hrs, Volume= 0.499 af, Depth= 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
77,592	73	Brush, Good, HSG D
77,592		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.0800	0.14		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
0.7	68	0.1029	1.60		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
12.7	168	Total			

Subcatchment PDA-4C: PDA-4C



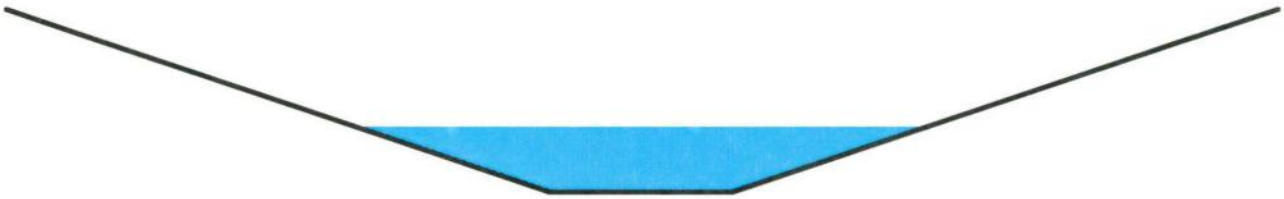
Summary for Reach 5R: Swale

Inflow Area = 0.957 ac, 0.00% Impervious, Inflow Depth = 3.67" for 25-Year event
Inflow = 2.83 cfs @ 12.26 hrs, Volume= 0.293 af
Outflow = 2.79 cfs @ 12.30 hrs, Volume= 0.293 af, Atten= 1%, Lag= 2.4 min

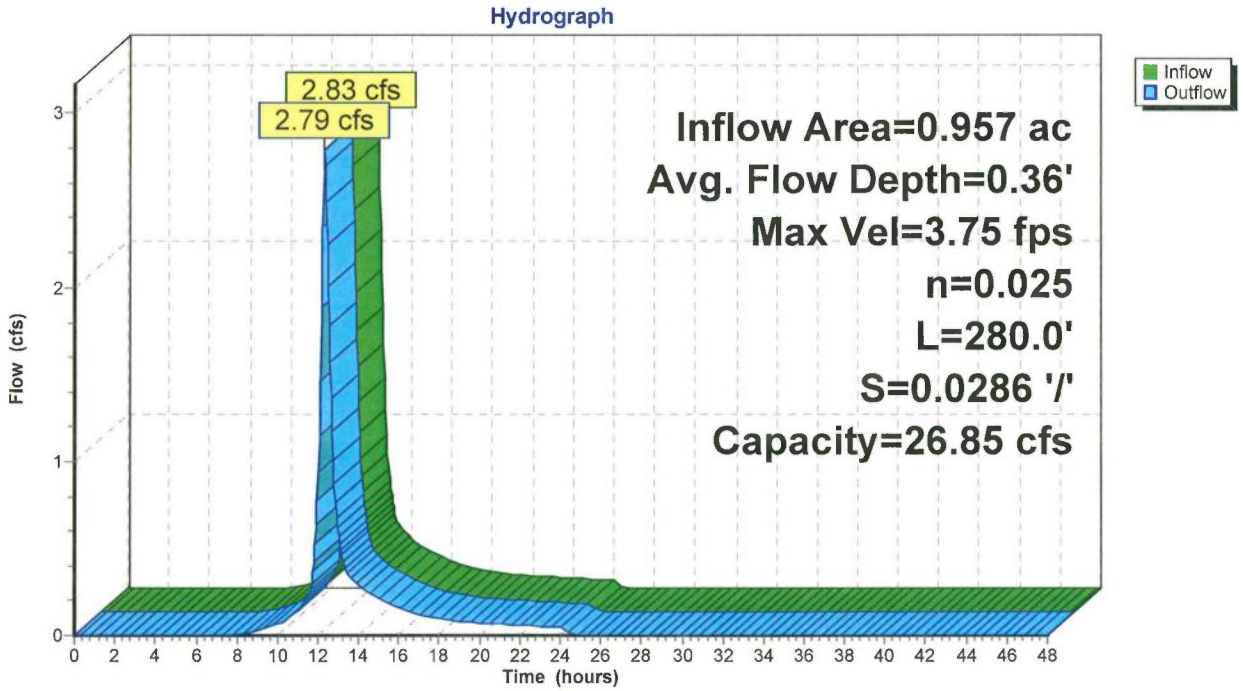
Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.75 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.41 fps, Avg. Travel Time= 3.3 min

Peak Storage= 210 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 26.85 cfs

1.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 280.0' Slope= 0.0286 '/'
Inlet Invert= 408.00', Outlet Invert= 400.00'



Reach 5R: Swale



Summary for Pond P-1: P-1

Inflow Area = 2.866 ac, 0.00% Impervious, Inflow Depth = 3.46" for 25-Year event
Inflow = 8.79 cfs @ 12.21 hrs, Volume= 0.827 af
Outflow = 2.05 cfs @ 12.75 hrs, Volume= 0.827 af, Atten= 77%, Lag= 32.8 min
Discarded = 0.80 cfs @ 12.76 hrs, Volume= 0.759 af
Primary = 1.25 cfs @ 12.75 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 413.64' @ 12.76 hrs Surf.Area= 6,876 sf Storage= 14,433 cf

Plug-Flow detention time= 172.4 min calculated for 0.827 af (100% of inflow)
Center-of-Mass det. time= 172.4 min (1,007.0 - 834.6)

Volume	Invert	Avail.Storage	Storage Description
#1	411.00'	16,968 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

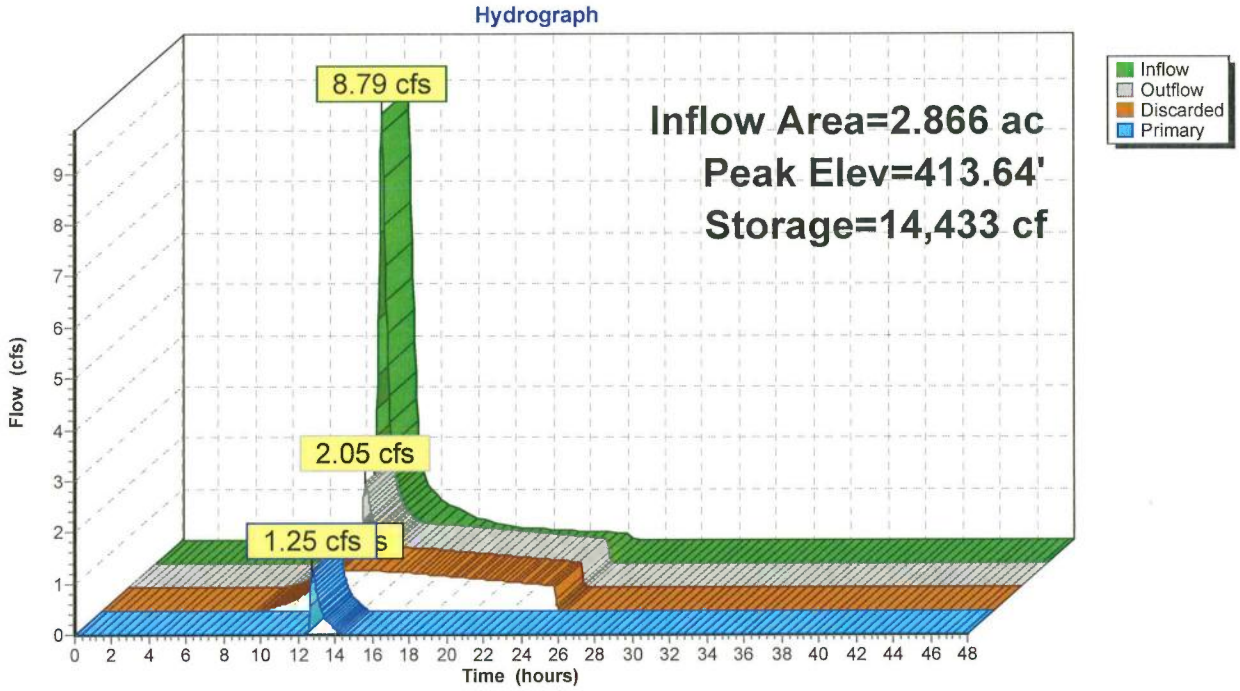
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
411.00	4,114	0	0
412.00	5,110	4,612	4,612
413.00	6,164	5,637	10,249
414.00	7,274	6,719	16,968

Device	Routing	Invert	Outlet Devices
#1	Discarded	411.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	413.50'	**10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.80 cfs @ 12.76 hrs HW=413.64' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.80 cfs)

Primary OutFlow Max=1.24 cfs @ 12.75 hrs HW=413.64' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.24 cfs @ 0.88 fps)

Pond P-1: P-1


Hydrograph
8.79 cfs
2.05 cfs
1.25 cfs
Inflow Area=2.866 ac
Peak Elev=413.64'
Storage=14,433 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
0 1 2 3 4 5 6 7 8 9

Summary for Pond P-2A: P-2A

Inflow Area = 1.355 ac, 0.00% Impervious, Inflow Depth = 3.17" for 25-Year event
Inflow = 3.27 cfs @ 12.30 hrs, Volume= 0.357 af
Outflow = 1.28 cfs @ 12.76 hrs, Volume= 0.357 af, Atten= 61%, Lag= 27.5 min
Discarded = 0.36 cfs @ 12.76 hrs, Volume= 0.320 af
Primary = 0.92 cfs @ 12.76 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 419.61' @ 12.76 hrs Surf.Area= 3,128 sf Storage= 5,825 cf

Plug-Flow detention time= 160.4 min calculated for 0.357 af (100% of inflow)
Center-of-Mass det. time= 160.3 min (1,008.0 - 847.7)

Volume	Invert	Avail.Storage	Storage Description
#1	417.00'	7,116 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

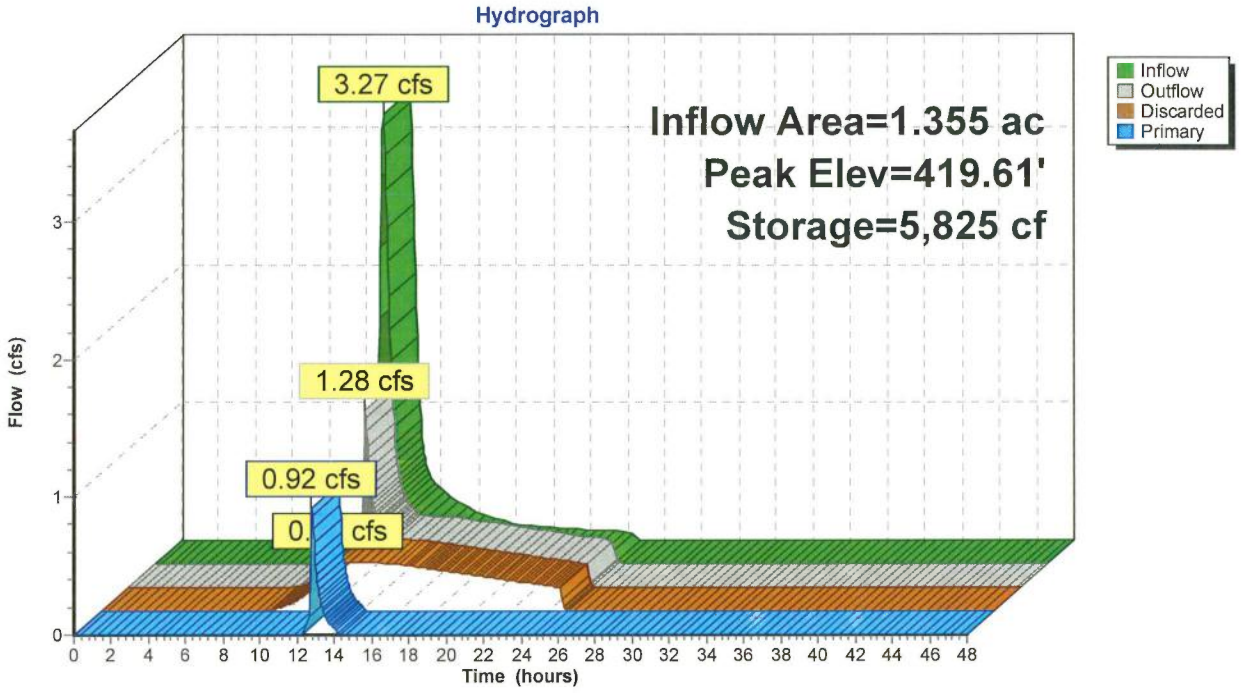
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
417.00	1,405	0	0
418.00	2,018	1,712	1,712
419.00	2,688	2,353	4,065
420.00	3,415	3,052	7,116

Device	Routing	Invert	Outlet Devices
#1	Discarded	417.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	419.50'	**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

Discarded OutFlow Max=0.36 cfs @ 12.76 hrs HW=419.60' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=0.90 cfs @ 12.76 hrs HW=419.60' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.90 cfs @ 0.86 fps)

Pond P-2A: P-2A


Hydrograph
3.27 cfs
1.28 cfs
0.92 cfs
0. cfs
Inflow Area=1.355 ac
Peak Elev=419.61'
Storage=5,825 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
0
1
2
3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Pond P-2B: P-2B

Inflow Area = 0.742 ac, 0.00% Impervious, Inflow Depth = 3.27" for 25-Year event
Inflow = 2.31 cfs @ 12.17 hrs, Volume= 0.202 af
Outflow = 0.28 cfs @ 13.16 hrs, Volume= 0.202 af, Atten= 88%, Lag= 59.1 min
Discarded = 0.28 cfs @ 13.16 hrs, Volume= 0.202 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 413.92' @ 13.16 hrs Surf.Area= 2,383 sf Storage= 3,533 cf

Plug-Flow detention time= 128.9 min calculated for 0.202 af (100% of inflow)
Center-of-Mass det. time= 128.9 min (965.5 - 836.6)

Volume	Invert	Avail.Storage	Storage Description
#1	412.00'	6,481 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

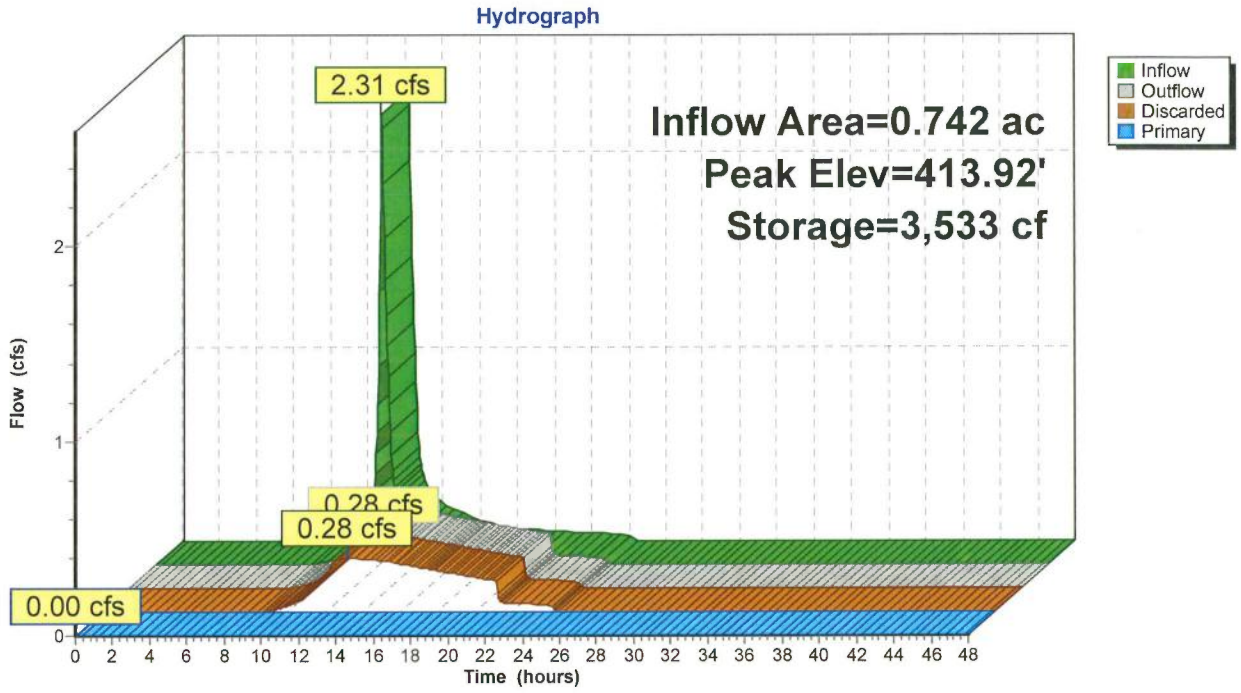
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
412.00	1,330	0	0
413.00	1,852	1,591	1,591
414.00	2,431	2,142	3,733
415.00	3,065	2,748	6,481

Device	Routing	Invert	Outlet Devices
#1	Discarded	412.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	414.50'	**10.0' long x 15.0' 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=0.28 cfs @ 13.16 hrs HW=413.92' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=412.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2B: P-2B


Hydrograph
2.31 cfs
0.28 cfs
0.28 cfs
0.00 cfs
Inflow Area=0.742 ac
Peak Elev=413.92'
Storage=3,533 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
0
1
2
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Pond P-3: P-3

Inflow Area = 1.638 ac, 0.00% Impervious, Inflow Depth = 3.27" for 25-Year event
Inflow = 4.37 cfs @ 12.26 hrs, Volume= 0.446 af
Outflow = 0.51 cfs @ 13.66 hrs, Volume= 0.446 af, Atten= 88%, Lag= 84.3 min
Discarded = 0.51 cfs @ 13.66 hrs, Volume= 0.446 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 411.44' @ 13.66 hrs Surf.Area= 4,420 sf Storage= 8,348 cf

Plug-Flow detention time= 172.9 min calculated for 0.446 af (100% of inflow)
Center-of-Mass det. time= 172.9 min (1,015.2 - 842.3)

Volume	Invert	Avail.Storage	Storage Description
#1	409.00'	10,964 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

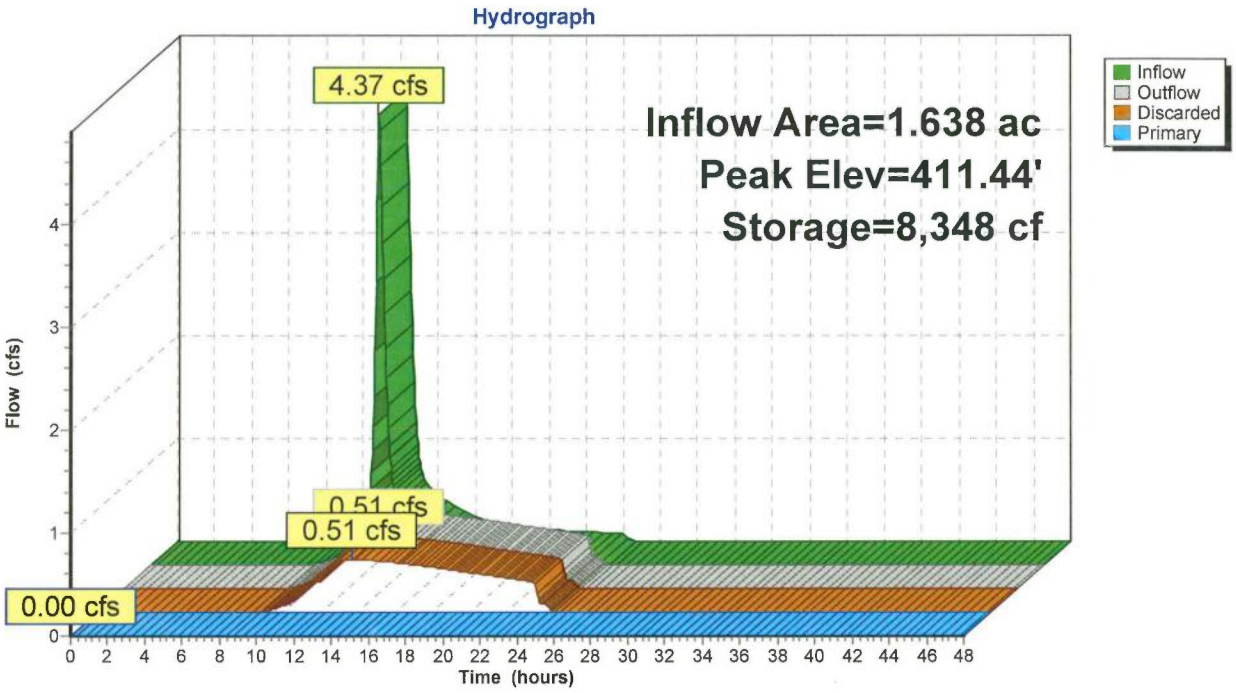
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
409.00	2,479	0	0
410.00	3,231	2,855	2,855
411.00	4,040	3,636	6,491
412.00	4,906	4,473	10,964

Device	Routing	Invert	Outlet Devices
#1	Discarded	409.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	411.50'	**10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.51 cfs @ 13.66 hrs HW=411.44' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.51 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=409.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-3: P-3


Hydrograph
4.37 cfs
0.51 cfs
0.51 cfs
0.00 cfs
Inflow Area=1.638 ac
Peak Elev=411.44'
Storage=8,348 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
0
1
2
3
4
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Pond P-4: P-4

Inflow Area = 4.212 ac, 0.00% Impervious, Inflow Depth = 3.83" for 25-Year event
Inflow = 13.63 cfs @ 12.22 hrs, Volume= 1.343 af
Outflow = 1.73 cfs @ 13.25 hrs, Volume= 0.977 af, Atten= 87%, Lag= 61.7 min
Discarded = 0.21 cfs @ 13.25 hrs, Volume= 0.621 af
Primary = 1.52 cfs @ 13.25 hrs, Volume= 0.356 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 399.62' @ 13.25 hrs Surf.Area= 11,327 sf Storage= 33,462 cf

Plug-Flow detention time= 677.7 min calculated for 0.976 af (73% of inflow)
Center-of-Mass det. time= 588.1 min (1,415.7 - 827.6)

Volume	Invert	Avail.Storage	Storage Description
#1	396.00'	37,885 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

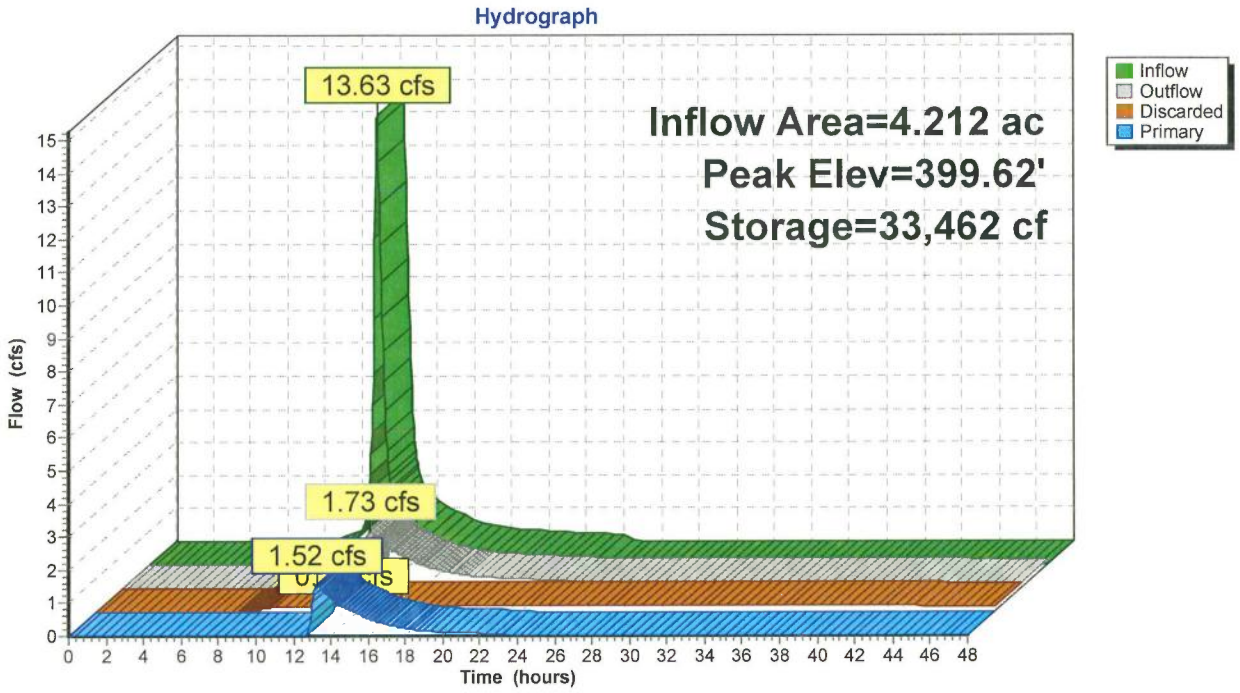
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
396.00	7,294	0	0
397.00	8,333	7,814	7,814
398.00	9,429	8,881	16,695
399.00	10,581	10,005	26,700
400.00	11,790	11,186	37,885

Device	Routing	Invert	Outlet Devices
#1	Discarded	396.00'	**0.800 in/hr Exfiltration over Surface area**
#2	Primary	399.50'	**15.0' long x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.21 cfs @ 13.25 hrs HW=399.62' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.21 cfs)

Primary OutFlow Max=1.50 cfs @ 13.25 hrs HW=399.62' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 1.50 cfs @ 0.85 fps)

Pond P-4: P-4

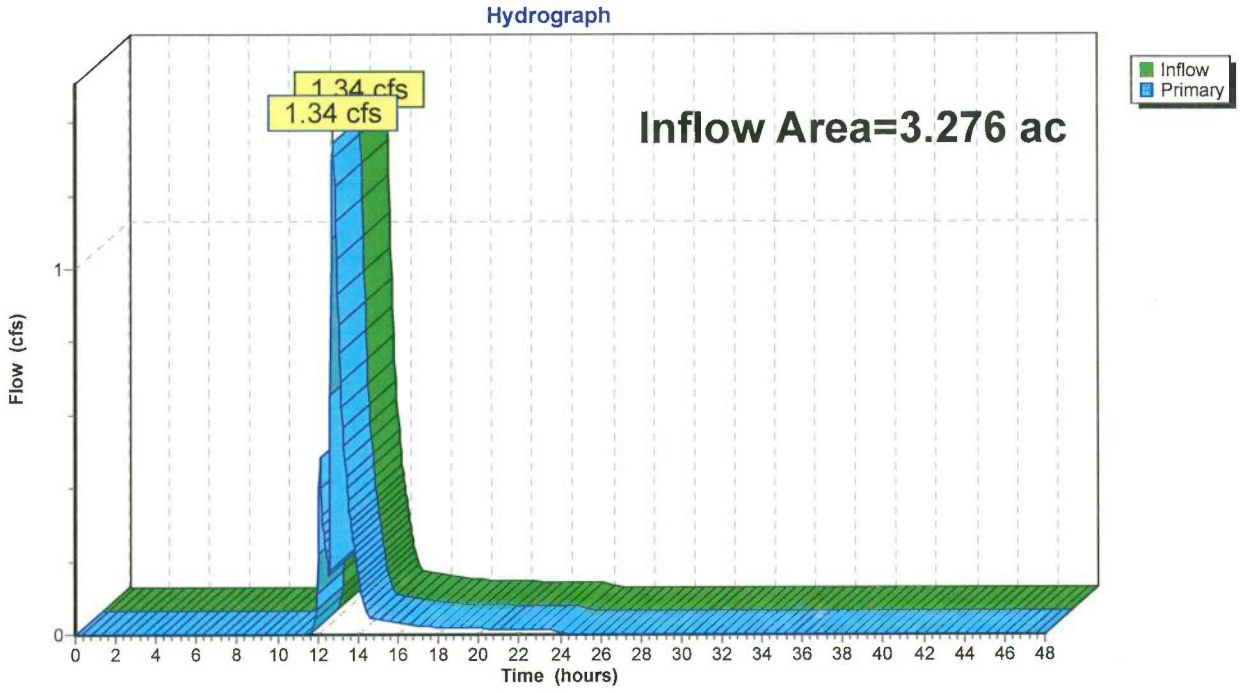

Hydrograph
13.63 cfs
1.73 cfs
1.52 cfs
Inflow Area=4.212 ac
Peak Elev=399.62'
Storage=33,462 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)

Summary for Link 1L: AP-1

Inflow Area = 3.276 ac, 0.00% Impervious, Inflow Depth = 0.41" for 25-Year event
Inflow = 1.34 cfs @ 12.75 hrs, Volume= 0.111 af
Primary = 1.34 cfs @ 12.75 hrs, Volume= 0.111 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: AP-1

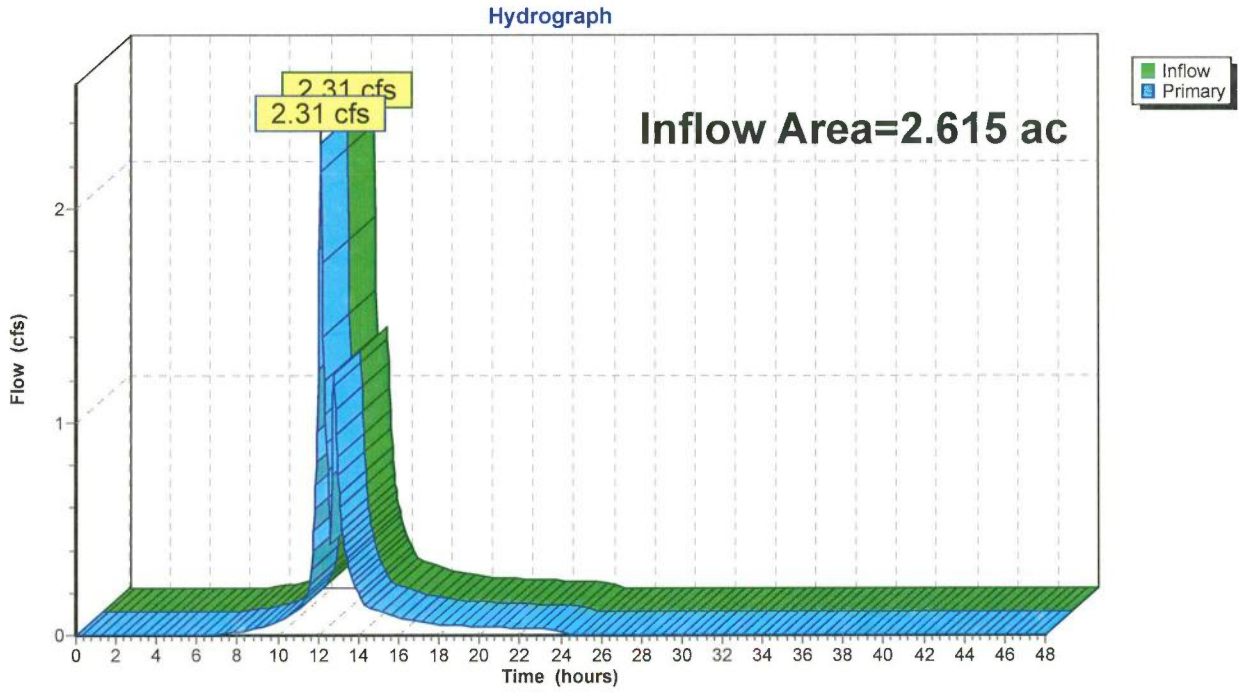


Summary for Link 2L: AP-2

Inflow Area = 2.615 ac, 0.00% Impervious, Inflow Depth = 1.00" for 25-Year event
Inflow = 2.31 cfs @ 12.12 hrs, Volume= 0.218 af
Primary = 2.31 cfs @ 12.12 hrs, Volume= 0.218 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: AP-2

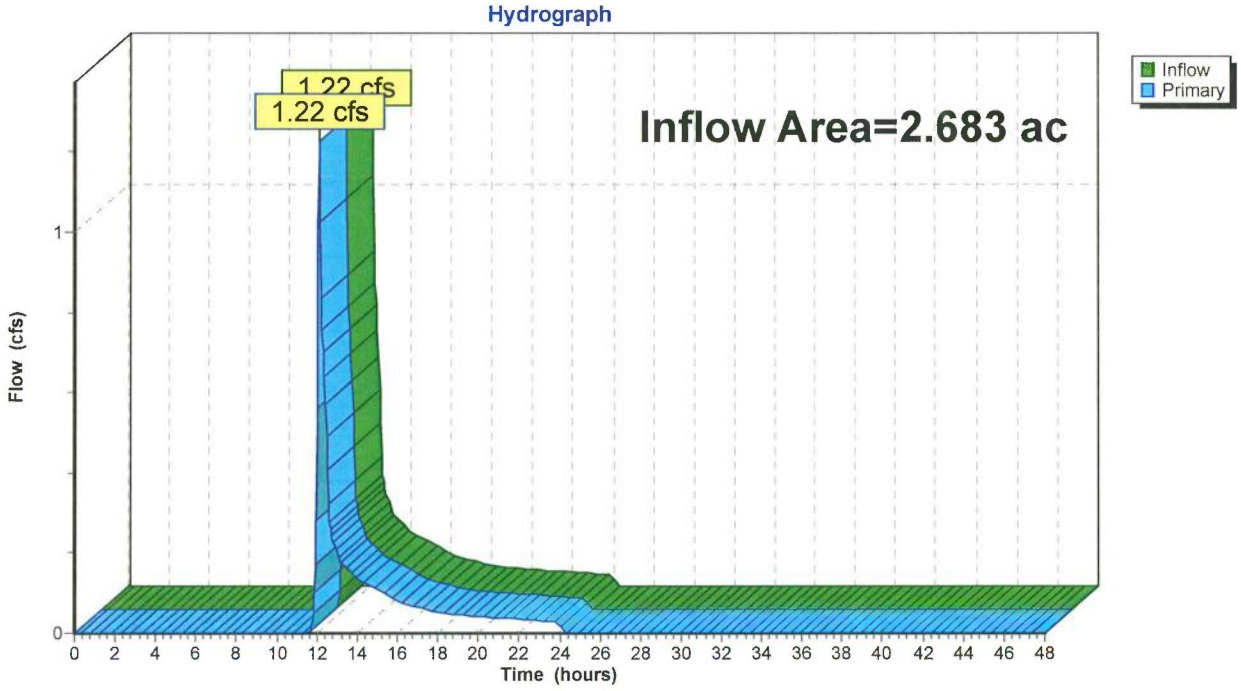


Summary for Link 3L: AP-3

Inflow Area = 2.683 ac, 0.00% Impervious, Inflow Depth = 0.48" for 25-Year event
Inflow = 1.22 cfs @ 12.10 hrs, Volume= 0.107 af
Primary = 1.22 cfs @ 12.10 hrs, Volume= 0.107 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 3L: AP-3

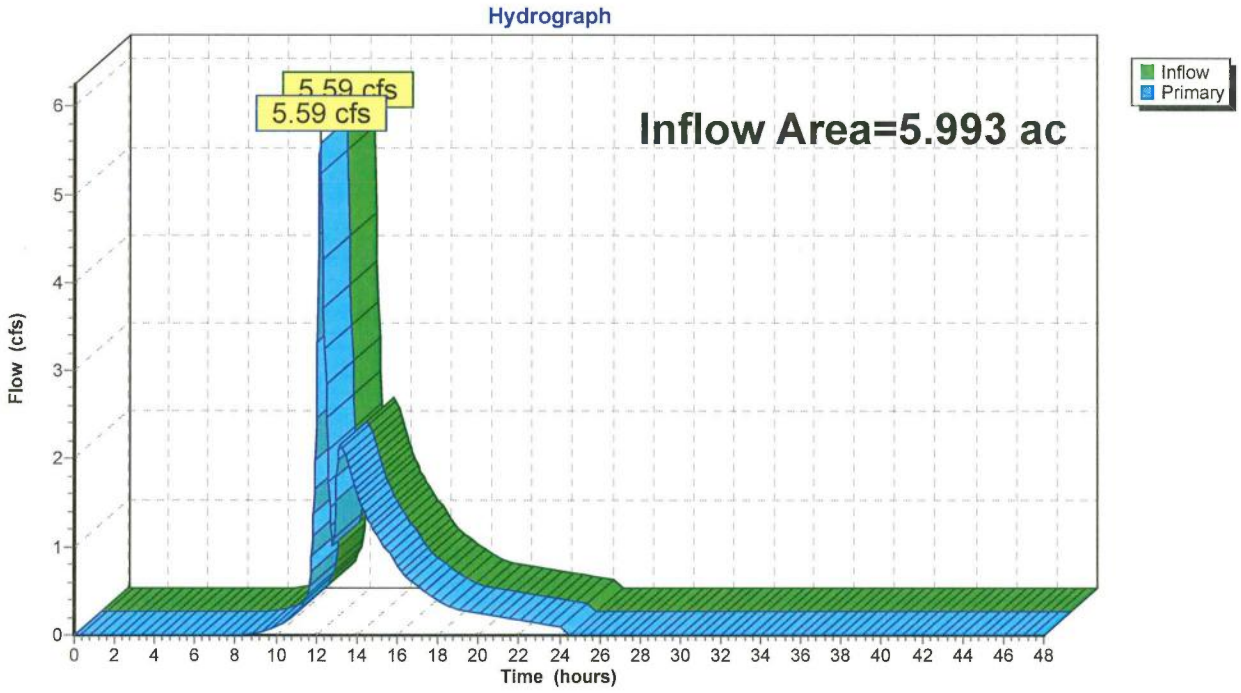


Summary for Link 4L: AP-4

Inflow Area = 5.993 ac, 0.00% Impervious, Inflow Depth = 1.71" for 25-Year event
Inflow = 5.59 cfs @ 12.18 hrs, Volume= 0.856 af
Primary = 5.59 cfs @ 12.18 hrs, Volume= 0.856 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 4L: AP-4



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 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 PDA-1A: PDA-1A Runoff Area=124,842 sf 0.00% Impervious Runoff Depth=4.18"
Flow Length=381' Tc=14.9 min CN=74 Runoff=10.62 cfs 0.999 af

Subcatchment PDA-1B: PDA-1B Runoff Area=17,880 sf 0.00% Impervious Runoff Depth=1.67"
Tc=5.0 min CN=49 Runoff=0.70 cfs 0.057 af

Subcatchment PDA-2A: PDA-2A Runoff Area=59,006 sf 0.00% Impervious Runoff Depth=3.86"
Flow Length=275' Tc=21.5 min CN=71 Runoff=4.00 cfs 0.436 af

Subcatchment PDA-2B: PDA-2B Runoff Area=32,304 sf 0.00% Impervious Runoff Depth=3.97"
Flow Length=219' Tc=12.0 min CN=72 Runoff=2.82 cfs 0.245 af

Subcatchment PDA-2C: PDA-2C Runoff Area=22,584 sf 0.00% Impervious Runoff Depth=4.95"
Flow Length=346' Tc=8.2 min CN=81 Runoff=2.72 cfs 0.214 af

Subcatchment PDA-3A: PDA-3A Runoff Area=71,342 sf 0.00% Impervious Runoff Depth=3.97"
Flow Length=322' Tc=18.2 min CN=72 Runoff=5.32 cfs 0.541 af

Subcatchment PDA-3B: PDA-3B Runoff Area=45,532 sf 0.00% Impervious Runoff Depth=1.67"
Tc=5.0 min CN=49 Runoff=1.78 cfs 0.145 af

Subcatchment PDA-4A: PDA-4A Runoff Area=141,773 sf 0.00% Impervious Runoff Depth=4.62"
Flow Length=432' Tc=14.7 min CN=78 Runoff=13.33 cfs 1.253 af

Subcatchment PDA-4B: PDA-4B Runoff Area=41,704 sf 0.00% Impervious Runoff Depth=4.40"
Flow Length=487' Tc=19.0 min CN=76 Runoff=3.39 cfs 0.351 af

Subcatchment PDA-4C: PDA-4C Runoff Area=77,592 sf 0.00% Impervious Runoff Depth=4.07"
Flow Length=168' Tc=12.7 min CN=73 Runoff=6.77 cfs 0.605 af

Reach 5R: Swale Avg. Flow Depth=0.39' Max Vel=3.93 fps Inflow=3.39 cfs 0.351 af
n=0.025 L=280.0' S=0.0286 '/' Capacity=26.85 cfs Outflow=3.35 cfs 0.351 af

Pond P-1: P-1 Peak Elev=413.79' Storage=15,467 cf Inflow=10.62 cfs 0.999 af
Discarded=0.81 cfs 0.818 af Primary=3.77 cfs 0.181 af Outflow=4.59 cfs 0.999 af

Pond P-2A: P-2A Peak Elev=419.69' Storage=6,077 cf Inflow=4.00 cfs 0.436 af
Discarded=0.37 cfs 0.347 af Primary=2.14 cfs 0.089 af Outflow=2.51 cfs 0.436 af

Pond P-2B: P-2B Peak Elev=414.31' Storage=4,512 cf Inflow=2.82 cfs 0.245 af
Discarded=0.30 cfs 0.245 af Primary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.245 af

Pond P-3: P-3 Peak Elev=411.63' Storage=9,202 cf Inflow=5.32 cfs 0.541 af
Discarded=0.53 cfs 0.491 af Primary=1.09 cfs 0.050 af Outflow=1.62 cfs 0.541 af

Pond P-4: P-4 Peak Elev=399.75' Storage=34,970 cf Inflow=16.26 cfs 1.604 af
Discarded=0.21 cfs 0.628 af Primary=4.70 cfs 0.609 af Outflow=4.91 cfs 1.237 af

Link 1L: AP-1 Inflow=3.94 cfs 0.238 af
Primary=3.94 cfs 0.238 af

Link 2L: AP-2 Inflow=2.75 cfs 0.303 af
Primary=2.75 cfs 0.303 af

Link 3L: AP-3 Inflow=1.78 cfs 0.195 af
Primary=1.78 cfs 0.195 af

Link 4L: AP-4 Inflow=6.77 cfs 1.214 af
Primary=6.77 cfs 1.214 af

Total Runoff Area = 14.567 ac Runoff Volume = 4.846 af Average Runoff Depth = 3.99"
100.00% Pervious = 14.567 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment PDA-1A: PDA-1A

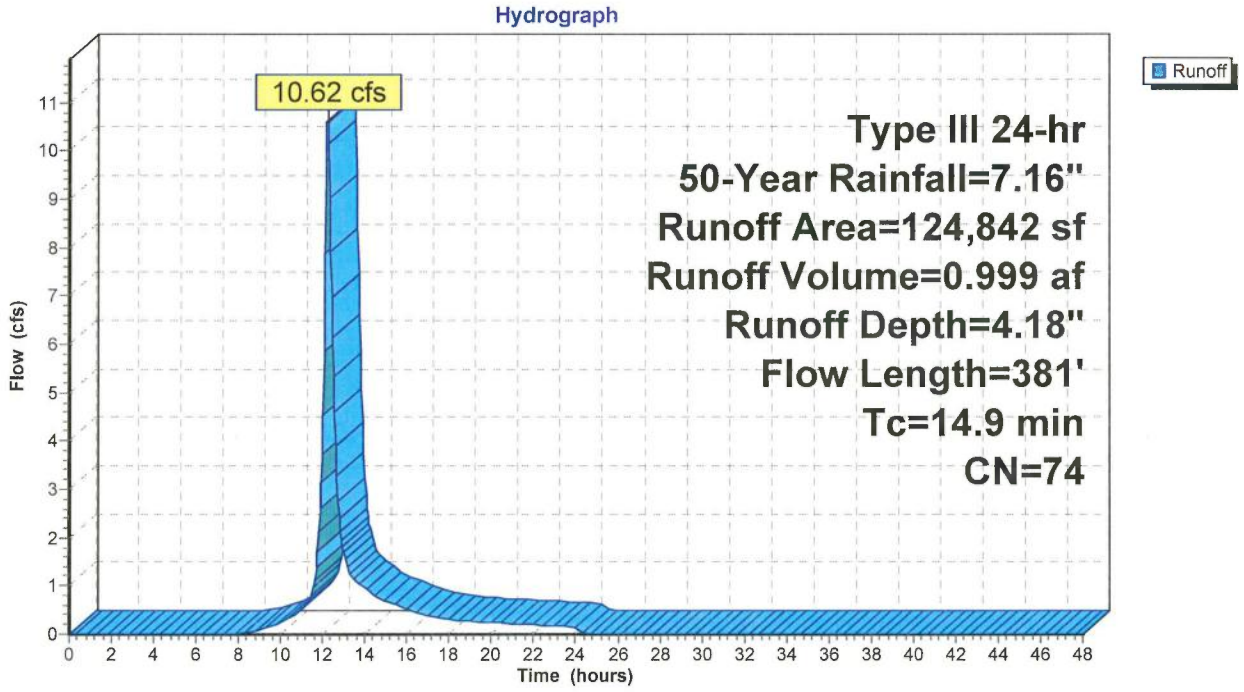
Runoff = 10.62 cfs @ 12.21 hrs, Volume= 0.999 af, Depth= 4.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
79,434	71	Meadow, non-grazed, HSG C
45,408	78	Meadow, non-grazed, HSG D
124,842	74	Weighted Average
124,842		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.0350	0.15		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
3.8	281	0.0306	1.22		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
14.9	381	Total			

Subcatchment PDA-1A: PDA-1A



Summary for Subcatchment PDA-1B: PDA-1B

[49] Hint: Tc<2dt may require smaller dt

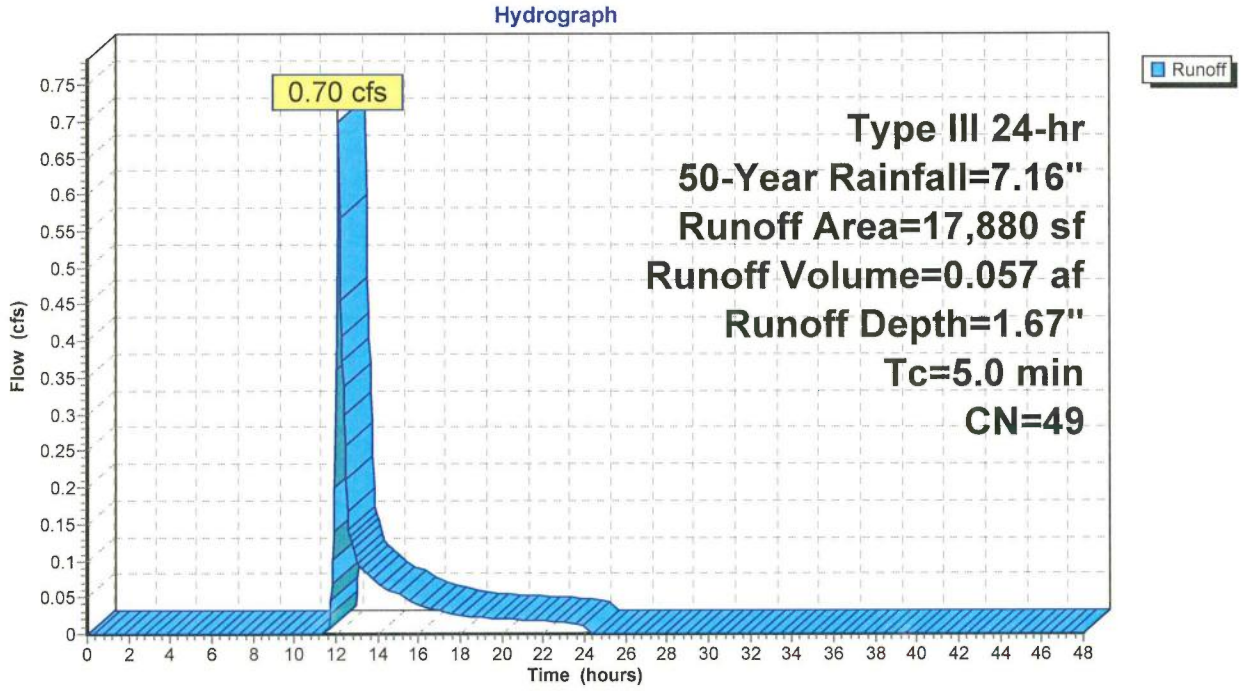
Runoff = 0.70 cfs @ 12.09 hrs, Volume= 0.057 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
16,448	48	Brush, Good, HSG B
1,432	65	Brush, Good, HSG C
17,880	49	Weighted Average
17,880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PDA-1B: PDA-1B



Summary for Subcatchment PDA-2A: PDA-2A

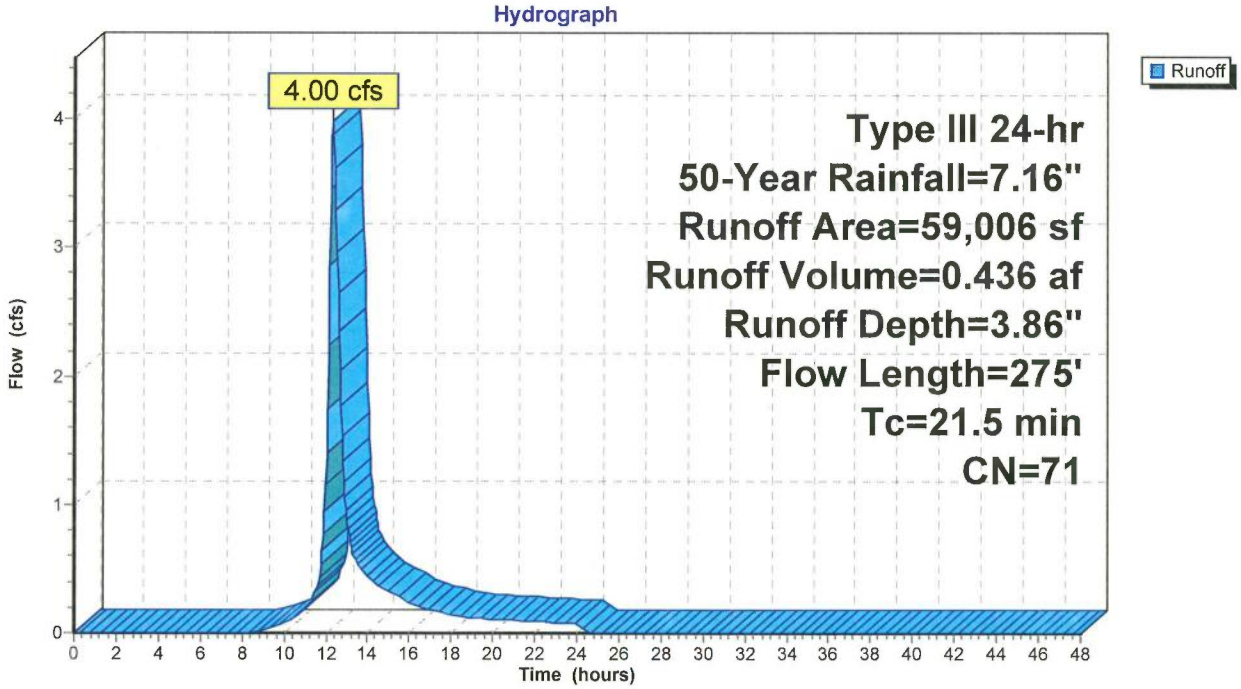
Runoff = 4.00 cfs @ 12.30 hrs, Volume= 0.436 af, Depth= 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
39,007	71	Meadow, non-grazed, HSG C
16,039	78	Meadow, non-grazed, HSG D
3,960	48	Brush, Good, HSG B
59,006	71	Weighted Average
59,006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
16.0	70	0.0069	0.07		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
2.9	175	0.0211	1.02		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
21.5	275	Total			

Subcatchment PDA-2A: PDA-2A



Summary for Subcatchment PDA-2B: PDA-2B

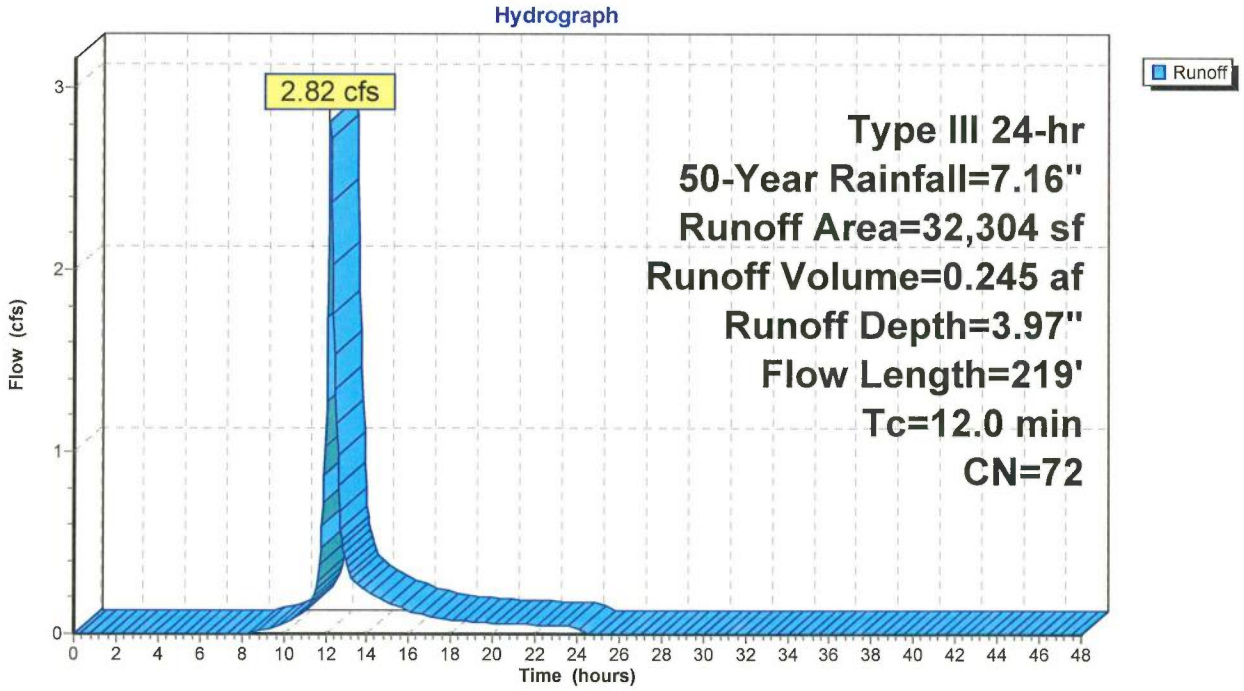
Runoff = 2.82 cfs @ 12.17 hrs, Volume= 0.245 af, Depth= 3.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
12,043	71	Meadow, non-grazed, HSG C
16,171	78	Meadow, non-grazed, HSG D
4,020	48	Brush, Good, HSG B
70	73	Brush, Good, HSG D
32,304	72	Weighted Average
32,304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
8.3	70	0.0357	0.14		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
1.1	119	0.0630	1.76		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
12.0	219	Total			

Subcatchment PDA-2B: PDA-2B



Summary for Subcatchment PDA-2C: PDA-2C

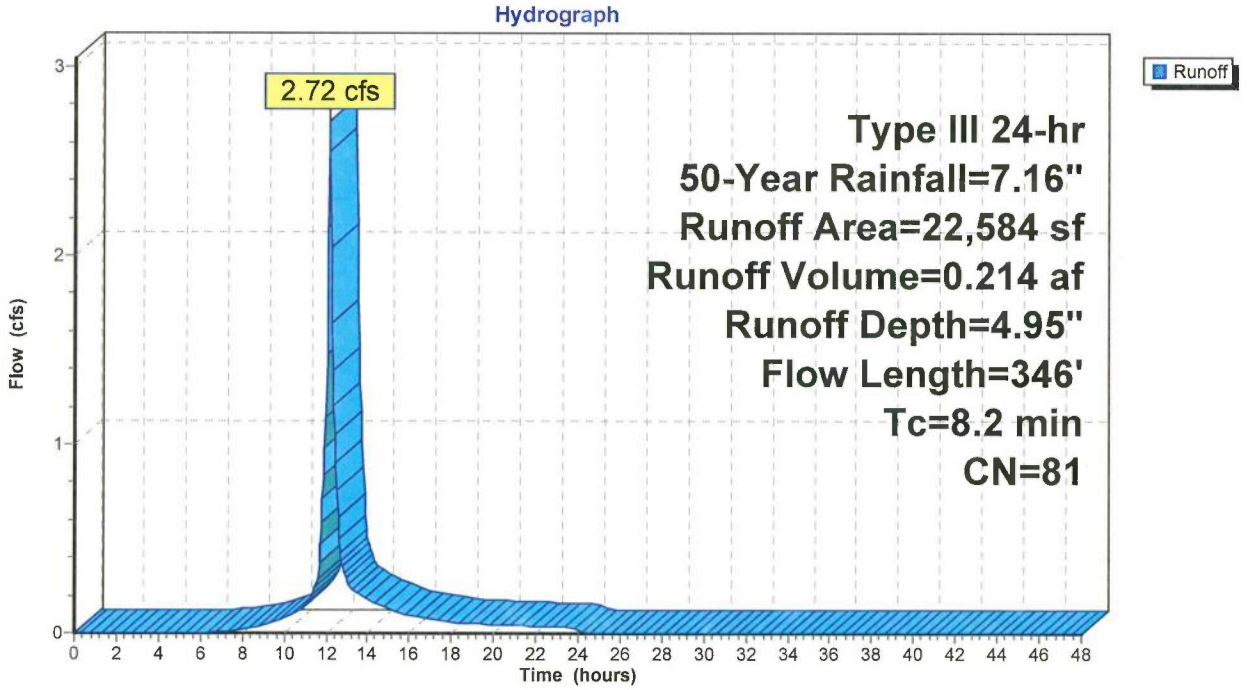
Runoff = 2.72 cfs @ 12.12 hrs, Volume= 0.214 af, Depth= 4.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
1,977	77	Woods, Good, HSG D
3,486	96	Gravel surface, HSG D
17,121	78	Meadow, non-grazed, HSG D
22,584	81	Weighted Average
22,584		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0600	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.39"
1.3	146	0.0684	1.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.8	100	0.0854	2.05		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
8.2	346	Total			

Subcatchment PDA-2C: PDA-2C



Summary for Subcatchment PDA-3A: PDA-3A

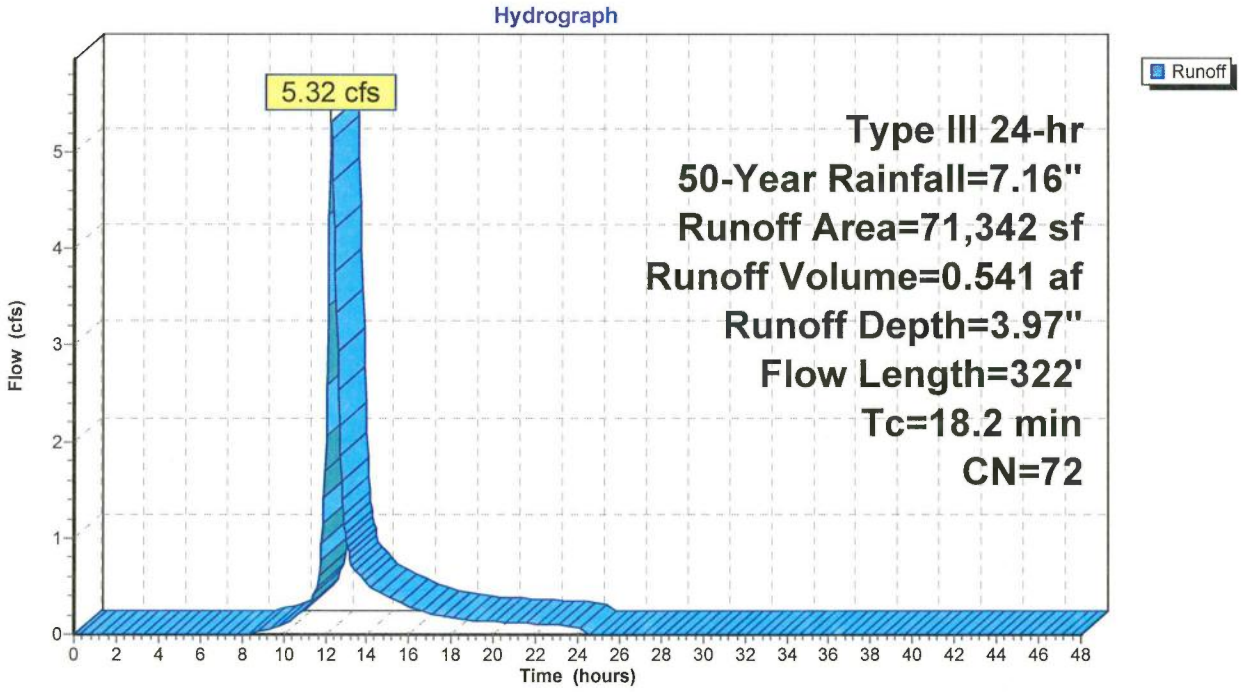
Runoff = 5.32 cfs @ 12.25 hrs, Volume= 0.541 af, Depth= 3.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
64,777	71	Meadow, non-grazed, HSG C
6,565	78	Meadow, non-grazed, HSG D
71,342	72	Weighted Average
71,342		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0150	0.11		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
2.6	222	0.0417	1.43		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
18.2	322	Total			

Subcatchment PDA-3A: PDA-3A



Summary for Subcatchment PDA-3B: PDA-3B

[49] Hint: Tc<2dt may require smaller dt

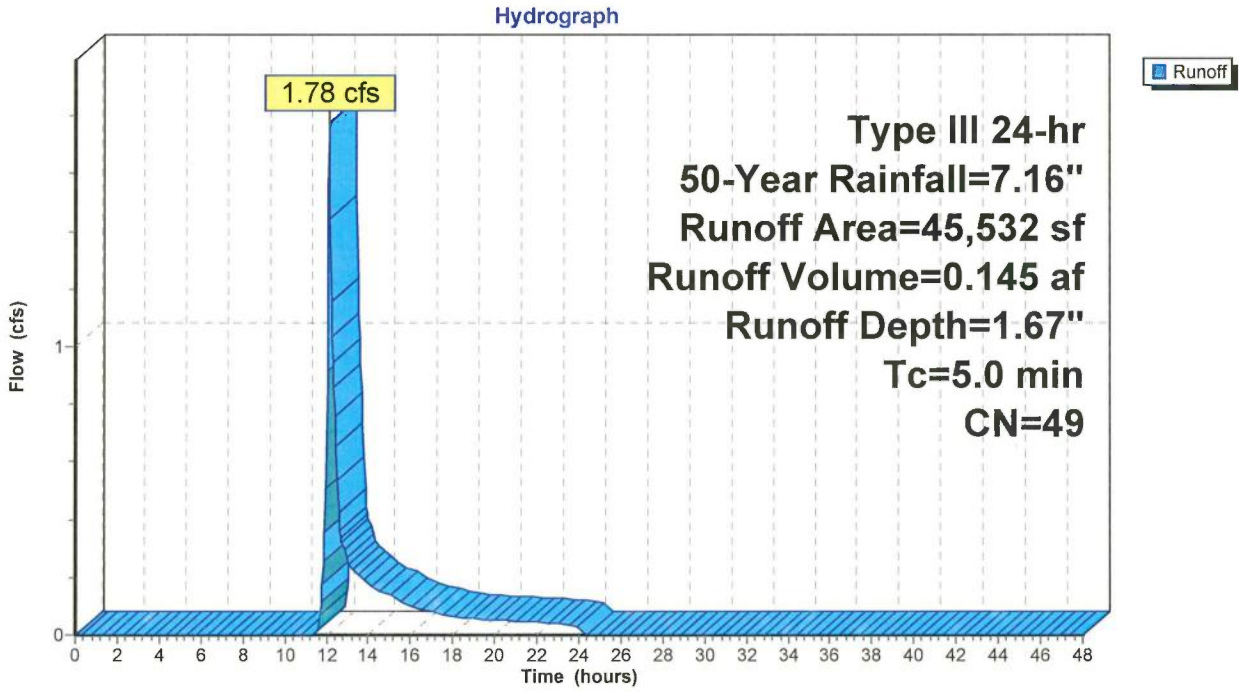
Runoff = 1.78 cfs @ 12.09 hrs, Volume= 0.145 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
43,429	48	Brush, Good, HSG B
2,103	73	Brush, Good, HSG D
45,532	49	Weighted Average
45,532		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PDA-3B: PDA-3B



Summary for Subcatchment PDA-4A: PDA-4A

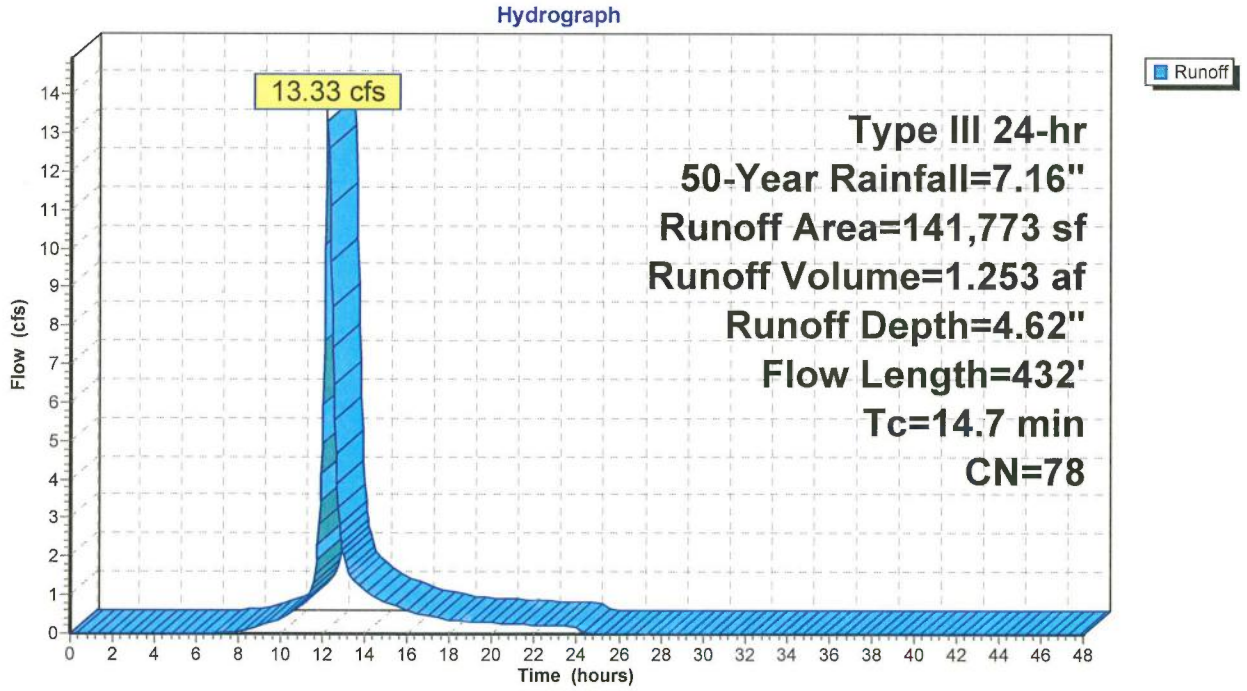
Runoff = 13.33 cfs @ 12.20 hrs, Volume= 1.253 af, Depth= 4.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
136,646	78	Meadow, non-grazed, HSG D
5,127	73	Brush, Good, HSG D
141,773	78	Weighted Average
141,773		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	67	0.0224	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
2.5	33	0.1515	0.22		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
1.2	157	0.0955	2.16		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
1.0	82	0.0366	1.34		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.4	93	0.0550	3.52		**Shallow Concentrated Flow, E-F** Grassed Waterway Kv= 15.0 fps
14.7	432	Total			

Subcatchment PDA-4A: PDA-4A



Summary for Subcatchment PDA-4B: PDA-4B

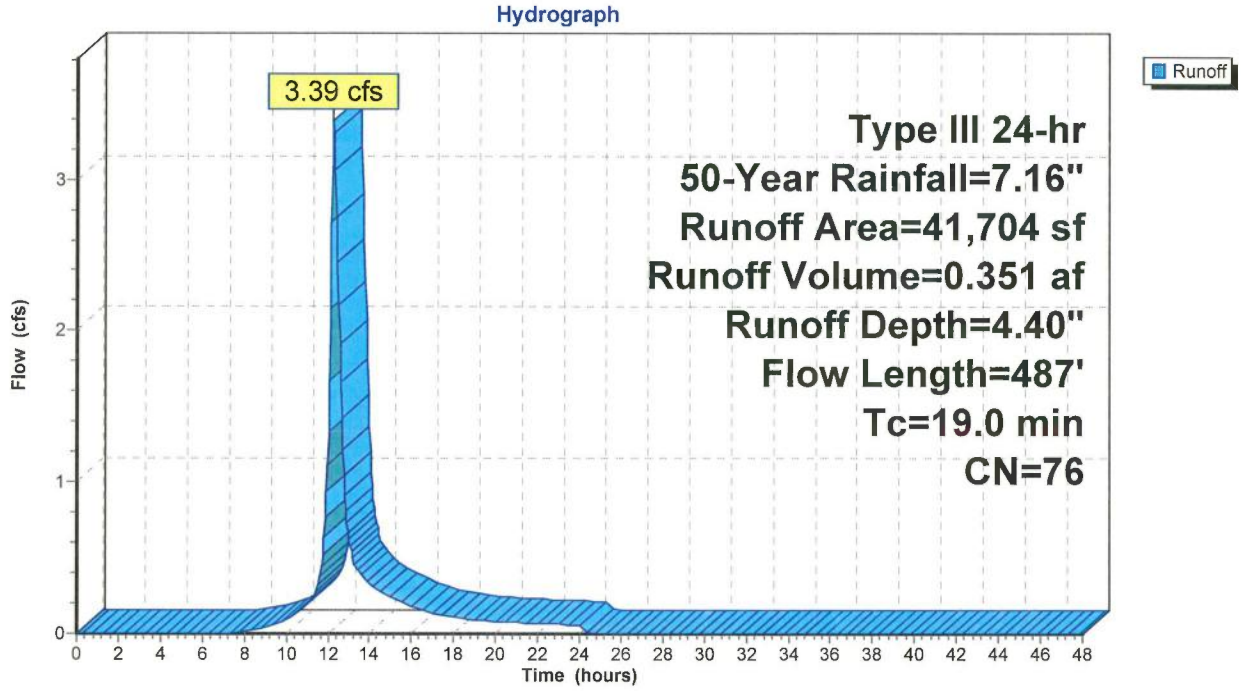
Runoff = 3.39 cfs @ 12.26 hrs, Volume= 0.351 af, Depth= 4.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
13,291	71	Meadow, non-grazed, HSG C
28,356	78	Meadow, non-grazed, HSG D
57	96	Gravel surface, HSG D
41,704	76	Weighted Average
41,704		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	100	0.0200	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
2.9	163	0.0184	0.95		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.0	117	0.0855	2.05		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.8	63	0.0317	1.25		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.4	44	0.0682	1.83		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
19.0	487	Total			

Subcatchment PDA-4B: PDA-4B



Summary for Subcatchment PDA-4C: PDA-4C

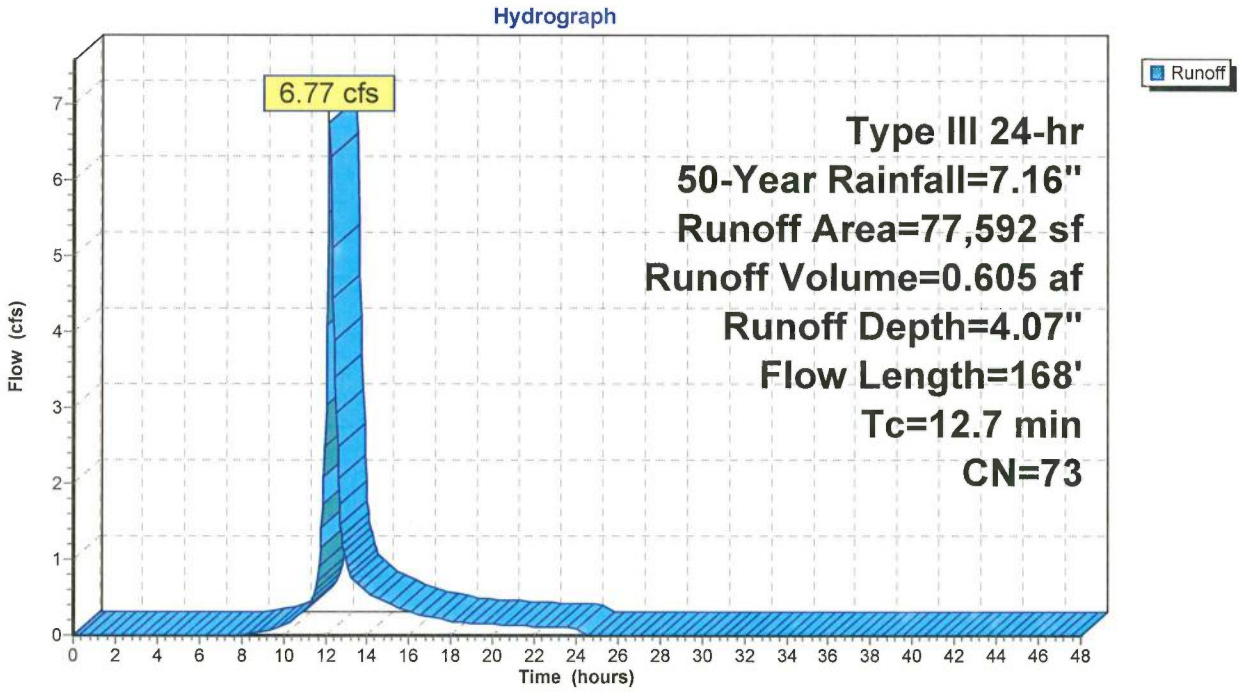
Runoff = 6.77 cfs @ 12.18 hrs, Volume= 0.605 af, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
77,592	73	Brush, Good, HSG D
77,592		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.0800	0.14		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
0.7	68	0.1029	1.60		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
12.7	168	Total			

Subcatchment PDA-4C: PDA-4C



Summary for Reach 5R: Swale

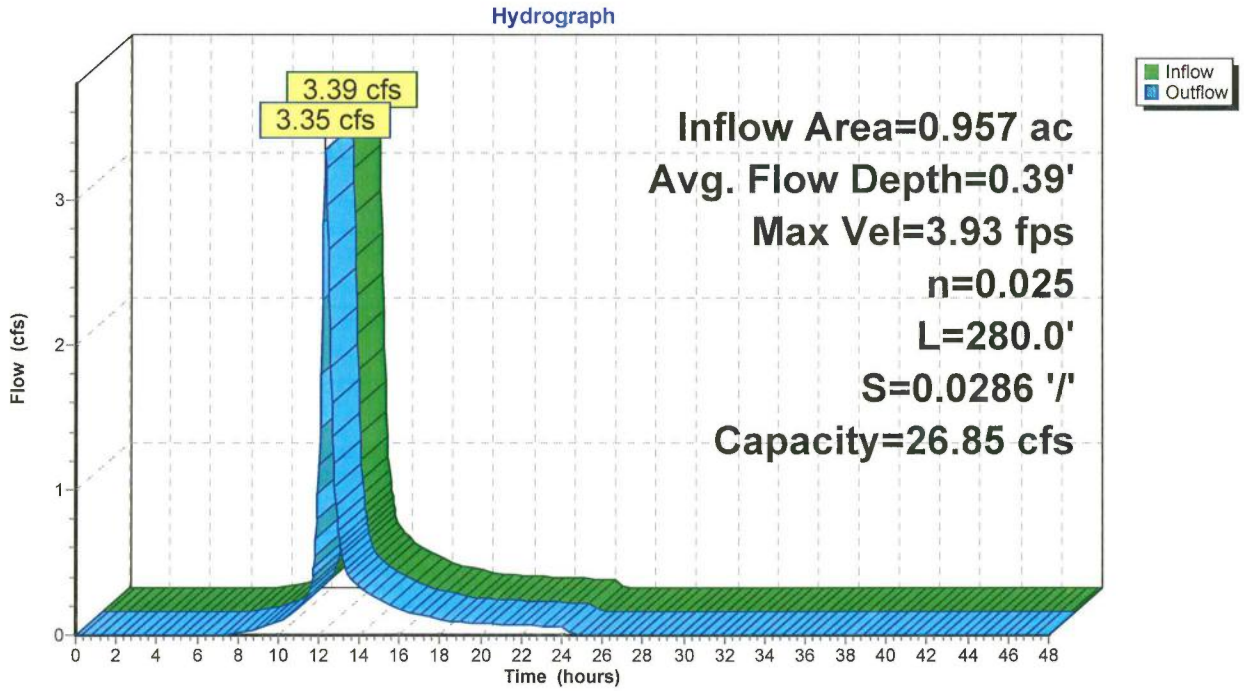
Inflow Area = 0.957 ac, 0.00% Impervious, Inflow Depth = 4.40" for 50-Year event
Inflow = 3.39 cfs @ 12.26 hrs, Volume= 0.351 af
Outflow = 3.35 cfs @ 12.30 hrs, Volume= 0.351 af, Atten= 1%, Lag= 2.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.93 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.47 fps, Avg. Travel Time= 3.2 min

Peak Storage= 240 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 26.85 cfs

1.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 280.0' Slope= 0.0286 '/'
Inlet Invert= 408.00', Outlet Invert= 400.00'

Reach 5R: Swale



Summary for Pond P-1: P-1

Inflow Area = 2.866 ac, 0.00% Impervious, Inflow Depth = 4.18" for 50-Year event
Inflow = 10.62 cfs @ 12.21 hrs, Volume= 0.999 af
Outflow = 4.59 cfs @ 12.56 hrs, Volume= 0.999 af, Atten= 57%, Lag= 21.1 min
Discarded = 0.81 cfs @ 12.56 hrs, Volume= 0.818 af
Primary = 3.77 cfs @ 12.56 hrs, Volume= 0.181 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 413.79' @ 12.56 hrs Surf.Area= 7,041 sf Storage= 15,467 cf

Plug-Flow detention time= 157.6 min calculated for 0.999 af (100% of inflow)
Center-of-Mass det. time= 157.6 min (986.8 - 829.2)

Volume	Invert	Avail.Storage	Storage Description
#1	411.00'	16,968 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

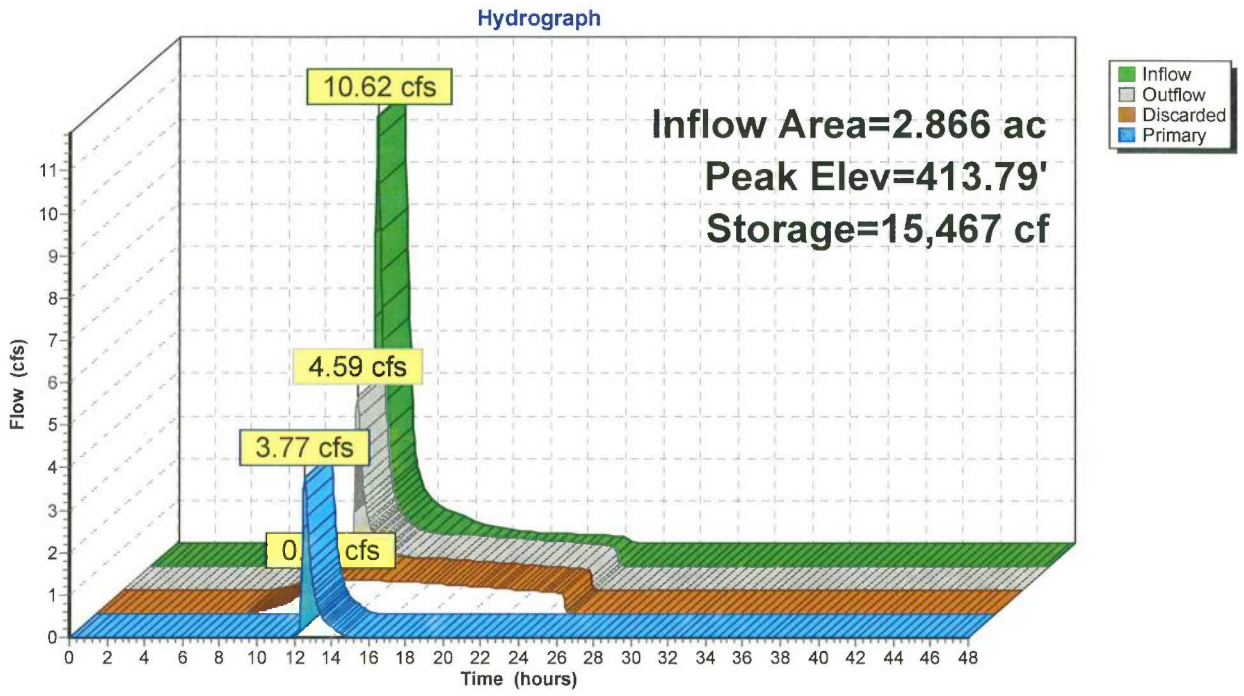
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
411.00	4,114	0	0
412.00	5,110	4,612	4,612
413.00	6,164	5,637	10,249
414.00	7,274	6,719	16,968

Device	Routing	Invert	Outlet Devices
#1	Discarded	411.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	413.50'	**10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.81 cfs @ 12.56 hrs HW=413.79' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.81 cfs)

Primary OutFlow Max=3.74 cfs @ 12.56 hrs HW=413.79' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 3.74 cfs @ 1.30 fps)

Pond P-1: P-1


Hydrograph
10.62 cfs
4.59 cfs
3.77 cfs
0 cfs
Inflow Area=2.866 ac
Peak Elev=413.79'
Storage=15,467 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)

Summary for Pond P-2A: P-2A

Inflow Area = 1.355 ac, 0.00% Impervious, Inflow Depth = 3.86" for 50-Year event
Inflow = 4.00 cfs @ 12.30 hrs, Volume= 0.436 af
Outflow = 2.51 cfs @ 12.58 hrs, Volume= 0.436 af, Atten= 37%, Lag= 16.7 min
Discarded = 0.37 cfs @ 12.58 hrs, Volume= 0.347 af
Primary = 2.14 cfs @ 12.58 hrs, Volume= 0.089 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 419.69' @ 12.58 hrs Surf.Area= 3,186 sf Storage= 6,077 cf

Plug-Flow detention time= 145.8 min calculated for 0.435 af (100% of inflow)
Center-of-Mass det. time= 145.7 min (987.7 - 842.0)

Volume	Invert	Avail.Storage	Storage Description
#1	417.00'	7,116 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

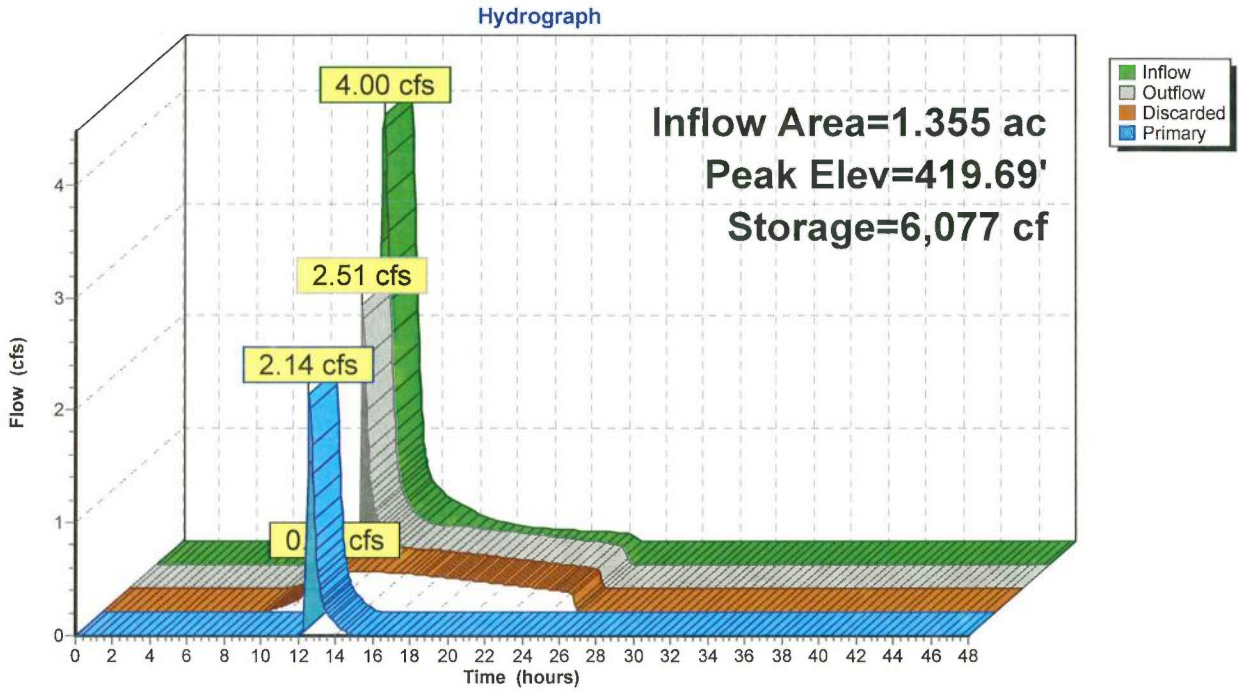
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
417.00	1,405	0	0
418.00	2,018	1,712	1,712
419.00	2,688	2,353	4,065
420.00	3,415	3,052	7,116

Device	Routing	Invert	Outlet Devices
#1	Discarded	417.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	419.50'	**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

Discarded OutFlow Max=0.37 cfs @ 12.58 hrs HW=419.68' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.37 cfs)

Primary OutFlow Max=2.11 cfs @ 12.58 hrs HW=419.68' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 2.11 cfs @ 1.15 fps)

Pond P-2A: P-2A


Hydrograph
4.00 cfs
2.51 cfs
2.14 cfs
0 cfs
Inflow Area=1.355 ac
Peak Elev=419.69'
Storage=6,077 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
0 1 2 3 4

Summary for Pond P-2B: P-2B

Inflow Area = 0.742 ac, 0.00% Impervious, Inflow Depth = 3.97" for 50-Year event
Inflow = 2.82 cfs @ 12.17 hrs, Volume= 0.245 af
Outflow = 0.30 cfs @ 13.27 hrs, Volume= 0.245 af, Atten= 89%, Lag= 66.3 min
Discarded = 0.30 cfs @ 13.27 hrs, Volume= 0.245 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 414.31' @ 13.27 hrs Surf.Area= 2,626 sf Storage= 4,512 cf

Plug-Flow detention time= 155.3 min calculated for 0.245 af (100% of inflow)
Center-of-Mass det. time= 155.2 min (986.2 - 831.0)

Volume	Invert	Avail.Storage	Storage Description
#1	412.00'	6,481 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

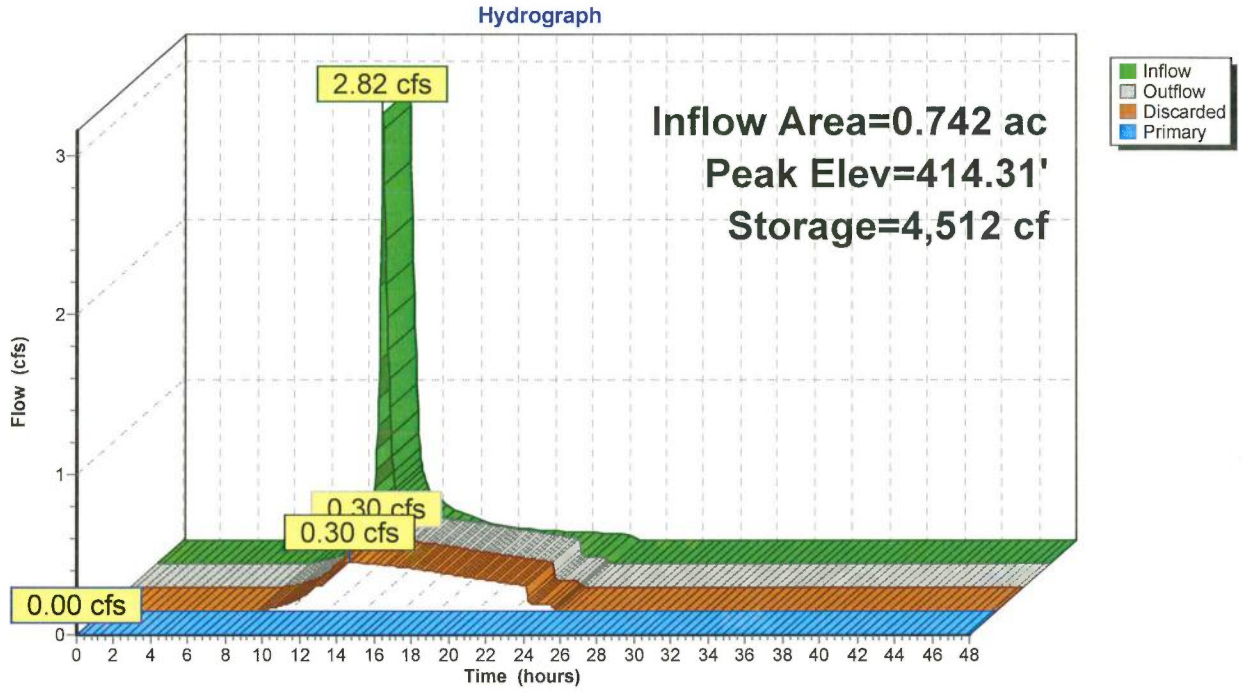
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
412.00	1,330	0	0
413.00	1,852	1,591	1,591
414.00	2,431	2,142	3,733
415.00	3,065	2,748	6,481

Device	Routing	Invert	Outlet Devices
#1	Discarded	412.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	414.50'	**10.0' long x 15.0' 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=0.30 cfs @ 13.27 hrs HW=414.31' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=412.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2B: P-2B


Hydrograph
2.82 cfs
0.30 cfs
0.30 cfs
0.00 cfs
Inflow Area=0.742 ac
Peak Elev=414.31'
Storage=4,512 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0 1 2 3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond P-3: P-3

Inflow Area = 1.638 ac, 0.00% Impervious, Inflow Depth = 3.97" for 50-Year event
Inflow = 5.32 cfs @ 12.25 hrs, Volume= 0.541 af
Outflow = 1.62 cfs @ 12.75 hrs, Volume= 0.541 af, Atten= 70%, Lag= 29.9 min
Discarded = 0.53 cfs @ 12.75 hrs, Volume= 0.491 af
Primary = 1.09 cfs @ 12.75 hrs, Volume= 0.050 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 411.63' @ 12.75 hrs Surf.Area= 4,585 sf Storage= 9,202 cf

Plug-Flow detention time= 165.9 min calculated for 0.541 af (100% of inflow)
Center-of-Mass det. time= 165.9 min (1,002.6 - 836.7)

Volume	Invert	Avail.Storage	Storage Description
#1	409.00'	10,964 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

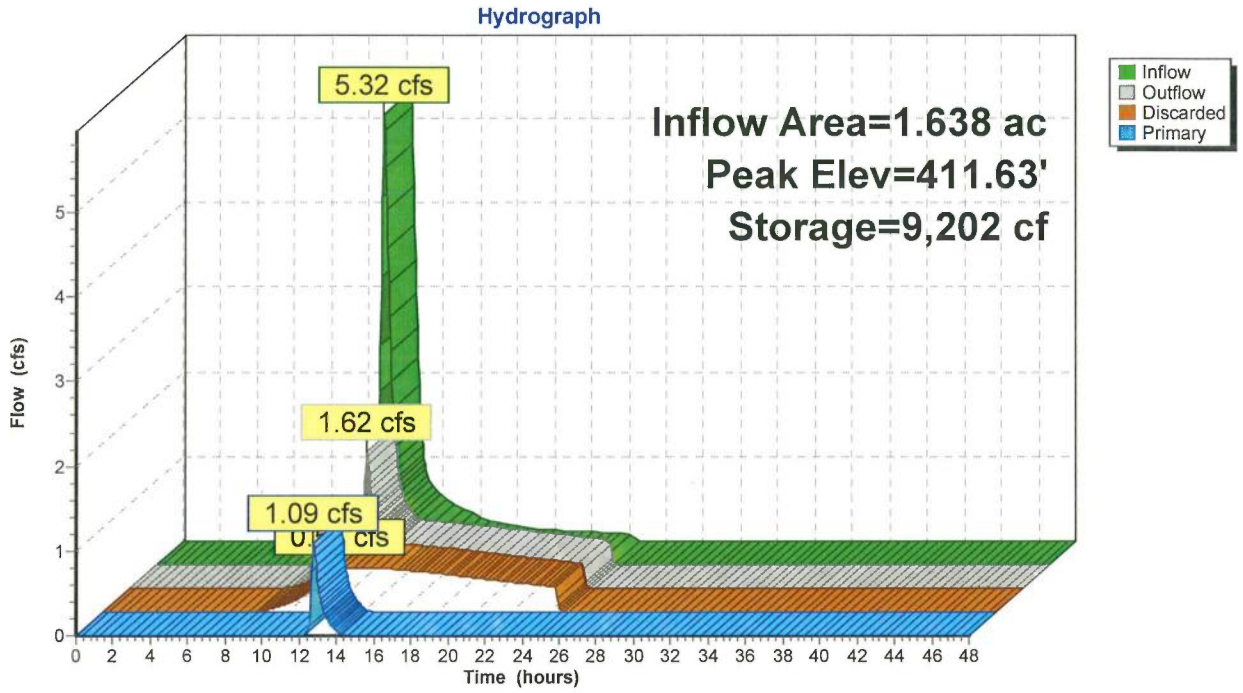
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
409.00	2,479	0	0
410.00	3,231	2,855	2,855
411.00	4,040	3,636	6,491
412.00	4,906	4,473	10,964

Device	Routing	Invert	Outlet Devices
#1	Discarded	409.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	411.50'	**10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.53 cfs @ 12.75 hrs HW=411.63' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.53 cfs)

Primary OutFlow Max=1.08 cfs @ 12.75 hrs HW=411.63' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.08 cfs @ 0.84 fps)

Pond P-3: P-3


Hydrograph
5.32 cfs
1.62 cfs
1.09 cfs
Inflow Area=1.638 ac
Peak Elev=411.63'
Storage=9,202 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
0
1
2
3
4
5
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Pond P-4: P-4

Inflow Area = 4.212 ac, 0.00% Impervious, Inflow Depth = 4.57" for 50-Year event
Inflow = 16.26 cfs @ 12.22 hrs, Volume= 1.604 af
Outflow = 4.91 cfs @ 12.69 hrs, Volume= 1.237 af, Atten= 70%, Lag= 28.6 min
Discarded = 0.21 cfs @ 12.69 hrs, Volume= 0.628 af
Primary = 4.70 cfs @ 12.69 hrs, Volume= 0.609 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 399.75' @ 12.69 hrs Surf.Area= 11,487 sf Storage= 34,970 cf

Plug-Flow detention time= 553.9 min calculated for 1.237 af (77% of inflow)
Center-of-Mass det. time= 471.2 min (1,293.8 - 822.5)

Volume	Invert	Avail.Storage	Storage Description
#1	396.00'	37,885 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

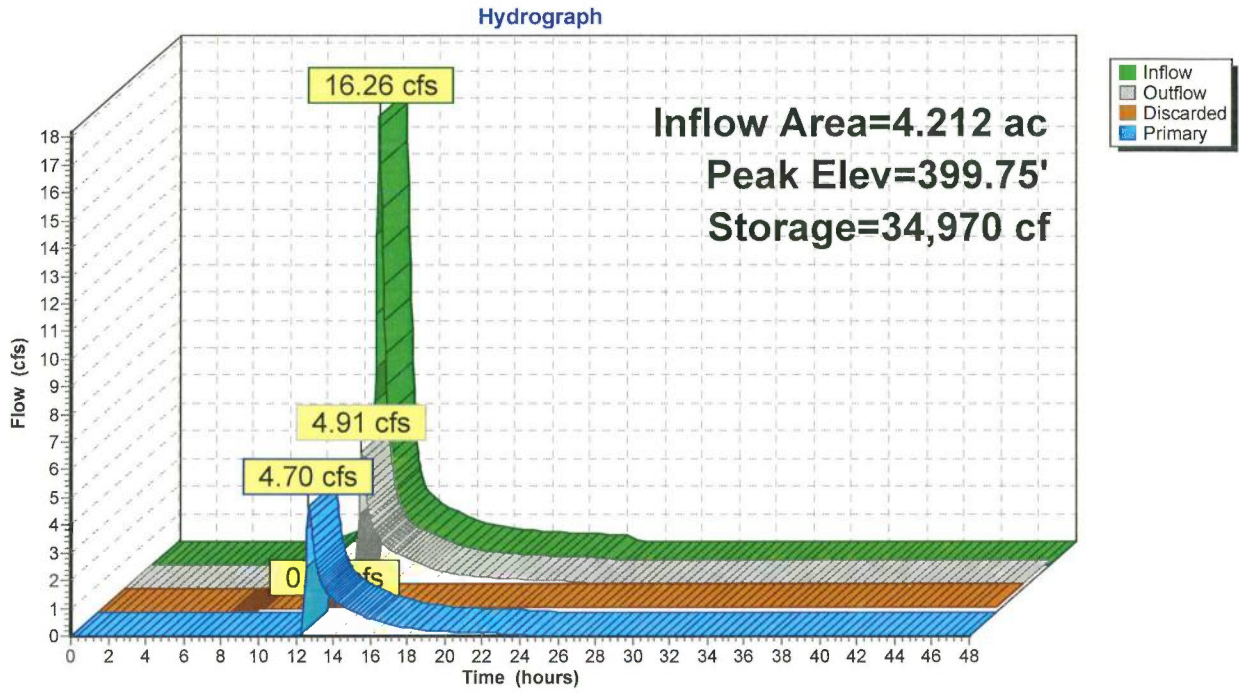
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
396.00	7,294	0	0
397.00	8,333	7,814	7,814
398.00	9,429	8,881	16,695
399.00	10,581	10,005	26,700
400.00	11,790	11,186	37,885

Device	Routing	Invert	Outlet Devices
#1	Discarded	396.00'	**0.800 in/hr Exfiltration over Surface area**
#2	Primary	399.50'	**15.0' long x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.21 cfs @ 12.69 hrs HW=399.75' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.21 cfs)

Primary OutFlow Max=4.67 cfs @ 12.69 hrs HW=399.75' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 4.67 cfs @ 1.25 fps)

Pond P-4: P-4

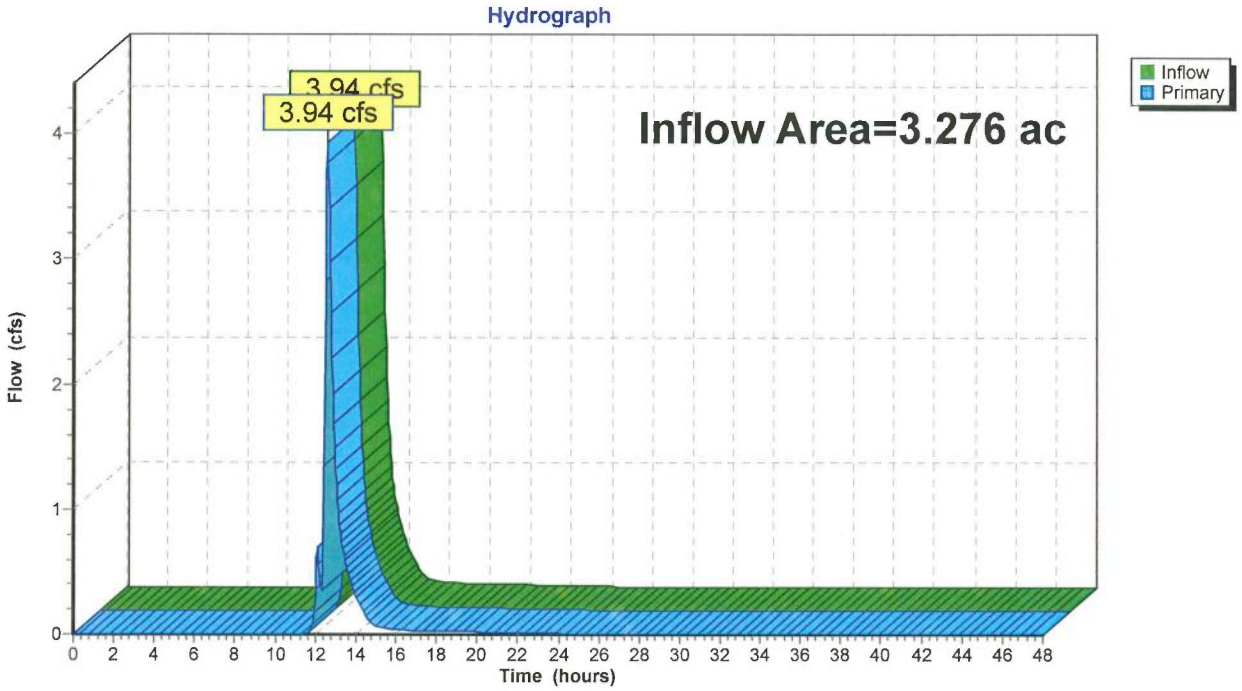

Hydrograph
16.26 cfs
4.91 cfs
4.70 cfs
Inflow Area=4.212 ac
Peak Elev=399.75'
Storage=34,970 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)

Summary for Link 1L: AP-1

Inflow Area = 3.276 ac, 0.00% Impervious, Inflow Depth = 0.87" for 50-Year event
Inflow = 3.94 cfs @ 12.55 hrs, Volume= 0.238 af
Primary = 3.94 cfs @ 12.55 hrs, Volume= 0.238 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: AP-1

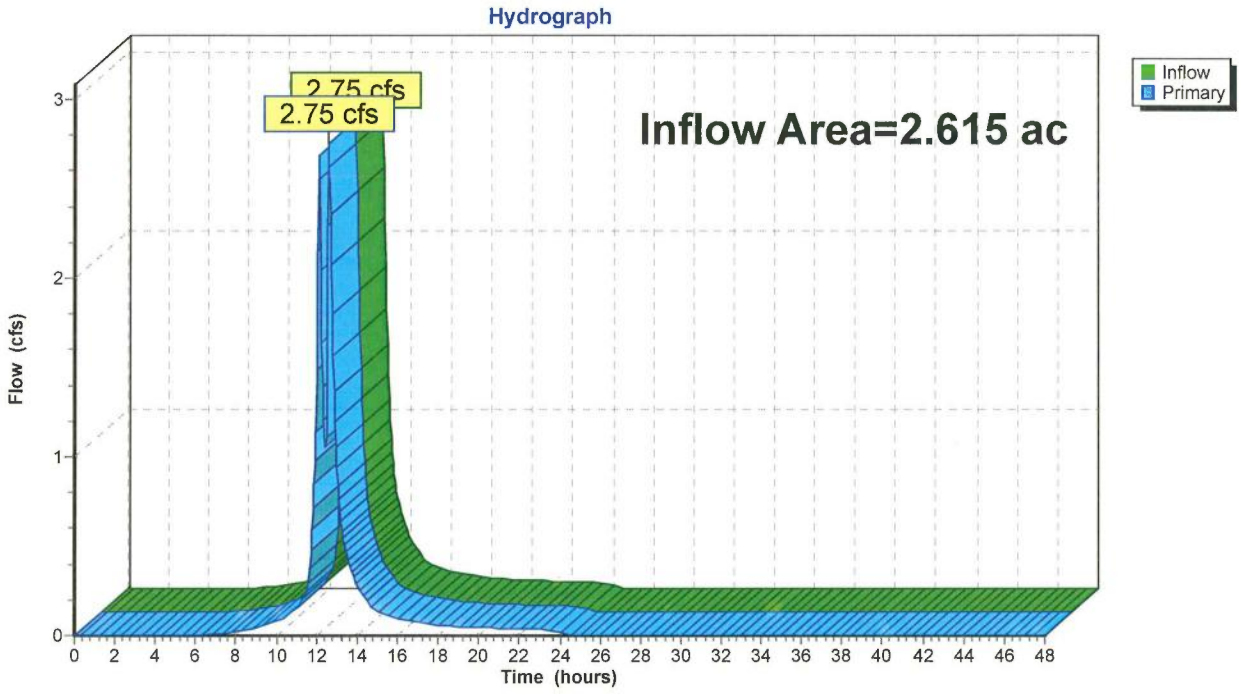


Summary for Link 2L: AP-2

Inflow Area = 2.615 ac, 0.00% Impervious, Inflow Depth = 1.39" for 50-Year event
Inflow = 2.75 cfs @ 12.57 hrs, Volume= 0.303 af
Primary = 2.75 cfs @ 12.57 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: AP-2

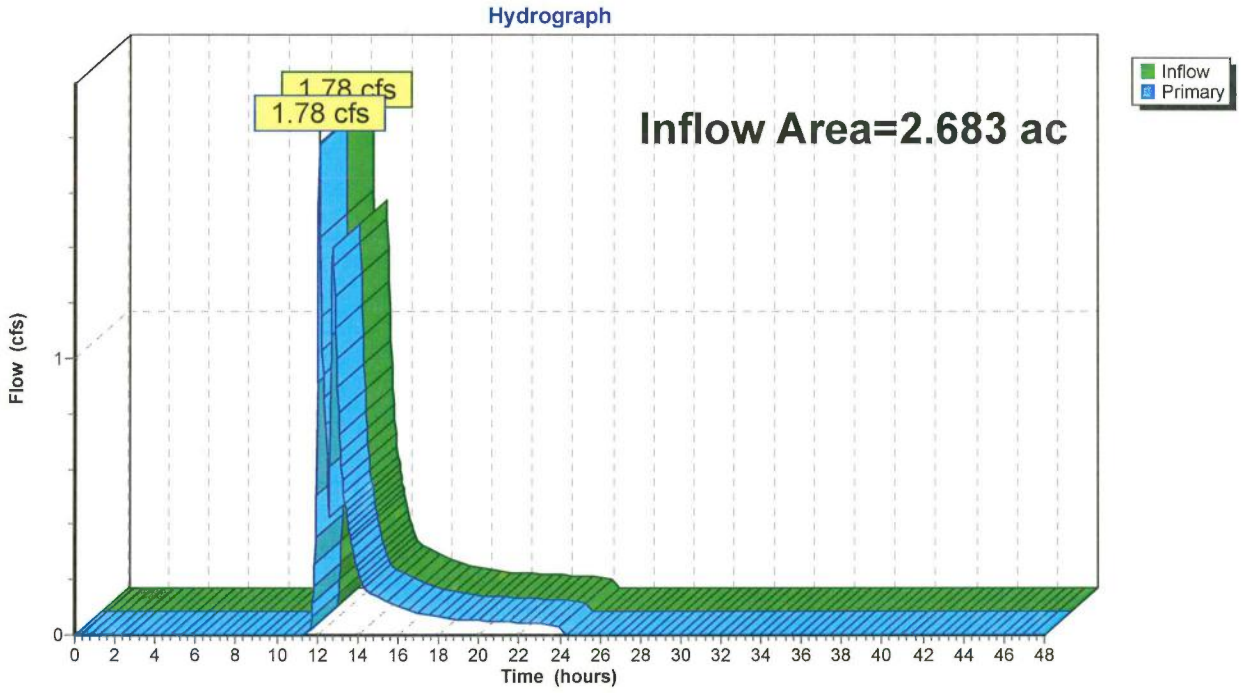


Summary for Link 3L: AP-3

Inflow Area = 2.683 ac, 0.00% Impervious, Inflow Depth = 0.87" for 50-Year event
Inflow = 1.78 cfs @ 12.09 hrs, Volume= 0.195 af
Primary = 1.78 cfs @ 12.09 hrs, Volume= 0.195 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 3L: AP-3

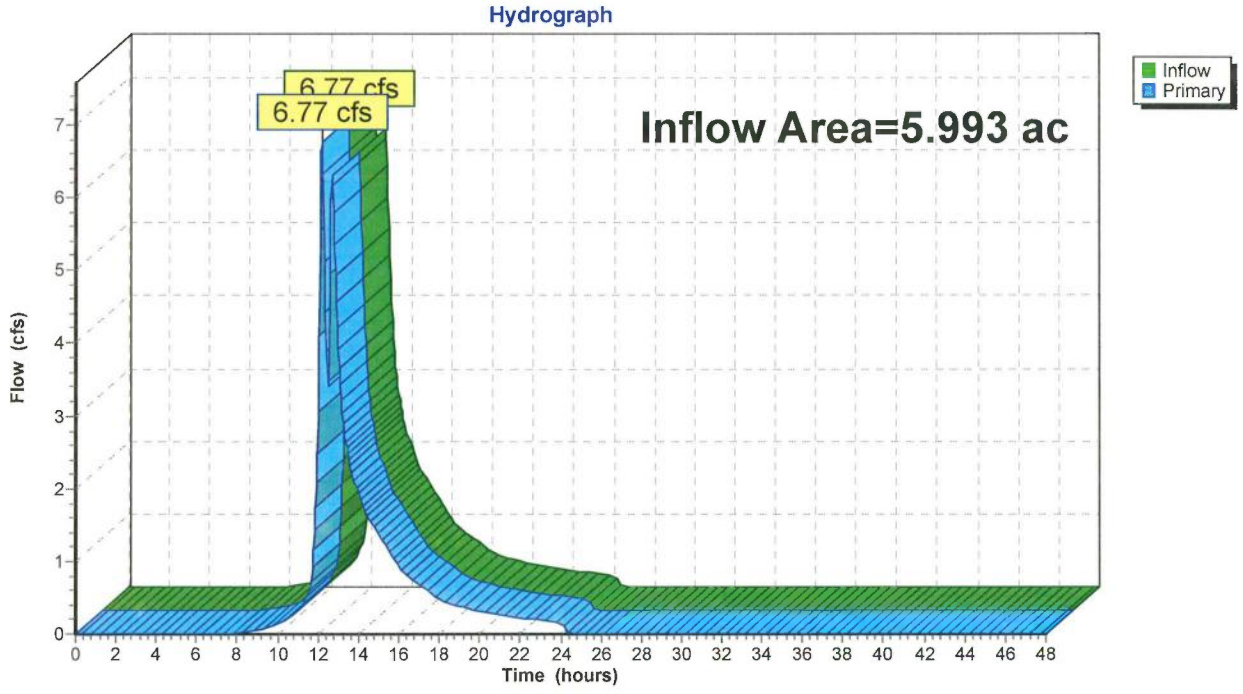


Summary for Link 4L: AP-4

Inflow Area = 5.993 ac, 0.00% Impervious, Inflow Depth = 2.43" for 50-Year event
Inflow = 6.77 cfs @ 12.18 hrs, Volume= 1.214 af
Primary = 6.77 cfs @ 12.18 hrs, Volume= 1.214 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 4L: AP-4



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 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 PDA-1A: PDA-1A Runoff Area=124,842 sf 0.00% Impervious Runoff Depth=4.99"
Flow Length=381' Tc=14.9 min CN=74 Runoff=12.64 cfs 1.191 af

Subcatchment PDA-1B: PDA-1B Runoff Area=17,880 sf 0.00% Impervious Runoff Depth=2.19"
Tc=5.0 min CN=49 Runoff=0.96 cfs 0.075 af

Subcatchment PDA-2A: PDA-2A Runoff Area=59,006 sf 0.00% Impervious Runoff Depth=4.64"
Flow Length=275' Tc=21.5 min CN=71 Runoff=4.81 cfs 0.524 af

Subcatchment PDA-2B: PDA-2B Runoff Area=32,304 sf 0.00% Impervious Runoff Depth=4.76"
Flow Length=219' Tc=12.0 min CN=72 Runoff=3.38 cfs 0.294 af

Subcatchment PDA-2C: PDA-2C Runoff Area=22,584 sf 0.00% Impervious Runoff Depth=5.81"
Flow Length=346' Tc=8.2 min CN=81 Runoff=3.17 cfs 0.251 af

Subcatchment PDA-3A: PDA-3A Runoff Area=71,342 sf 0.00% Impervious Runoff Depth=4.76"
Flow Length=322' Tc=18.2 min CN=72 Runoff=6.38 cfs 0.649 af

Subcatchment PDA-3B: PDA-3B Runoff Area=45,532 sf 0.00% Impervious Runoff Depth=2.19"
Tc=5.0 min CN=49 Runoff=2.46 cfs 0.191 af

Subcatchment PDA-4A: PDA-4A Runoff Area=141,773 sf 0.00% Impervious Runoff Depth=5.46"
Flow Length=432' Tc=14.7 min CN=78 Runoff=15.67 cfs 1.480 af

Subcatchment PDA-4B: PDA-4B Runoff Area=41,704 sf 0.00% Impervious Runoff Depth=5.22"
Flow Length=487' Tc=19.0 min CN=76 Runoff=4.01 cfs 0.417 af

Subcatchment PDA-4C: PDA-4C Runoff Area=77,592 sf 0.00% Impervious Runoff Depth=4.87"
Flow Length=168' Tc=12.7 min CN=73 Runoff=8.09 cfs 0.723 af

Reach 5R: Swale Avg. Flow Depth=0.43' Max Vel=4.11 fps Inflow=4.01 cfs 0.417 af
n=0.025 L=280.0' S=0.0286 '/' Capacity=26.85 cfs Outflow=3.96 cfs 0.417 af

Pond P-1: P-1 Peak Elev=413.91' Storage=16,312 cf Inflow=12.64 cfs 1.191 af
Discarded=0.83 cfs 0.875 af Primary=6.57 cfs 0.316 af Outflow=7.40 cfs 1.191 af

Pond P-2A: P-2A Peak Elev=419.76' Storage=6,308 cf Inflow=4.81 cfs 0.524 af
Discarded=0.37 cfs 0.372 af Primary=3.50 cfs 0.152 af Outflow=3.87 cfs 0.524 af

Pond P-2B: P-2B Peak Elev=414.56' Storage=5,202 cf Inflow=3.38 cfs 0.294 af
Discarded=0.32 cfs 0.279 af Primary=0.43 cfs 0.015 af Outflow=0.76 cfs 0.294 af

Pond P-3: P-3 Peak Elev=411.74' Storage=9,715 cf Inflow=6.38 cfs 0.649 af
Discarded=0.54 cfs 0.529 af Primary=2.78 cfs 0.120 af Outflow=3.32 cfs 0.649 af

Pond P-4: P-4 Peak Elev=399.89' Storage=36,600 cf Inflow=19.17 cfs 1.896 af
Discarded=0.22 cfs 0.635 af Primary=9.37 cfs 0.893 af Outflow=9.58 cfs 1.528 af

Link 1L: AP-1 Inflow=6.91 cfs 0.391 af
Primary=6.91 cfs 0.391 af

Link 2L: AP-2 Inflow=4.48 cfs 0.418 af
Primary=4.48 cfs 0.418 af

Link 3L: AP-3 Inflow=3.30 cfs 0.311 af
Primary=3.30 cfs 0.311 af

Link 4L: AP-4 Inflow=12.72 cfs 1.616 af
Primary=12.72 cfs 1.616 af

Total Runoff Area = 14.567 ac Runoff Volume = 5.794 af Average Runoff Depth = 4.77"
100.00% Pervious = 14.567 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment PDA-1A: PDA-1A

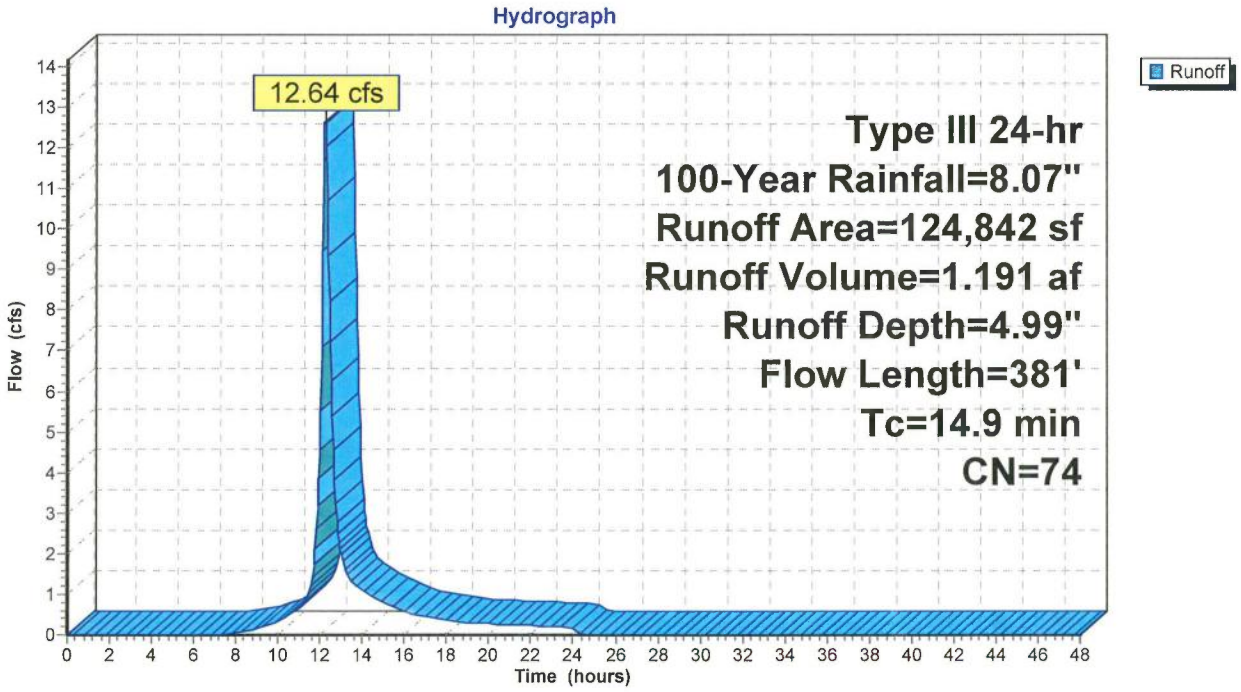
Runoff = 12.64 cfs @ 12.21 hrs, Volume= 1.191 af, Depth= 4.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
79,434	71	Meadow, non-grazed, HSG C
45,408	78	Meadow, non-grazed, HSG D
124,842	74	Weighted Average
124,842		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	100	0.0350	0.15		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
3.8	281	0.0306	1.22		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
14.9	381	Total			

Subcatchment PDA-1A: PDA-1A



Summary for Subcatchment PDA-1B: PDA-1B

[49] Hint: Tc<2dt may require smaller dt

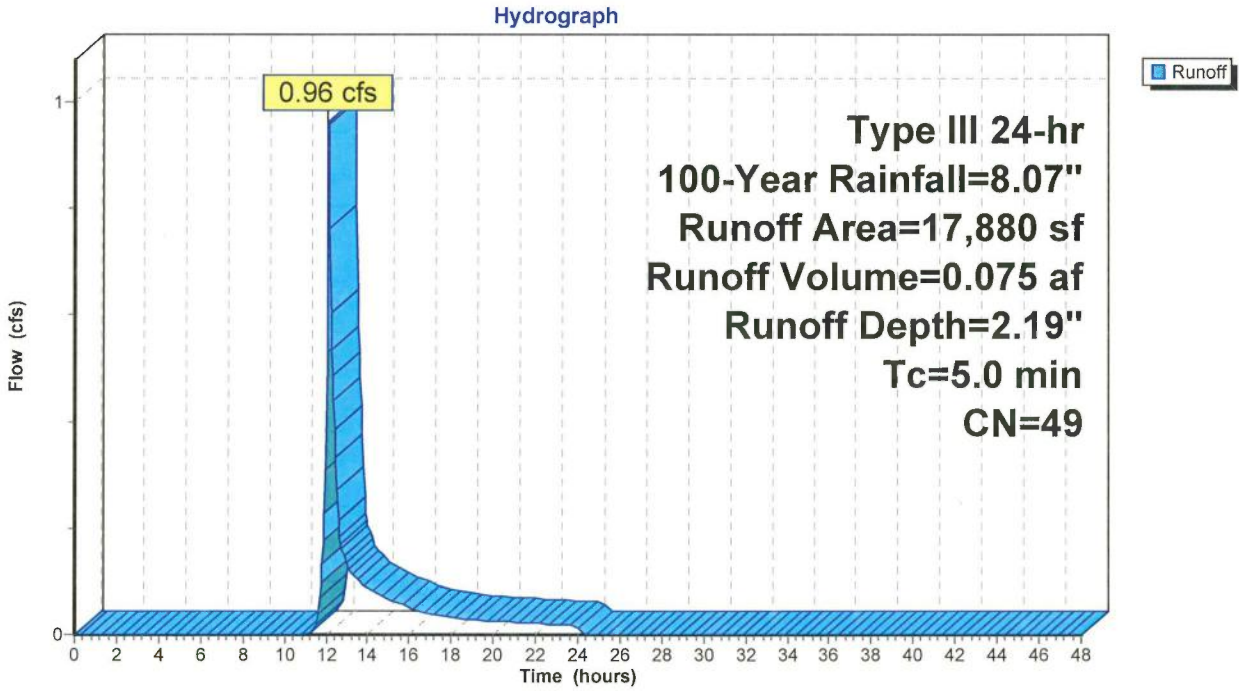
Runoff = 0.96 cfs @ 12.09 hrs, Volume= 0.075 af, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
16,448	48	Brush, Good, HSG B
1,432	65	Brush, Good, HSG C
17,880	49	Weighted Average
17,880		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PDA-1B: PDA-1B



Summary for Subcatchment PDA-2A: PDA-2A

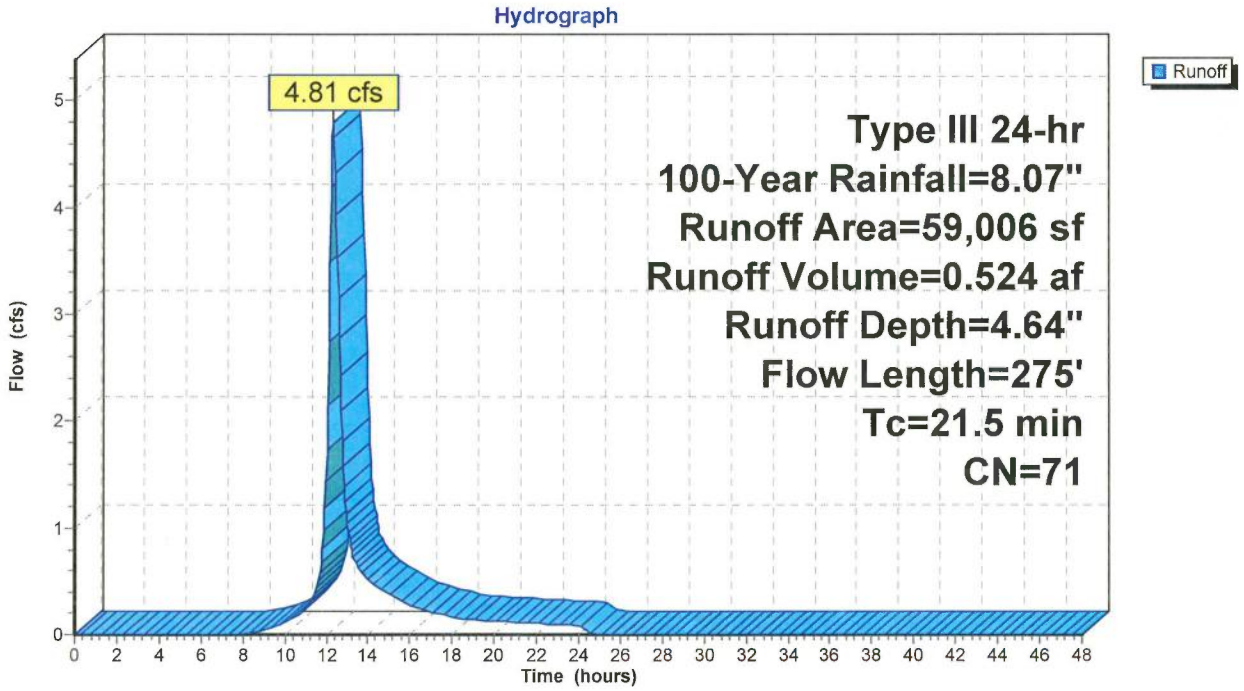
Runoff = 4.81 cfs @ 12.30 hrs, Volume= 0.524 af, Depth= 4.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
39,007	71	Meadow, non-grazed, HSG C
16,039	78	Meadow, non-grazed, HSG D
3,960	48	Brush, Good, HSG B
59,006	71	Weighted Average
59,006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
16.0	70	0.0069	0.07		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
2.9	175	0.0211	1.02		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
21.5	275	Total			

Subcatchment PDA-2A: PDA-2A



Summary for Subcatchment PDA-2B: PDA-2B

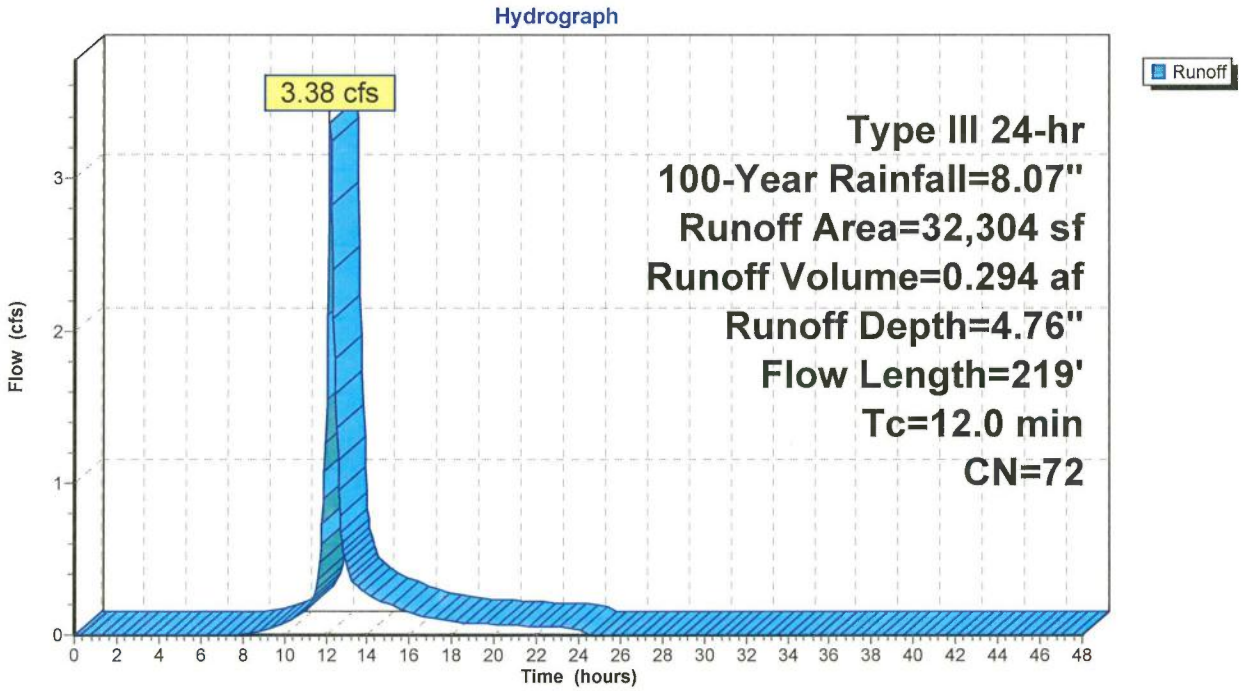
Runoff = 3.38 cfs @ 12.17 hrs, Volume= 0.294 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
12,043	71	Meadow, non-grazed, HSG C
16,171	78	Meadow, non-grazed, HSG D
4,020	48	Brush, Good, HSG B
70	73	Brush, Good, HSG D
32,304	72	Weighted Average
32,304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
8.3	70	0.0357	0.14		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
1.1	119	0.0630	1.76		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
12.0	219	Total			

Subcatchment PDA-2B: PDA-2B



Summary for Subcatchment PDA-2C: PDA-2C

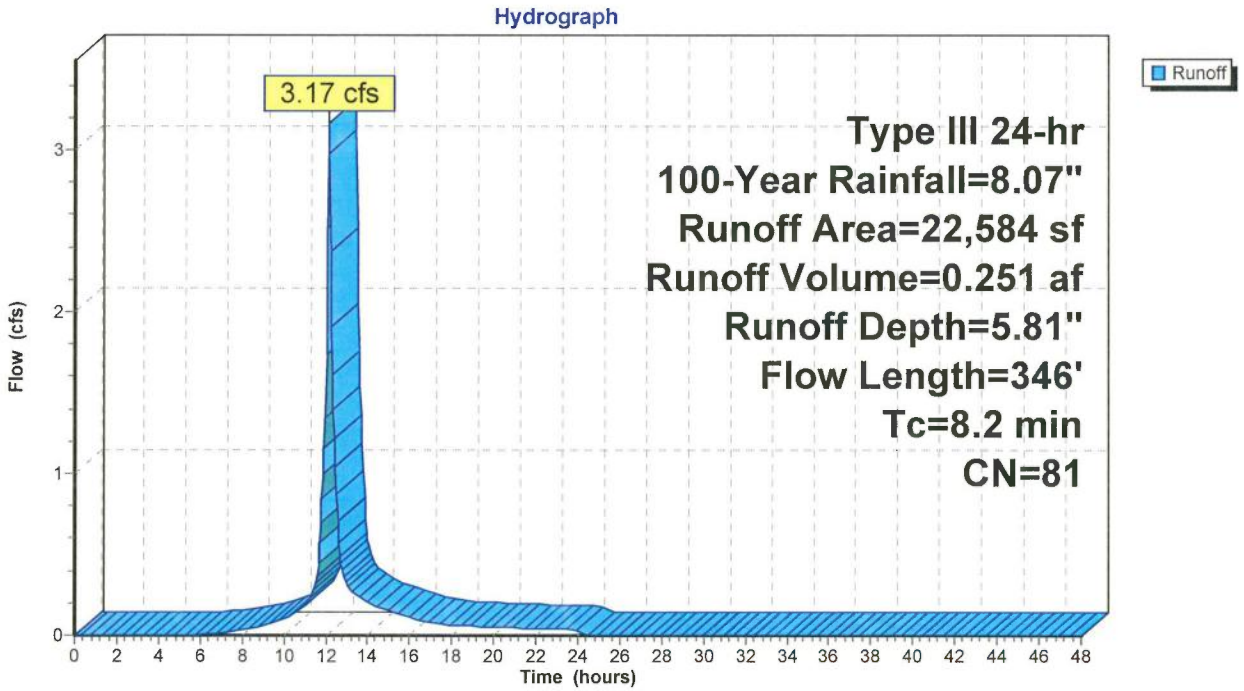
Runoff = 3.17 cfs @ 12.11 hrs, Volume= 0.251 af, Depth= 5.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
1,977	77	Woods, Good, HSG D
3,486	96	Gravel surface, HSG D
17,121	78	Meadow, non-grazed, HSG D
22,584	81	Weighted Average
22,584		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0600	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.39"
1.3	146	0.0684	1.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.8	100	0.0854	2.05		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
8.2	346	Total			

Subcatchment PDA-2C: PDA-2C



Summary for Subcatchment PDA-3A: PDA-3A

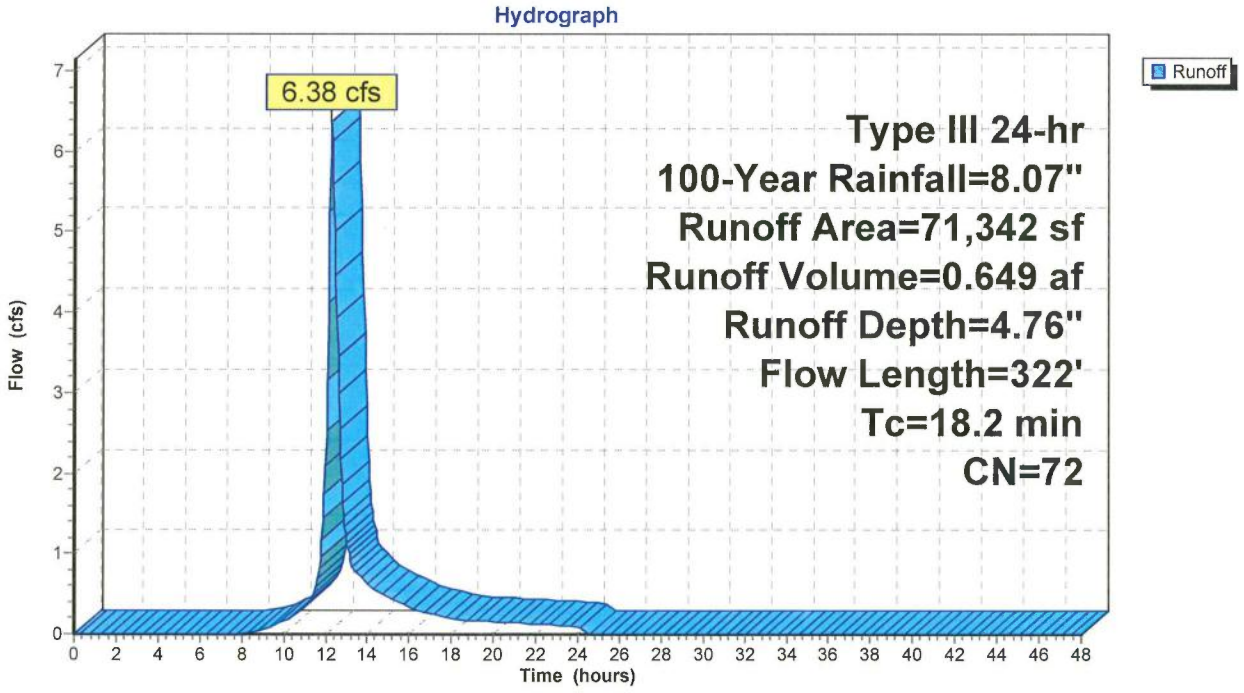
Runoff = 6.38 cfs @ 12.25 hrs, Volume= 0.649 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
64,777	71	Meadow, non-grazed, HSG C
6,565	78	Meadow, non-grazed, HSG D
71,342	72	Weighted Average
71,342		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0150	0.11		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
2.6	222	0.0417	1.43		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
18.2	322	Total			

Subcatchment PDA-3A: PDA-3A



Summary for Subcatchment PDA-3B: PDA-3B

[49] Hint: Tc<2dt may require smaller dt

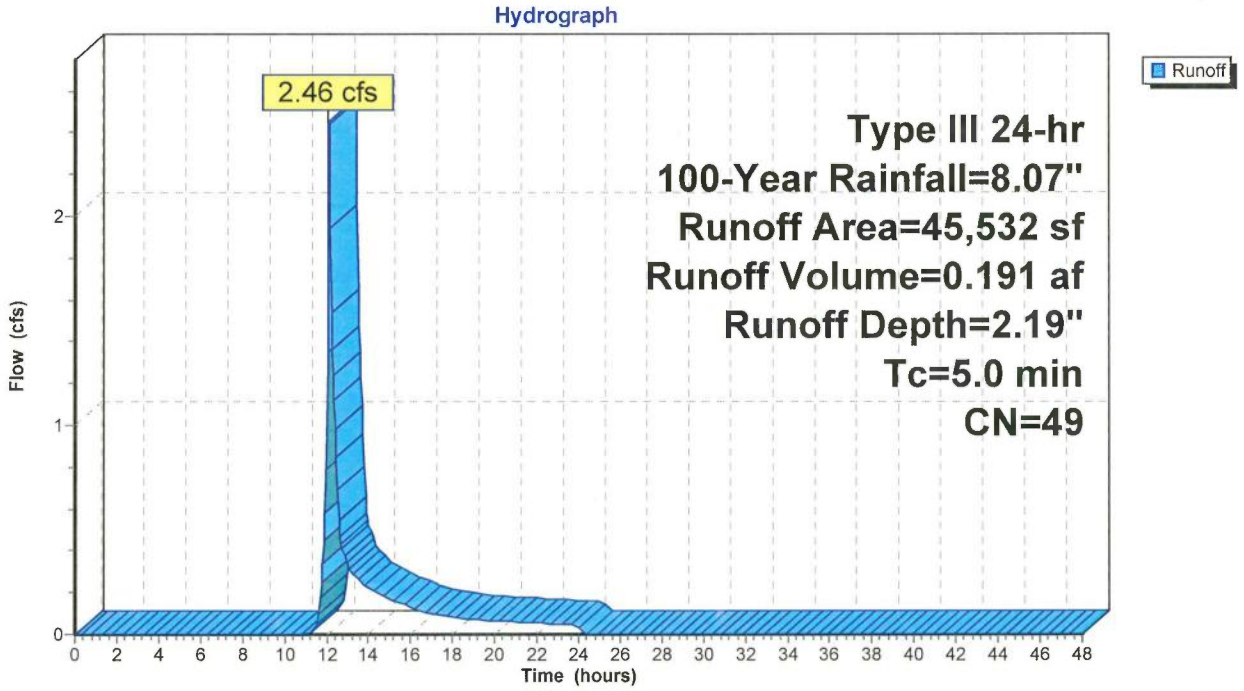
Runoff = 2.46 cfs @ 12.09 hrs, Volume= 0.191 af, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
43,429	48	Brush, Good, HSG B
2,103	73	Brush, Good, HSG D
45,532	49	Weighted Average
45,532		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PDA-3B: PDA-3B



Summary for Subcatchment PDA-4A: PDA-4A

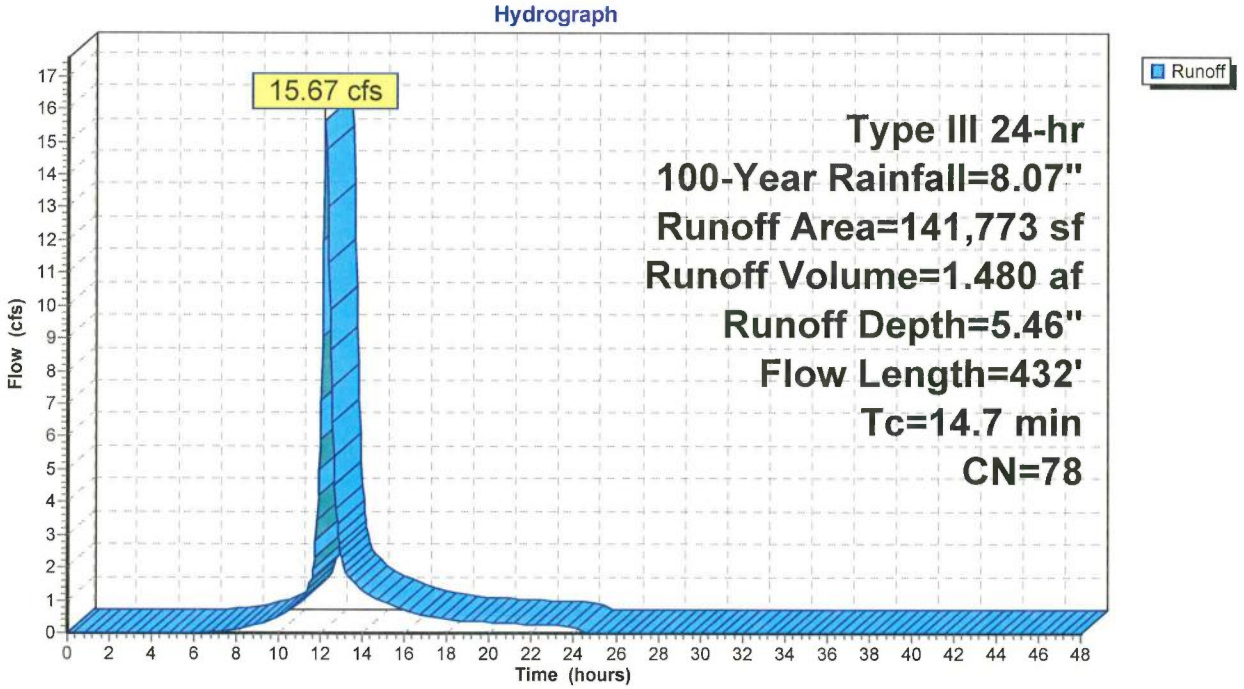
Runoff = 15.67 cfs @ 12.20 hrs, Volume= 1.480 af, Depth= 5.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
136,646	78	Meadow, non-grazed, HSG D
5,127	73	Brush, Good, HSG D
141,773	78	Weighted Average
141,773		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	67	0.0224	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
2.5	33	0.1515	0.22		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
1.2	157	0.0955	2.16		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
1.0	82	0.0366	1.34		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.4	93	0.0550	3.52		**Shallow Concentrated Flow, E-F** Grassed Waterway Kv= 15.0 fps
14.7	432	Total			

Subcatchment PDA-4A: PDA-4A



Summary for Subcatchment PDA-4B: PDA-4B

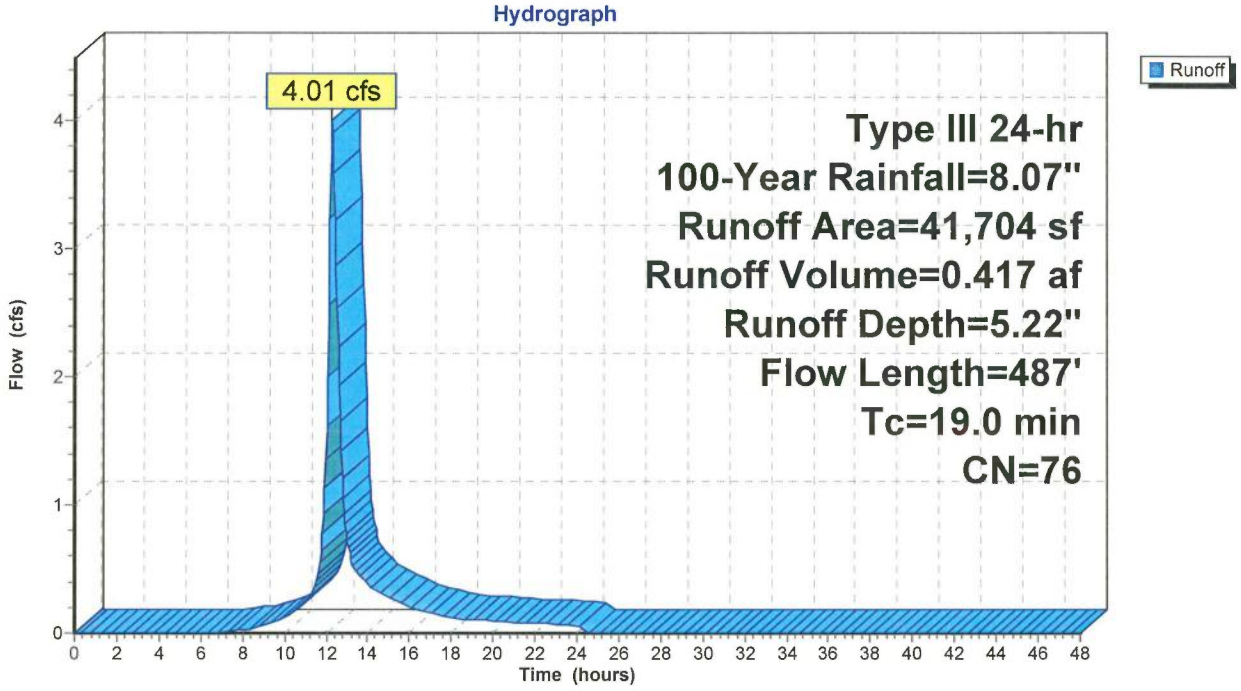
Runoff = 4.01 cfs @ 12.26 hrs, Volume= 0.417 af, Depth= 5.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
13,291	71	Meadow, non-grazed, HSG C
28,356	78	Meadow, non-grazed, HSG D
57	96	Gravel surface, HSG D
41,704	76	Weighted Average
41,704		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	100	0.0200	0.12		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
2.9	163	0.0184	0.95		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.0	117	0.0855	2.05		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.8	63	0.0317	1.25		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
0.4	44	0.0682	1.83		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
19.0	487	Total			

Subcatchment PDA-4B: PDA-4B



Summary for Subcatchment PDA-4C: PDA-4C

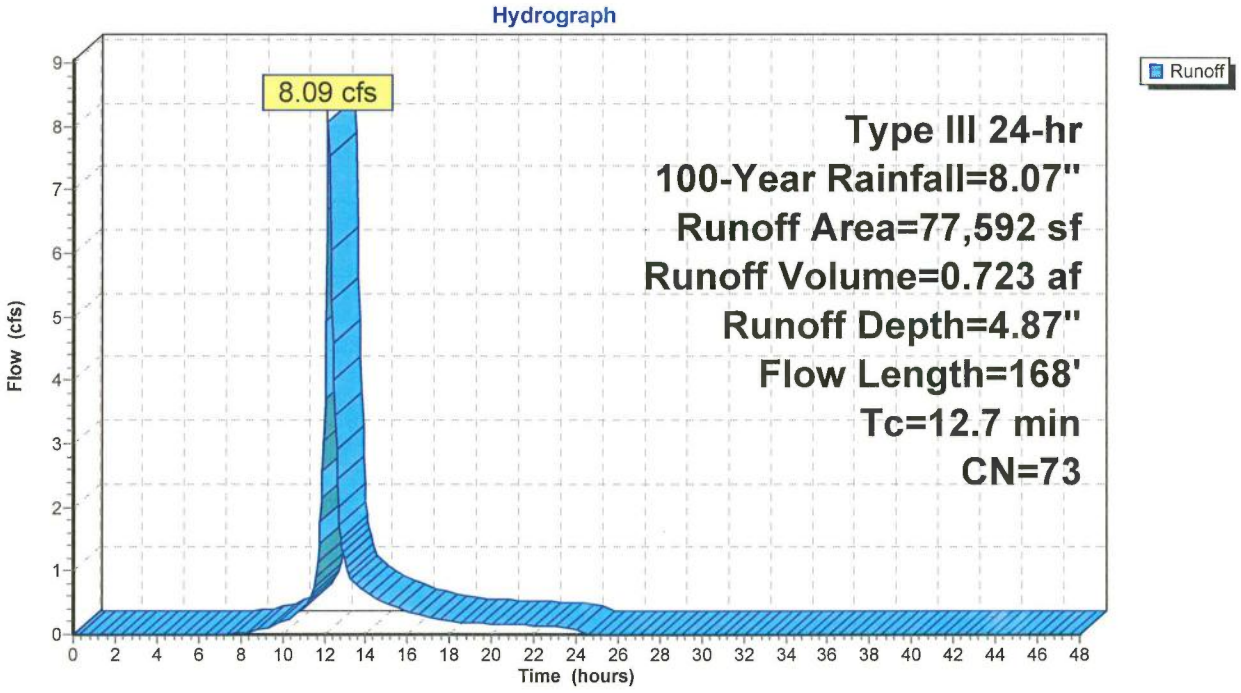
Runoff = 8.09 cfs @ 12.18 hrs, Volume= 0.723 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
77,592	73	Brush, Good, HSG D
77,592		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0	100	0.0800	0.14		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
0.7	68	0.1029	1.60		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
12.7	168	Total			

Subcatchment PDA-4C: PDA-4C



Summary for Reach 5R: Swale

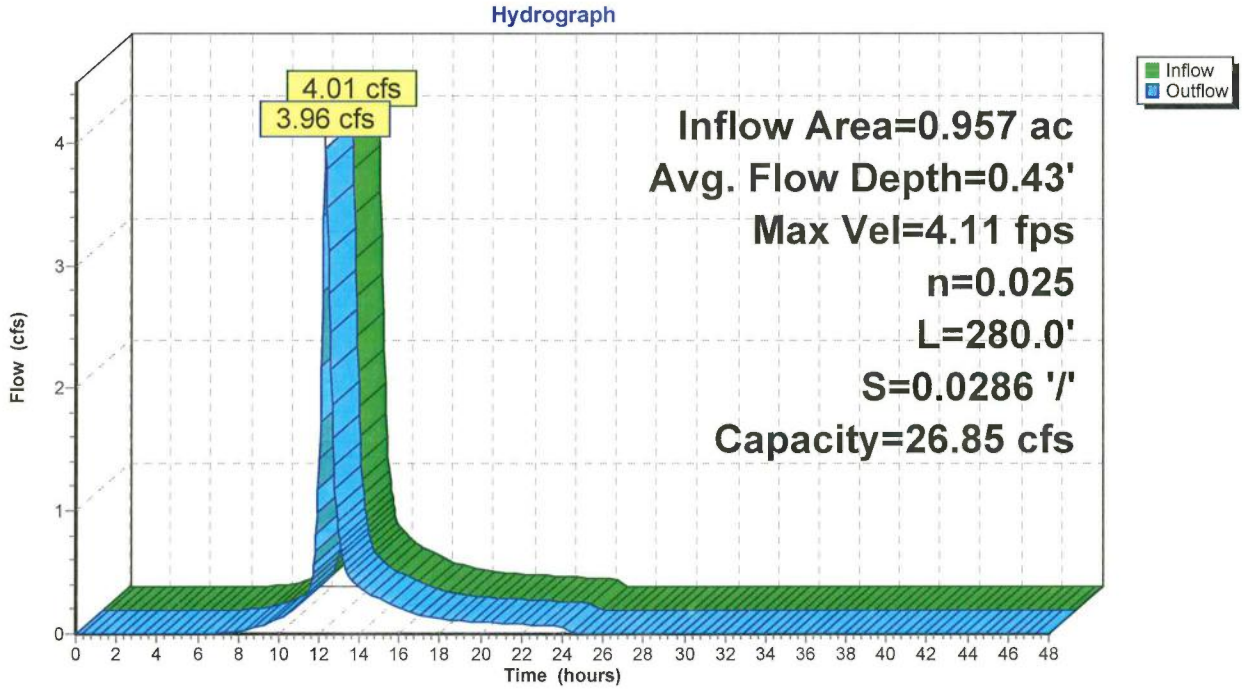
Inflow Area = 0.957 ac, 0.00% Impervious, Inflow Depth = 5.22" for 100-Year event
Inflow = 4.01 cfs @ 12.26 hrs, Volume= 0.417 af
Outflow = 3.96 cfs @ 12.30 hrs, Volume= 0.417 af, Atten= 1%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.11 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.54 fps, Avg. Travel Time= 3.0 min

Peak Storage= 272 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 26.85 cfs

1.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 280.0' Slope= 0.0286 '/'
Inlet Invert= 408.00', Outlet Invert= 400.00'

Reach 5R: Swale



Summary for Pond P-1: P-1

Inflow Area = 2.866 ac, 0.00% Impervious, Inflow Depth = 4.99" for 100-Year event
Inflow = 12.64 cfs @ 12.21 hrs, Volume= 1.191 af
Outflow = 7.40 cfs @ 12.45 hrs, Volume= 1.191 af, Atten= 41%, Lag= 14.6 min
Discarded = 0.83 cfs @ 12.45 hrs, Volume= 0.875 af
Primary = 6.57 cfs @ 12.45 hrs, Volume= 0.316 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 413.91' @ 12.45 hrs Surf.Area= 7,173 sf Storage= 16,312 cf

Plug-Flow detention time= 144.2 min calculated for 1.191 af (100% of inflow)
Center-of-Mass det. time= 144.2 min (968.3 - 824.2)

Volume	Invert	Avail.Storage	Storage Description
#1	411.00'	16,968 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

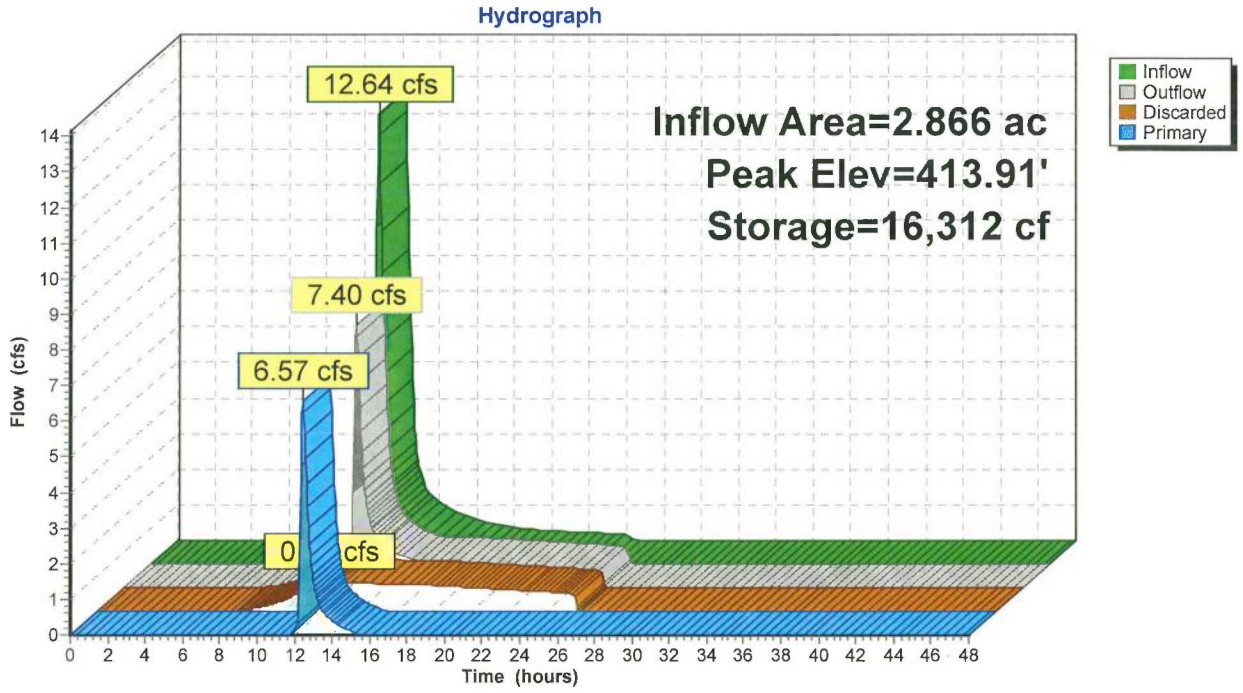
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
411.00	4,114	0	0
412.00	5,110	4,612	4,612
413.00	6,164	5,637	10,249
414.00	7,274	6,719	16,968

Device	Routing	Invert	Outlet Devices
#1	Discarded	411.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	413.50'	**10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.83 cfs @ 12.45 hrs HW=413.91' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.83 cfs)

Primary OutFlow Max=6.56 cfs @ 12.45 hrs HW=413.91' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 6.56 cfs @ 1.60 fps)

Pond P-1: P-1


Hydrograph
12.64 cfs
7.40 cfs
6.57 cfs
0 cfs
Inflow Area=2.866 ac
Peak Elev=413.91'
Storage=16,312 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

Summary for Pond P-2A: P-2A

Inflow Area = 1.355 ac, 0.00% Impervious, Inflow Depth = 4.64" for 100-Year event
Inflow = 4.81 cfs @ 12.30 hrs, Volume= 0.524 af
Outflow = 3.87 cfs @ 12.47 hrs, Volume= 0.524 af, Atten= 19%, Lag= 10.4 min
Discarded = 0.37 cfs @ 12.47 hrs, Volume= 0.372 af
Primary = 3.50 cfs @ 12.47 hrs, Volume= 0.152 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 419.76' @ 12.47 hrs Surf.Area= 3,238 sf Storage= 6,308 cf

Plug-Flow detention time= 132.6 min calculated for 0.523 af (100% of inflow)
Center-of-Mass det. time= 132.5 min (969.2 - 836.7)

Volume	Invert	Avail.Storage	Storage Description
#1	417.00'	7,116 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

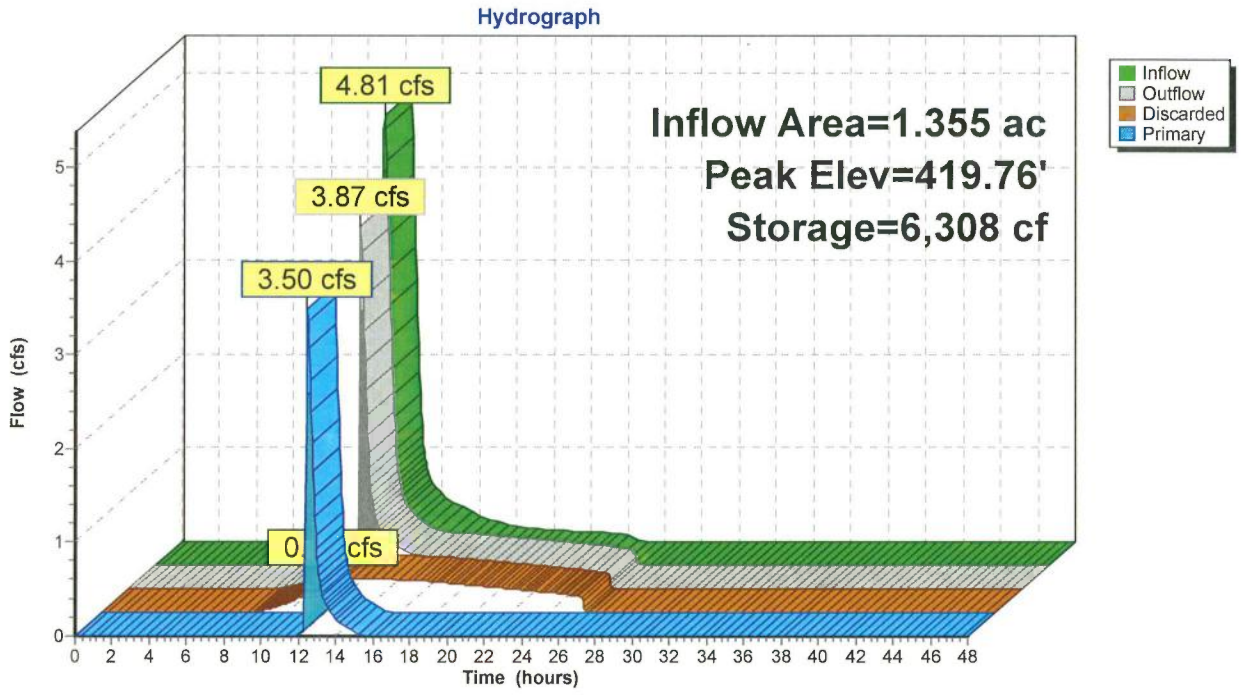
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
417.00	1,405	0	0
418.00	2,018	1,712	1,712
419.00	2,688	2,353	4,065
420.00	3,415	3,052	7,116

Device	Routing	Invert	Outlet Devices
#1	Discarded	417.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	419.50'	**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

Discarded OutFlow Max=0.37 cfs @ 12.47 hrs HW=419.75' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.37 cfs)

Primary OutFlow Max=3.39 cfs @ 12.47 hrs HW=419.75' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 3.39 cfs @ 1.35 fps)

Pond P-2A: P-2A


Hydrograph
4.81 cfs
3.87 cfs
3.50 cfs
0 cfs
Inflow Area=1.355 ac
Peak Elev=419.76'
Storage=6,308 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
0 1 2 3 4 5
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Pond P-2B: P-2B

Inflow Area = 0.742 ac, 0.00% Impervious, Inflow Depth = 4.76" for 100-Year event
Inflow = 3.38 cfs @ 12.17 hrs, Volume= 0.294 af
Outflow = 0.76 cfs @ 12.67 hrs, Volume= 0.294 af, Atten= 78%, Lag= 30.4 min
Discarded = 0.32 cfs @ 12.67 hrs, Volume= 0.279 af
Primary = 0.43 cfs @ 12.67 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 414.56' @ 12.67 hrs Surf.Area= 2,788 sf Storage= 5,202 cf

Plug-Flow detention time= 162.0 min calculated for 0.294 af (100% of inflow)
Center-of-Mass det. time= 161.8 min (987.6 - 825.8)

Volume	Invert	Avail.Storage	Storage Description
#1	412.00'	6,481 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

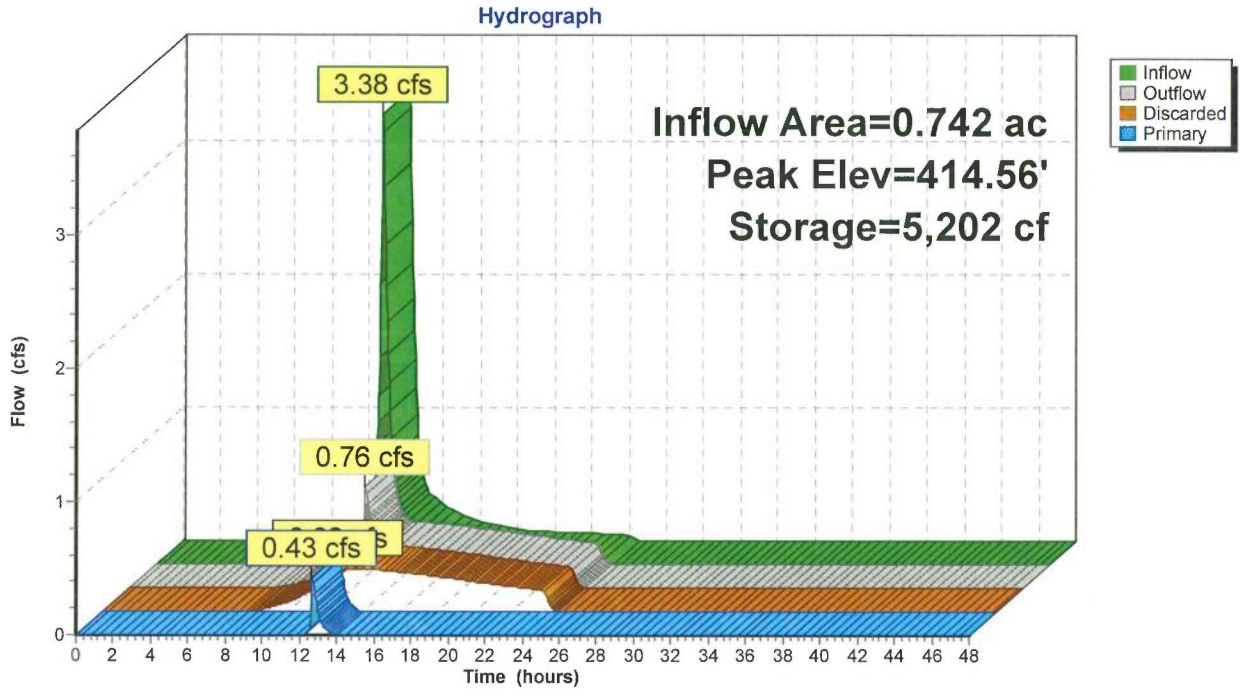
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
412.00	1,330	0	0
413.00	1,852	1,591	1,591
414.00	2,431	2,142	3,733
415.00	3,065	2,748	6,481

Device	Routing	Invert	Outlet Devices
#1	Discarded	412.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	414.50'	**10.0' long x 15.0' 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=0.32 cfs @ 12.67 hrs HW=414.56' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=0.41 cfs @ 12.67 hrs HW=414.56' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.41 cfs @ 0.66 fps)

Pond P-2B: P-2B


Hydrograph
3.38 cfs
0.76 cfs
0.43 cfs
Inflow Area=0.742 ac
Peak Elev=414.56'
Storage=5,202 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
0
1
2
3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Pond P-3: P-3

Inflow Area = 1.638 ac, 0.00% Impervious, Inflow Depth = 4.76" for 100-Year event
Inflow = 6.38 cfs @ 12.25 hrs, Volume= 0.649 af
Outflow = 3.32 cfs @ 12.57 hrs, Volume= 0.649 af, Atten= 48%, Lag= 19.2 min
Discarded = 0.54 cfs @ 12.57 hrs, Volume= 0.529 af
Primary = 2.78 cfs @ 12.57 hrs, Volume= 0.120 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 411.74' @ 12.57 hrs Surf.Area= 4,680 sf Storage= 9,715 cf

Plug-Flow detention time= 152.2 min calculated for 0.649 af (100% of inflow)
Center-of-Mass det. time= 152.2 min (983.7 - 831.5)

Volume	Invert	Avail.Storage	Storage Description
#1	409.00'	10,964 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

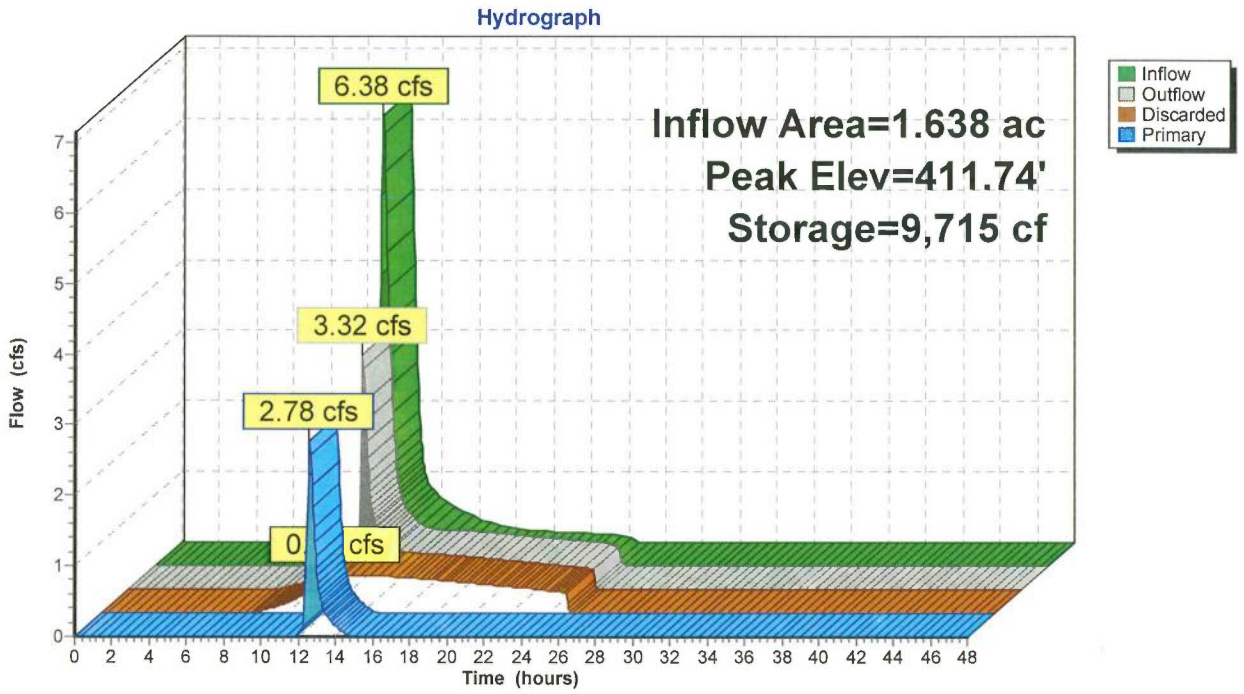
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
409.00	2,479	0	0
410.00	3,231	2,855	2,855
411.00	4,040	3,636	6,491
412.00	4,906	4,473	10,964

Device	Routing	Invert	Outlet Devices
#1	Discarded	409.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	411.50'	**10.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.54 cfs @ 12.57 hrs HW=411.74' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.54 cfs)

Primary OutFlow Max=2.72 cfs @ 12.57 hrs HW=411.74' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.72 cfs @ 1.15 fps)

Pond P-3: P-3


Hydrograph
6.38 cfs
3.32 cfs
2.78 cfs
0 cfs
Inflow Area=1.638 ac
Peak Elev=411.74'
Storage=9,715 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
0 1 2 3 4 5 6 7

Summary for Pond P-4: P-4

Inflow Area = 4.212 ac, 0.00% Impervious, Inflow Depth = 5.40" for 100-Year event
Inflow = 19.17 cfs @ 12.21 hrs, Volume= 1.896 af
Outflow = 9.58 cfs @ 12.53 hrs, Volume= 1.528 af, Atten= 50%, Lag= 18.9 min
Discarded = 0.22 cfs @ 12.53 hrs, Volume= 0.635 af
Primary = 9.37 cfs @ 12.53 hrs, Volume= 0.893 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 399.89' @ 12.53 hrs Surf.Area= 11,657 sf Storage= 36,600 cf

Plug-Flow detention time= 461.8 min calculated for 1.528 af (81% of inflow)
Center-of-Mass det. time= 386.7 min (1,204.5 - 817.8)

Volume	Invert	Avail.Storage	Storage Description
#1	396.00'	37,885 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

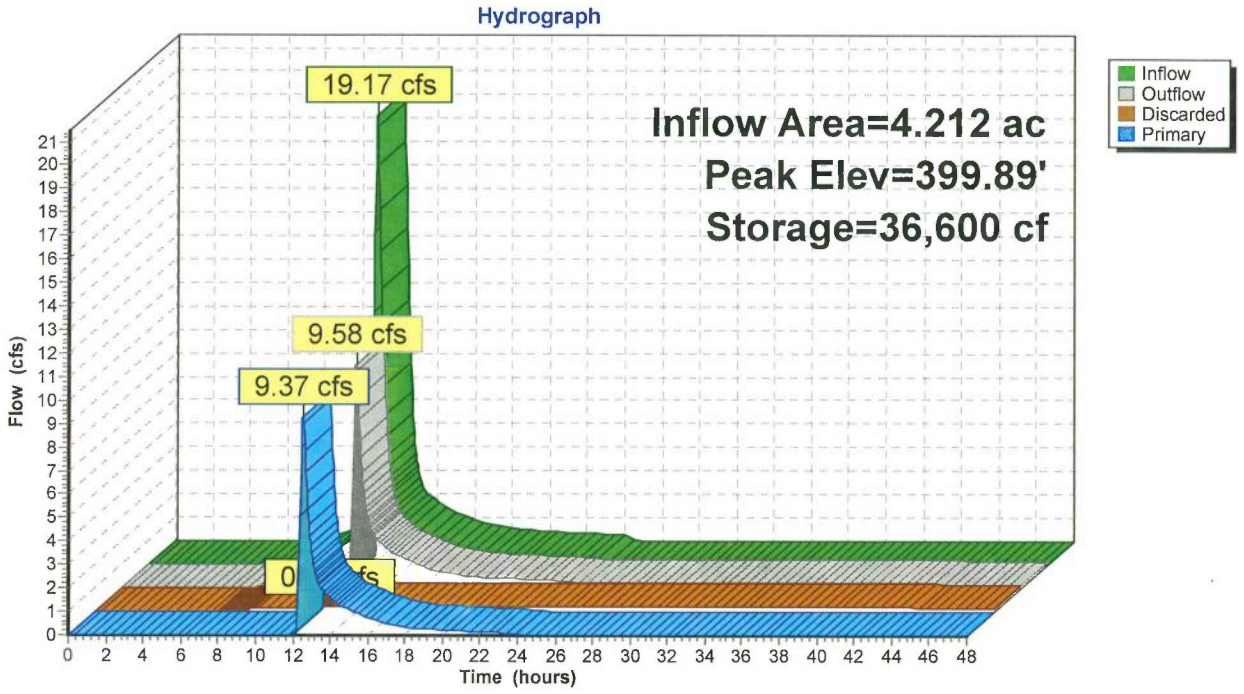
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
396.00	7,294	0	0
397.00	8,333	7,814	7,814
398.00	9,429	8,881	16,695
399.00	10,581	10,005	26,700
400.00	11,790	11,186	37,885

Device	Routing	Invert	Outlet Devices
#1	Discarded	396.00'	**0.800 in/hr Exfiltration over Surface area**
#2	Primary	399.50'	**15.0' long x 10.0' 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) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.22 cfs @ 12.53 hrs HW=399.89' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=9.28 cfs @ 12.53 hrs HW=399.89' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 9.28 cfs @ 1.59 fps)

Pond P-4: P-4

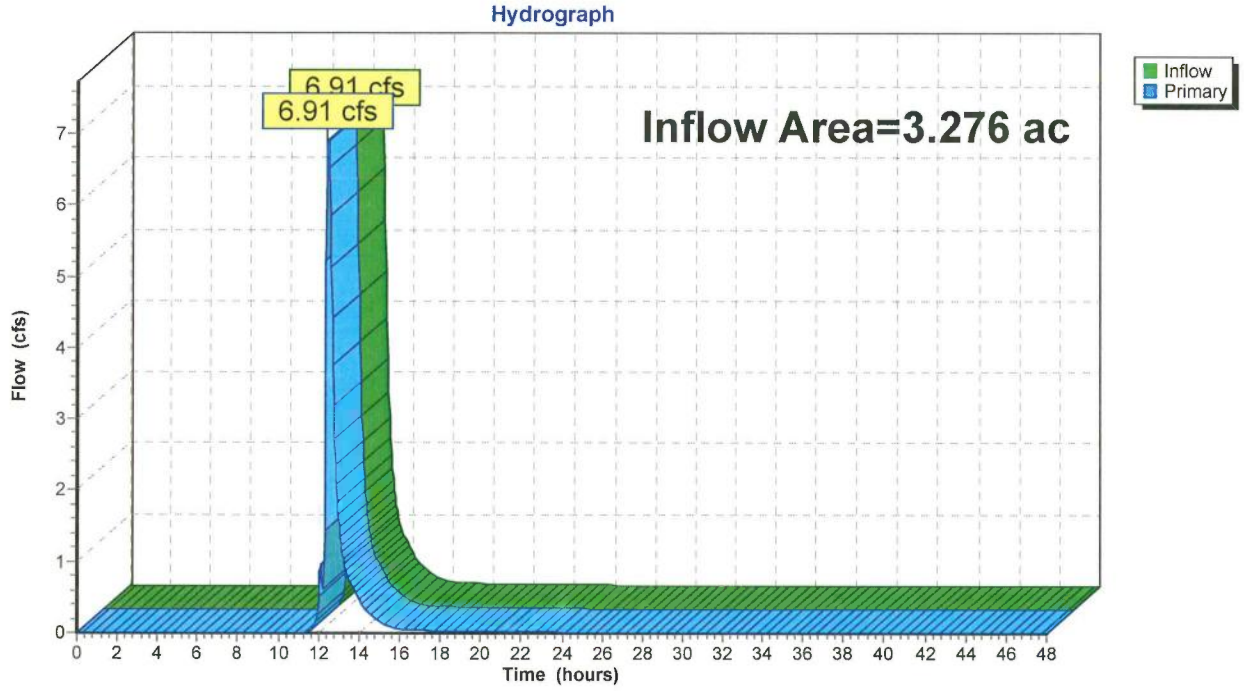

Hydrograph
19.17 cfs
9.58 cfs
9.37 cfs
Inflow Area=4.212 ac
Peak Elev=399.89'
Storage=36,600 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)

Summary for Link 1L: AP-1

Inflow Area = 3.276 ac, 0.00% Impervious, Inflow Depth = 1.43" for 100-Year event
Inflow = 6.91 cfs @ 12.44 hrs, Volume= 0.391 af
Primary = 6.91 cfs @ 12.44 hrs, Volume= 0.391 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: AP-1

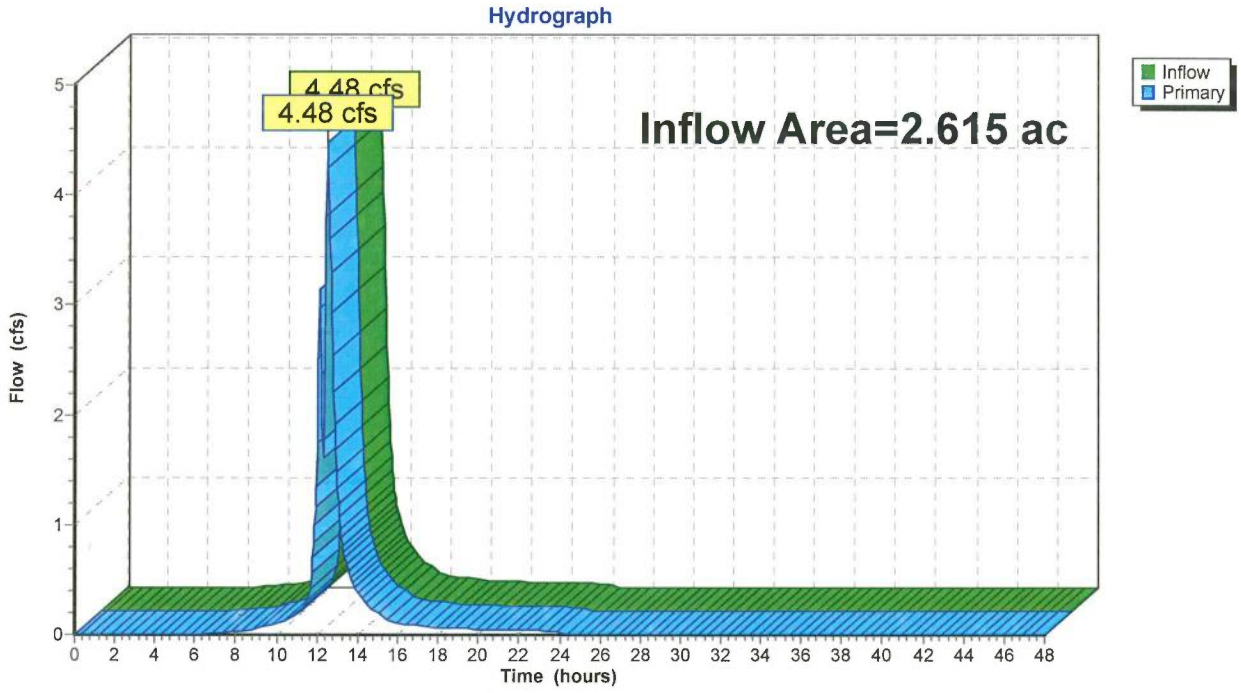


Summary for Link 2L: AP-2

Inflow Area = 2.615 ac, 0.00% Impervious, Inflow Depth = 1.92" for 100-Year event
Inflow = 4.48 cfs @ 12.46 hrs, Volume= 0.418 af
Primary = 4.48 cfs @ 12.46 hrs, Volume= 0.418 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: AP-2

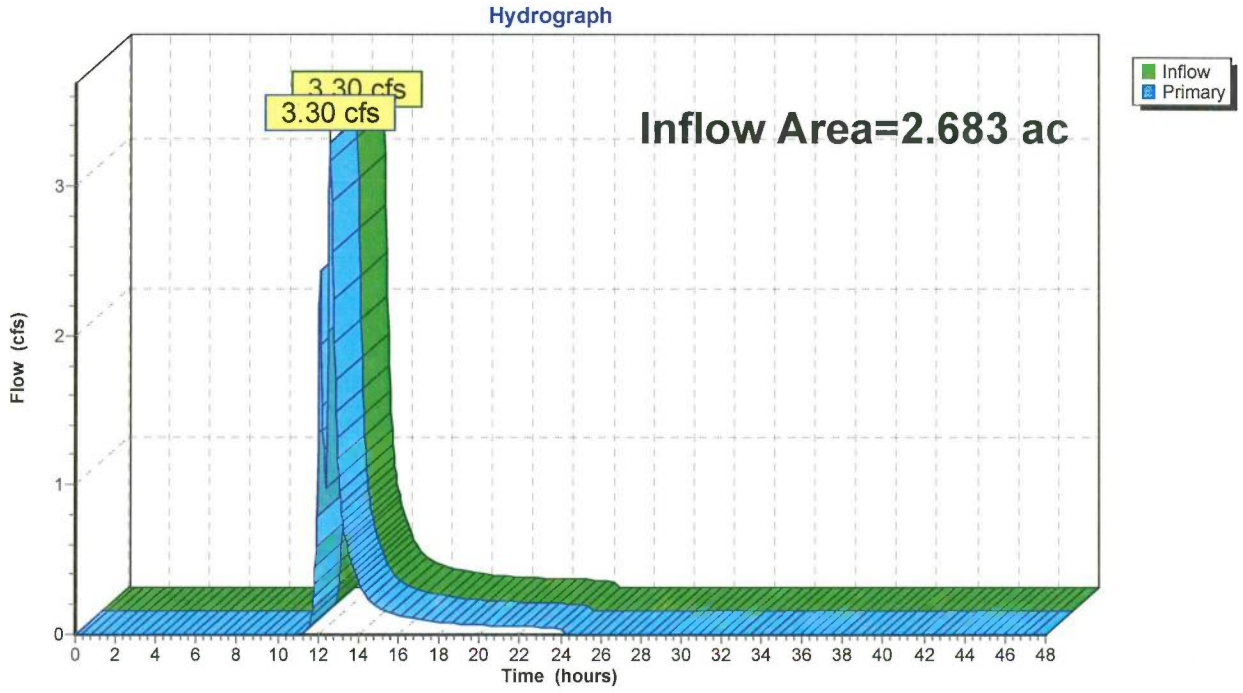


Summary for Link 3L: AP-3

Inflow Area = 2.683 ac, 0.00% Impervious, Inflow Depth = 1.39" for 100-Year event
Inflow = 3.30 cfs @ 12.56 hrs, Volume= 0.311 af
Primary = 3.30 cfs @ 12.56 hrs, Volume= 0.311 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 3L: AP-3

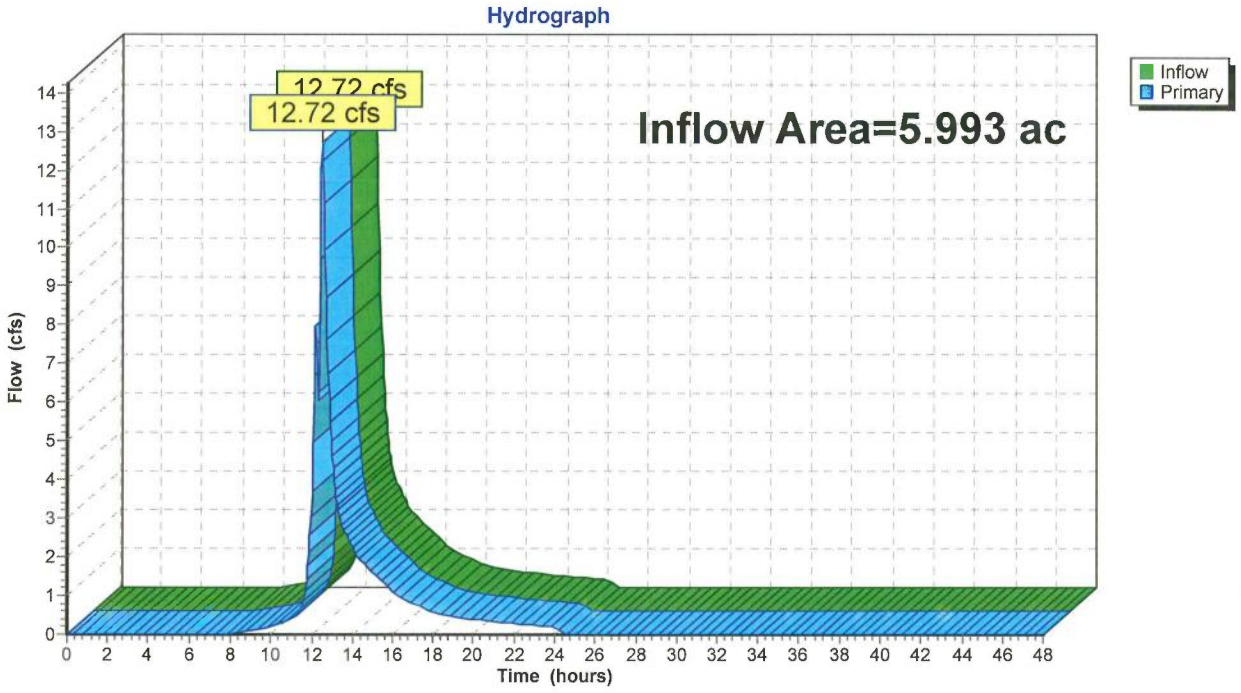


Summary for Link 4L: AP-4

Inflow Area = 5.993 ac, 0.00% Impervious, Inflow Depth = 3.24" for 100-Year event
Inflow = 12.72 cfs @ 12.50 hrs, Volume= 1.616 af
Primary = 12.72 cfs @ 12.50 hrs, Volume= 1.616 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 4L: AP-4



APPENDIX D: NOAA ATLAS 14 PRECIPITATION FREQUENCY TABLE

NOAA Atlas 14, Volume 10, Version 3
Location name: Town of East Hampton, Connecticut, USA*
Latitude: 41.5682°, Longitude: -72.5084°
Elevation: 421.08 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.334 (0.259-0.419)	0.405 (0.314-0.508)	0.521 (0.403-0.656)	0.617 (0.474-0.780)	0.750 (0.559-0.990)	0.850 (0.621-1.15)	0.955 (0.677-1.33)	1.07 (0.721-1.53)	1.24 (0.804-1.83)	1.38 (0.872-2.07)
10-min	0.473 (0.367-0.593)	0.574 (0.445-0.720)	0.739 (0.572-0.930)	0.875 (0.672-1.11)	1.06 (0.791-1.40)	1.20 (0.879-1.62)	1.35 (0.959-1.89)	1.52 (1.02-2.16)	1.76 (1.14-2.59)	1.95 (1.24-2.93)
15-min	0.557 (0.432-0.698)	0.675 (0.524-0.847)	0.868 (0.670-1.09)	1.03 (0.791-1.30)	1.25 (0.931-1.65)	1.42 (1.03-1.91)	1.59 (1.13-2.22)	1.79 (1.20-2.54)	2.07 (1.34-3.04)	2.30 (1.45-3.44)
30-min	0.761 (0.591-0.954)	0.922 (0.715-1.16)	1.19 (0.917-1.49)	1.41 (1.08-1.78)	1.71 (1.27-2.25)	1.93 (1.41-2.60)	2.17 (1.54-3.03)	2.44 (1.64-3.47)	2.82 (1.83-4.15)	3.13 (1.98-4.70)
60-min	0.965 (0.749-1.21)	1.17 (0.907-1.47)	1.50 (1.16-1.89)	1.78 (1.37-2.26)	2.16 (1.61-2.85)	2.45 (1.79-3.30)	2.75 (1.95-3.84)	3.09 (2.08-4.40)	3.57 (2.31-5.26)	3.97 (2.51-5.95)
2-hr	1.28 (1.00-1.59)	1.54 (1.20-1.91)	1.96 (1.52-2.44)	2.31 (1.79-2.90)	2.79 (2.09-3.66)	3.15 (2.32-4.21)	3.53 (2.53-4.90)	3.97 (2.68-5.61)	4.62 (3.01-6.75)	5.17 (3.28-7.69)
3-hr	1.49 (1.17-1.85)	1.79 (1.41-2.22)	2.27 (1.78-2.83)	2.67 (2.08-3.34)	3.22 (2.43-4.21)	3.63 (2.69-4.85)	4.07 (2.93-5.65)	4.59 (3.11-6.46)	5.36 (3.49-7.79)	6.01 (3.82-8.90)
6-hr	1.91 (1.52-2.35)	2.29 (1.81-2.82)	2.90 (2.29-3.59)	3.41 (2.68-4.24)	4.12 (3.13-5.35)	4.64 (3.46-6.16)	5.20 (3.77-7.17)	5.87 (4.00-8.19)	6.88 (4.50-9.91)	7.73 (4.93-11.3)
12-hr	2.37 (1.90-2.90)	2.85 (2.28-3.49)	3.64 (2.90-4.47)	4.30 (3.40-5.30)	5.20 (3.99-6.70)	5.87 (4.41-7.73)	6.59 (4.81-9.01)	7.45 (5.09-10.3)	8.74 (5.73-12.5)	9.84 (6.30-14.3)
24-hr	2.78 (2.25-3.38)	3.39 (2.74-4.12)	4.38 (3.52-5.33)	5.20 (4.15-6.36)	6.33 (4.89-8.11)	7.16 (5.43-9.38)	8.07 (5.94-11.0)	9.17 (6.30-12.6)	10.9 (7.15-15.4)	12.3 (7.90-17.7)
2-day	3.12 (2.55-3.76)	3.86 (3.14-4.65)	5.05 (4.10-6.11)	6.04 (4.87-7.35)	7.41 (5.78-9.45)	8.41 (6.43-11.0)	9.52 (7.09-12.9)	10.9 (7.51-14.9)	13.1 (8.65-18.4)	15.0 (9.66-21.4)
3-day	3.39 (2.78-4.07)	4.19 (3.43-5.03)	5.50 (4.49-6.63)	6.59 (5.34-7.98)	8.09 (6.34-10.3)	9.18 (7.06-11.9)	10.4 (7.78-14.1)	11.9 (8.24-16.2)	14.4 (9.50-20.1)	16.5 (10.6-23.5)
4-day	3.64 (2.99-4.35)	4.49 (3.69-5.37)	5.88 (4.81-7.06)	7.04 (5.72-8.49)	8.63 (6.79-10.9)	9.79 (7.54-12.7)	11.1 (8.31-15.0)	12.7 (8.80-17.2)	15.3 (10.1-21.3)	17.6 (11.3-24.9)
7-day	4.32 (3.58-5.14)	5.27 (4.37-6.28)	6.83 (5.63-8.15)	8.12 (6.65-9.74)	9.90 (7.83-12.4)	11.2 (8.67-14.4)	12.6 (9.50-16.9)	14.4 (10.0-19.4)	17.2 (11.5-23.8)	19.7 (12.8-27.7)
10-day	5.01 (4.18-5.94)	6.02 (5.01-7.14)	7.67 (6.35-9.12)	9.04 (7.44-10.8)	10.9 (8.66-13.6)	12.3 (9.55-15.7)	13.8 (10.4-18.3)	15.7 (10.9-20.9)	18.5 (12.3-25.5)	21.0 (13.6-29.4)
20-day	7.19 (6.05-8.46)	8.28 (6.95-9.74)	10.1 (8.40-11.9)	11.5 (9.57-13.7)	13.6 (10.8-16.7)	15.1 (11.7-18.9)	16.7 (12.5-21.6)	18.5 (13.0-24.4)	21.1 (14.1-28.7)	23.2 (15.1-32.2)
30-day	9.04 (7.64-10.6)	10.2 (8.58-11.9)	12.0 (10.1-14.1)	13.5 (11.3-16.0)	15.6 (12.5-19.1)	17.2 (13.4-21.4)	18.9 (14.1-24.1)	20.6 (14.5-27.0)	22.9 (15.4-31.0)	24.8 (16.1-34.2)
45-day	11.3 (9.64-13.2)	12.5 (10.6-14.6)	14.4 (12.2-16.9)	16.0 (13.4-18.8)	18.2 (14.6-22.0)	19.9 (15.5-24.5)	21.6 (16.1-27.2)	23.2 (16.4-30.2)	25.3 (17.0-34.0)	26.8 (17.5-36.7)
60-day	13.3 (11.3-15.4)	14.5 (12.3-16.8)	16.5 (14.0-19.2)	18.1 (15.2-21.2)	20.4 (16.4-24.5)	22.1 (17.3-27.1)	23.8 (17.8-29.8)	25.4 (18.0-33.0)	27.3 (18.5-36.5)	28.6 (18.7-39.0)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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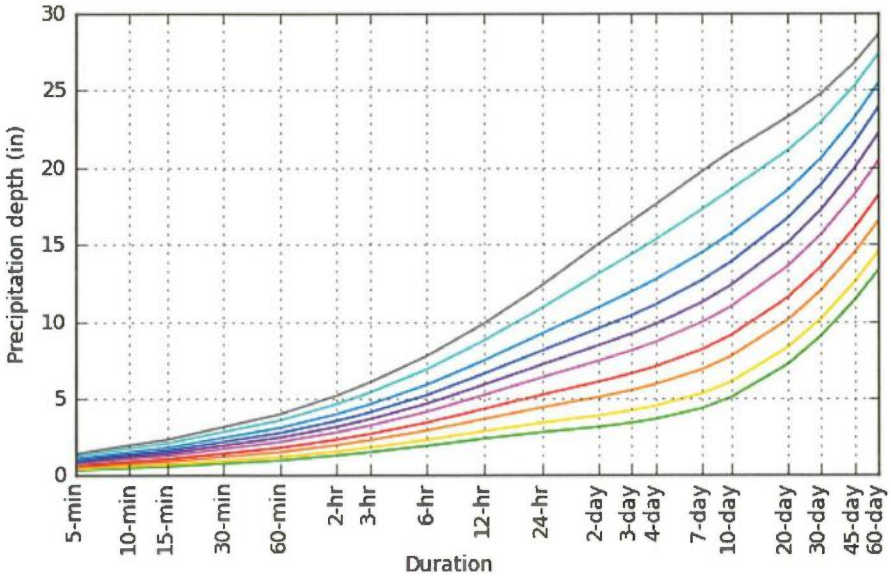
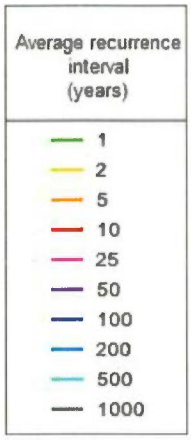
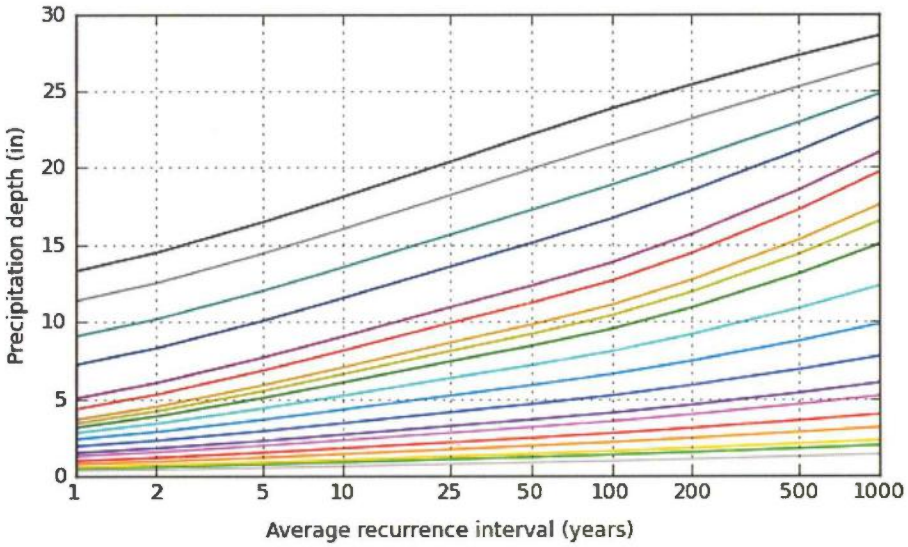
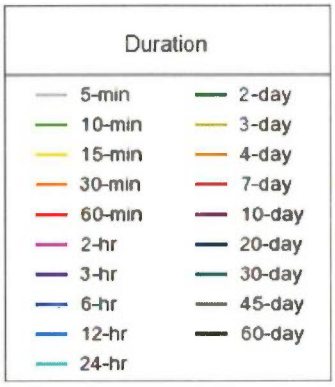
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 41.5682°, Longitude: -72.5084°









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Created (GMT): Tue Jan 7 12:57:25 2020

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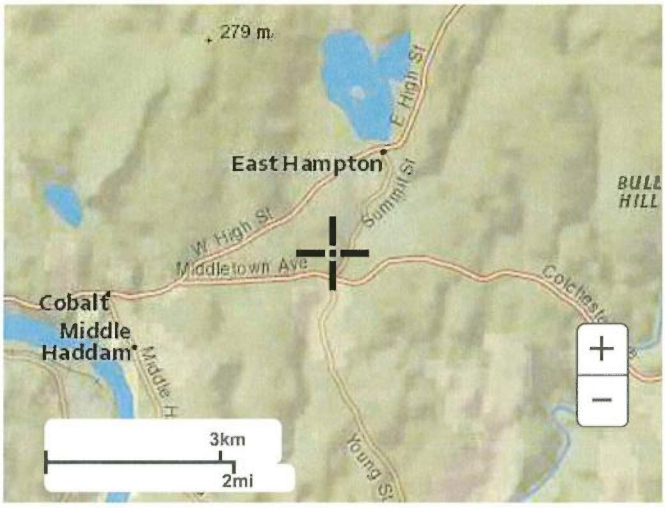
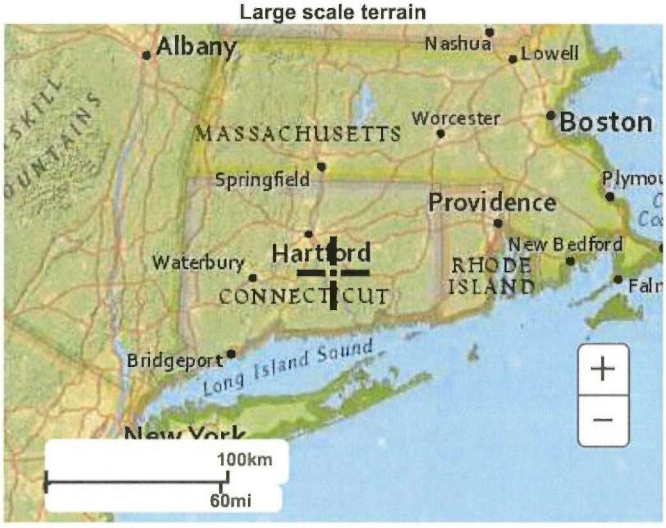
Maps & aerials

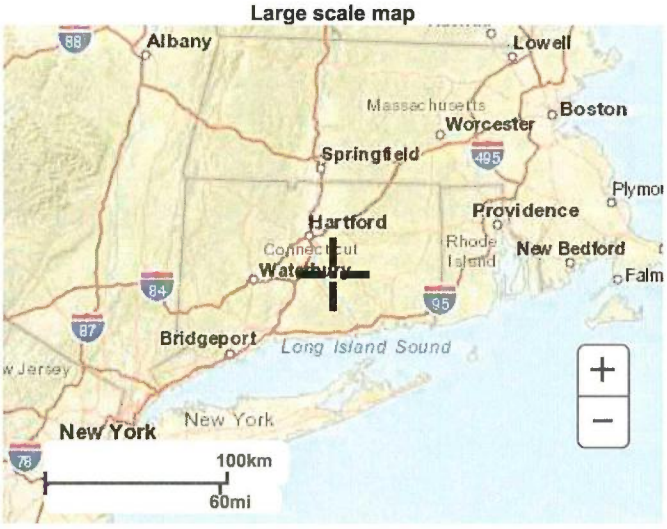
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

APPENDIX E: TEST PIT LOCATION SKETCH

GeoInsight®
Environmental Strategy & Engineering
Practical in Nature

February 6, 2020

GeoInsight Project 9611-000

Cela Sinay-Bernie
Citrine Power LLC
55 Greens Farms Road, Suite 200-78
Westport, Connecticut 06880

Re: In-Situ Infiltration Testing
East Hampton Industrial Park Ground Mount
46 Skinner Street
East Hampton, Connecticut

Ms. Sinay-Bernie:

GeoInsight, Inc. (GeoInsight) prepared this letter for Citrine Power LLC (Citrine) to present the results of *in-situ* hydraulic conductivity testing performed at the above-referenced property. On January 10, 2020, GeoInsight was on-site to perform field testing activities. The test pit locations where testing was performed are shown on the attached Figure 1.

GeoInsight performed *in-situ* hydraulic conductivity testing at three locations (SMB-1 through SMB-3). The testing was performed using the Guelph Permeameter, which is a borehole constant-head test method to evaluate the *in-situ* saturated hydraulic conductivity of the soil. The results of GeoInsight's testing are summarized as follows:

Test Location	Soil Classification	Test Depth (inches below ground surface)	Saturated Hydraulic Conductivity
SMB-1	Sand (SW)	54	6.8 inches per hour
SMB-2	Silty Sand (SM)	26	0.3 inches per hour
SMB-3	Silty Sand (SM)	48	0.8 inches per hour
Notes: Soil classification based upon the United Soil Classification System (ASTM D2488)			

GeoInsight, Inc.
186 Granite Street, 3rd Floor Suite A
Manchester, NH 03101-2643
Tel (603) 314-0820
Fax (603) 314-0821
www.geoinsight.com

GeoInsight, Inc.
One Monarch Drive, Suite 201
Littleton, MA 01460-1440
Tel (978) 679-1600
Fax (978) 679-1601

GeoInsight, Inc.
200 Court Street, 2nd Floor
Middletown, CT 06457-3341
Tel (860) 894-1022
Fax (860) 894-1023

GeoInsight, Inc.
4 Market Place Drive, 2nd Floor
York, ME 03909
Tel (207) 606-1043

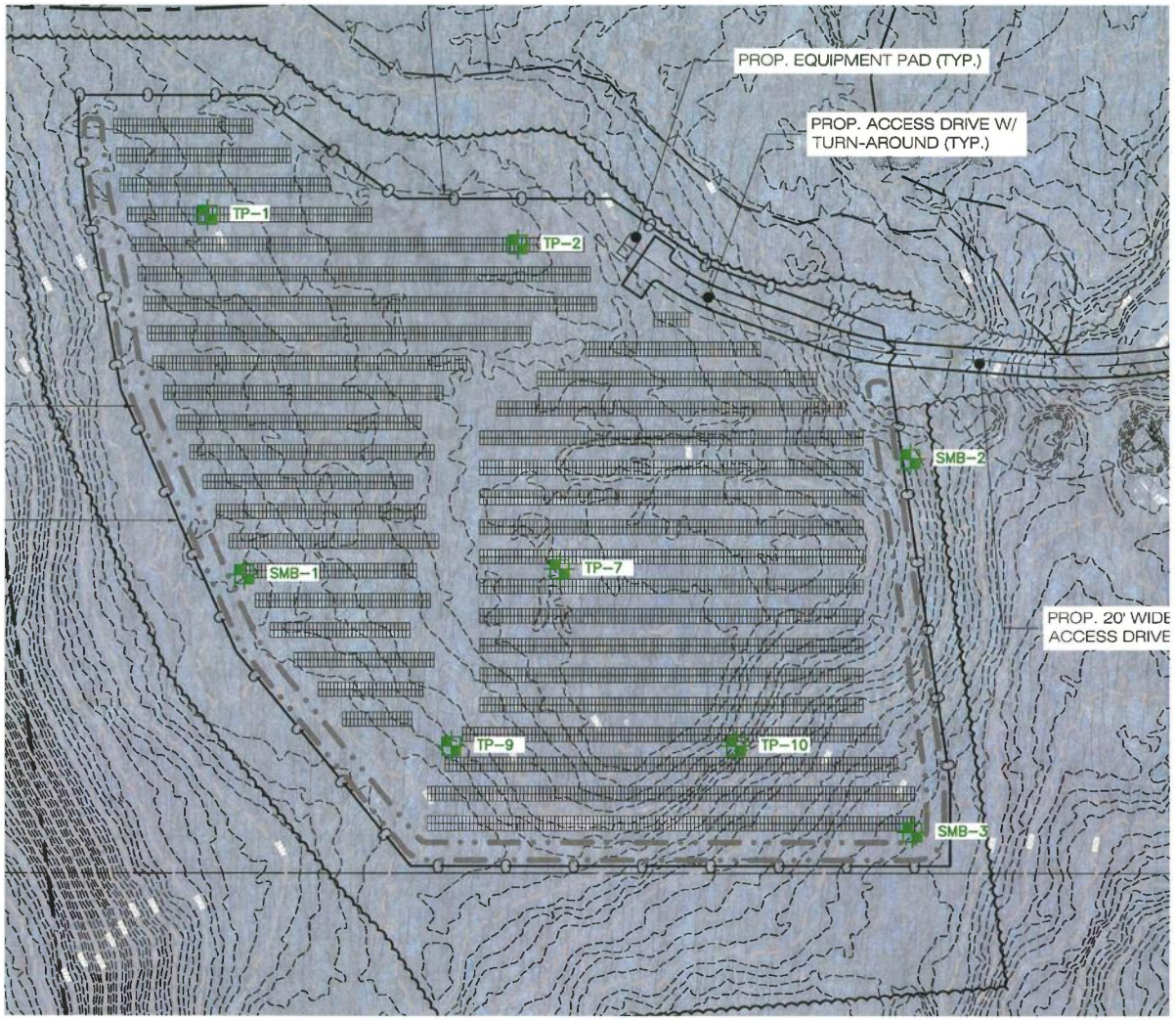
GeoInsight appreciates the opportunity to be of service to Citrine on this project. If you have questions about this letter or any other matter, please contact us at (860) 894-1022.

Sincerely,
GEOINSIGHT, INC.

Brian T. Nereson, P.E.
Senior Geotechnical Engineer

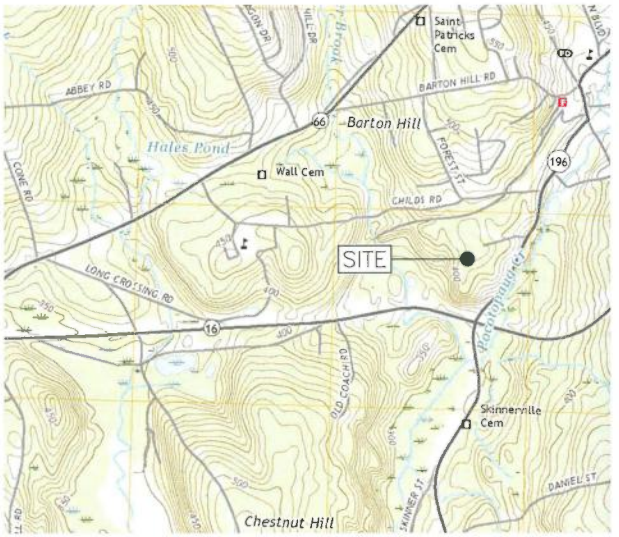
Jeffrey W. King, P.G., L.E.P.
Senior Hydrogeologist/Regional Manager

Attachment: Figure 1



SUBSURFACE EXPLORATION
LOCATION PLAN
1"=100'

0 100 200
APPROX. SCALE IN FEET



SITE LOCUS
1"=2000'

LEGEND

TP-10 APPROXIMATE TEST PIT LOCATION AND DESIGNATION

N

CLIENT: CITRINE POWER, LLC				GeoInsight Practical in Nature
PROJECT: EAST HAMPTON INDUSTRIAL PARK GROUND MOUT				
TITLE: SUBSURFACE EXPLORATION LOCATION PLAN				
DESIGNED: BTN	DRAWN: BTN	CHECKED: MCP	APPROVED: MCP	
SCALE: AS SHOWN	DATE: 2-6-20	FILE NO.: 9611D001	PROJECT NO.: 9611	FIGURE NO.: 1

PLOT DATE: 2-6-20
FILE: R:\9611 - Citrine Power, 46 Skinner St., East Hampton, CT - Geotech. Analysis\Figures and Plans\9611D001.dwg

APPENDIX F: WATER QUALITY VOLUME CALCULATIONS

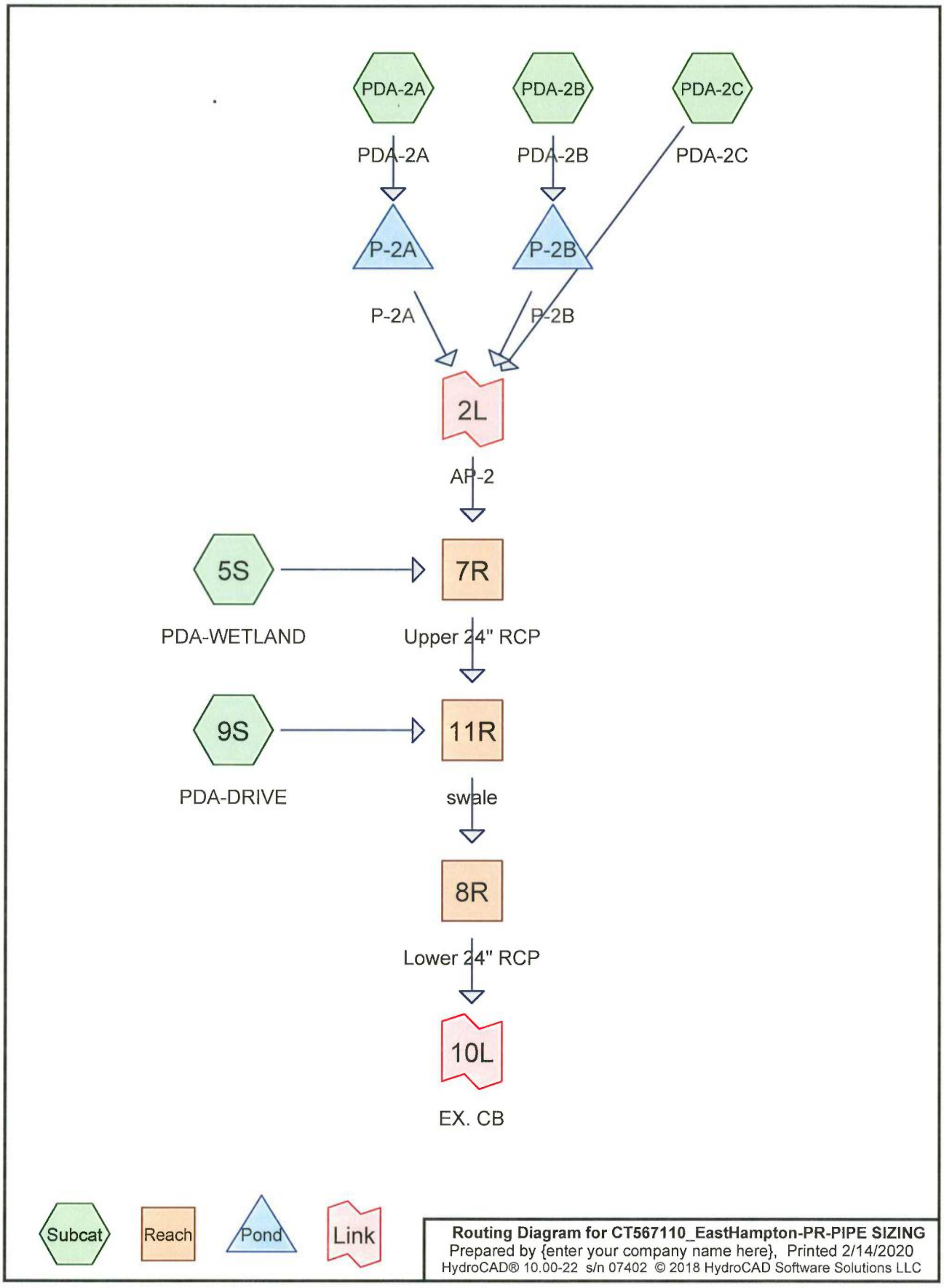
WATER QUALITY VOLUME CALCULATIONS
FOR
EAST HAMPTON INDUSTRIAL PARK GROUND MOUNT
46 SKINNER STREET, EAST HAMPTON, CT

$$WQV = \frac{(1")(R)(A)}{12}$$

where: WQV = water quality volume (ac-ft)
R = volumetric runoff coefficient = 0.05+0.009(I)
I = percent impervious cover
A = site area in acres

AREA (LOD)	=	14.27	AC
PERVIOUS AREA	=	11.07	AC
IMPERVIOUS AREA	=	3.20	AC
A	=	14.27	AC
I	=	22%	
R	=	0.25	
WQV	=	0.30	AC-FT
WQV	=	13,044.41	CF
WQV	=	483.13	CYD
PROVIDED VOLUMES		STORAGE	UNIT
INFILTRATION BASIN 1	=	498.88	CYD
INFILTRATION BASIN 2A	=	203.68	CYD
INFILTRATION BASIN 2B	=	186.17	CYD
INFILTRATION BASIN 3	=	319.19	CYD
INFILTRATION BASIN 4	=	1,190.41	CYD
TOTAL WQV REQUIRED	=	483.13	CYD
TOTAL WQV PROVIDED	=	2,398.33	CYD

APPENDIX G: DRIVEWAY PIPE CROSSINGS


PDA-2A
PDA-2B
PDA-2C
PDA-2A
PDA-2B
PDA-2C
P-2A
P-2B
P-2A
P-2B
2L
AP-2
5S
7R
PDA-WETLAND
Upper 24" RCP
9S
11R
PDA-DRIVE
swale
8R
Lower 24" RCP
10L
EX. CB
Subcat
Reach
Pond
Link
Routing Diagram for CT567110_EastHampton-PR-PIPE SIZING
Prepared by {enter your company name here}, Printed 2/14/2020
HydroCAD® 10.00-22 s/n 07402 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.183	48	Brush, Good, HSG B (PDA-2A, PDA-2B)
0.002	73	Brush, Good, HSG D (PDA-2B)
0.063	82	Dirt roads, HSG B (9S)
0.687	89	Dirt roads, HSG D (5S, 9S)
0.010	96	Gravel surface, HSG B (9S)
0.238	96	Gravel surface, HSG D (9S, PDA-2C)
1.172	71	Meadow, non-grazed, HSG C (PDA-2A, PDA-2B)
1.195	78	Meadow, non-grazed, HSG D (9S, PDA-2A, PDA-2B, PDA-2C)
2.749	55	Woods, Good, HSG B (5S)
1.844	77	Woods, Good, HSG D (5S, 9S, PDA-2C)
8.141	**70**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
3.004	HSG B	5S, 9S, PDA-2A, PDA-2B
1.172	HSG C	PDA-2A, PDA-2B
3.966	HSG D	5S, 9S, PDA-2A, PDA-2B, PDA-2C
0.000	Other	
8.141		**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	0.183	0.000	0.002	0.000	0.185	Brush, Good	PDA-2A, PDA-2B
0.000	0.063	0.000	0.687	0.000	0.750	Dirt roads	5S, 9S
0.000	0.010	0.000	0.238	0.000	0.247	Gravel surface	9S, PDA-2C
0.000	0.000	1.172	1.195	0.000	2.367	Meadow, non-grazed	9S, PDA-2A, PDA-2B, PDA-2C
0.000	2.749	0.000	1.844	0.000	4.593	Woods, Good	5S, 9S, PDA-2C
0.000	**3.004**	**1.172**	**3.966**	**0.000**	**8.141**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	7R	395.50	395.00	20.0	0.0250	0.011	24.0	0.0	6.0
2	8R	359.00	358.50	25.0	0.0200	0.011	24.0	0.0	6.0

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment5S: PDA-WETLAND Runoff Area=190,126 sf 0.00% Impervious Runoff Depth=0.61"
Flow Length=802' Tc=33.3 min CN=63 Runoff=1.31 cfs 0.221 af

Subcatchment9S: PDA-DRIVE Runoff Area=50,618 sf 0.00% Impervious Runoff Depth=2.00"
Flow Length=546' Tc=9.0 min CN=86 Runoff=2.41 cfs 0.194 af

SubcatchmentPDA-2A: PDA-2A Runoff Area=59,006 sf 0.00% Impervious Runoff Depth=0.99"
Flow Length=275' Tc=21.5 min CN=71 Runoff=0.95 cfs 0.112 af

SubcatchmentPDA-2B: PDA-2B Runoff Area=32,304 sf 0.00% Impervious Runoff Depth=1.05"
Flow Length=219' Tc=12.0 min CN=72 Runoff=0.69 cfs 0.065 af

SubcatchmentPDA-2C: PDA-2C Runoff Area=22,584 sf 0.00% Impervious Runoff Depth=1.62"
Flow Length=346' Tc=8.2 min CN=81 Runoff=0.90 cfs 0.070 af

Reach 7R: Upper 24" RCP Avg. Flow Depth=0.15' Max Vel=5.59 fps Inflow=1.54 cfs 0.291 af
24.0" Round Pipe w/ 6.0" inside fill n=0.011 L=20.0' S=0.0250 '/' Capacity=30.61 cfs Outflow=1.54 cfs 0.291 af

Reach 8R: Lower 24" RCP Avg. Flow Depth=0.26' Max Vel=6.81 fps Inflow=3.34 cfs 0.484 af
24.0" Round Pipe w/ 6.0" inside fill n=0.011 L=25.0' S=0.0200 '/' Capacity=27.37 cfs Outflow=3.33 cfs 0.484 af

Reach 11R: swale Avg. Flow Depth=0.48' Max Vel=2.91 fps Inflow=3.46 cfs 0.484 af
n=0.069 L=367.0' S=0.0954 '/' Capacity=46.76 cfs Outflow=3.34 cfs 0.484 af

Pond P-2A: P-2A Peak Elev=417.86' Storage=1,443 cf Inflow=0.95 cfs 0.112 af
Discarded=0.22 cfs 0.112 af Primary=0.00 cfs 0.000 af Outflow=0.22 cfs 0.112 af

Pond P-2B: P-2B Peak Elev=412.48' Storage=696 cf Inflow=0.69 cfs 0.065 af
Discarded=0.18 cfs 0.065 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.065 af

Link 2L: AP-2 Inflow=0.90 cfs 0.070 af
Primary=0.90 cfs 0.070 af

Link 10L: EX. CB Inflow=3.33 cfs 0.484 af
Primary=3.33 cfs 0.484 af

Total Runoff Area = 8.141 ac Runoff Volume = 0.662 af Average Runoff Depth = 0.98"
100.00% Pervious = 8.141 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 5S: PDA-WETLAND

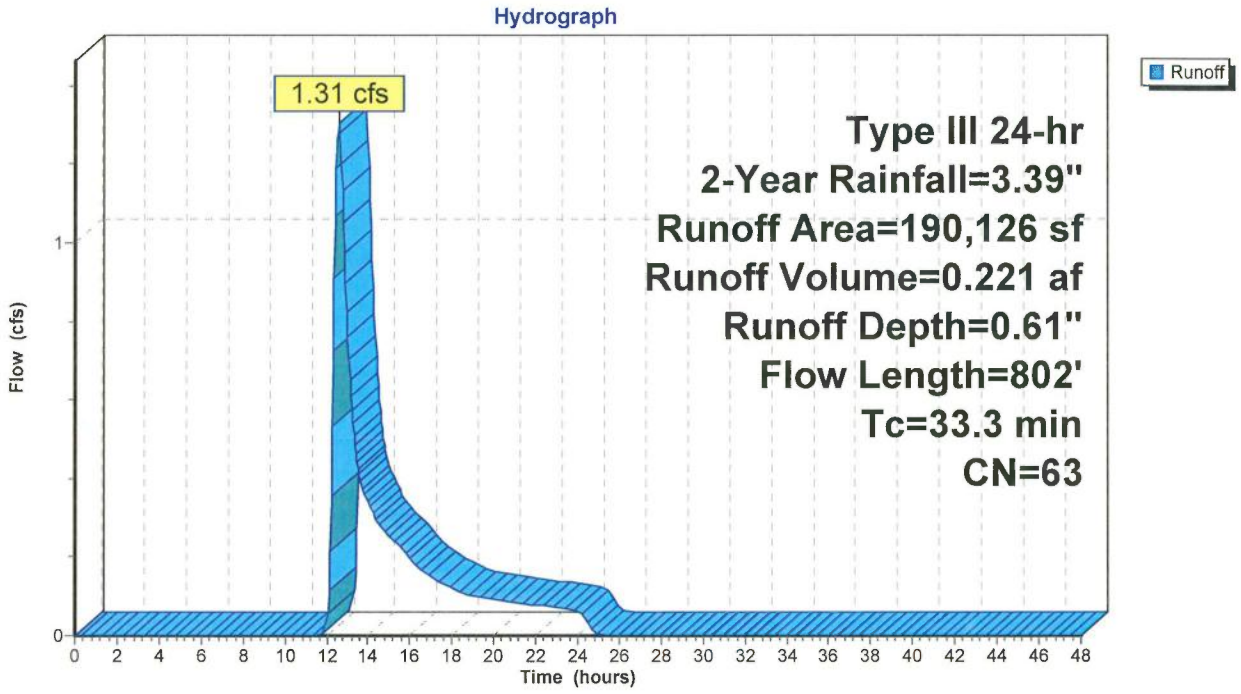
Runoff = 1.31 cfs @ 12.57 hrs, Volume= 0.221 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
119,727	55	Woods, Good, HSG B
67,409	77	Woods, Good, HSG D
2,990	89	Dirt roads, HSG D
190,126	63	Weighted Average
190,126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.1	100	0.0250	0.09		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
10.6	452	0.0203	0.71		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.1	77	0.0519	1.14		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
1.4	82	0.0366	0.96		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
1.1	91	0.0769	1.39		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
33.3	802	Total			

Subcatchment 5S: PDA-WETLAND



Summary for Subcatchment 9S: PDA-DRIVE

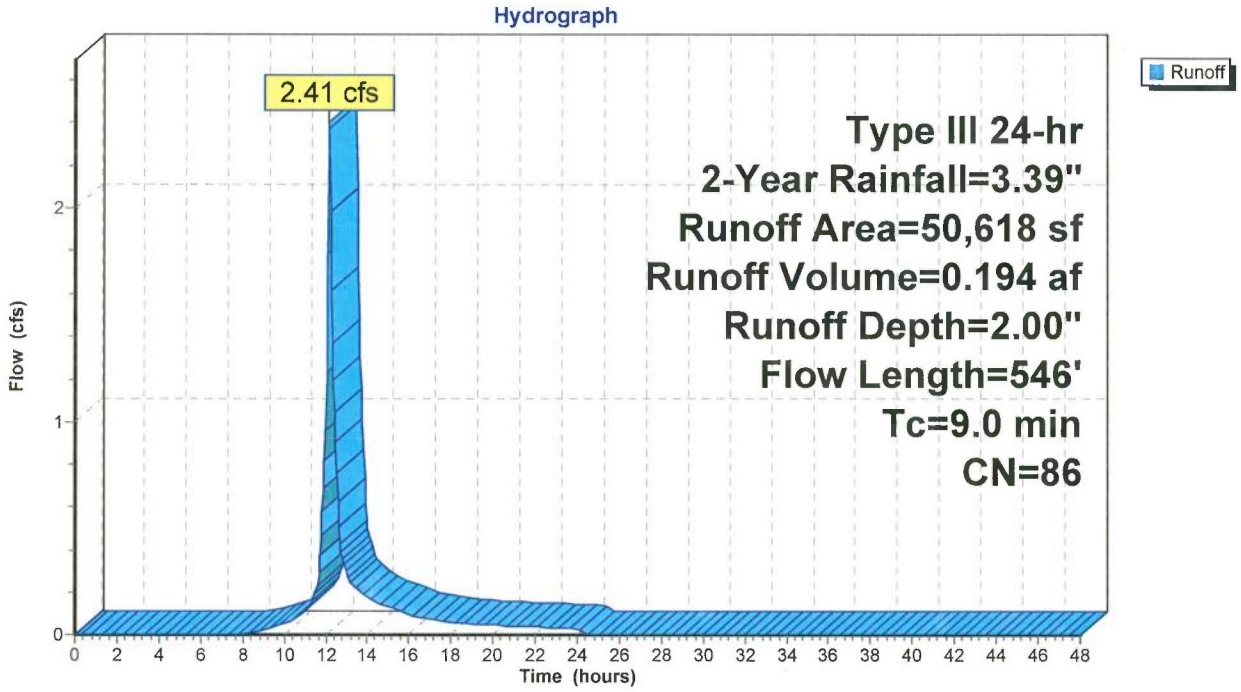
Runoff = 2.41 cfs @ 12.13 hrs, Volume= 0.194 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
10,945	77	Woods, Good, HSG D
6,876	96	Gravel surface, HSG D
2,714	78	Meadow, non-grazed, HSG D
26,943	89	Dirt roads, HSG D
2,723	82	Dirt roads, HSG B
417	96	Gravel surface, HSG B
50,618	86	Weighted Average
50,618		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.0400	0.23		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.39"
0.4	50	0.1700	2.06		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.8	87	0.0690	1.84		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.4000	10.18		**Shallow Concentrated Flow, D-E** Unpaved Kv= 16.1 fps
0.1	36	0.1700	6.64		**Shallow Concentrated Flow, E-F** Unpaved Kv= 16.1 fps
0.5	258	0.0954	9.49	77.85	**Channel Flow, F-G** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.041 Riprap, 2-inch
9.0	546	Total			

Subcatchment 9S: PDA-DRIVE



Summary for Subcatchment PDA-2A: PDA-2A

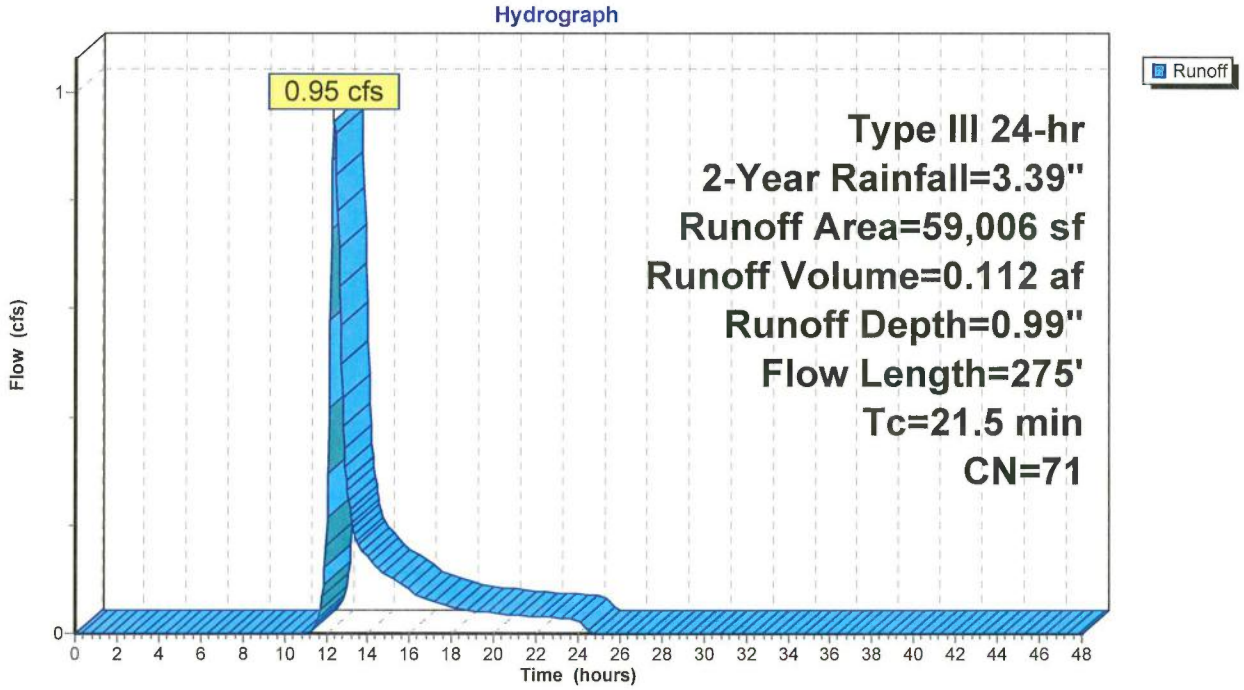
Runoff = 0.95 cfs @ 12.33 hrs, Volume= 0.112 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
39,007	71	Meadow, non-grazed, HSG C
16,039	78	Meadow, non-grazed, HSG D
3,960	48	Brush, Good, HSG B
59,006	71	Weighted Average
59,006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
16.0	70	0.0069	0.07		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
2.9	175	0.0211	1.02		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
21.5	275	Total			

Subcatchment PDA-2A: PDA-2A



Summary for Subcatchment PDA-2B: PDA-2B

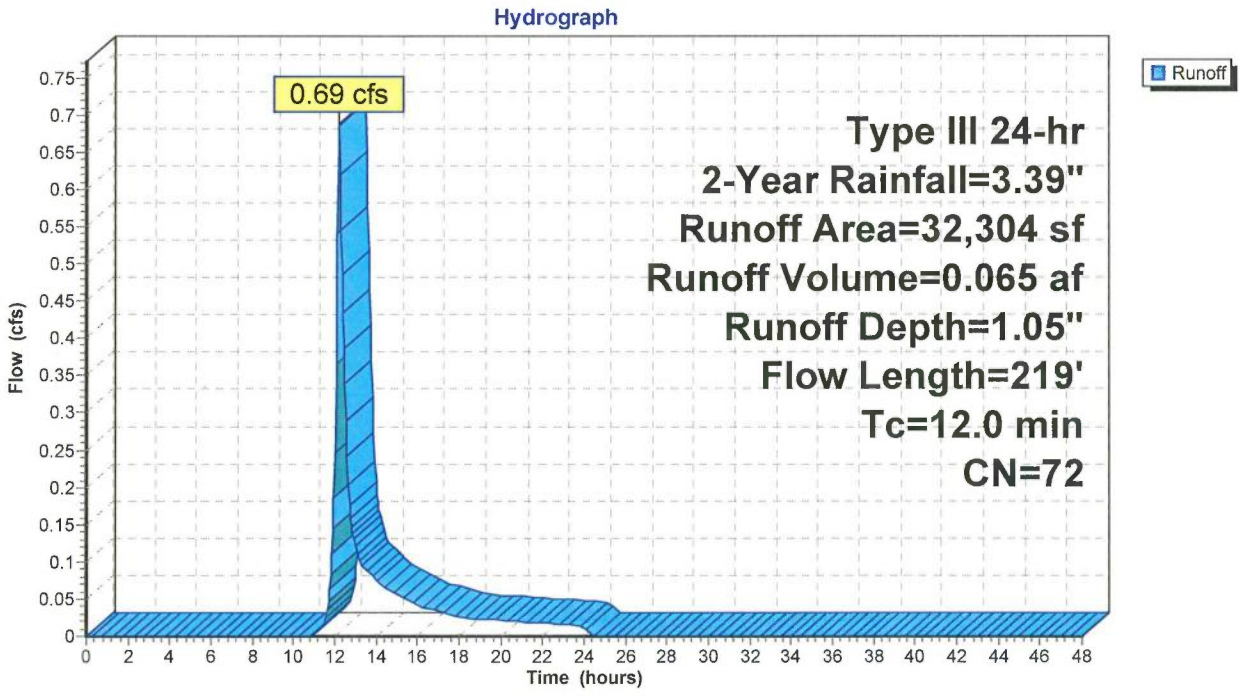
Runoff = 0.69 cfs @ 12.18 hrs, Volume= 0.065 af, Depth= 1.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
12,043	71	Meadow, non-grazed, HSG C
16,171	78	Meadow, non-grazed, HSG D
4,020	48	Brush, Good, HSG B
70	73	Brush, Good, HSG D
32,304	72	Weighted Average
32,304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
8.3	70	0.0357	0.14		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
1.1	119	0.0630	1.76		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
12.0	219	Total			

Subcatchment PDA-2B: PDA-2B



Summary for Subcatchment PDA-2C: PDA-2C

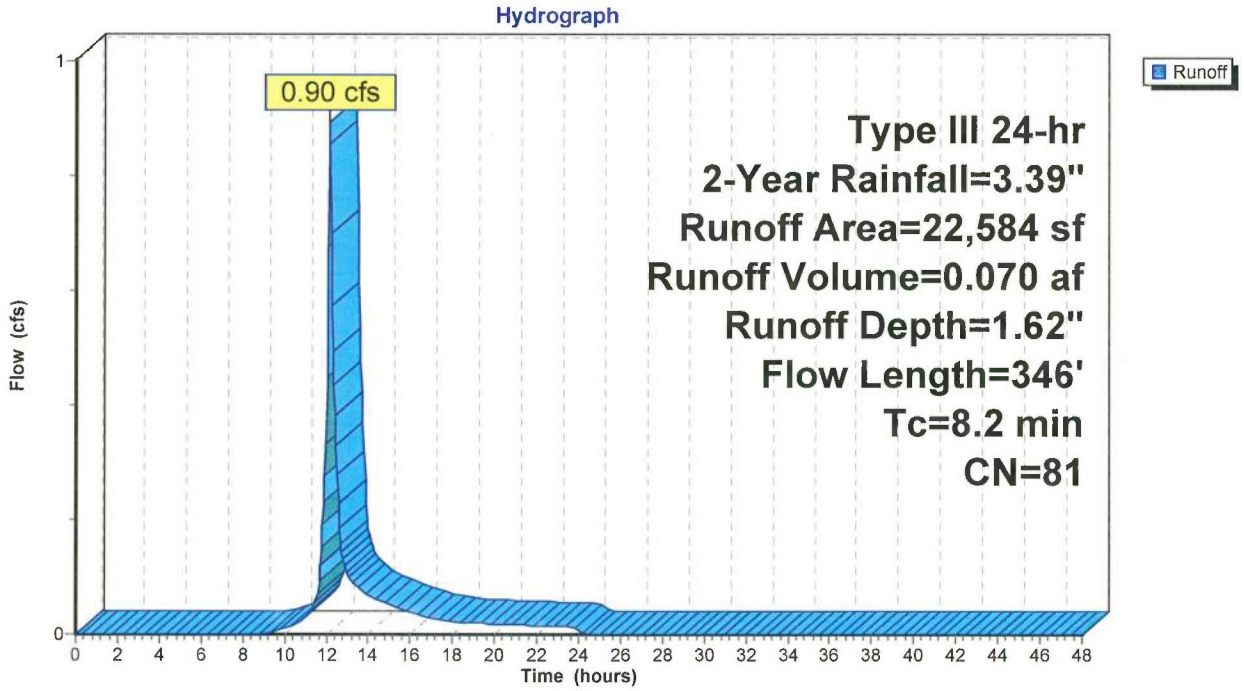
Runoff = 0.90 cfs @ 12.12 hrs, Volume= 0.070 af, Depth= 1.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.39"

Area (sf)	CN	Description
1,977	77	Woods, Good, HSG D
3,486	96	Gravel surface, HSG D
17,121	78	Meadow, non-grazed, HSG D
22,584	81	Weighted Average
22,584		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0600	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.39"
1.3	146	0.0684	1.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.8	100	0.0854	2.05		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
8.2	346	Total			

Subcatchment PDA-2C: PDA-2C



Summary for Reach 7R: Upper 24" RCP

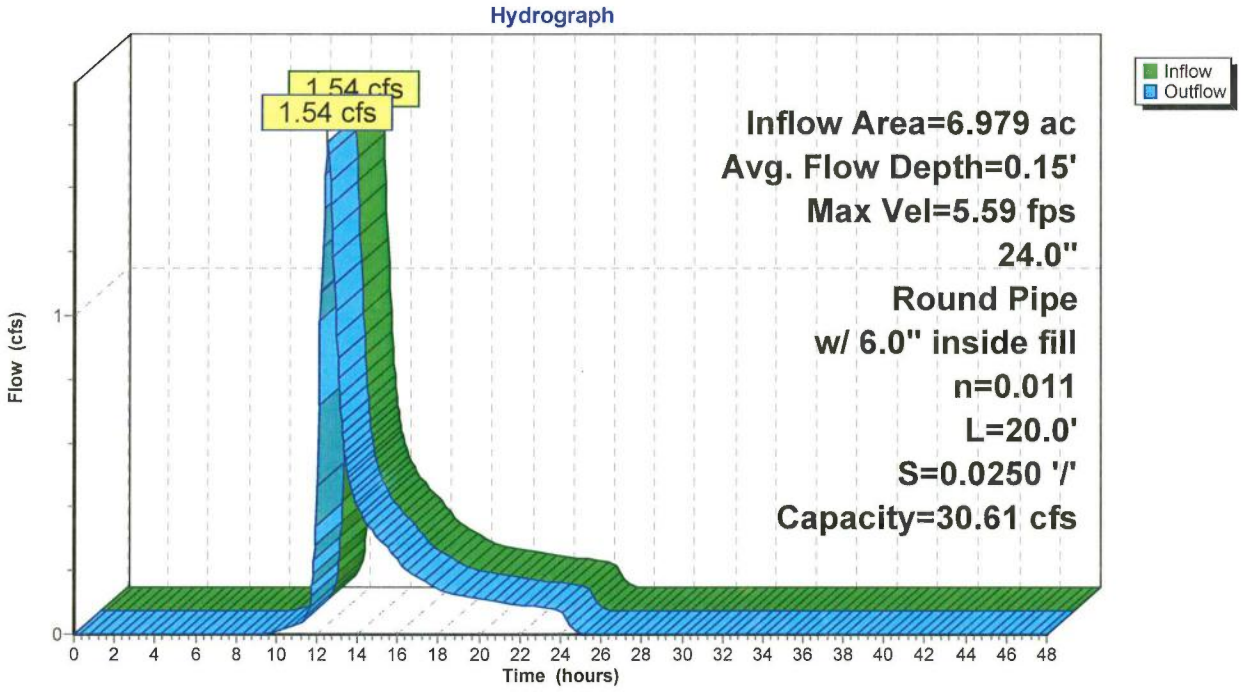
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 6.979 ac, 0.00% Impervious, Inflow Depth = 0.50" for 2-Year event
Inflow = 1.54 cfs @ 12.51 hrs, Volume= 0.291 af
Outflow = 1.54 cfs @ 12.51 hrs, Volume= 0.291 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.59 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.41 fps, Avg. Travel Time= 0.1 min

Peak Storage= 6 cf @ 12.51 hrs
Average Depth at Peak Storage= 0.65' above invert (0.15' above fill)
Bank-Full Depth= 2.00' above invert (1.50' above fill) Flow Area= 2.5 sf, Capacity= 30.61 cfs

24.0" Round Pipe w/ 6.0" inside fill
n= 0.011 Concrete pipe, straight & clean
Length= 20.0' Slope= 0.0250 '/'
Inlet Invert= 395.50', Outlet Invert= 395.00'



Summary for Reach 8R: Lower 24" RCP

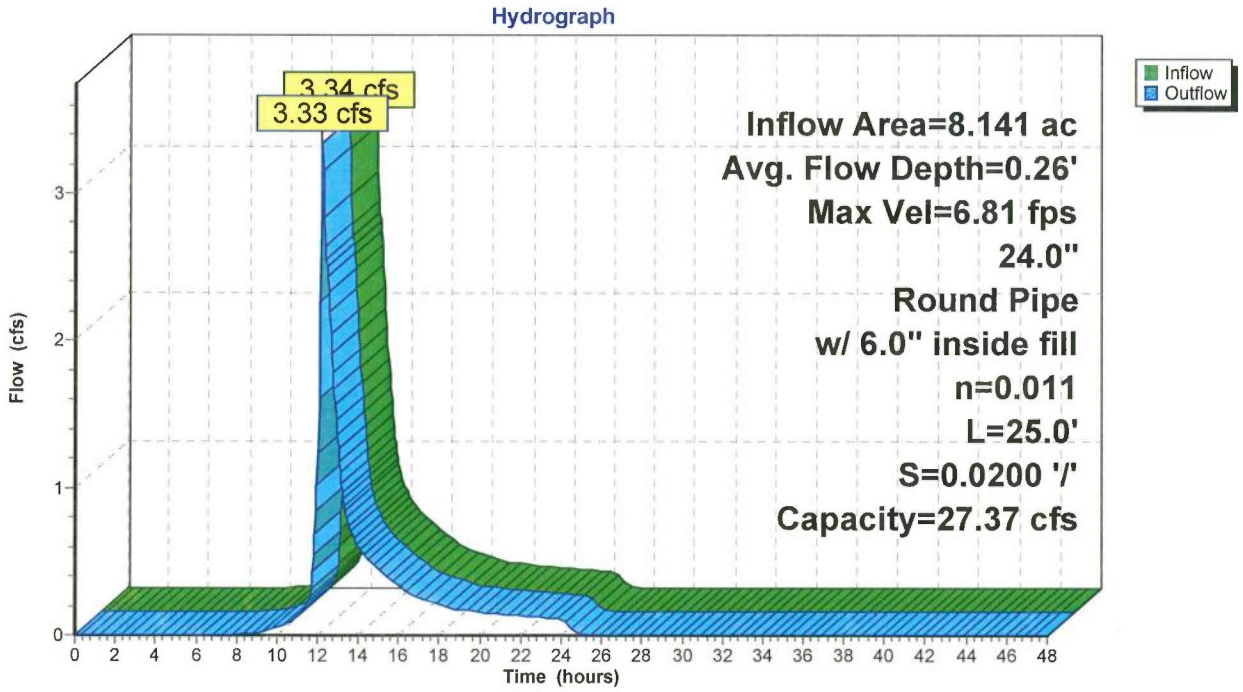
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 8.141 ac, 0.00% Impervious, Inflow Depth = 0.71" for 2-Year event
Inflow = 3.34 cfs @ 12.21 hrs, Volume= 0.484 af
Outflow = 3.33 cfs @ 12.21 hrs, Volume= 0.484 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.81 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.48 fps, Avg. Travel Time= 0.2 min

Peak Storage= 12 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.76' above invert (0.26' above fill)
Bank-Full Depth= 2.00' above invert (1.50' above fill) Flow Area= 2.5 sf, Capacity= 27.37 cfs

24.0" Round Pipe w/ 6.0" inside fill
n= 0.011 Concrete pipe, straight & clean
Length= 25.0' Slope= 0.0200 '/'
Inlet Invert= 359.00', Outlet Invert= 358.50'



Summary for Reach 11R: swale

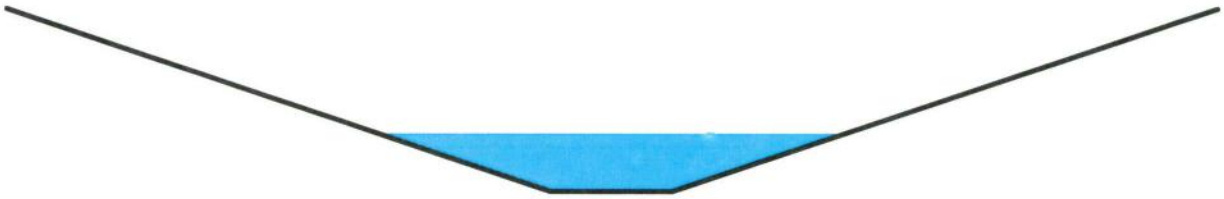
[61] Hint: Exceeded Reach 7R outlet invert by 0.48' @ 12.15 hrs

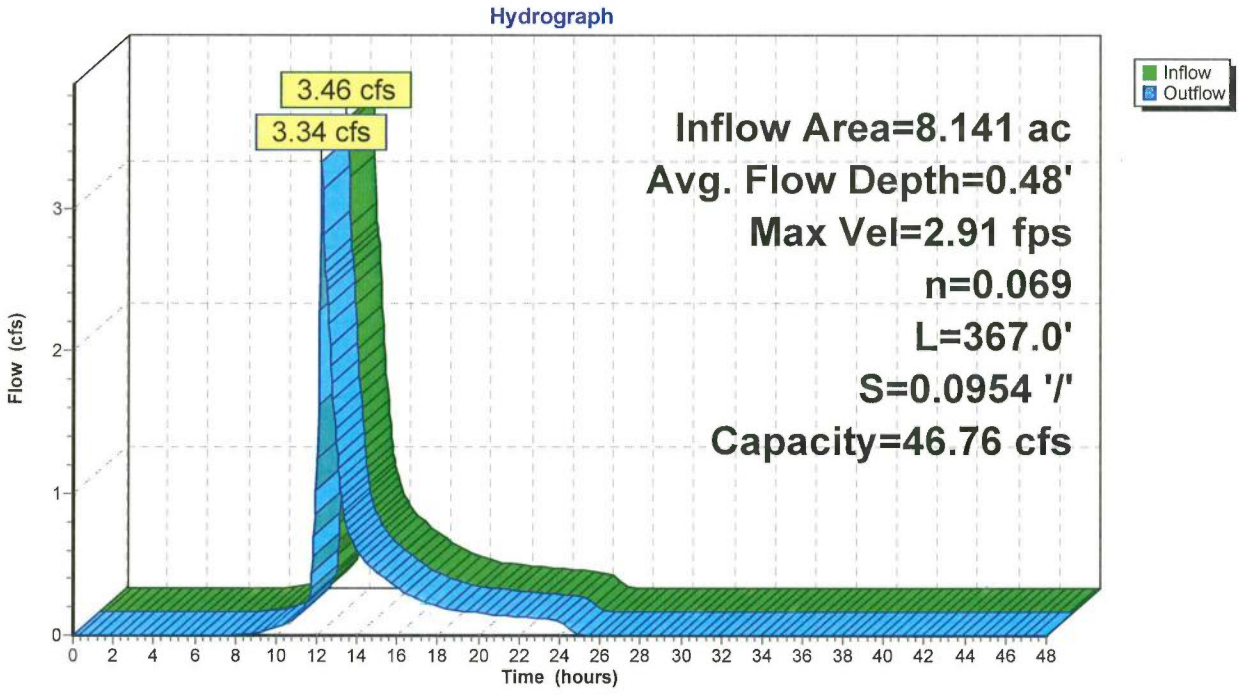
Inflow Area = 8.141 ac, 0.00% Impervious, Inflow Depth = 0.71" for 2-Year event
Inflow = 3.46 cfs @ 12.14 hrs, Volume= 0.484 af
Outflow = 3.34 cfs @ 12.21 hrs, Volume= 0.484 af, Atten= 4%, Lag= 4.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.91 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.22 fps, Avg. Travel Time= 5.0 min

Peak Storage= 429 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 1.50' Flow Area= 8.3 sf, Capacity= 46.76 cfs

1.00' x 1.50' deep channel, n= 0.069 Riprap, 6-inch
Side Slope Z-value= 3.0 '/' Top Width= 10.00'
Length= 367.0' Slope= 0.0954 '/'
Inlet Invert= 395.00', Outlet Invert= 360.00'





Summary for Pond P-2A: P-2A

Inflow Area = 1.355 ac, 0.00% Impervious, Inflow Depth = 0.99" for 2-Year event
Inflow = 0.95 cfs @ 12.33 hrs, Volume= 0.112 af
Outflow = 0.22 cfs @ 13.12 hrs, Volume= 0.112 af, Atten= 76%, Lag= 47.6 min
Discarded = 0.22 cfs @ 13.12 hrs, Volume= 0.112 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 417.86' @ 13.12 hrs Surf.Area= 1,935 sf Storage= 1,443 cf

Plug-Flow detention time= 56.3 min calculated for 0.112 af (100% of inflow)
Center-of-Mass det. time= 56.3 min (938.8 - 882.5)

Volume	Invert	Avail.Storage	Storage Description
#1	417.00'	7,116 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

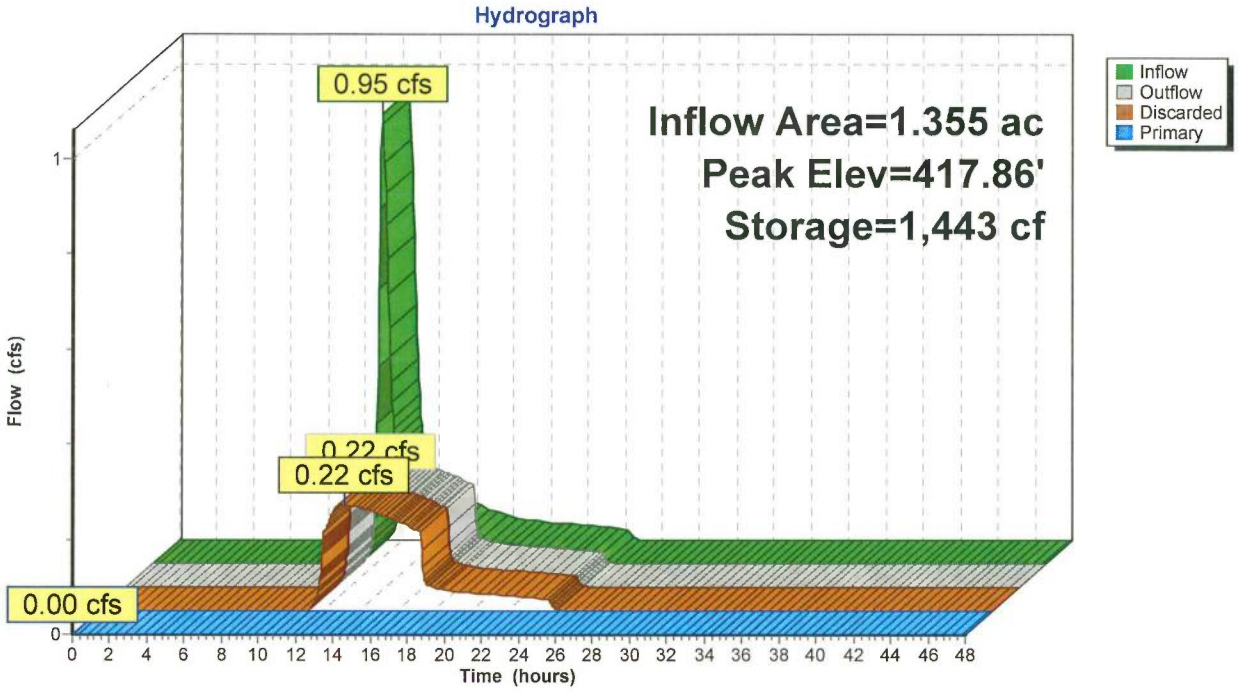
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
417.00	1,405	0	0
418.00	2,018	1,712	1,712
419.00	2,688	2,353	4,065
420.00	3,415	3,052	7,116

Device	Routing	Invert	Outlet Devices
#1	Discarded	417.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	419.50'	**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

Discarded OutFlow Max=0.22 cfs @ 13.12 hrs HW=417.86' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=417.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2A: P-2A


Hydrograph
Inflow
Outflow
Discarded
Primary
0.95 cfs
0.22 cfs
0.22 cfs
0.00 cfs
Inflow Area=1.355 ac
Peak Elev=417.86'
Storage=1,443 cf
Flow (cfs)
0
1
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Pond P-2B: P-2B

Inflow Area = 0.742 ac, 0.00% Impervious, Inflow Depth = 1.05" for 2-Year event
Inflow = 0.69 cfs @ 12.18 hrs, Volume= 0.065 af
Outflow = 0.18 cfs @ 12.69 hrs, Volume= 0.065 af, Atten= 73%, Lag= 30.4 min
Discarded = 0.18 cfs @ 12.69 hrs, Volume= 0.065 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 412.48' @ 12.69 hrs Surf.Area= 1,580 sf Storage= 696 cf

Plug-Flow detention time= 27.1 min calculated for 0.065 af (100% of inflow)
Center-of-Mass det. time= 27.1 min (897.5 - 870.5)

Volume	Invert	Avail.Storage	Storage Description
#1	412.00'	6,481 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

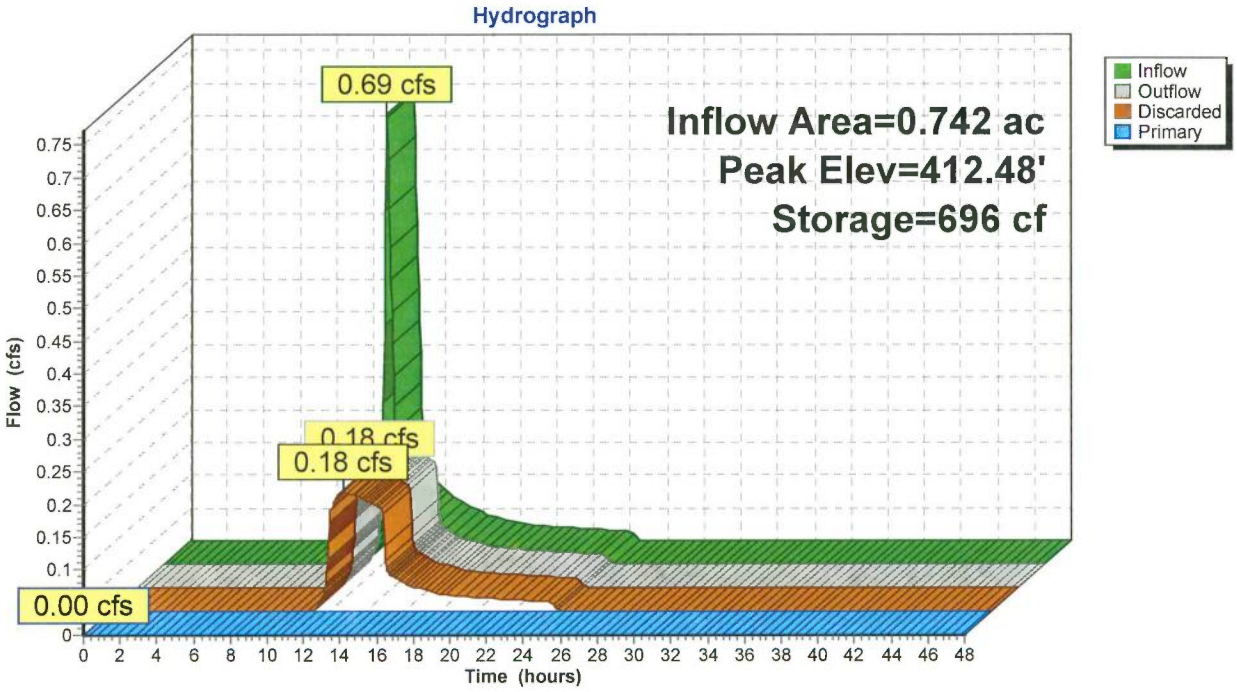
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
412.00	1,330	0	0
413.00	1,852	1,591	1,591
414.00	2,431	2,142	3,733
415.00	3,065	2,748	6,481

Device	Routing	Invert	Outlet Devices
#1	Discarded	412.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	414.50'	**10.0' long x 15.0' 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=0.18 cfs @ 12.69 hrs HW=412.48' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=412.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2B: P-2B

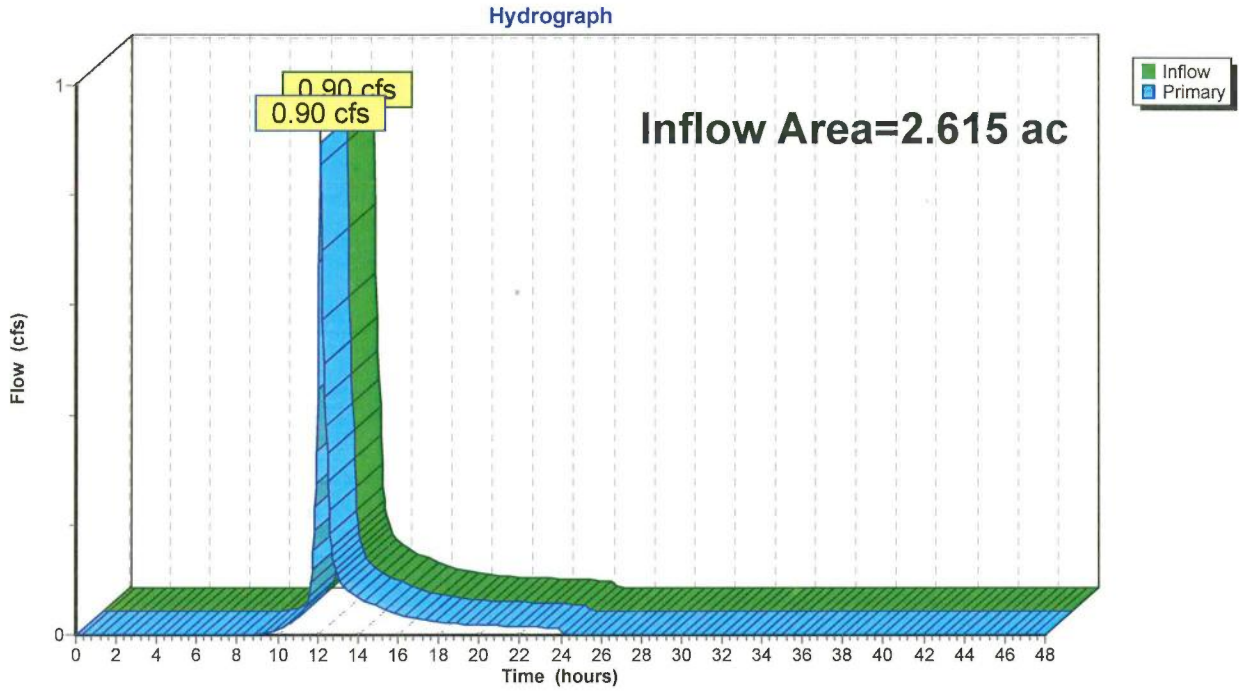

Hydrograph
0.69 cfs
0.18 cfs
0.18 cfs
0.00 cfs
Inflow Area=0.742 ac
Peak Elev=412.48'
Storage=696 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0 0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 0.5 0.55 0.6 0.65 0.7 0.75
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Link 2L: AP-2

Inflow Area = 2.615 ac, 0.00% Impervious, Inflow Depth = 0.32" for 2-Year event
Inflow = 0.90 cfs @ 12.12 hrs, Volume= 0.070 af
Primary = 0.90 cfs @ 12.12 hrs, Volume= 0.070 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: AP-2

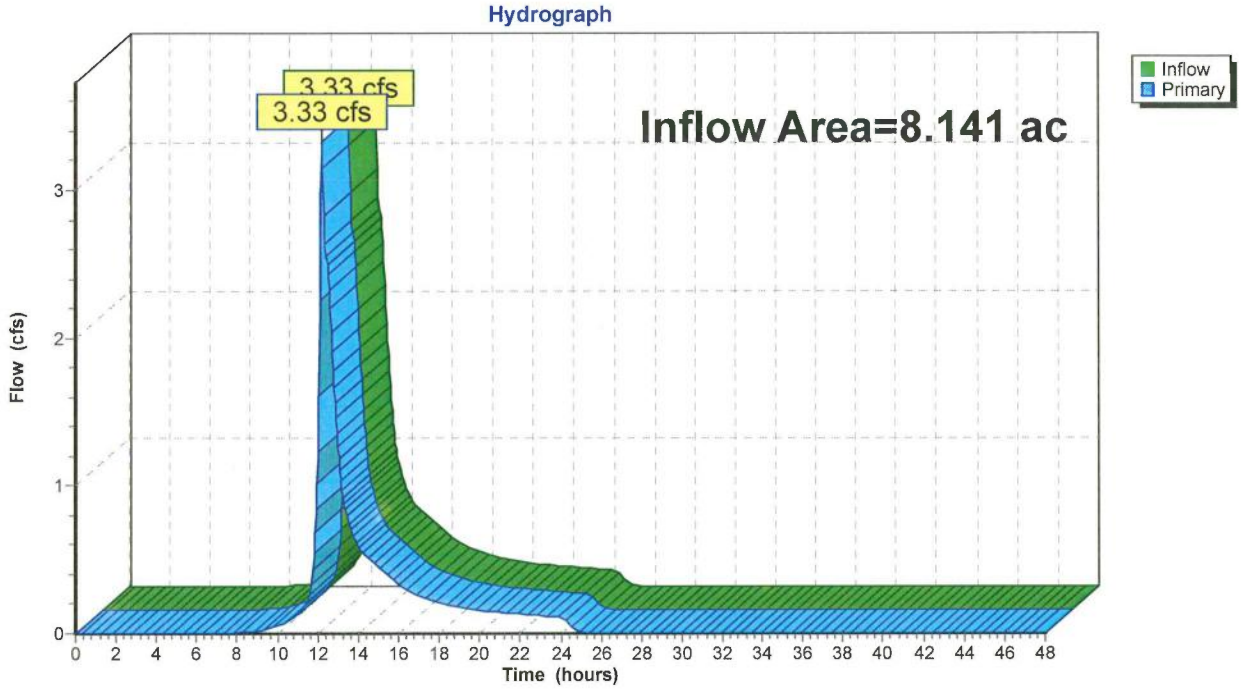


Summary for Link 10L: EX. CB

Inflow Area = 8.141 ac, 0.00% Impervious, Inflow Depth = 0.71" for 2-Year event
Inflow = 3.33 cfs @ 12.21 hrs, Volume= 0.484 af
Primary = 3.33 cfs @ 12.21 hrs, Volume= 0.484 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 10L: EX. CB



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment5S: PDA-WETLAND Runoff Area=190,126 sf 0.00% Impervious Runoff Depth=2.41"
Flow Length=802' Tc=33.3 min CN=63 Runoff=6.44 cfs 0.877 af

Subcatchment9S: PDA-DRIVE Runoff Area=50,618 sf 0.00% Impervious Runoff Depth=4.72"
Flow Length=546' Tc=9.0 min CN=86 Runoff=5.58 cfs 0.457 af

SubcatchmentPDA-2A: PDA-2A Runoff Area=59,006 sf 0.00% Impervious Runoff Depth=3.17"
Flow Length=275' Tc=21.5 min CN=71 Runoff=3.27 cfs 0.357 af

SubcatchmentPDA-2B: PDA-2B Runoff Area=32,304 sf 0.00% Impervious Runoff Depth=3.27"
Flow Length=219' Tc=12.0 min CN=72 Runoff=2.31 cfs 0.202 af

SubcatchmentPDA-2C: PDA-2C Runoff Area=22,584 sf 0.00% Impervious Runoff Depth=4.19"
Flow Length=346' Tc=8.2 min CN=81 Runoff=2.31 cfs 0.181 af

Reach 7R: Upper 24" RCP Avg. Flow Depth=0.40' Max Vel=9.44 fps Inflow=7.16 cfs 1.094 af
24.0" Round Pipe w/ 6.0" inside fill n=0.011 L=20.0' S=0.0250 '/' Capacity=30.61 cfs Outflow=7.16 cfs 1.094 af

Reach 8R: Lower 24" RCP Avg. Flow Depth=0.54' Max Vel=9.70 fps Inflow=10.02 cfs 1.552 af
24.0" Round Pipe w/ 6.0" inside fill n=0.011 L=25.0' S=0.0200 '/' Capacity=27.37 cfs Outflow=10.01 cfs 1.552 af

Reach 11R: swale Avg. Flow Depth=0.79' Max Vel=3.85 fps Inflow=10.24 cfs 1.552 af
n=0.069 L=367.0' S=0.0954 '/' Capacity=46.76 cfs Outflow=10.02 cfs 1.552 af

Pond P-2A: P-2A Peak Elev=419.61' Storage=5,825 cf Inflow=3.27 cfs 0.357 af
Discarded=0.36 cfs 0.320 af Primary=0.92 cfs 0.037 af Outflow=1.28 cfs 0.357 af

Pond P-2B: P-2B Peak Elev=413.92' Storage=3,533 cf Inflow=2.31 cfs 0.202 af
Discarded=0.28 cfs 0.202 af Primary=0.00 cfs 0.000 af Outflow=0.28 cfs 0.202 af

Link 2L: AP-2 Inflow=2.31 cfs 0.218 af
Primary=2.31 cfs 0.218 af

Link 10L: EX. CB Inflow=10.01 cfs 1.552 af
Primary=10.01 cfs 1.552 af

Total Runoff Area = 8.141 ac Runoff Volume = 2.074 af Average Runoff Depth = 3.06"
100.00% Pervious = 8.141 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 5S: PDA-WETLAND

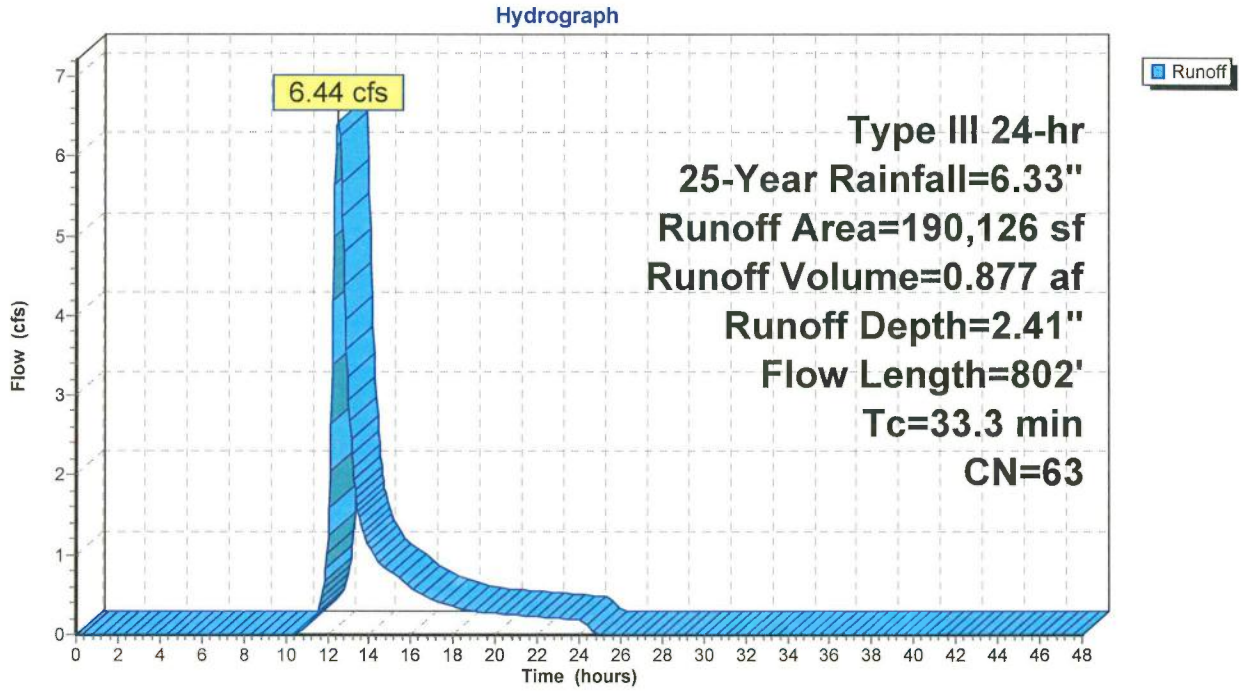
Runoff = 6.44 cfs @ 12.49 hrs, Volume= 0.877 af, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
119,727	55	Woods, Good, HSG B
67,409	77	Woods, Good, HSG D
2,990	89	Dirt roads, HSG D
190,126	63	Weighted Average
190,126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.1	100	0.0250	0.09		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
10.6	452	0.0203	0.71		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.1	77	0.0519	1.14		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
1.4	82	0.0366	0.96		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
1.1	91	0.0769	1.39		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
33.3	802	Total			

Subcatchment 5S: PDA-WETLAND



Summary for Subcatchment 9S: PDA-DRIVE

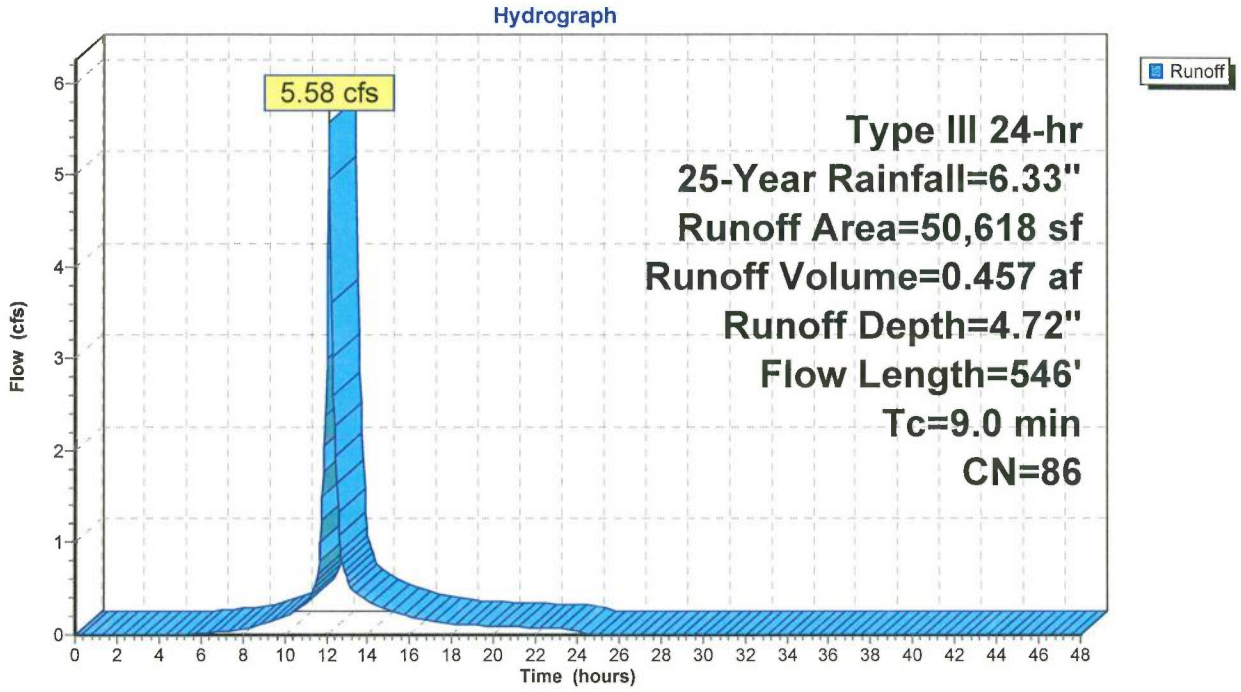
Runoff = 5.58 cfs @ 12.12 hrs, Volume= 0.457 af, Depth= 4.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
10,945	77	Woods, Good, HSG D
6,876	96	Gravel surface, HSG D
2,714	78	Meadow, non-grazed, HSG D
26,943	89	Dirt roads, HSG D
2,723	82	Dirt roads, HSG B
417	96	Gravel surface, HSG B
50,618	86	Weighted Average
50,618		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.0400	0.23		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.39"
0.4	50	0.1700	2.06		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.8	87	0.0690	1.84		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.4000	10.18		**Shallow Concentrated Flow, D-E** Unpaved Kv= 16.1 fps
0.1	36	0.1700	6.64		**Shallow Concentrated Flow, E-F** Unpaved Kv= 16.1 fps
0.5	258	0.0954	9.49	77.85	**Channel Flow, F-G** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.041 Riprap, 2-inch
9.0	546	Total			

Subcatchment 9S: PDA-DRIVE



Summary for Subcatchment PDA-2A: PDA-2A

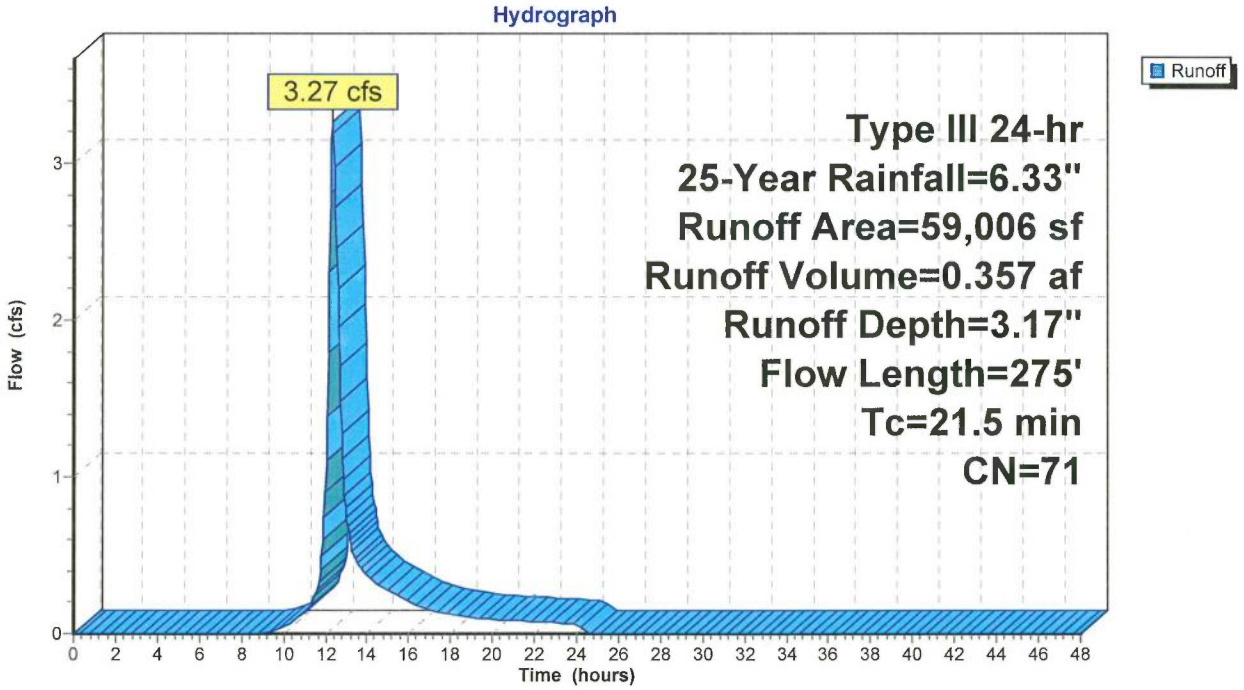
Runoff = 3.27 cfs @ 12.30 hrs, Volume= 0.357 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
39,007	71	Meadow, non-grazed, HSG C
16,039	78	Meadow, non-grazed, HSG D
3,960	48	Brush, Good, HSG B
59,006	71	Weighted Average
59,006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
16.0	70	0.0069	0.07		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
2.9	175	0.0211	1.02		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
21.5	275	Total			

Subcatchment PDA-2A: PDA-2A



Summary for Subcatchment PDA-2B: PDA-2B

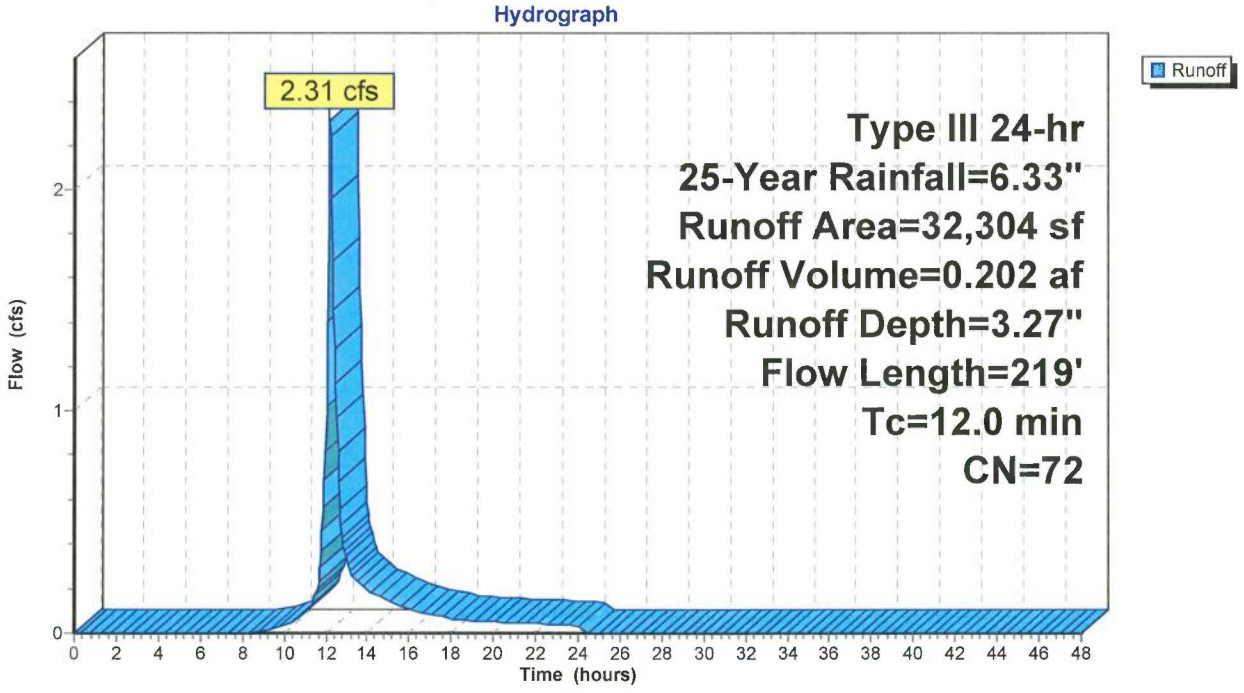
Runoff = 2.31 cfs @ 12.17 hrs, Volume= 0.202 af, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
12,043	71	Meadow, non-grazed, HSG C
16,171	78	Meadow, non-grazed, HSG D
4,020	48	Brush, Good, HSG B
70	73	Brush, Good, HSG D
32,304	72	Weighted Average
32,304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
8.3	70	0.0357	0.14		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
1.1	119	0.0630	1.76		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
12.0	219	Total			

Subcatchment PDA-2B: PDA-2B



Summary for Subcatchment PDA-2C: PDA-2C

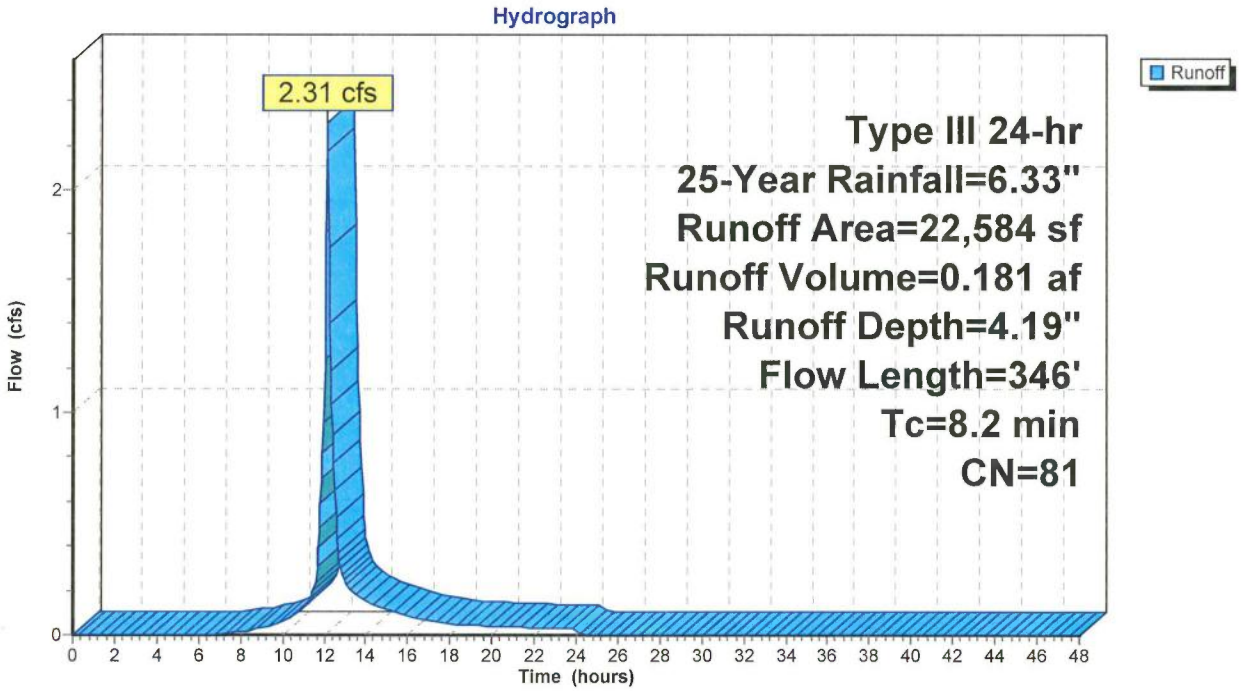
Runoff = 2.31 cfs @ 12.12 hrs, Volume= 0.181 af, Depth= 4.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
1,977	77	Woods, Good, HSG D
3,486	96	Gravel surface, HSG D
17,121	78	Meadow, non-grazed, HSG D
22,584	81	Weighted Average
22,584		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0600	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.39"
1.3	146	0.0684	1.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.8	100	0.0854	2.05		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
8.2	346	Total			

Subcatchment PDA-2C: PDA-2C



Summary for Reach 7R: Upper 24" RCP

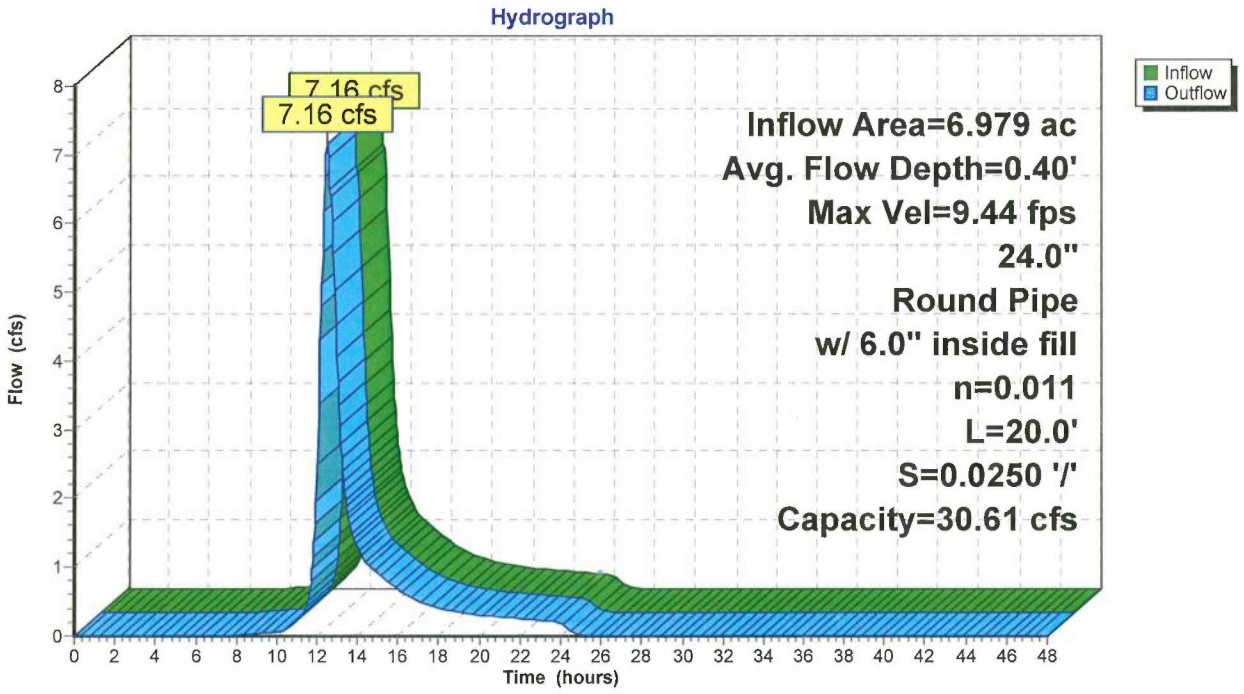
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 6.979 ac, 0.00% Impervious, Inflow Depth = 1.88" for 25-Year event
Inflow = 7.16 cfs @ 12.46 hrs, Volume= 1.094 af
Outflow = 7.16 cfs @ 12.46 hrs, Volume= 1.094 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.44 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.31 fps, Avg. Travel Time= 0.1 min

Peak Storage= 15 cf @ 12.46 hrs
Average Depth at Peak Storage= 0.90' above invert (0.40' above fill)
Bank-Full Depth= 2.00' above invert (1.50' above fill) Flow Area= 2.5 sf, Capacity= 30.61 cfs

24.0" Round Pipe w/ 6.0" inside fill
n= 0.011 Concrete pipe, straight & clean
Length= 20.0' Slope= 0.0250 '/'
Inlet Invert= 395.50', Outlet Invert= 395.00'



Summary for Reach 8R: Lower 24" RCP

[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach 11R outlet invert by 0.04' @ 12.20 hrs

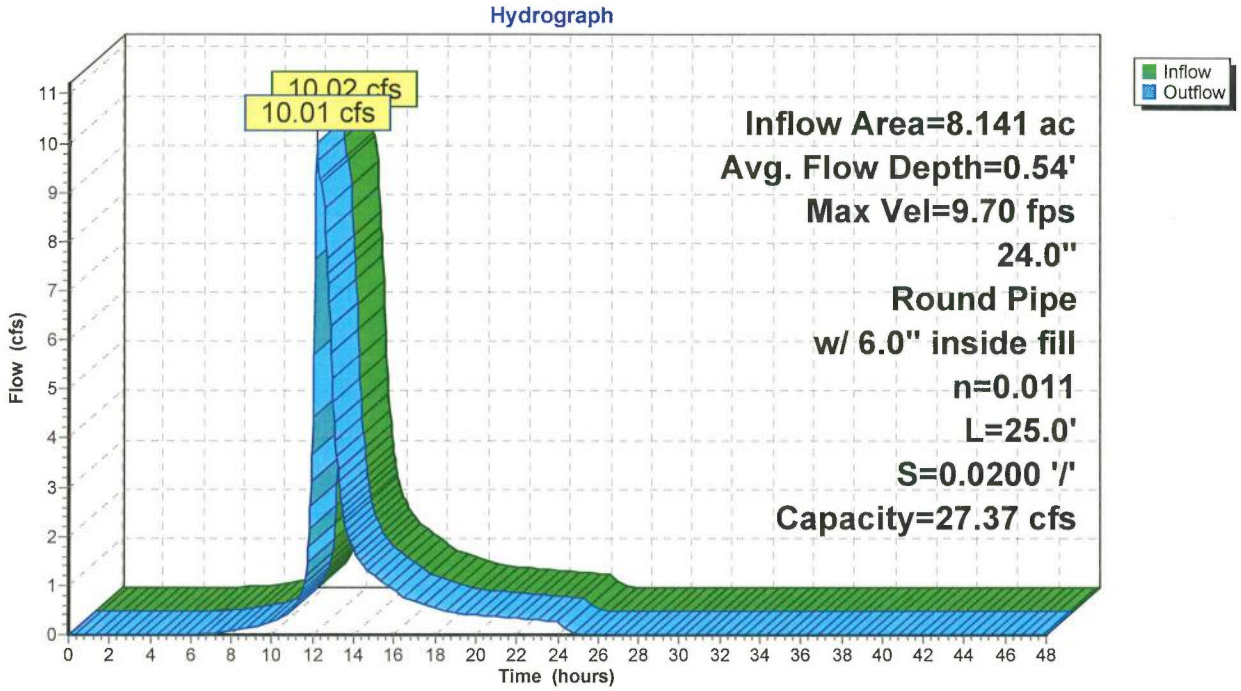
Inflow Area =	8.141 ac,	0.00% Impervious,	Inflow Depth =	2.29"	for 25-Year event
Inflow =	10.02 cfs @	12.20 hrs,	Volume=	1.552 af	
Outflow =	10.01 cfs @	12.21 hrs,	Volume=	1.552 af,	Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.70 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.32 fps, Avg. Travel Time= 0.1 min

Peak Storage= 26 cf @ 12.21 hrs
Average Depth at Peak Storage= 1.04' above invert (0.54' above fill)
Bank-Full Depth= 2.00' above invert (1.50' above fill) Flow Area= 2.5 sf, Capacity= 27.37 cfs

24.0" Round Pipe w/ 6.0" inside fill
n= 0.011 Concrete pipe, straight & clean
Length= 25.0' Slope= 0.0200 '/'
Inlet Invert= 359.00', Outlet Invert= 358.50'

Reach 8R: Lower 24" RCP



Summary for Reach 11R: swale

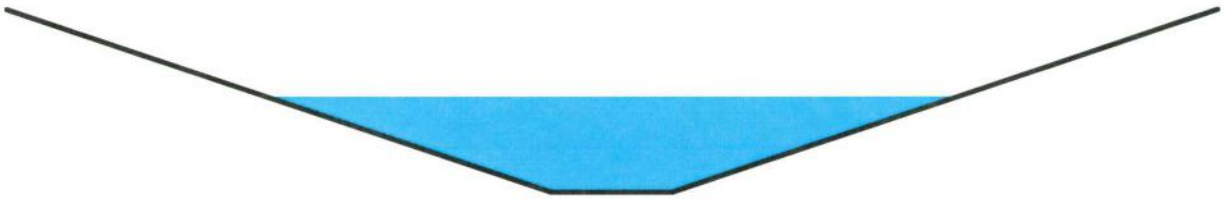
[61] Hint: Exceeded Reach 7R outlet invert by 0.78' @ 12.15 hrs

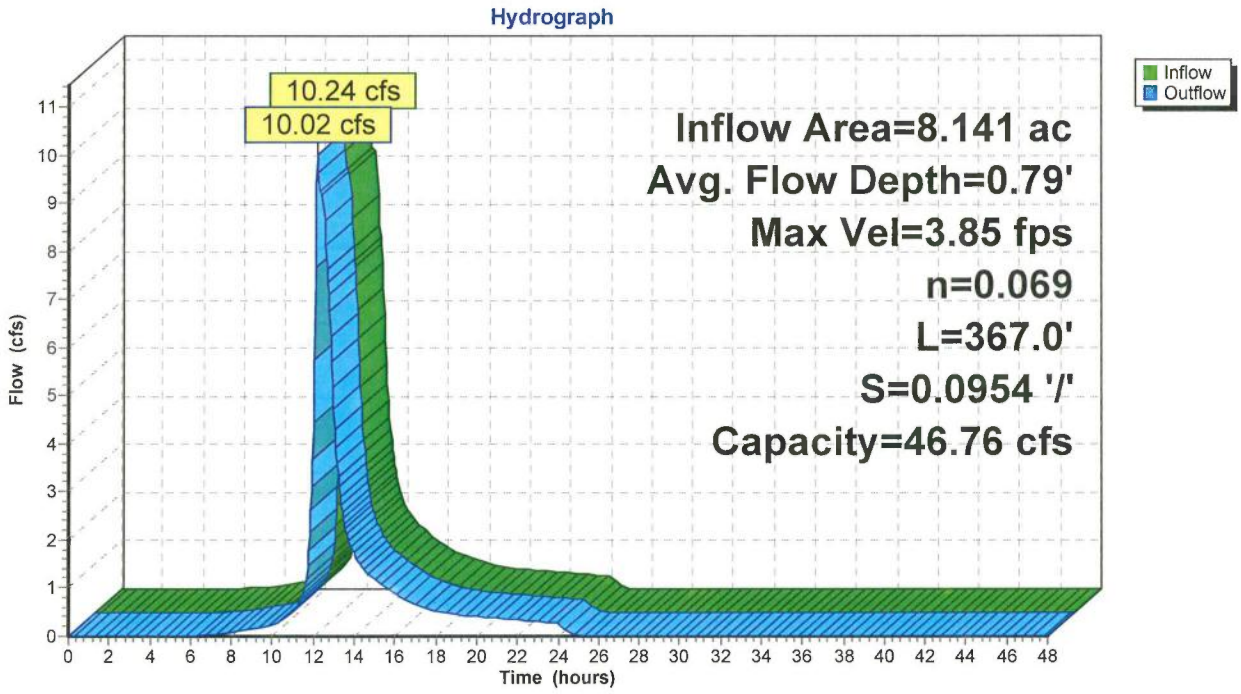
Inflow Area = 8.141 ac, 0.00% Impervious, Inflow Depth = 2.29" for 25-Year event
Inflow = 10.24 cfs @ 12.15 hrs, Volume= 1.552 af
Outflow = 10.02 cfs @ 12.20 hrs, Volume= 1.552 af, Atten= 2%, Lag= 3.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.85 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 3.9 min

Peak Storage= 970 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.79'
Bank-Full Depth= 1.50' Flow Area= 8.3 sf, Capacity= 46.76 cfs

1.00' x 1.50' deep channel, n= 0.069 Riprap, 6-inch
Side Slope Z-value= 3.0 '/' Top Width= 10.00'
Length= 367.0' Slope= 0.0954 '/'
Inlet Invert= 395.00', Outlet Invert= 360.00'





Summary for Pond P-2A: P-2A

Inflow Area = 1.355 ac, 0.00% Impervious, Inflow Depth = 3.17" for 25-Year event
Inflow = 3.27 cfs @ 12.30 hrs, Volume= 0.357 af
Outflow = 1.28 cfs @ 12.76 hrs, Volume= 0.357 af, Atten= 61%, Lag= 27.5 min
Discarded = 0.36 cfs @ 12.76 hrs, Volume= 0.320 af
Primary = 0.92 cfs @ 12.76 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 419.61' @ 12.76 hrs Surf.Area= 3,128 sf Storage= 5,825 cf

Plug-Flow detention time= 160.4 min calculated for 0.357 af (100% of inflow)
Center-of-Mass det. time= 160.3 min (1,008.0 - 847.7)

Volume	Invert	Avail.Storage	Storage Description
#1	417.00'	7,116 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

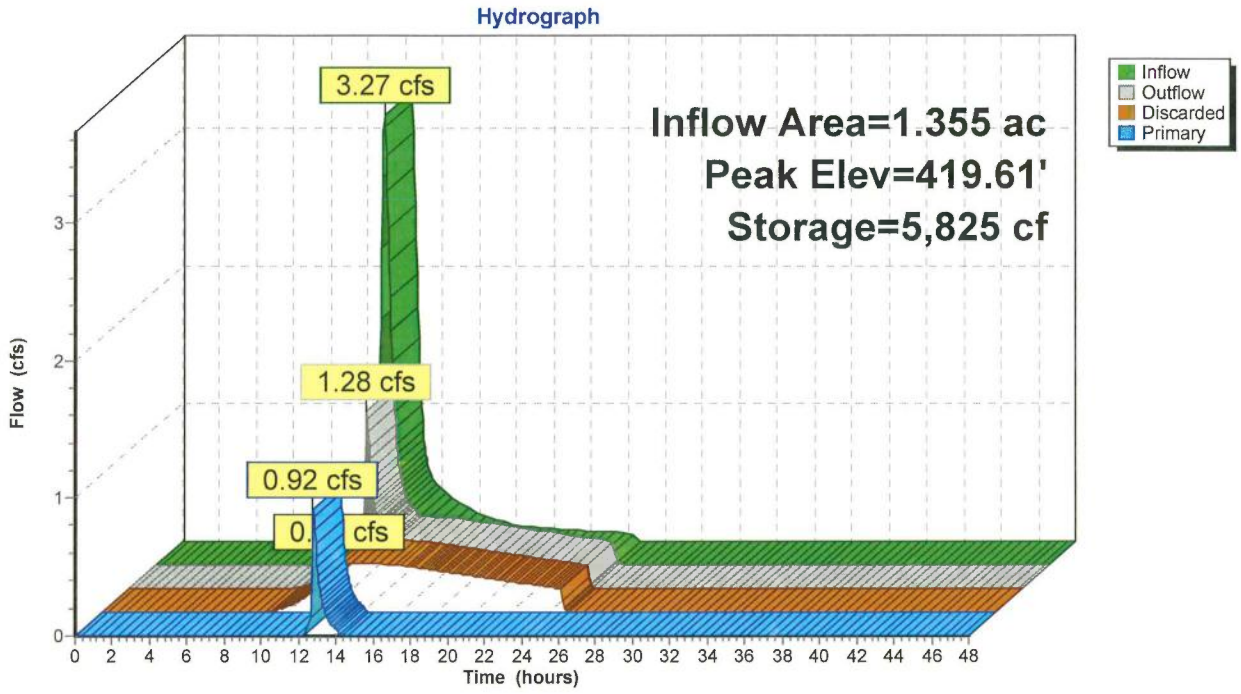
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
417.00	1,405	0	0
418.00	2,018	1,712	1,712
419.00	2,688	2,353	4,065
420.00	3,415	3,052	7,116

Device	Routing	Invert	Outlet Devices
#1	Discarded	417.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	419.50'	**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

Discarded OutFlow Max=0.36 cfs @ 12.76 hrs HW=419.60' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=0.90 cfs @ 12.76 hrs HW=419.60' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.90 cfs @ 0.86 fps)

Pond P-2A: P-2A


Hydrograph
3.27 cfs
1.28 cfs
0.92 cfs
0. cfs
Inflow Area=1.355 ac
Peak Elev=419.61'
Storage=5,825 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
0
1
2
3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Pond P-2B: P-2B

Inflow Area = 0.742 ac, 0.00% Impervious, Inflow Depth = 3.27" for 25-Year event
Inflow = 2.31 cfs @ 12.17 hrs, Volume= 0.202 af
Outflow = 0.28 cfs @ 13.16 hrs, Volume= 0.202 af, Atten= 88%, Lag= 59.1 min
Discarded = 0.28 cfs @ 13.16 hrs, Volume= 0.202 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 413.92' @ 13.16 hrs Surf.Area= 2,383 sf Storage= 3,533 cf

Plug-Flow detention time= 128.9 min calculated for 0.202 af (100% of inflow)
Center-of-Mass det. time= 128.9 min (965.5 - 836.6)

Volume	Invert	Avail.Storage	Storage Description
#1	412.00'	6,481 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

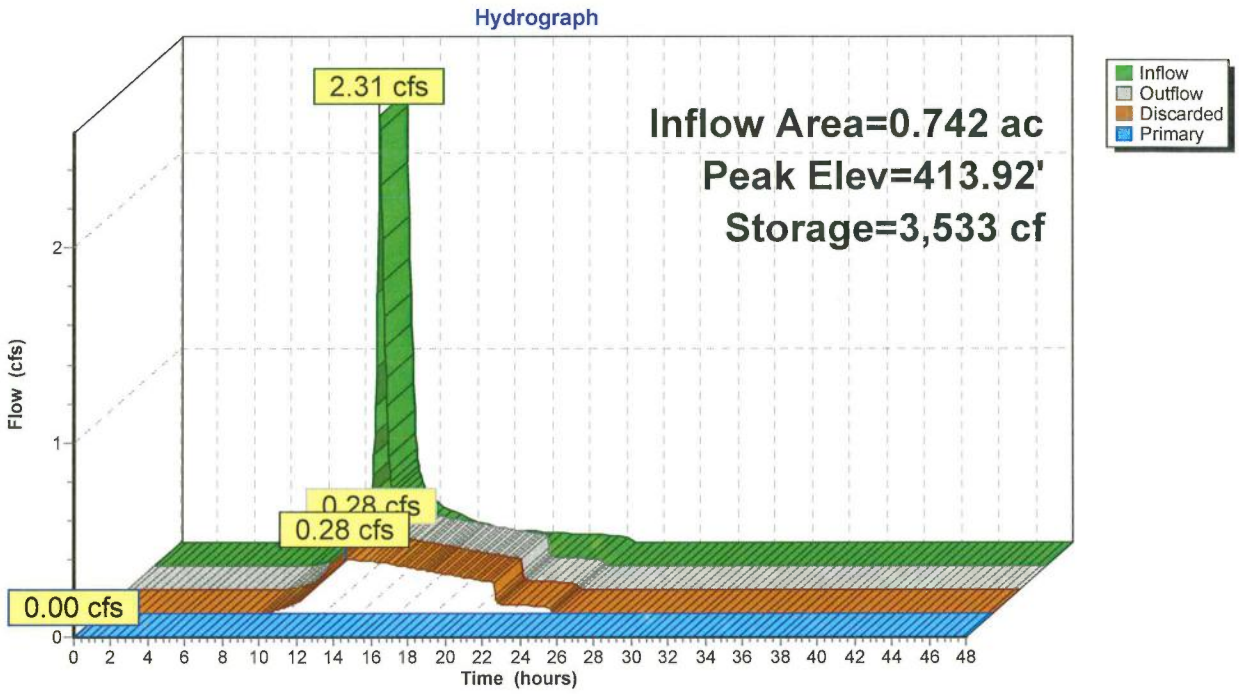
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
412.00	1,330	0	0
413.00	1,852	1,591	1,591
414.00	2,431	2,142	3,733
415.00	3,065	2,748	6,481

Device	Routing	Invert	Outlet Devices
#1	Discarded	412.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	414.50'	**10.0' long x 15.0' 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=0.28 cfs @ 13.16 hrs HW=413.92' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=412.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2B: P-2B

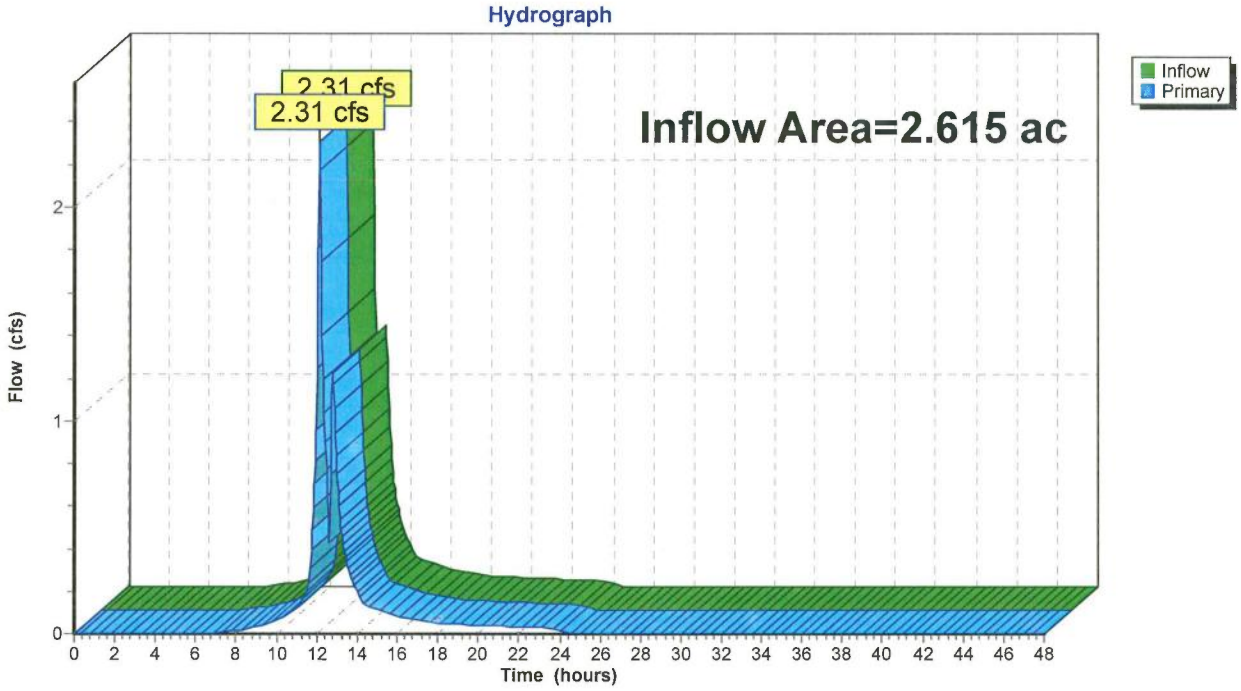

Hydrograph
2.31 cfs
0.28 cfs
0.28 cfs
0.00 cfs
Inflow Area=0.742 ac
Peak Elev=413.92'
Storage=3,533 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
0
1
2
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Link 2L: AP-2

Inflow Area = 2.615 ac, 0.00% Impervious, Inflow Depth = 1.00" for 25-Year event
Inflow = 2.31 cfs @ 12.12 hrs, Volume= 0.218 af
Primary = 2.31 cfs @ 12.12 hrs, Volume= 0.218 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: AP-2

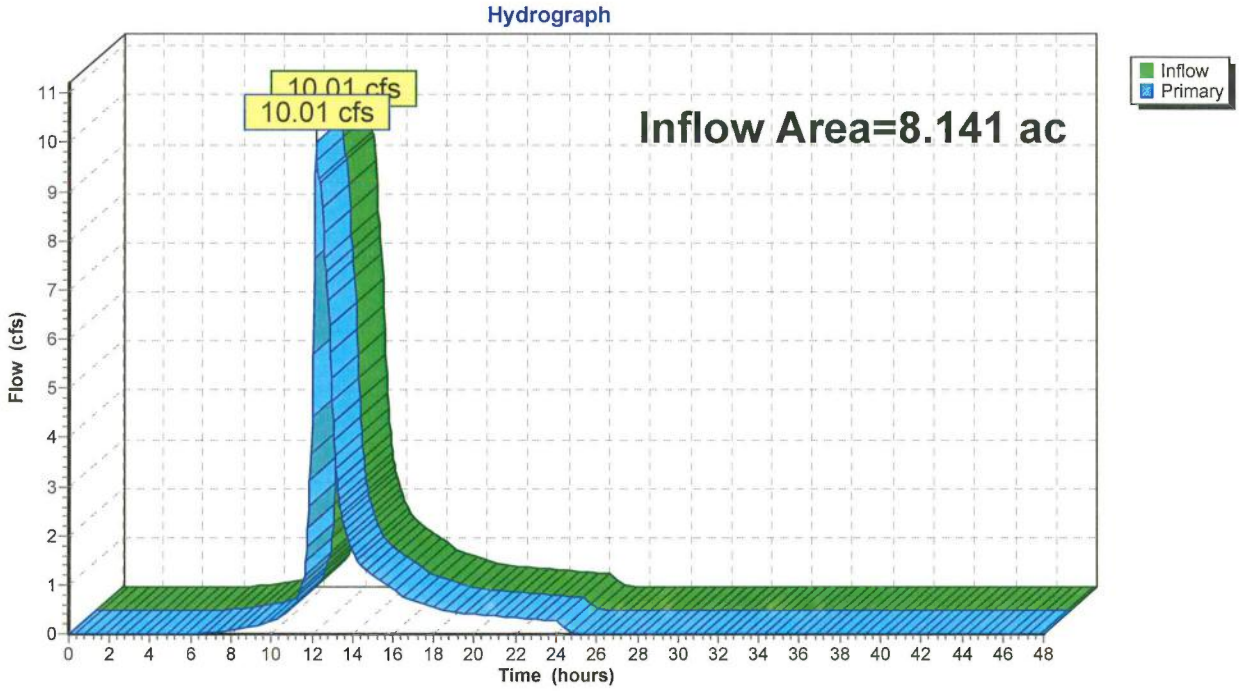


Summary for Link 10L: EX. CB

Inflow Area = 8.141 ac, 0.00% Impervious, Inflow Depth = 2.29" for 25-Year event
Inflow = 10.01 cfs @ 12.21 hrs, Volume= 1.552 af
Primary = 10.01 cfs @ 12.21 hrs, Volume= 1.552 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 10L: EX. CB



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment5S: PDA-WETLAND Runoff Area=190,126 sf 0.00% Impervious Runoff Depth=3.02"
Flow Length=802' Tc=33.3 min CN=63 Runoff=8.18 cfs 1.099 af

Subcatchment9S: PDA-DRIVE Runoff Area=50,618 sf 0.00% Impervious Runoff Depth=5.52"
Flow Length=546' Tc=9.0 min CN=86 Runoff=6.48 cfs 0.535 af

SubcatchmentPDA-2A: PDA-2A Runoff Area=59,006 sf 0.00% Impervious Runoff Depth=3.86"
Flow Length=275' Tc=21.5 min CN=71 Runoff=4.00 cfs 0.436 af

SubcatchmentPDA-2B: PDA-2B Runoff Area=32,304 sf 0.00% Impervious Runoff Depth=3.97"
Flow Length=219' Tc=12.0 min CN=72 Runoff=2.82 cfs 0.245 af

SubcatchmentPDA-2C: PDA-2C Runoff Area=22,584 sf 0.00% Impervious Runoff Depth=4.95"
Flow Length=346' Tc=8.2 min CN=81 Runoff=2.72 cfs 0.214 af

Reach 7R: Upper 24" RCP Avg. Flow Depth=0.52' Max Vel=10.70 fps Inflow=10.72 cfs 1.402 af
24.0" Round Pipe w/ 6.0" inside fill n=0.011 L=20.0' S=0.0250 '/' Capacity=30.61 cfs Outflow=10.72 cfs 1.402 af

Reach 8R: Lower 24" RCP Avg. Flow Depth=0.61' Max Vel=10.26 fps Inflow=12.18 cfs 1.936 af
24.0" Round Pipe w/ 6.0" inside fill n=0.011 L=25.0' S=0.0200 '/' Capacity=27.37 cfs Outflow=12.17 cfs 1.936 af

Reach 11R: swale Avg. Flow Depth=0.85' Max Vel=4.05 fps Inflow=12.37 cfs 1.936 af
n=0.069 L=367.0' S=0.0954 '/' Capacity=46.76 cfs Outflow=12.18 cfs 1.936 af

Pond P-2A: P-2A Peak Elev=419.69' Storage=6,077 cf Inflow=4.00 cfs 0.436 af
Discarded=0.37 cfs 0.347 af Primary=2.14 cfs 0.089 af Outflow=2.51 cfs 0.436 af

Pond P-2B: P-2B Peak Elev=414.31' Storage=4,512 cf Inflow=2.82 cfs 0.245 af
Discarded=0.30 cfs 0.245 af Primary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.245 af

Link 2L: AP-2 Inflow=2.75 cfs 0.303 af
Primary=2.75 cfs 0.303 af

Link 10L: EX. CB Inflow=12.17 cfs 1.936 af
Primary=12.17 cfs 1.936 af

Total Runoff Area = 8.141 ac Runoff Volume = 2.528 af Average Runoff Depth = 3.73"
100.00% Pervious = 8.141 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 5S: PDA-WETLAND

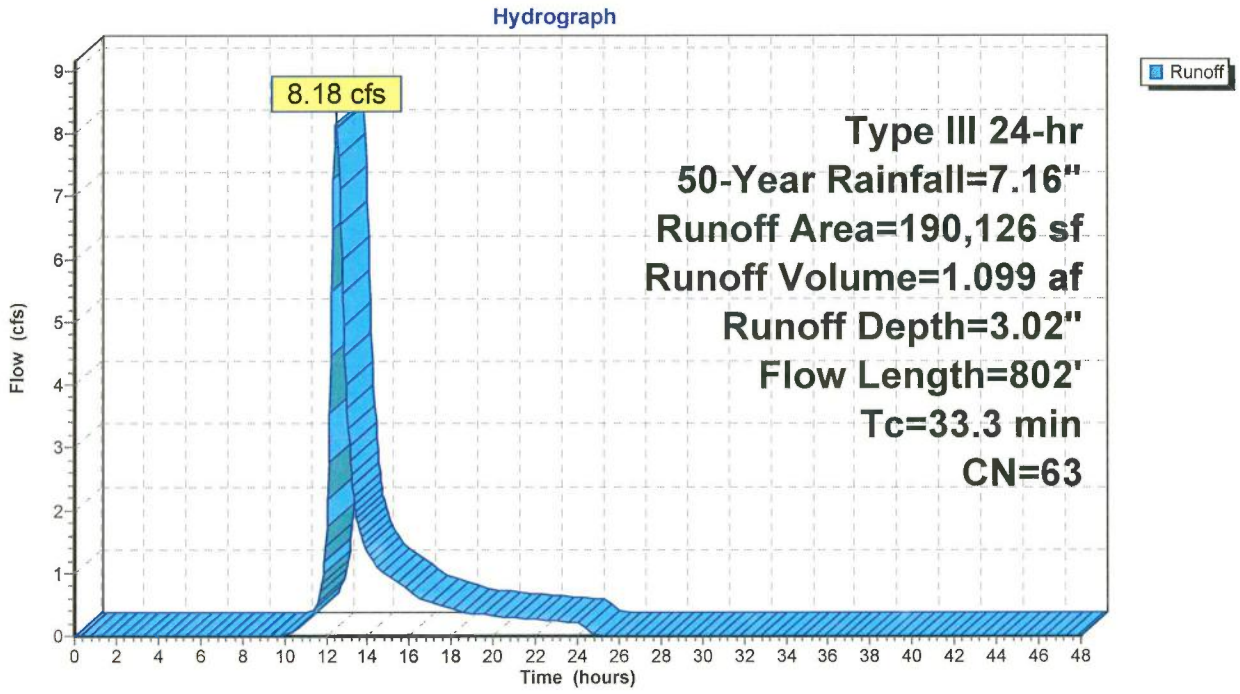
Runoff = 8.18 cfs @ 12.48 hrs, Volume= 1.099 af, Depth= 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
119,727	55	Woods, Good, HSG B
67,409	77	Woods, Good, HSG D
2,990	89	Dirt roads, HSG D
190,126	63	Weighted Average
190,126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.1	100	0.0250	0.09		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
10.6	452	0.0203	0.71		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.1	77	0.0519	1.14		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
1.4	82	0.0366	0.96		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
1.1	91	0.0769	1.39		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
33.3	802	Total			

Subcatchment 5S: PDA-WETLAND



Summary for Subcatchment 9S: PDA-DRIVE

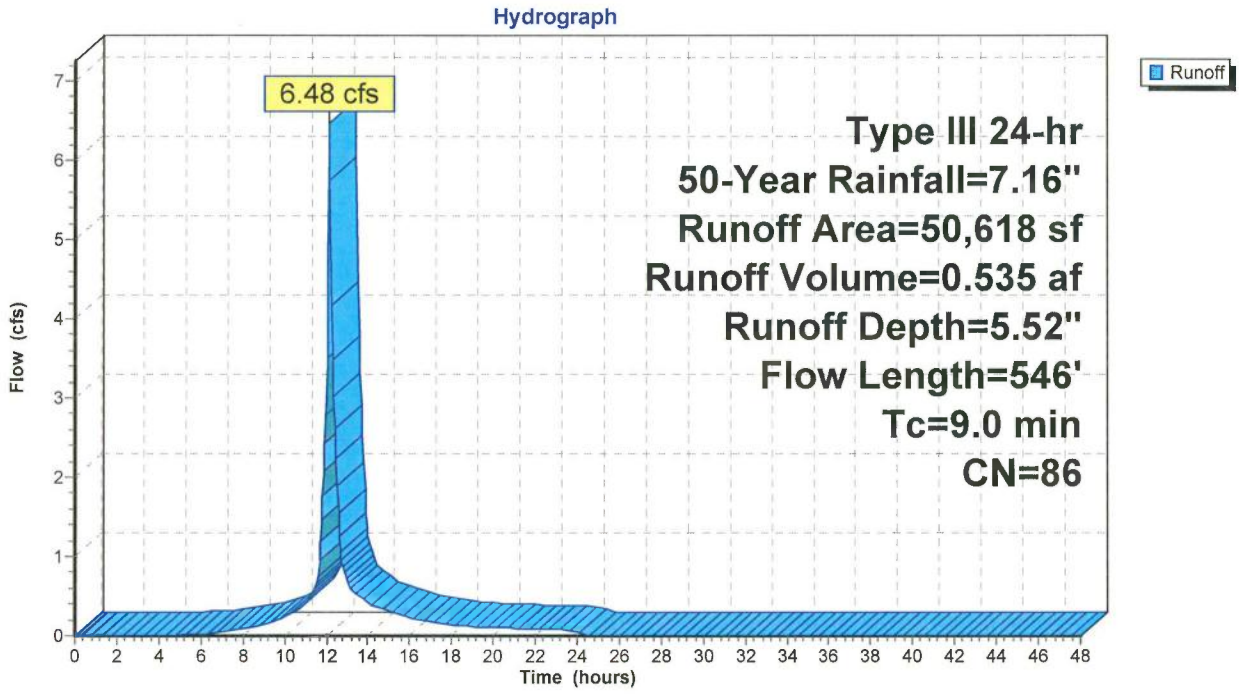
Runoff = 6.48 cfs @ 12.12 hrs, Volume= 0.535 af, Depth= 5.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
10,945	77	Woods, Good, HSG D
6,876	96	Gravel surface, HSG D
2,714	78	Meadow, non-grazed, HSG D
26,943	89	Dirt roads, HSG D
2,723	82	Dirt roads, HSG B
417	96	Gravel surface, HSG B
50,618	86	Weighted Average
50,618		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.0400	0.23		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.39"
0.4	50	0.1700	2.06		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.8	87	0.0690	1.84		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.4000	10.18		**Shallow Concentrated Flow, D-E** Unpaved Kv= 16.1 fps
0.1	36	0.1700	6.64		**Shallow Concentrated Flow, E-F** Unpaved Kv= 16.1 fps
0.5	258	0.0954	9.49	77.85	**Channel Flow, F-G** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.041 Riprap, 2-inch
9.0	546	Total			

Subcatchment 9S: PDA-DRIVE



Summary for Subcatchment PDA-2A: PDA-2A

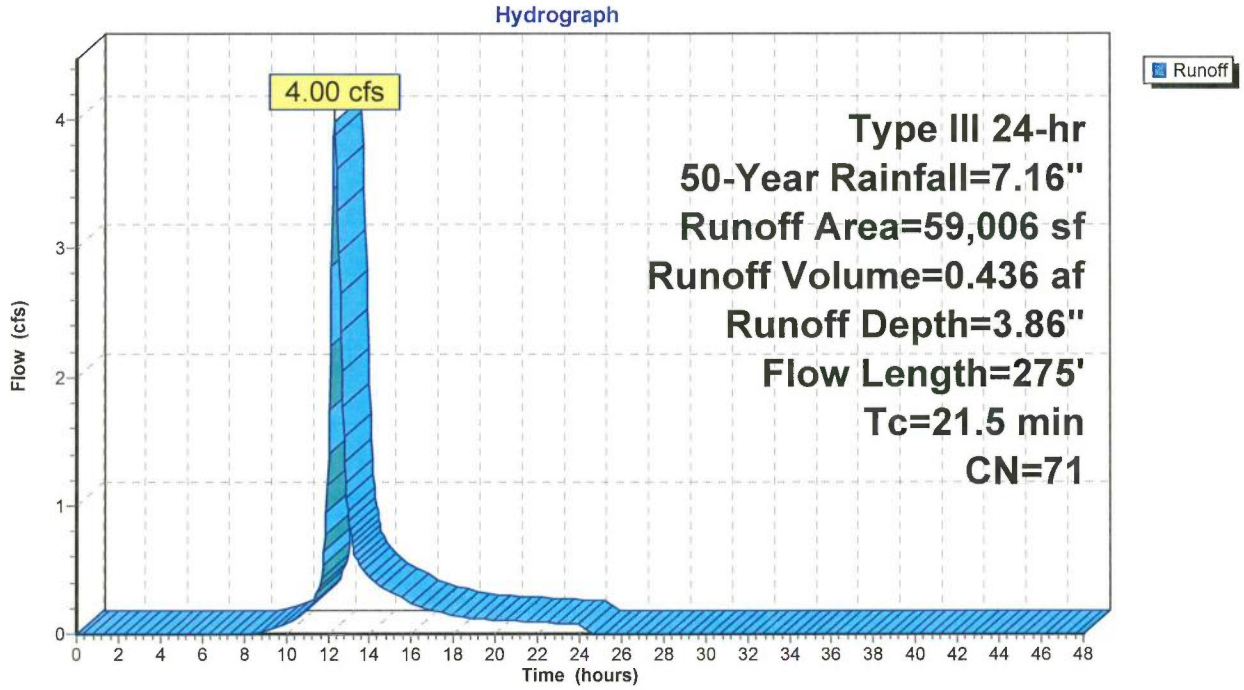
Runoff = 4.00 cfs @ 12.30 hrs, Volume= 0.436 af, Depth= 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
39,007	71	Meadow, non-grazed, HSG C
16,039	78	Meadow, non-grazed, HSG D
3,960	48	Brush, Good, HSG B
59,006	71	Weighted Average
59,006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
16.0	70	0.0069	0.07		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
2.9	175	0.0211	1.02		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
21.5	275	Total			

Subcatchment PDA-2A: PDA-2A



Summary for Subcatchment PDA-2B: PDA-2B

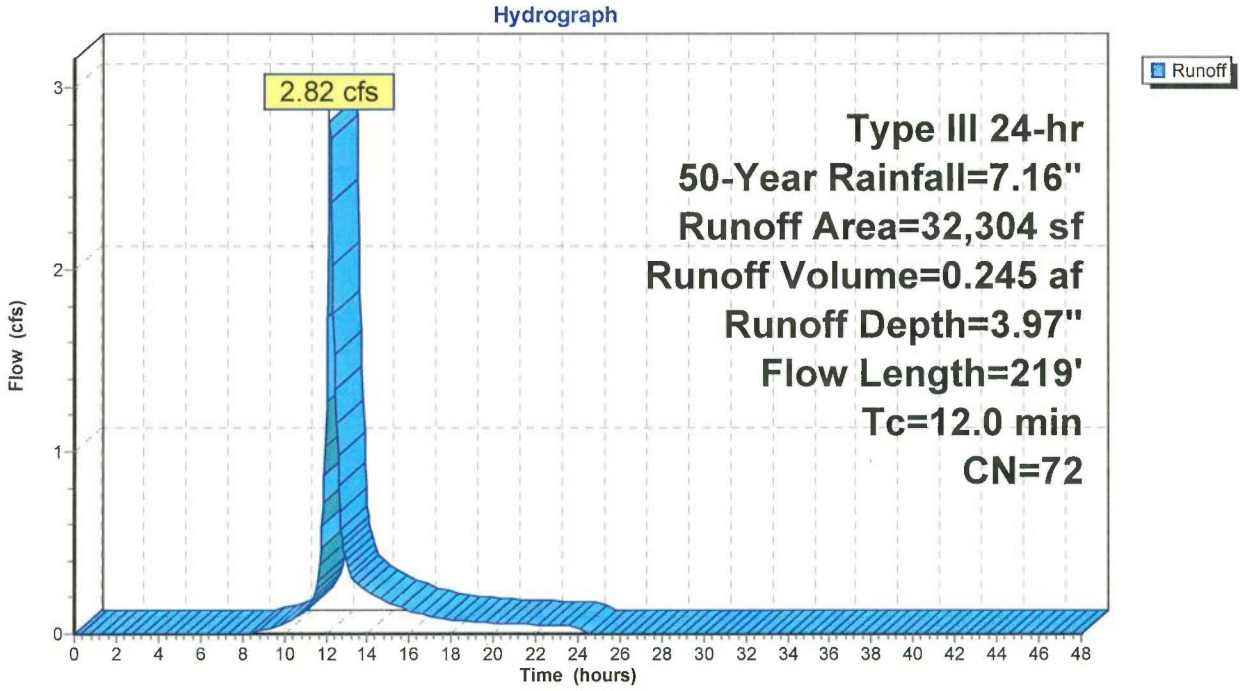
Runoff = 2.82 cfs @ 12.17 hrs, Volume= 0.245 af, Depth= 3.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
12,043	71	Meadow, non-grazed, HSG C
16,171	78	Meadow, non-grazed, HSG D
4,020	48	Brush, Good, HSG B
70	73	Brush, Good, HSG D
32,304	72	Weighted Average
32,304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
8.3	70	0.0357	0.14		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
1.1	119	0.0630	1.76		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
12.0	219	Total			

Subcatchment PDA-2B: PDA-2B



Summary for Subcatchment PDA-2C: PDA-2C

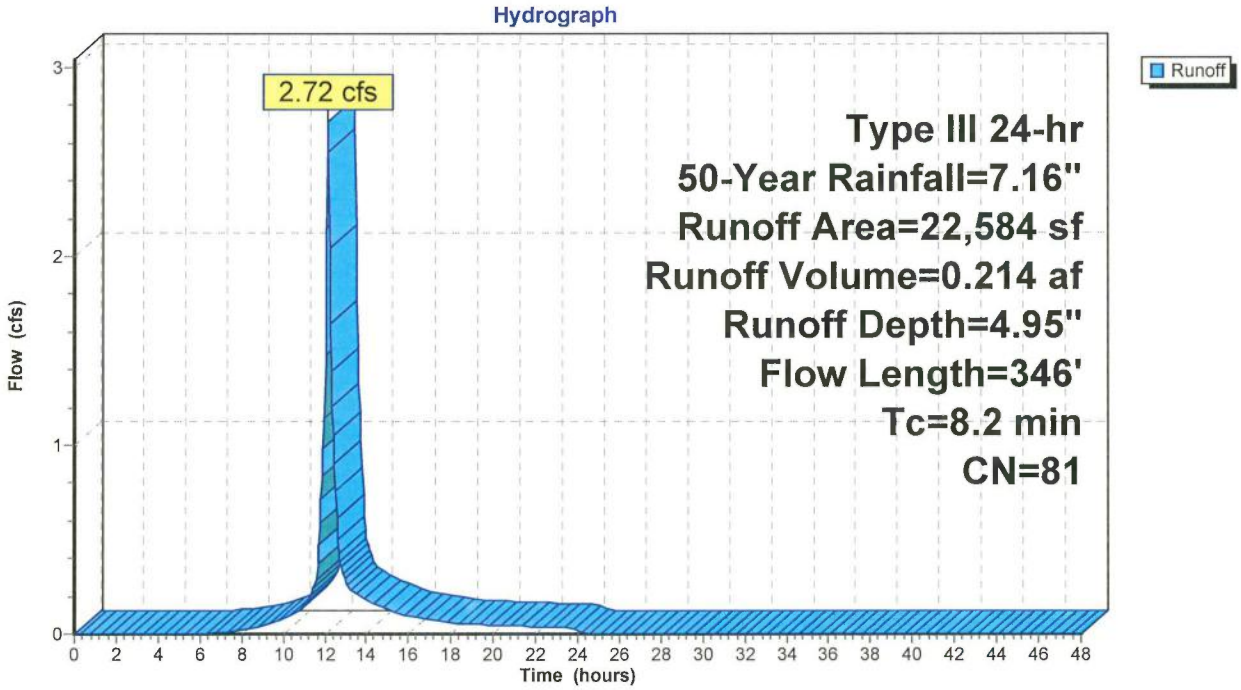
Runoff = 2.72 cfs @ 12.12 hrs, Volume= 0.214 af, Depth= 4.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=7.16"

Area (sf)	CN	Description
1,977	77	Woods, Good, HSG D
3,486	96	Gravel surface, HSG D
17,121	78	Meadow, non-grazed, HSG D
22,584	81	Weighted Average
22,584		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0600	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.39"
1.3	146	0.0684	1.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.8	100	0.0854	2.05		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
8.2	346	Total			

Subcatchment PDA-2C: PDA-2C



Summary for Reach 7R: Upper 24" RCP

[52] Hint: Inlet/Outlet conditions not evaluated
[88] Warning: Qout>Qin may require smaller dt or Finer Routing

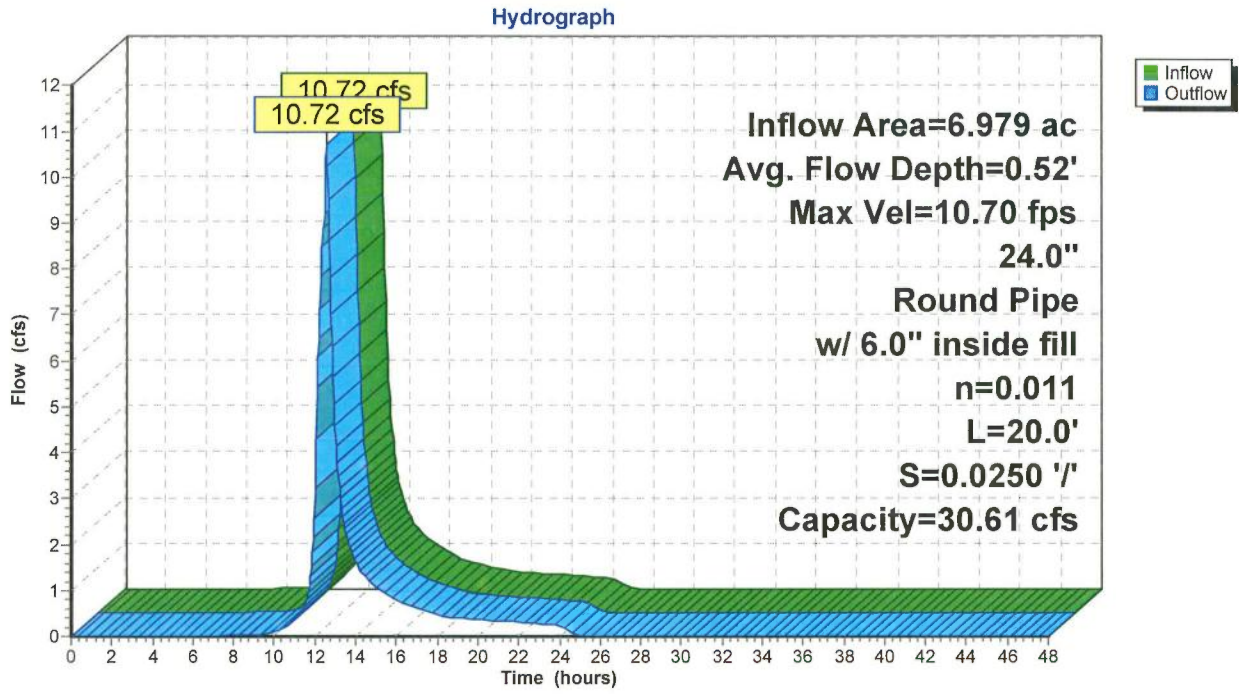
Inflow Area = 6.979 ac, 0.00% Impervious, Inflow Depth = 2.41" for 50-Year event
Inflow = 10.72 cfs @ 12.54 hrs, Volume= 1.402 af
Outflow = 10.72 cfs @ 12.54 hrs, Volume= 1.402 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.70 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.51 fps, Avg. Travel Time= 0.1 min

Peak Storage= 20 cf @ 12.54 hrs
Average Depth at Peak Storage= 1.02' above invert (0.52' above fill)
Bank-Full Depth= 2.00' above invert (1.50' above fill) Flow Area= 2.5 sf, Capacity= 30.61 cfs

24.0" Round Pipe w/ 6.0" inside fill
n= 0.011 Concrete pipe, straight & clean
Length= 20.0' Slope= 0.0250 '/'
Inlet Invert= 395.50', Outlet Invert= 395.00'

Reach 7R: Upper 24" RCP



Summary for Reach 8R: Lower 24" RCP

[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach 11R outlet invert by 0.11' @ 12.55 hrs

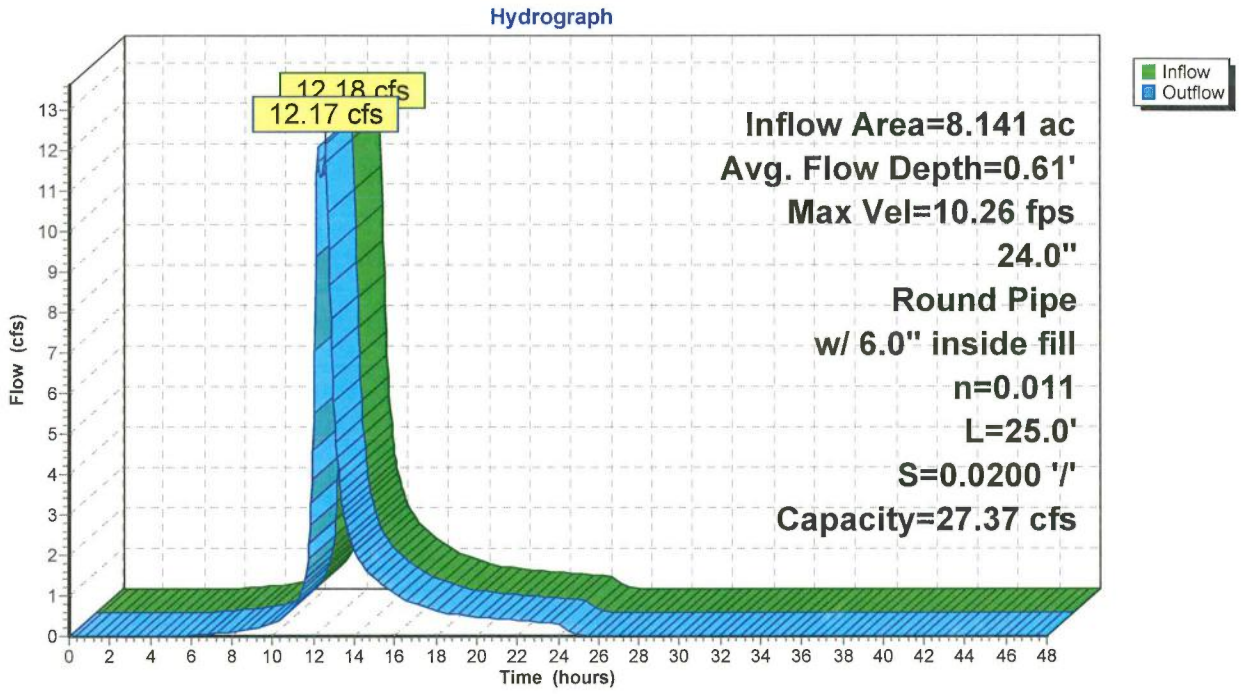
Inflow Area = 8.141 ac, 0.00% Impervious, Inflow Depth = 2.85" for 50-Year event
Inflow = 12.18 cfs @ 12.57 hrs, Volume= 1.936 af
Outflow = 12.17 cfs @ 12.57 hrs, Volume= 1.936 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.26 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.51 fps, Avg. Travel Time= 0.1 min

Peak Storage= 30 cf @ 12.57 hrs
Average Depth at Peak Storage= 1.11' above invert (0.61' above fill)
Bank-Full Depth= 2.00' above invert (1.50' above fill) Flow Area= 2.5 sf, Capacity= 27.37 cfs

24.0" Round Pipe w/ 6.0" inside fill
n= 0.011 Concrete pipe, straight & clean
Length= 25.0' Slope= 0.0200 '/'
Inlet Invert= 359.00', Outlet Invert= 358.50'

Reach 8R: Lower 24" RCP



Summary for Reach 11R: swale

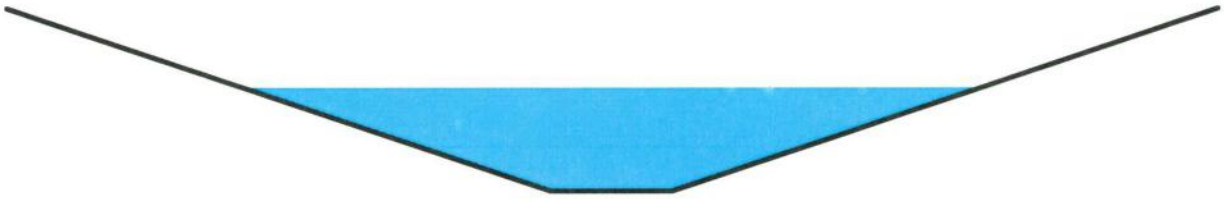
[61] Hint: Exceeded Reach 7R outlet invert by 0.85' @ 12.55 hrs

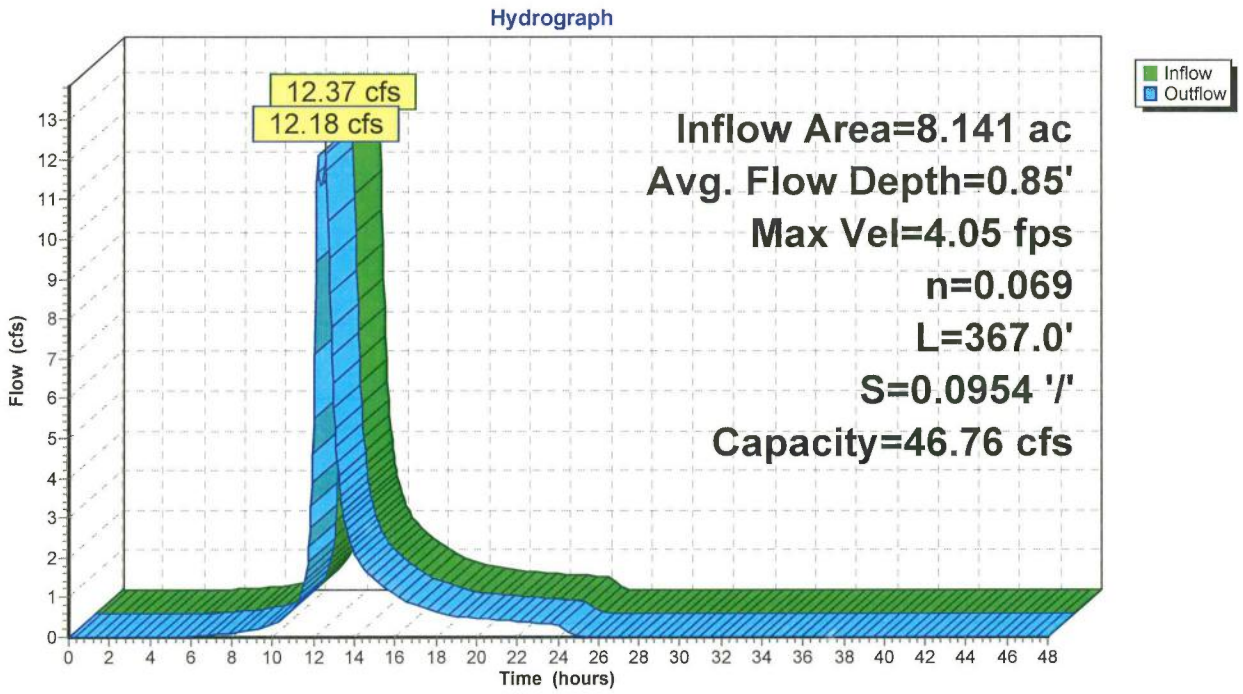
Inflow Area = 8.141 ac, 0.00% Impervious, Inflow Depth = 2.85" for 50-Year event
Inflow = 12.37 cfs @ 12.15 hrs, Volume= 1.936 af
Outflow = 12.18 cfs @ 12.57 hrs, Volume= 1.936 af, Atten= 2%, Lag= 25.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.05 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.62 fps, Avg. Travel Time= 3.8 min

Peak Storage= 1,118 cf @ 12.55 hrs
Average Depth at Peak Storage= 0.85'
Bank-Full Depth= 1.50' Flow Area= 8.3 sf, Capacity= 46.76 cfs

1.00' x 1.50' deep channel, n= 0.069 Riprap, 6-inch
Side Slope Z-value= 3.0 '/' Top Width= 10.00'
Length= 367.0' Slope= 0.0954 '/'
Inlet Invert= 395.00', Outlet Invert= 360.00'





Summary for Pond P-2A: P-2A

Inflow Area = 1.355 ac, 0.00% Impervious, Inflow Depth = 3.86" for 50-Year event
Inflow = 4.00 cfs @ 12.30 hrs, Volume= 0.436 af
Outflow = 2.51 cfs @ 12.58 hrs, Volume= 0.436 af, Atten= 37%, Lag= 16.7 min
Discarded = 0.37 cfs @ 12.58 hrs, Volume= 0.347 af
Primary = 2.14 cfs @ 12.58 hrs, Volume= 0.089 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 419.69' @ 12.58 hrs Surf.Area= 3,186 sf Storage= 6,077 cf

Plug-Flow detention time= 145.8 min calculated for 0.435 af (100% of inflow)
Center-of-Mass det. time= 145.7 min (987.7 - 842.0)

Volume	Invert	Avail.Storage	Storage Description
#1	417.00'	7,116 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

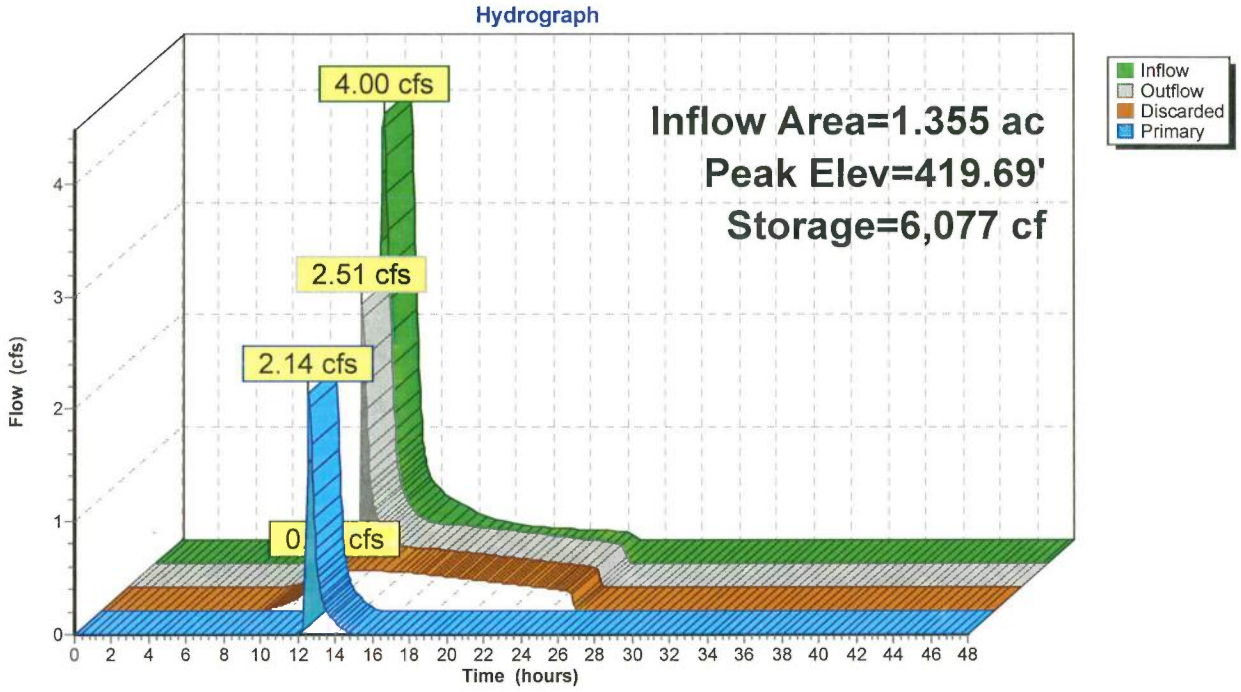
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
417.00	1,405	0	0
418.00	2,018	1,712	1,712
419.00	2,688	2,353	4,065
420.00	3,415	3,052	7,116

Device	Routing	Invert	Outlet Devices
#1	Discarded	417.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	419.50'	**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

Discarded OutFlow Max=0.37 cfs @ 12.58 hrs HW=419.68' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.37 cfs)

Primary OutFlow Max=2.11 cfs @ 12.58 hrs HW=419.68' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 2.11 cfs @ 1.15 fps)

Pond P-2A: P-2A


Hydrograph
4.00 cfs
2.51 cfs
2.14 cfs
0 cfs
Inflow Area=1.355 ac
Peak Elev=419.69'
Storage=6,077 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond P-2B: P-2B

Inflow Area = 0.742 ac, 0.00% Impervious, Inflow Depth = 3.97" for 50-Year event
Inflow = 2.82 cfs @ 12.17 hrs, Volume= 0.245 af
Outflow = 0.30 cfs @ 13.27 hrs, Volume= 0.245 af, Atten= 89%, Lag= 66.3 min
Discarded = 0.30 cfs @ 13.27 hrs, Volume= 0.245 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 414.31' @ 13.27 hrs Surf.Area= 2,626 sf Storage= 4,512 cf

Plug-Flow detention time= 155.3 min calculated for 0.245 af (100% of inflow)
Center-of-Mass det. time= 155.2 min (986.2 - 831.0)

Volume	Invert	Avail.Storage	Storage Description
#1	412.00'	6,481 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

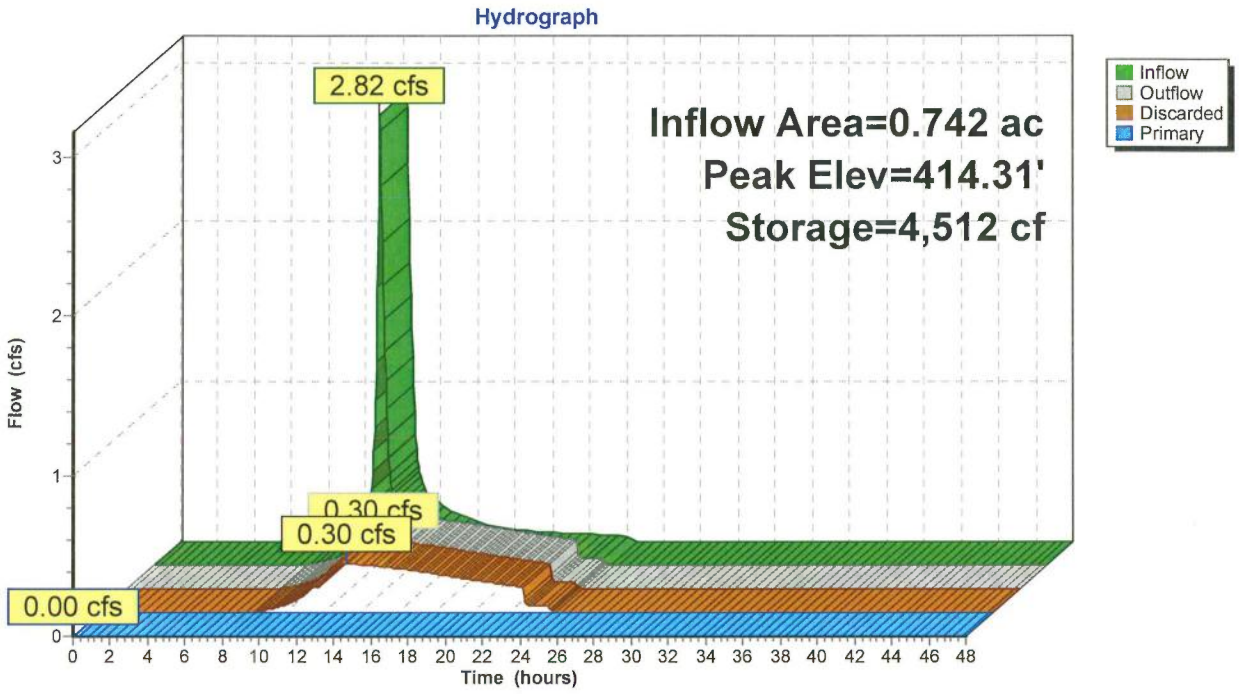
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
412.00	1,330	0	0
413.00	1,852	1,591	1,591
414.00	2,431	2,142	3,733
415.00	3,065	2,748	6,481

Device	Routing	Invert	Outlet Devices
#1	Discarded	412.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	414.50'	**10.0' long x 15.0' 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=0.30 cfs @ 13.27 hrs HW=414.31' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=412.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2B: P-2B

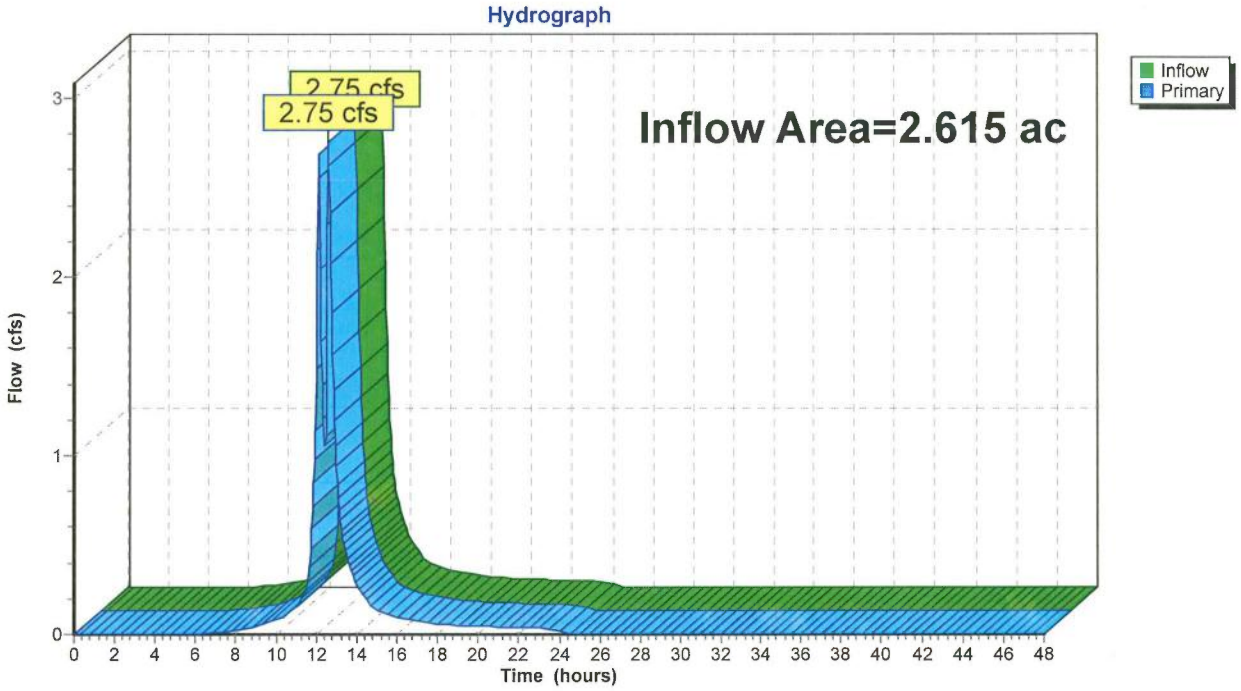

Hydrograph
2.82 cfs
0.30 cfs
0.30 cfs
0.00 cfs
Inflow Area=0.742 ac
Peak Elev=414.31'
Storage=4,512 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0 1 2 3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Link 2L: AP-2

Inflow Area = 2.615 ac, 0.00% Impervious, Inflow Depth = 1.39" for 50-Year event
Inflow = 2.75 cfs @ 12.57 hrs, Volume= 0.303 af
Primary = 2.75 cfs @ 12.57 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: AP-2

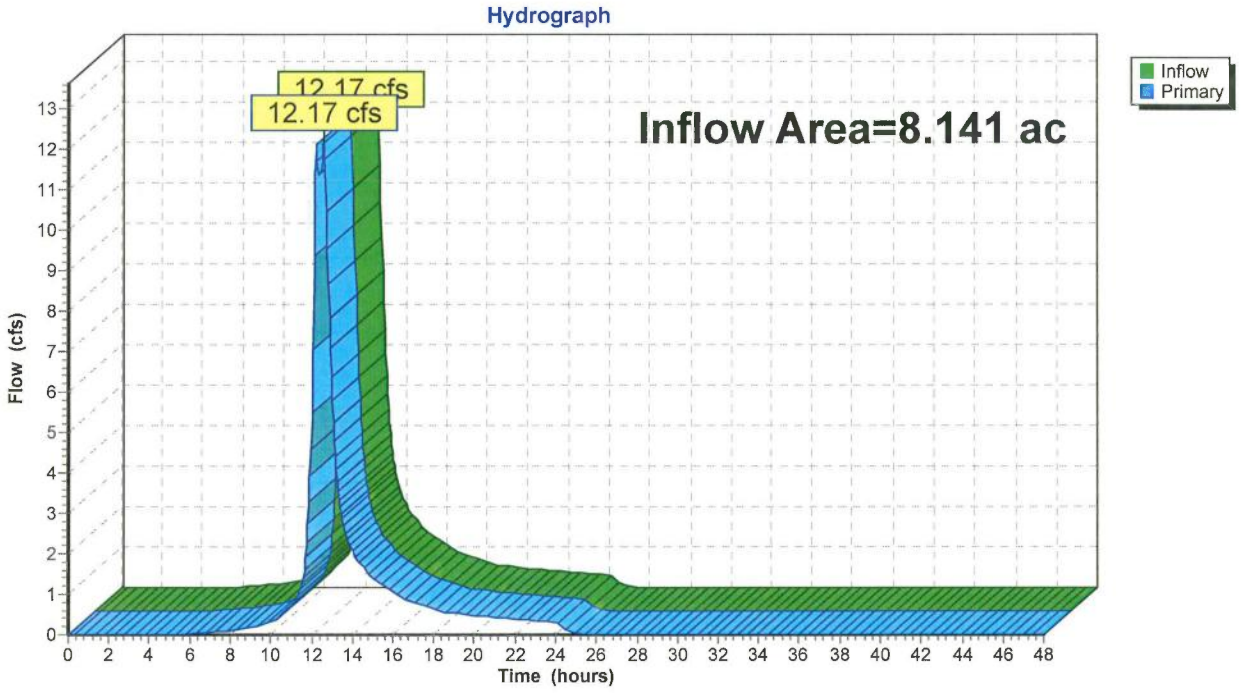


Summary for Link 10L: EX. CB

Inflow Area = 8.141 ac, 0.00% Impervious, Inflow Depth = 2.85" for 50-Year event
Inflow = 12.17 cfs @ 12.57 hrs, Volume= 1.936 af
Primary = 12.17 cfs @ 12.57 hrs, Volume= 1.936 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 10L: EX. CB



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment5S: PDA-WETLAND Runoff Area=190,126 sf 0.00% Impervious Runoff Depth=3.72"
Flow Length=802' Tc=33.3 min CN=63 Runoff=10.16 cfs 1.354 af

Subcatchment9S: PDA-DRIVE Runoff Area=50,618 sf 0.00% Impervious Runoff Depth=6.40"
Flow Length=546' Tc=9.0 min CN=86 Runoff=7.45 cfs 0.620 af

SubcatchmentPDA-2A: PDA-2A Runoff Area=59,006 sf 0.00% Impervious Runoff Depth=4.64"
Flow Length=275' Tc=21.5 min CN=71 Runoff=4.81 cfs 0.524 af

SubcatchmentPDA-2B: PDA-2B Runoff Area=32,304 sf 0.00% Impervious Runoff Depth=4.76"
Flow Length=219' Tc=12.0 min CN=72 Runoff=3.38 cfs 0.294 af

SubcatchmentPDA-2C: PDA-2C Runoff Area=22,584 sf 0.00% Impervious Runoff Depth=5.81"
Flow Length=346' Tc=8.2 min CN=81 Runoff=3.17 cfs 0.251 af

Reach 7R: Upper 24" RCP Avg. Flow Depth=0.65' Max Vel=11.71 fps Inflow=14.64 cfs 1.772 af
24.0" Round Pipe w/ 6.0" inside fill n=0.011 L=20.0' S=0.0250 '/' Capacity=30.61 cfs Outflow=14.65 cfs 1.772 af

Reach 8R: Lower 24" RCP Avg. Flow Depth=0.78' Max Vel=11.23 fps Inflow=16.91 cfs 2.392 af
24.0" Round Pipe w/ 6.0" inside fill n=0.011 L=25.0' S=0.0200 '/' Capacity=27.37 cfs Outflow=16.91 cfs 2.392 af

Reach 11R: swale Avg. Flow Depth=0.98' Max Vel=4.40 fps Inflow=17.14 cfs 2.392 af
n=0.069 L=367.0' S=0.0954 '/' Capacity=46.76 cfs Outflow=16.91 cfs 2.392 af

Pond P-2A: P-2A Peak Elev=419.76' Storage=6,308 cf Inflow=4.81 cfs 0.524 af
Discarded=0.37 cfs 0.372 af Primary=3.50 cfs 0.152 af Outflow=3.87 cfs 0.524 af

Pond P-2B: P-2B Peak Elev=414.56' Storage=5,202 cf Inflow=3.38 cfs 0.294 af
Discarded=0.32 cfs 0.279 af Primary=0.43 cfs 0.015 af Outflow=0.76 cfs 0.294 af

Link 2L: AP-2 Inflow=4.48 cfs 0.418 af
Primary=4.48 cfs 0.418 af

Link 10L: EX. CB Inflow=16.91 cfs 2.392 af
Primary=16.91 cfs 2.392 af

Total Runoff Area = 8.141 ac Runoff Volume = 3.043 af Average Runoff Depth = 4.48"
100.00% Pervious = 8.141 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 5S: PDA-WETLAND

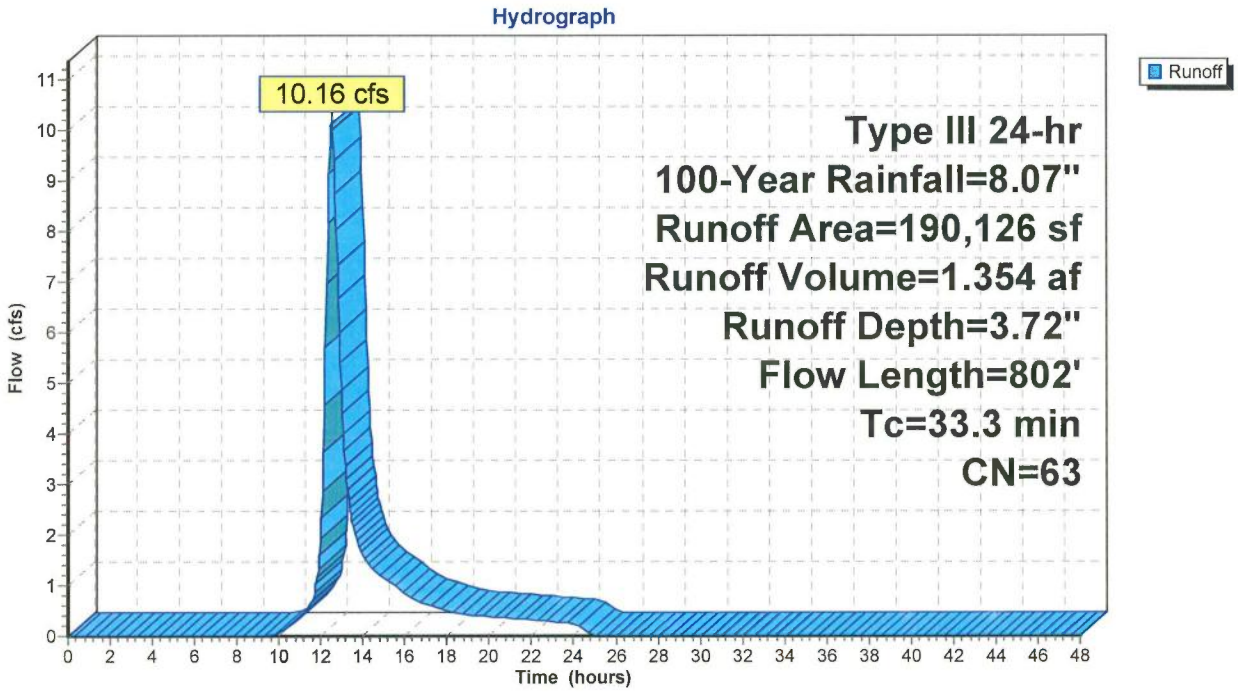
Runoff = 10.16 cfs @ 12.48 hrs, Volume= 1.354 af, Depth= 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
119,727	55	Woods, Good, HSG B
67,409	77	Woods, Good, HSG D
2,990	89	Dirt roads, HSG D
190,126	63	Weighted Average
190,126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.1	100	0.0250	0.09		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.39"
10.6	452	0.0203	0.71		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.1	77	0.0519	1.14		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
1.4	82	0.0366	0.96		**Shallow Concentrated Flow, D-E** Woodland Kv= 5.0 fps
1.1	91	0.0769	1.39		**Shallow Concentrated Flow, E-F** Woodland Kv= 5.0 fps
33.3	802	Total			

Subcatchment 5S: PDA-WETLAND



Summary for Subcatchment 9S: PDA-DRIVE

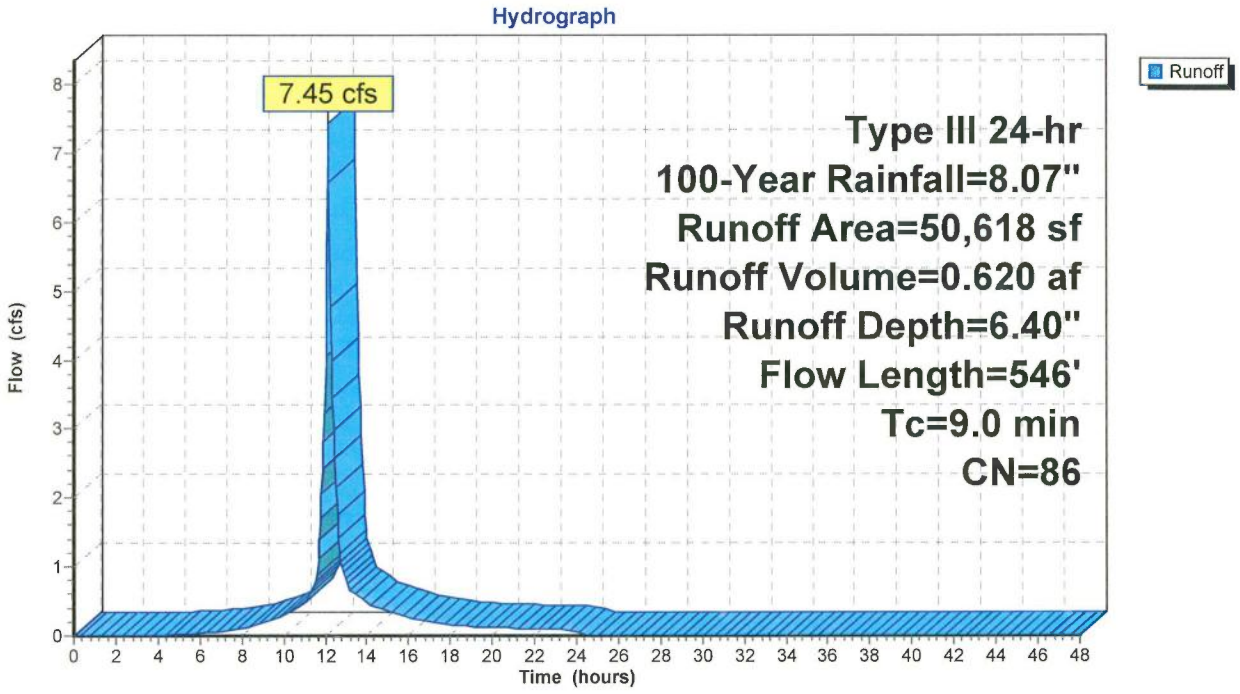
Runoff = 7.45 cfs @ 12.12 hrs, Volume= 0.620 af, Depth= 6.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
10,945	77	Woods, Good, HSG D
6,876	96	Gravel surface, HSG D
2,714	78	Meadow, non-grazed, HSG D
26,943	89	Dirt roads, HSG D
2,723	82	Dirt roads, HSG B
417	96	Gravel surface, HSG B
50,618	86	Weighted Average
50,618		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	100	0.0400	0.23		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.39"
0.4	50	0.1700	2.06		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.8	87	0.0690	1.84		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.0	15	0.4000	10.18		**Shallow Concentrated Flow, D-E** Unpaved Kv= 16.1 fps
0.1	36	0.1700	6.64		**Shallow Concentrated Flow, E-F** Unpaved Kv= 16.1 fps
0.5	258	0.0954	9.49	77.85	**Channel Flow, F-G** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.041 Riprap, 2-inch
9.0	546	Total			

Subcatchment 9S: PDA-DRIVE



Summary for Subcatchment PDA-2A: PDA-2A

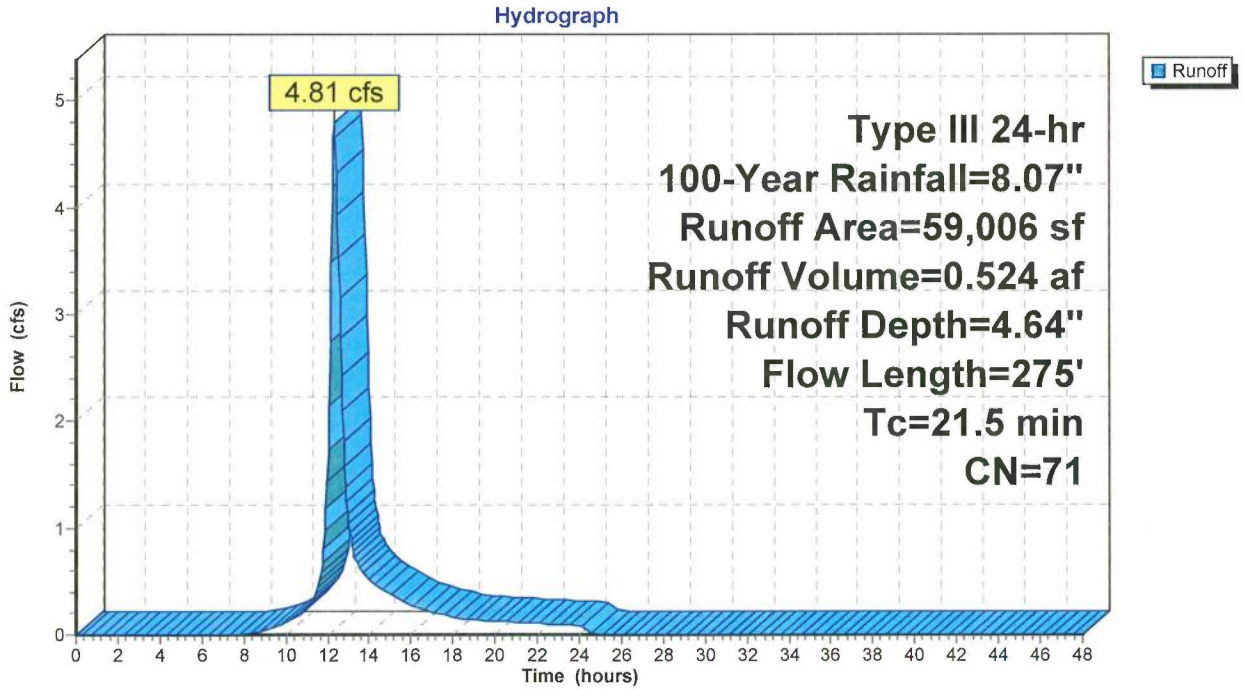
Runoff = 4.81 cfs @ 12.30 hrs, Volume= 0.524 af, Depth= 4.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
39,007	71	Meadow, non-grazed, HSG C
16,039	78	Meadow, non-grazed, HSG D
3,960	48	Brush, Good, HSG B
59,006	71	Weighted Average
59,006		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
16.0	70	0.0069	0.07		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
2.9	175	0.0211	1.02		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
21.5	275	Total			

Subcatchment PDA-2A: PDA-2A



Summary for Subcatchment PDA-2B: PDA-2B

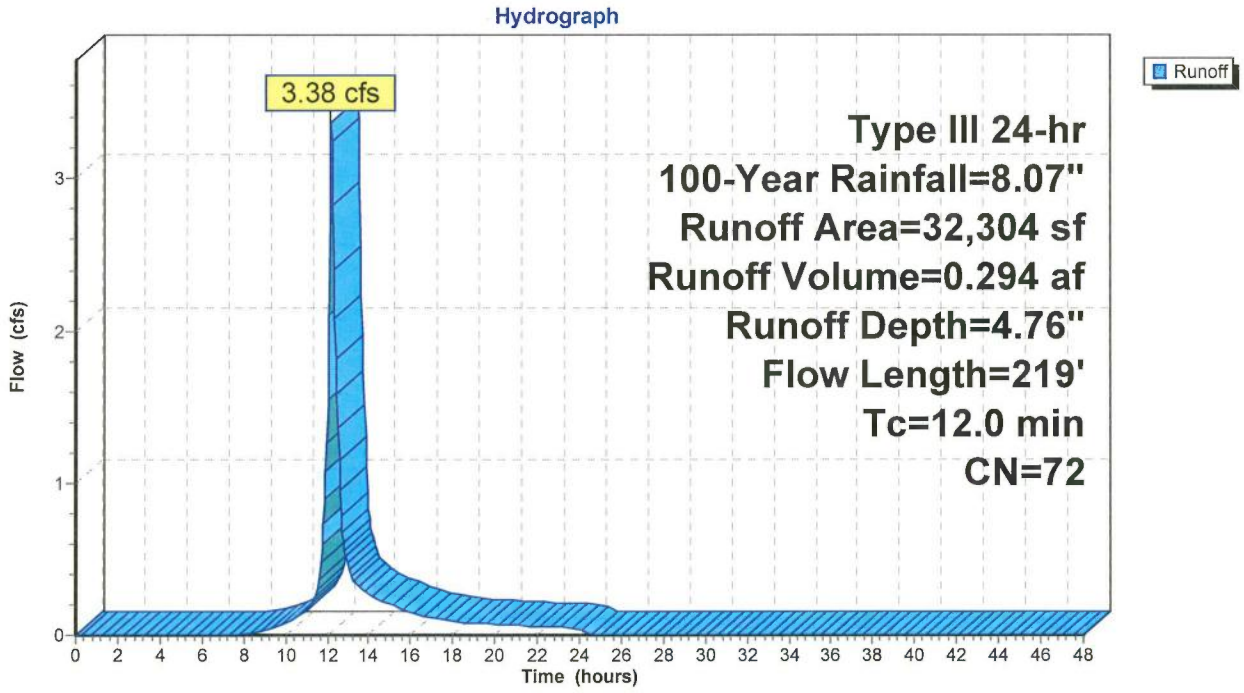
Runoff = 3.38 cfs @ 12.17 hrs, Volume= 0.294 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
12,043	71	Meadow, non-grazed, HSG C
16,171	78	Meadow, non-grazed, HSG D
4,020	48	Brush, Good, HSG B
70	73	Brush, Good, HSG D
32,304	72	Weighted Average
32,304		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	30	0.1167	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.39"
8.3	70	0.0357	0.14		**Sheet Flow, B-C** Grass: Dense n= 0.240 P2= 3.39"
1.1	119	0.0630	1.76		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
12.0	219	Total			

Subcatchment PDA-2B: PDA-2B



Summary for Subcatchment PDA-2C: PDA-2C

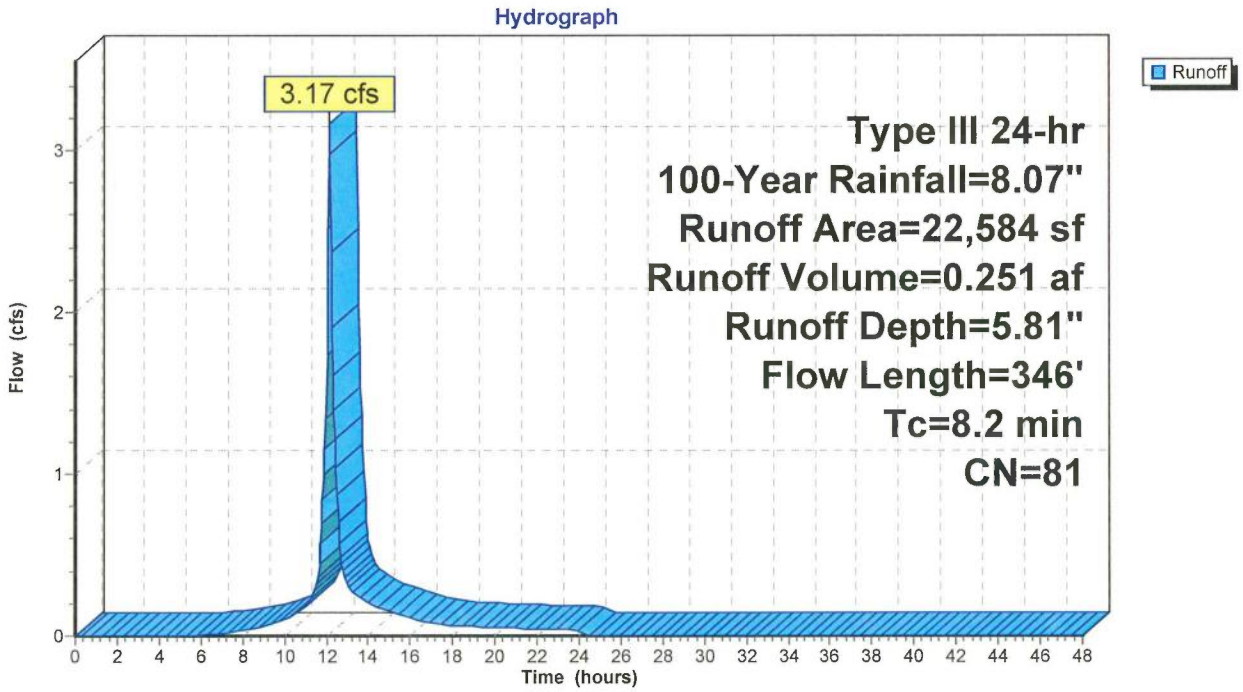
Runoff = 3.17 cfs @ 12.11 hrs, Volume= 0.251 af, Depth= 5.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.07"

Area (sf)	CN	Description
1,977	77	Woods, Good, HSG D
3,486	96	Gravel surface, HSG D
17,121	78	Meadow, non-grazed, HSG D
22,584	81	Weighted Average
22,584		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.0600	0.27		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.39"
1.3	146	0.0684	1.83		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.8	100	0.0854	2.05		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
8.2	346	Total			

Subcatchment PDA-2C: PDA-2C



Summary for Reach 7R: Upper 24" RCP

[52] Hint: Inlet/Outlet conditions not evaluated
[88] Warning: Qout>Qin may require smaller dt or Finer Routing

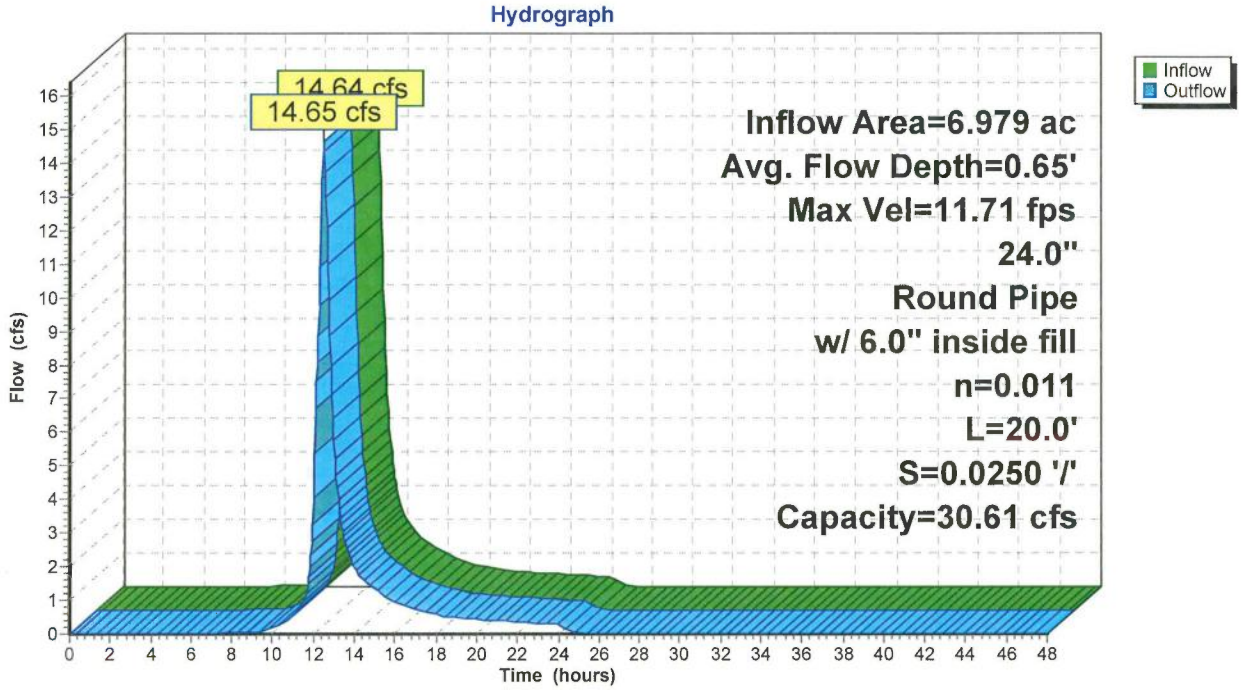
Inflow Area = 6.979 ac, 0.00% Impervious, Inflow Depth = 3.05" for 100-Year event
Inflow = 14.64 cfs @ 12.47 hrs, Volume= 1.772 af
Outflow = 14.65 cfs @ 12.47 hrs, Volume= 1.772 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.71 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.72 fps, Avg. Travel Time= 0.1 min

Peak Storage= 25 cf @ 12.47 hrs
Average Depth at Peak Storage= 1.15' above invert (0.65' above fill)
Bank-Full Depth= 2.00' above invert (1.50' above fill) Flow Area= 2.5 sf, Capacity= 30.61 cfs

24.0" Round Pipe w/ 6.0" inside fill
n= 0.011 Concrete pipe, straight & clean
Length= 20.0' Slope= 0.0250 '/'
Inlet Invert= 395.50', Outlet Invert= 395.00'

Reach 7R: Upper 24" RCP



Summary for Reach 8R: Lower 24" RCP

[52] Hint: Inlet/Outlet conditions not evaluated
[61] Hint: Exceeded Reach 11R outlet invert by 0.28' @ 12.50 hrs

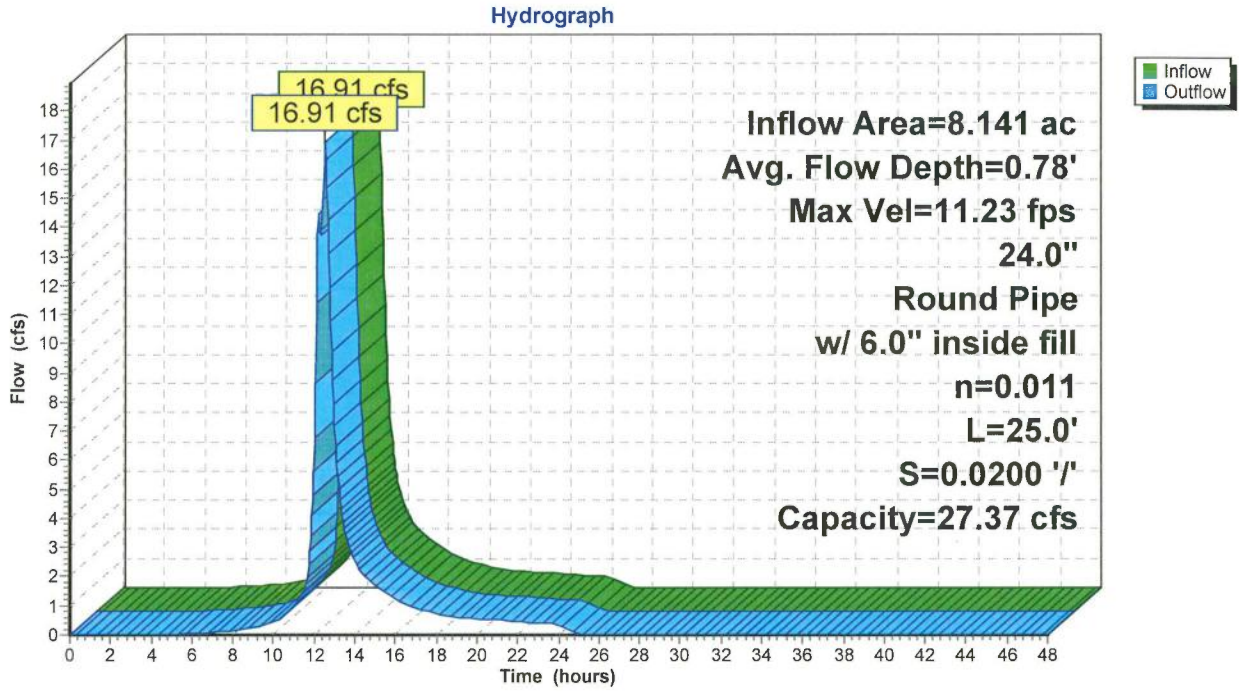
Inflow Area =	8.141 ac,	0.00% Impervious,	Inflow Depth =	3.53"	for 100-Year event
Inflow =	16.91 cfs @	12.50 hrs, Volume=	2.392 af		
Outflow =	16.91 cfs @	12.50 hrs, Volume=	2.392 af,	Atten= 0%,	Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.23 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.70 fps, Avg. Travel Time= 0.1 min

Peak Storage= 38 cf @ 12.50 hrs
Average Depth at Peak Storage= 1.28' above invert (0.78' above fill)
Bank-Full Depth= 2.00' above invert (1.50' above fill) Flow Area= 2.5 sf, Capacity= 27.37 cfs

24.0" Round Pipe w/ 6.0" inside fill
n= 0.011 Concrete pipe, straight & clean
Length= 25.0' Slope= 0.0200 '/'
Inlet Invert= 359.00', Outlet Invert= 358.50'

Reach 8R: Lower 24" RCP



Summary for Reach 11R: swale

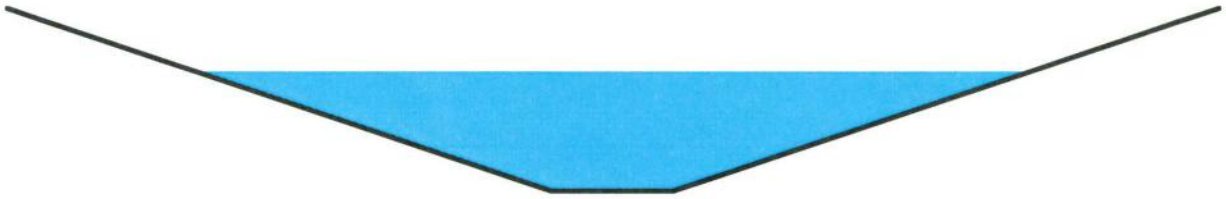
[62] Hint: Exceeded Reach 7R OUTLET depth by 0.01' @ 12.15 hrs

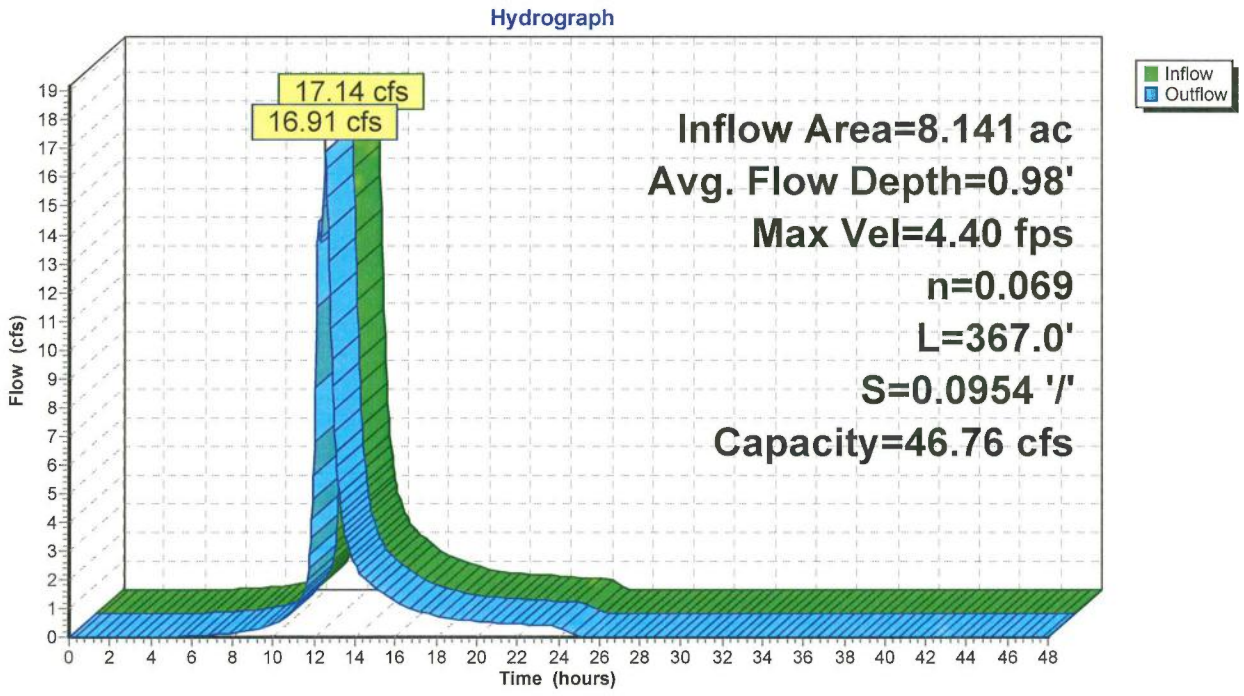
Inflow Area = 8.141 ac, 0.00% Impervious, Inflow Depth = 3.53" for 100-Year event
Inflow = 17.14 cfs @ 12.45 hrs, Volume= 2.392 af
Outflow = 16.91 cfs @ 12.50 hrs, Volume= 2.392 af, Atten= 1%, Lag= 2.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.40 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.70 fps, Avg. Travel Time= 3.6 min

Peak Storage= 1,429 cf @ 12.47 hrs
Average Depth at Peak Storage= 0.98'
Bank-Full Depth= 1.50' Flow Area= 8.3 sf, Capacity= 46.76 cfs

1.00' x 1.50' deep channel, n= 0.069 Riprap, 6-inch
Side Slope Z-value= 3.0 '/' Top Width= 10.00'
Length= 367.0' Slope= 0.0954 '/'
Inlet Invert= 395.00', Outlet Invert= 360.00'





Summary for Pond P-2A: P-2A

Inflow Area = 1.355 ac, 0.00% Impervious, Inflow Depth = 4.64" for 100-Year event
Inflow = 4.81 cfs @ 12.30 hrs, Volume= 0.524 af
Outflow = 3.87 cfs @ 12.47 hrs, Volume= 0.524 af, Atten= 19%, Lag= 10.4 min
Discarded = 0.37 cfs @ 12.47 hrs, Volume= 0.372 af
Primary = 3.50 cfs @ 12.47 hrs, Volume= 0.152 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 419.76' @ 12.47 hrs Surf.Area= 3,238 sf Storage= 6,308 cf

Plug-Flow detention time= 132.6 min calculated for 0.523 af (100% of inflow)
Center-of-Mass det. time= 132.5 min (969.2 - 836.7)

Volume	Invert	Avail.Storage	Storage Description
#1	417.00'	7,116 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

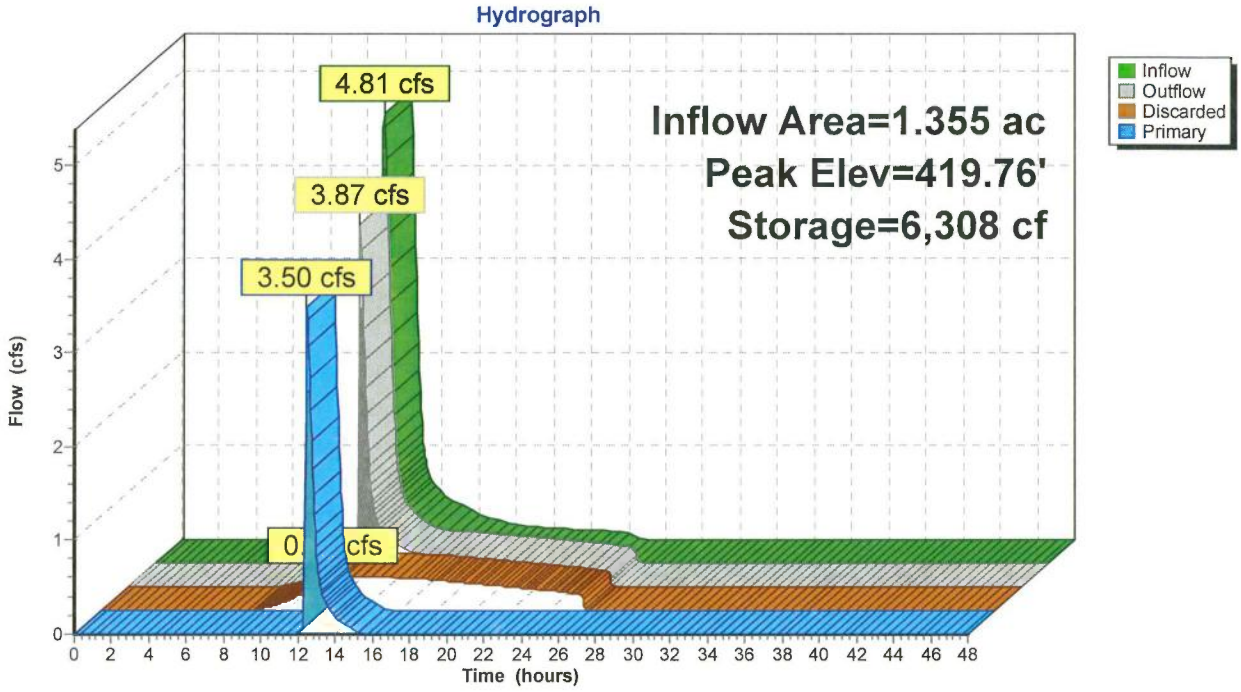
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
417.00	1,405	0	0
418.00	2,018	1,712	1,712
419.00	2,688	2,353	4,065
420.00	3,415	3,052	7,116

Device	Routing	Invert	Outlet Devices
#1	Discarded	417.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	419.50'	**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

Discarded OutFlow Max=0.37 cfs @ 12.47 hrs HW=419.75' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.37 cfs)

Primary OutFlow Max=3.39 cfs @ 12.47 hrs HW=419.75' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 3.39 cfs @ 1.35 fps)

Pond P-2A: P-2A


Hydrograph
4.81 cfs
3.87 cfs
3.50 cfs
0 cfs
Inflow Area=1.355 ac
Peak Elev=419.76'
Storage=6,308 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
0 1 2 3 4 5

Summary for Pond P-2B: P-2B

Inflow Area = 0.742 ac, 0.00% Impervious, Inflow Depth = 4.76" for 100-Year event
Inflow = 3.38 cfs @ 12.17 hrs, Volume= 0.294 af
Outflow = 0.76 cfs @ 12.67 hrs, Volume= 0.294 af, Atten= 78%, Lag= 30.4 min
Discarded = 0.32 cfs @ 12.67 hrs, Volume= 0.279 af
Primary = 0.43 cfs @ 12.67 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 414.56' @ 12.67 hrs Surf.Area= 2,788 sf Storage= 5,202 cf

Plug-Flow detention time= 162.0 min calculated for 0.294 af (100% of inflow)
Center-of-Mass det. time= 161.8 min (987.6 - 825.8)

Volume	Invert	Avail.Storage	Storage Description
#1	412.00'	6,481 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

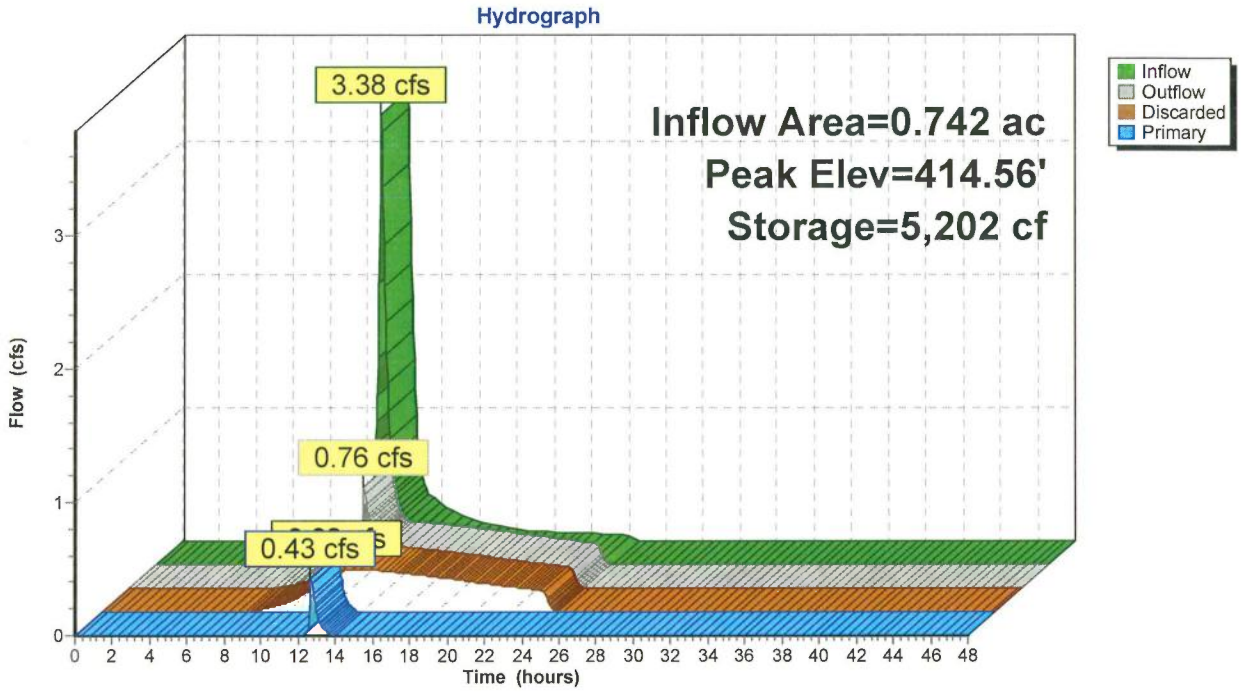
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
412.00	1,330	0	0
413.00	1,852	1,591	1,591
414.00	2,431	2,142	3,733
415.00	3,065	2,748	6,481

Device	Routing	Invert	Outlet Devices
#1	Discarded	412.00'	**5.000 in/hr Exfiltration over Surface area**
#2	Primary	414.50'	**10.0' long x 15.0' 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=0.32 cfs @ 12.67 hrs HW=414.56' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=0.41 cfs @ 12.67 hrs HW=414.56' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.41 cfs @ 0.66 fps)

Pond P-2B: P-2B

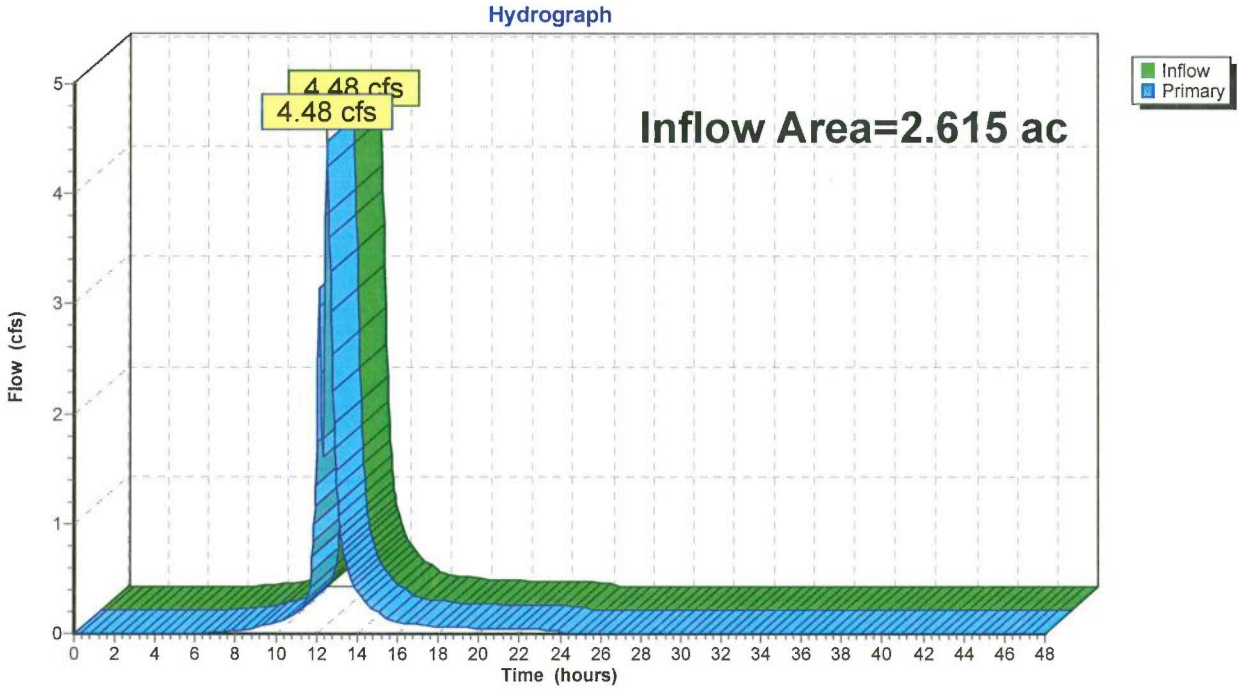

Hydrograph
3.38 cfs
0.76 cfs
0.43 cfs
Inflow Area=0.742 ac
Peak Elev=414.56'
Storage=5,202 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
0
1
2
3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Link 2L: AP-2

Inflow Area = 2.615 ac, 0.00% Impervious, Inflow Depth = 1.92" for 100-Year event
Inflow = 4.48 cfs @ 12.46 hrs, Volume= 0.418 af
Primary = 4.48 cfs @ 12.46 hrs, Volume= 0.418 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 2L: AP-2



Summary for Link 10L: EX. CB

Inflow Area = 8.141 ac, 0.00% Impervious, Inflow Depth = 3.53" for 100-Year event
Inflow = 16.91 cfs @ 12.50 hrs, Volume= 2.392 af
Primary = 16.91 cfs @ 12.50 hrs, Volume= 2.392 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 10L: EX. CB