Stormwater Analysis & Design Report - Moo Cow Solar

2446 Victory Highway
Coventry, RI 02816

February 1, 2024
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Executive Summary

The goal of this analysis is to evaluate pre- and post-development stormwater conditions and develop a site design consistent with the Rhode Island Stormwater Management, Design and Installation Rules (250-RICR-150-10-8).

The Site is located at 2446 Victory Highway in Coventry, Rhode Island. The 117.3-acre parcel is identified as Assessor's Plat 304, Lot 27.1 and Lot 28. The property is privately owned and designated as land used for forestry, farming and related activities. The property also features an existing abandoned dwelling and two historical cemeteries totaling less than 2,000-SF in area. It consists of small open fields and vacant wooded lands surrounding the fields. There are large wetland complexes scattered throughout the northern and southern portions of the property, as well as a stream on the eastern side of the property outside of the limit of disturbance.

The Applicant proposes to construct a 4.37± MW direct current (DC) ground mounted photovoltaic solar array and corresponding electrical equipment, equipment pad, utility poles, fence, and stormwater basins. The project will be accessed by a crushed stone driveway to be constructed from Victory Highway. The proposed array occupies approximately 9.74± acres of the parcel and will be surrounded by a seven-foot-tall chain-link security fence, enclosing a total area of approximately 13.5± acres. A 6-inch clearance will be provided beneath the security fence to wildlife passage. The total Limits of Disturbance, including shade tree cutting, is 15.4± acres.

The results of the stormwater analysis indicate that the post-development conditions peak runoff rates generated by the 1, 10, and 100-year design storms will not exceed pre-development conditions. Post-development peak runoff rates have been mitigated using stormwater basins designed to infiltrate and/or provide some pretreatment of overland flow before exfiltrating or discharging to their respective Design Points. Stormwater attenuation, groundwater recharge, and water quality treatment will be provided by two stormwater basins and one sand filter providing infiltration and filtration. The 11 Minimum Stormwater Management Standards required by the Rhode Island Stormwater Management, Design and Installation Rules have been met, to the maximum extent practicable.

1.0 Purpose

The goal of this analysis is to evaluate pre- and post-development stormwater conditions and develop a Site design consistent with the Rhode Island Stormwater Management, Design and Installation Rules (250-RICR-150-10-8).

2.0 Existing Conditions

2.1 Existing Site Use

The Site is located at 2446 Victory Highway in Coventry, Rhode Island. The 117.3-acre parcel is identified as Assessor's Plat 304, Lot 27.1 and Lot 28. The two lots will be administratively combined after approval of the Site Plan by the Coventry Planning Commission. The Site is privately owned and designated as land used for forestry, farming and related activities. The Site is located in a Residential zone. The Site also features an existing abandoned residential dwelling and two historical cemeteries that total less than 2,000-SF in area. The Site consists of small open fields and vacant wooded lands surrounding the fields. There are large wetland complexes scattered throughout the northern and southern portions of the Site, as well as an unnamed stream located on the eastern side of the Site outside of the project Limit of Disturbance (LOD).

Outside of the wetlands, the majority of the slopes across the property range from approximately 0% to 25%. Ground elevations range from approximately 595 ft on the westernmost portion of the Site to 535 ft on the eastern portion of the LOD.

2.2 Hydrology

The western portion of the Site is located within the Flat River Reservoir sub-watershed (HUC 010900040602), while the eastern portion of the Site is located within the Big River sub-watershed (HUC 010900040601). According to RIDEM's online Environmental Resource Map, both sub-watersheds are listed as 303d Impaired Watersheds (RIDEM 2023a). The designed drainage basins will outlet into wetlands that converge to a tributary of the Quidneck Reservoir or the Nooseneck River. The Nooseneck River is listed as coldwater fisheries in *250-RICR-150-05-1 (Water Quality Regulations), Section 1.25.I.1* but was removed from the TMDL list in the 2022 Impaired Waters Report, dated December 2021. The Quidneck Reservoir is not listed as a coldwater fishery or TMDL.

2.3 Wetland Delineation

Wetlands were delineated by ESI in April and May 2022, and verified by TRC in November 2022. The Final Wetland report is dated January 2023.

The field survey resulted in the identification and delineation of several wetland complexes found throughout the Site, delineated by the flag series 'A', 'B', 'C', 'D', 'E', 'F', 'H' and 'I'.

Flag series A (A1-A74), F (F1-F47), and H (H1-H74) were flagged as three separate wetland areas but are a single hydrologically connected, deciduous forested swamp ≥10 acres. The

wetland area delineated by flag series F connects to the A flag series wetland offsite to the south. Both the A and F flag series direct flow towards the series H wetland, which flows offsite to the east.

Flag series B (B1-B4) is a small, isolated vernal pool located just to the northeast of series C.

Flag series C (C1-C4) is an isolated, excavated pit (vernal pool) to the southwest of series B with the top 0-1 inches at a color of 10YR 2/1, 1-6 inches at 2.5Y 4/3, and 6+ inches at 2.5Y 6/2.

Flag series D (D1-D50) is a deciduous forested swamp ≥10 acres in size, which extends offsite to the north. In the north half of the delineated area there are multiple wetland types within 50 feet of the wetland edge as the deciduous forested swamp transitions to a deciduous shrub swamp and then an emergent marsh. Per RIDEM, since these transitions happen within 50 feet of the wetland edge, the buffer zone in the areas between flags D1-D5 and flags D57-D66 will receive an additional 25 feet of buffer zone.

Flag series E (E1-E42) is a deciduous forested swamp between 1 and 10 acres in size, with very similar characteristics to flag series F. Due to its size being <10 acres, it is afforded a smaller buffer zone than the deciduous forested wetlands located onsite that are ≥10 acres in size.

Flag series I (I1-I6) is a small, <1 acre isolated wetland to the northwest of series H.

2.4 Test Pits

Five test pits, identified TP-1 through TP-7, were observed by TRC on June 8 and June 14, 2023. The test pit logs are included in Appendix D and summarized in the following table.

Table 1: Test Pit Observations

ID	Estimated SHGW Depth (ft)	Restrictive Layer Depth	Design Soil Texture Class	Design Rawls Rate (in/hr)
TP-1	8.0	>8	Loamy Sand	2.41
TP-2	7.0	>8	Loamy Sand	2.41
TP-3	2.5	>6	Silt Loam	0.27
TP-5	3.4	>8	Loam	0.52
TP-6	3.3	>7.5	Loam	0.52
TP-7	3.0	>8	Sandy Loam	1.02

3.0 Proposed Development

The Applicant proposes to construct a 4.37± MW direct current (DC) ground mounted photovoltaic solar array and corresponding electrical equipment, equipment pad, utility poles, fence, and stormwater basins. The project will be accessed by a crushed stone driveway to be constructed from Victory Highway. The proposed array occupies approximately 9.74± acres of the parcel and will be surrounded by a seven-foot-tall chain-link security fence, enclosing a total

area of approximately 13.5± acres. A 6-inch clearance will be provided beneath the security fence to wildlife passage. The total LOD, including shade tree cutting, is 15.4± acres.

The ground within the fenced area and beneath the solar array will be cleared, grubbed and seeded with a low maintenance grass seed mix. Shade trees between the proposed fence and the solar array where no grading is proposed will be cut but not grubbed, leaving the existing ground cover intact. A restoration seed mix will be seeded over this area. The small open field area located on the north side of the site within the 40-foot vegetated buffer zone will be planted with native vegetation to maintain a visual buffer along that side of the Site consistent with the Coventry zoning ordinance. Seed mixes and landscape plantings are shown on the Landscape Plans.

4.0 Hydrologic and Hydraulic Analysis

4.1 Methodology

HydroCAD® software (developed by Applied Microcomputer Systems) was used to create a hydraulic and hydrologic model utilizing the methods prescribed in Soil Conservation Service (SCS) Technical Release No. 20 and SCS Technical Release No. 55. The HydroCAD® program calculates runoff based on rainfall and watershed characteristics and produces a runoff hydrograph (a runoff rate versus time curve). The stage-storage-discharge curves for a specific detention area are used to compute an outflow hydrograph by hydraulically routing an inflow hydrograph through a basin. This procedure calculates the relationship of the inflow hydrograph with the characteristics of the detention area to determine the outflow, stage, and storage capacity of the detention area for a given time during the specified storm event. All drainage analyses utilized Type III, 24-hour rainfall data from the Rhode Island Stormwater Management, Design and Installation Rules (250-RICR-150-10-8.6E) for Kent County. The rainfall frequency values used in this drainage analysis are listed in the table below.

Table 2: Rainfall Frequency Values

Frequency	1-Yr	10-Yr	100-Yr
Inches of Rainfall	2.7	4.8	8.7

Hydrographs were generated based on drainage area, hydrologic soil group, curve number (CN) values, times of concentration (Tc), and rainfall amount. The CN values for each drainage area were estimated by determining the composite value of the CN for the soil groups and ground cover mixture. Stormwater model simulations were performed for the 24-hour rainfall for the 1.2”, 1, 10, and 100-year storm events using a Type III storm distribution.

The watershed characteristics for existing conditions, including flow patterns, were estimated based on topographic information determined by field survey and aerial photography. Refer to the HydroCAD calculations included in Appendix A.

4.2 Points Of Analysis

Four design points were evaluated based on existing drainage patterns and site characteristics. Each design point is summarized below and illustrated on the drainage area maps included in Appendix E.

- Design Point 1 (DP-1) represents a small <1 acre subcatchment on the northwestern side of the development that drains off-site.
- Design Point -2 (DP-2) represents a small < 1 acre subcatchment on the north-central portion of the development that drains off-site.
- Design Point 3 (DP-3) represents the drainage to wetlands delineated by flags ‘D’ and ‘F’ located to the east and south of the development.
- Design Point 4 (DP-4) represents the remaining drainage areas that discharge to wetlands delineated by flags ‘A’, ‘B’, ‘C’, ‘E’, ‘H’ and ‘I’.

4.3 Pre-Development Drainage Areas

Design Points 1, 2 and 3 receive stormwater runoff from drainage areas 101, 106 and 102, respectively. Design Point 4 receives stormwater runoff from drainage areas 103, 104, 105 and 107. The drainage areas are summarized below and illustrated on drawing DA-1, included in Appendix E. Table 3 lists key characteristics of the hydrologic model for each drainage area.

These drainage areas are primarily wooded, with the exception of 102, which includes the existing residential gravel driveway and existing abandoned residential dwelling, and 103, which includes a portion of the existing residential gravel driveway.

The drainage areas contain varying soils classified as Hydrologic Soil Group (HSG) B & D soils. An NRCS Soils Map created from the Web Soil Survey that summarizes the varying HSG classifications of the soils can be found in Appendix C.

Table 3: Pre-Development Drainage Area Characteristics

Drainage Area ID	Point of Analysis	Area (acres)	Curve Number	Time of Conc. (minutes)
101	DP-1	0.794	69	32.2
106	DP-2	0.946	68	19.1
102	DP-3	10.089	77	38.0
103	DP-4	6.498	77	36.6
104		2.650	77	21.3
105		7.357	77	30.6
107		23.785	65	32.7

4.4 Post-Development Drainage Areas

The post-development conditions stormwater runoff has been modeled as ten drainage areas that flow to the four Design Points. The drainage areas are summarized below and illustrated on drawing DA-2, included in Appendix E. Table 4 lists key characteristics of the hydrologic model for each drainage area.

- Drainage Area 201 drains to Design Point 1 (off-Site). It includes the northwestern portion of the Site, approximately 0.794 acres of undeveloped wooded area.
- Drainage Area 206U drains unattenuated off-Site to the north to Design Point 2. This area contains 0.5+/- acres of undeveloped woods and a portion of the proposed cleared area to develop the northern side of the solar array field.
- Drainage Area 206C drains to the Sand Filter before discharging to Design Point 2. This area contains a portion of the proposed cleared area to develop the northern side of the solar array field.
- Drainage Area 202 drains to directly to the northern wetland, Design Point 3. This area consists of 8+ acres of undeveloped woods and the new gravel access road leading to the solar array.

- Drainage Area 203 drains to Design Point 4. This area consists of 6+/- acres of undeveloped woods and a portion of the new gravel access road leading to the solar array.
- Drainage Area 204 drains to Design Point 4 and consists of mostly undeveloped wooded area on the southern side of the Site and a small portion of the new gravel access road leading to the solar array.
- Drainage Area 205U drains to Design Point 4 unattenuated. This area consists of the western portion of the proposed solar array and the eastern side of the proposed gravel access road.
- Drainage Area 205C drains to the West Basin before discharging to Design Point 4. This area consists primarily of the western portion of the proposed array.
- Drainage Area 207U drains to Design Point 4 unattenuated and consists of the central portion of the proposed array and some off-Site flow from the north.
- Drainage Area 207C includes the remainder of Drainage Area 207 that drains to the East Basin before discharging to Design Point 4. This area consists of the east-central portion of the solar array and a portion of off-Site flow from the north.

Table 4: Post-Development Drainage Area Characteristics

Drainage Area ID	Design Point	Area (acres)	Curve Number	Time of Conc. (minutes)
201	1	0.794	69	32.2
206U	2	0.847	69	24.2
206C		0.489	79	15.3
202	3	10.071	77	38.0
203	4	6.498	77	36.6
204		2.650	77	21.3
205U		5.302	78	29.4
205C		1.711	81	16.0
207U		16.815	65	32.9
207C		6.941	73	17.8

4.5 Proposed Stormwater Design

Stormwater Best Management Practices were designed in general accordance with the Stormwater Management, Design and Installation Rules to provide water quality treatment and attenuate peak flows from the 1, 10, and 100-year, Type III 24-hour design storms. They include level stone trenches, three basins, and a washed crushed stone access road surface.

- Level stone trenches – Level stone trenches are proposed to encourage sheet flow beneath the panel drip edges. The trenches are proposed beneath the panels where slopes exceed 8% and are not generally parallel with the array drip edge. They are 14 feet long by 2.5 feet wide with a reverse slope. The trenches will be installed parallel with the contours and spaced at intervals no longer than 100 feet.

- West Basin – A 1 foot deep, 11,954 cubic foot infiltration basin will attenuate stormwater runoff from Drainage Area 205C and infiltrate the 1-yr and 10-yr design storms. A 50 foot wide spillway has been provided to accommodate the 100-yr design storm. Pre-treatment will be provided by a pea gravel diaphragm.

- Sand Filter – A 2 foot deep, 7,238 cubic foot sand filter will infiltrate stormwater runoff from Drainage Area 206C for the WQv and 1-yr and 10-yr design storms. A 10 foot wide spillway has been provided to accommodate the 100-yr design storm. Pre-treatment will be provided by a stone berm and shallow forebay area.

- East Basin – A 3 foot deep, 73,563 cubic foot infiltration basin will attenuate stormwater runoff from Drainage Area 207C and infiltrate the 1-yr and 10-yr design storms. A 20 foot wide spillway has been provided to accommodate the 100-yr design storm. Pre-treatment will be provided by a pea gravel diaphragm. A portion of the infiltration basin, where adjacent slopes exceed 15%, will be lined with an impervious liner to prevent undermining the adjacent steep slope.

- Crushed Stone Road – The access road will be surfaced with a minimum of 6 inches of washed crushed stone and will be used infrequently; therefore, it is expected to remain pervious.

All basins have been designed to drain within 48 hours after the design storm ends.

4.6 Results

The results of the stormwater analysis indicate that the post-development conditions peak runoff rates generated by the design storms will not exceed pre-development conditions. The results are summarized in the tables below. Refer to the HydroCAD calculations provided in Appendix A for detailed results.

Table 5: Basin Elevations (ft)

	East Basin	West Basin	Sand Filter
Bottom	552.00	575.00	574.00
Spillway Crest	554.00	575.50	575.50
Top of Berm	555.00	576.00	576.00
1-yr Design Storm	552.43	575.10	573.34
10-yr Design Storm	553.74	575.51	574.64
100-yr Design Storm	554.43	575.66	575.56

Table 6: Design Point 1 Peak Runoff Rate, cfs

Design Storm	Pre-Dev	Post-Dev
1-yr	0.21	0.21
10-yr	0.89	0.89
100-yr	2.52	2.52

Table 7: Design Point 2 Peak Runoff Rate, cfs

Design Storm	Pre-Dev	Post-Dev
1-yr	0.27	0.25
10-yr	1.27	1.08
100-yr	3.67	3.05

Table 8: Design Point 3 Peak Runoff Rate, cfs

Design Storm	Pre-Dev	Post-Dev
1-yr	4.90	4.89
10-yr	14.64	14.61
100-yr	35.07	35.01

Table 9: Design Point 4 Peak Runoff Rate, cfs

Design Storm	Pre-Dev	Post-Dev
1-yr	12.09	10.10
10-yr	46.74	37.46
100-yr	127.81	118.31

5.0 Stormwater Management Standards

5.1 Minimum Standard 1: LID Site Planning and Design Strategies

LID site planning and design strategies must be used to the maximum extent practicable in order to reduce the generation of the water runoff volume for both new and redevelopment projects.

The following LID site planning and design strategies are proposed to the maximum extent practicable to reduce the volume of stormwater runoff generated:

1. The proposed array area has been sited to avoid steep slopes to the maximum extent practicable.
2. Site disturbance will be minimized by only grubbing areas required for construction. Stumps and existing groundcover will remain in areas of shade tree clearing.
3. Grading has been minimized and is generally limited to construction of the crushed stone driveway, construction of BMPs and reducing the slope of areas too steep to accommodate the proposed racking.

5.2 Minimum Standard 2: Groundwater Recharge

Stormwater must be recharged within the same subwatershed to maintain baseflow at pre-development recharge levels to the maximum extent practicable in accordance with the requirements described in §§ 8.8(D) through (H) of this Part. Applicants may be required to provide a water budget analysis for proposed groundwater dewatering. Recharge volume is determined as a function of annual pre-development recharge for site-specific soils or surficial materials, average annual rainfall volume, and amount of impervious cover on a site. Recharge must occur in a manner that protects groundwater quality.

The groundwater recharge criterion (Re_v) is minimal as the only impervious surface proposed is a 1,539± square feet for the equipment pads. The equipment pads are located within Drainage Areas 205C and 206C. The total recharge volume is only 13± cubic feet. The West Basin and Sand Filter provide a total of 41,418 cubic feet of infiltration capacity.

The road will be constructed of washed crushed stone and will be used infrequently; therefore, it is expected to remain pervious. The long-term Operations and Maintenance Plan requires regrading the road as necessary to maintain its pervious characteristics if the water quality volume (one inch of runoff) does not infiltrate.

The recharge value was calculated using the formula given in 250-RICR-150-10-8.8D:

$$Re_v = 1" * F * I / 12$$

Where:

F = 0.10 (Hydrologic Soils Group D)

I = 1,539 sf (Proposed Impervious Area)

Re_v = 12.8 cf (Recharge Volume)

5.3 Minimum Standard 3: Water Quality

Stormwater runoff must be treated before discharge. The amount that must be treated from each rainfall event is known as the required water quality volume (WQv). The required WQv is calculated as described in §§ 8.9(E) through (J) of this Part and excludes LID credits allowed under §8.18 of this Part.

The WQv was calculated using the formula provided by 250-RICR-150-10-8.9(F):

$$WQ_v = 0.2" * I / 12$$

Where:

I = Disturbed area within the proposed solar array

WQ_v = Water Quality Volume (cubic feet)

The minimum WQv required is provided by two infiltration basins (East and West Basins) and an exfiltrating sand filter (Sand Filter). Refer to the detailed calculations provided in Appendix B.

Table 10: Water Quality Volume

Design Point	Required (cf)	Provided (cf)
2	599	5,258
4	8,927	51,898

5.4 Minimum Standard 4: Conveyance and Natural Channel Protection

Open drainage and pipe conveyance systems must be designed to provide adequate passage for flows leading to, from, and through stormwater management facilities for at least the peak flow from the 10-year, 24-hour Type III design storm event. Protection for natural channels downstream must be supplied by providing 24-hour extended detention of the 1-year, 24-hour Type III design storm event runoff volume.

For Design Points 1 and 2, the Channel Protection Volume criterion can be waived per 8.10.D.3, as the 1-year, post-development peak discharge without attenuation to each design point is less than 2 cfs. The unattenuated flow to Design Points 1 and 2 is 0.21 cfs and 0.27 cfs, respectively. For the remaining Design Points, the CPv criterion can be waived per 8.10.D.2, as the impervious cover is less than 1 acre.

The East Basin discharges to Wetland 'H' which eventually discharges to the Nooseneck River. The Nooseneck River is classified as a cold water fishery. The basin has been designed to infiltrate the 1-yr and 10-yr, 24-hour Type III design storm. Only larger storms discharge via spillways provided at the basin. Furthermore, the discharged stormwater flows into the unnamed stream and will have to travel over 500 feet prior to reaching the River.

5.5 Minimum Standard 5: Overbank Flood Protection

Downstream overbank flood protection must be provided by attenuating the post development peak discharge rate to the pre-development levels for the 10-year and 100-year, 24-hour Type III design storm events. In addition, designers must demonstrate that runoff from the site for storms up to the 100-year, 24-hour Type III design storm events actually reach proposed structural practices designed to meet this criterion.

Overbank flood protection will be provided by the proposed basins. The post-development peak discharge rates for the 10-year and 100-year design storms will be attenuated to or below pre-development levels. Refer to Section 4.6.

5.6 Minimum Standard 6: Redevelopment and Infill Projects

Not Applicable - The proposed project is not a Redevelopment and Infill Project.

5.7 Minimum Standard 7: Pollution Prevention

All development sites require the use of source control and pollution prevention measures to minimize the impact that the land use may have on stormwater runoff quality. These measures shall be outlined in a stormwater pollution prevention plan.

The proposed project work will include low impact use of the project Site. No paving activities, solid waste generation, significant snow removal, or hazardous waste use is proposed. Low maintenance grasses that require little to no fertilization will be used.

5.8 Minimum Standard 8: Land Uses with Higher Potential Pollutant Loads

Stormwater discharges from land uses with higher potential pollutant loads (LUHPPLs) require the use of specific source control and pollution prevention measures and the specific stormwater BMPs approved for such use. Allowable BMPs for LUHPPLs are included in the Table in § 8.14(D) of this Part. Many LUHPPLs require additional special permits such as a RIPDES Multi-Sector General Permit, and sector-specific required BMPs are included in Section VI of the Multi-Sector General Permit.

Not Applicable -The proposed project is not a Land Use with Higher Potential Pollutant Loads.

5.9 Minimum Standard 9: Illicit Discharges

All illicit discharges to stormwater management systems are prohibited, including discharges from OWTS, and sub-drains and French drains near OWTS that do not meet the State's Rules Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of Onsite Wastewater Treatment Systems.

No illicit discharges have been identified or are proposed.

5.10 Minimum Standard 10: Construction Activity SESC and Pollution Prevention Control Measure

Soil Erosion and sedimentation control measures must be utilized during the construction phase as well as during any land disturbing activities.

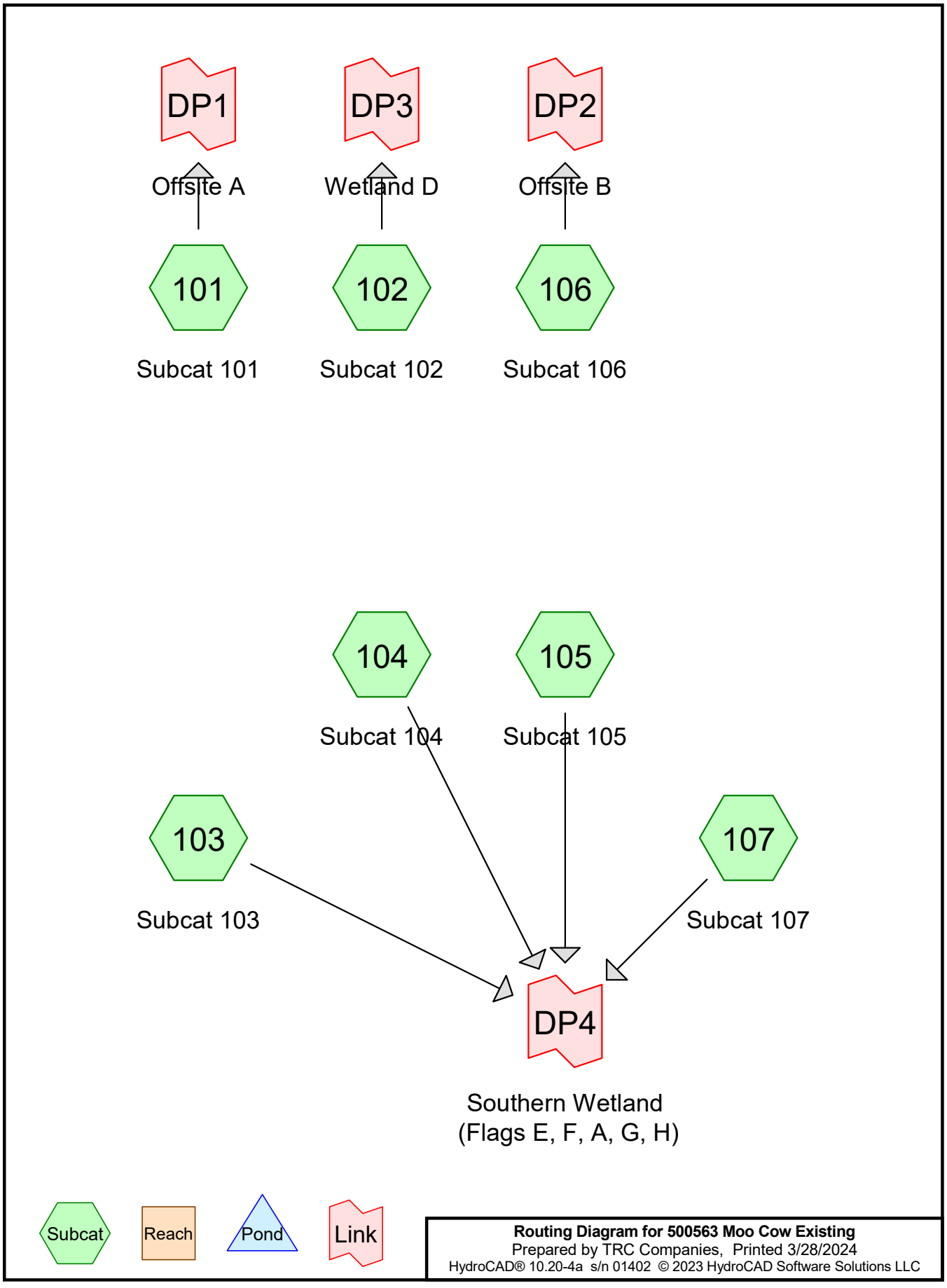
A Soil Erosion and Sediment Control (SESC) Plan has been prepared.

5.11 Minimum Standard 11: Stormwater Management System Operation and Maintenance

The stormwater management system, including all structural stormwater controls and conveyances, must have an Operation and Maintenance Plan to ensure that it continues to function as designed. The Operation and Maintenance Plan shall identify measures for implementing maintenance activities in a manner that minimizes stormwater runoff impacts.

A long-term Operation and Maintenance Plan has been prepared.

Attachment A: HydroCAD Summary Report



Routing Diagram for 500563 Moo Cow Existing
Prepared by TRC Companies, Printed 3/28/2024

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	Type III 24-hr		Default	24.00	1	2.70	2

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 Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment 101: Subcat 101 Runoff Area=0.794 ac 0.00% Impervious Runoff Depth=0.52"
Flow Length=379' Tc=32.2 min CN=69 Runoff=0.21 cfs 0.034 af

Subcatchment 102: Subcat 102 Runoff Area=10.089 ac 0.76% Impervious Runoff Depth=0.87"
Flow Length=870' Tc=38.0 min CN=77 Runoff=4.90 cfs 0.730 af

Subcatchment 103: Subcat 103 Runoff Area=6.498 ac 0.21% Impervious Runoff Depth=0.87"
Flow Length=448' Tc=36.6 min UI Adjusted CN=77 Runoff=3.21 cfs 0.470 af

Subcatchment 104: Subcat 104 Runoff Area=2.650 ac 0.00% Impervious Runoff Depth=0.87"
Flow Length=295' Tc=21.3 min CN=77 Runoff=1.66 cfs 0.192 af

Subcatchment 105: Subcat 105 Runoff Area=7.357 ac 0.00% Impervious Runoff Depth=0.87"
Flow Length=341' Tc=30.6 min CN=77 Runoff=3.95 cfs 0.533 af

Subcatchment 106: Subcat 106 Runoff Area=0.946 ac 0.00% Impervious Runoff Depth=0.48"
Flow Length=100' Slope=0.0255 '/' Tc=19.1 min CN=68 Runoff=0.27 cfs 0.038 af

Subcatchment 107: Subcat 107 Runoff Area=23.785 ac 0.00% Impervious Runoff Depth=0.38"
Flow Length=1,133' Tc=32.7 min CN=65 Runoff=3.90 cfs 0.745 af

Link DP1: Offsite A Inflow=0.21 cfs 0.034 af
Primary=0.21 cfs 0.034 af

Link DP2: Offsite B Inflow=0.27 cfs 0.038 af
Primary=0.27 cfs 0.038 af

Link DP3: Wetland D Inflow=4.90 cfs 0.730 af
Primary=4.90 cfs 0.730 af

Link DP4: Southern Wetland (Flags E, F, A, G, H) Inflow=12.09 cfs 1.940 af
Primary=12.09 cfs 1.940 af

Total Runoff Area = 52.119 ac Runoff Volume = 2.742 af Average Runoff Depth = 0.63"
99.83% Pervious = 52.029 ac 0.17% Impervious = 0.090 ac

Summary for Subcatchment 101: Subcat 101

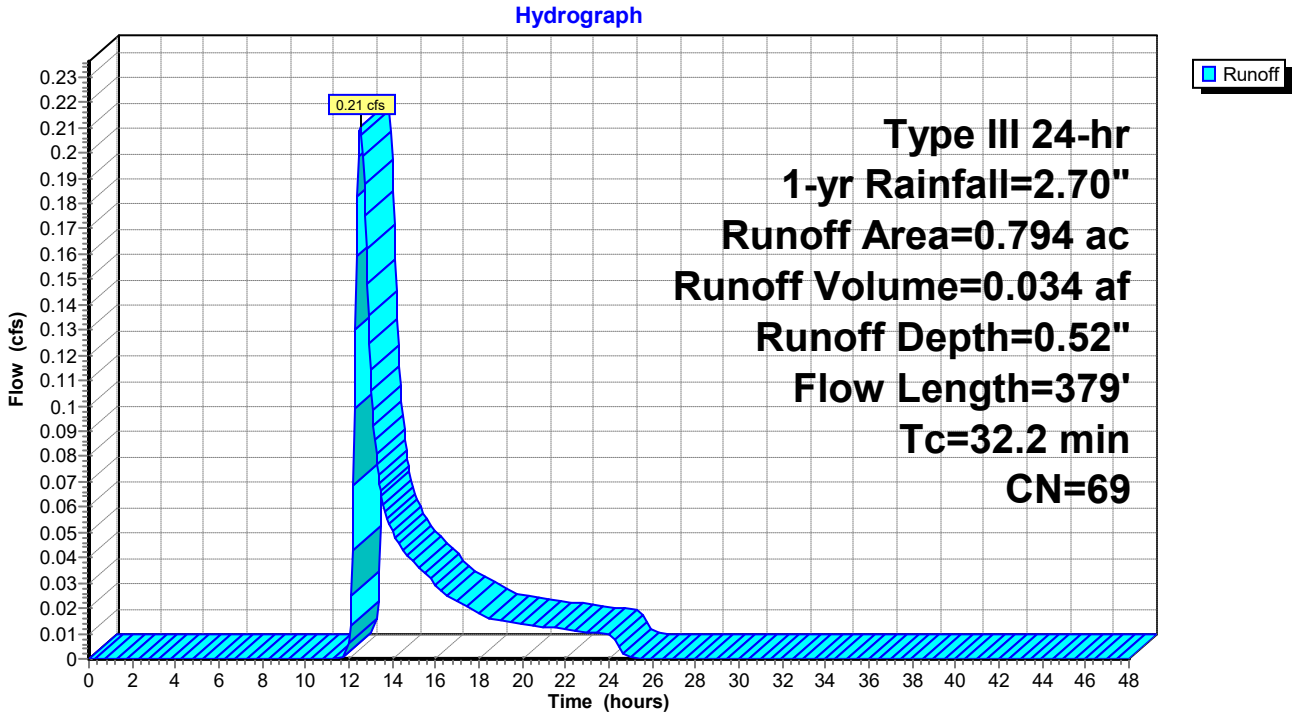
Runoff = 0.21 cfs @ 12.55 hrs, Volume= 0.034 af, Depth= 0.52"
Routed to Link DP1 : Offsite A

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 1-yr Rainfall=2.70"

Area (ac)	CN	Description
0.273	55	Woods, Good, HSG B
0.521	77	Woods, Good, HSG D
0.794	69	Weighted Average
0.794		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.0	100	0.0108	0.06		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.32"
5.2	279	0.0314	0.89		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
32.2	379	Total			

Subcatchment 101: Subcat 101



Summary for Subcatchment 102: Subcat 102

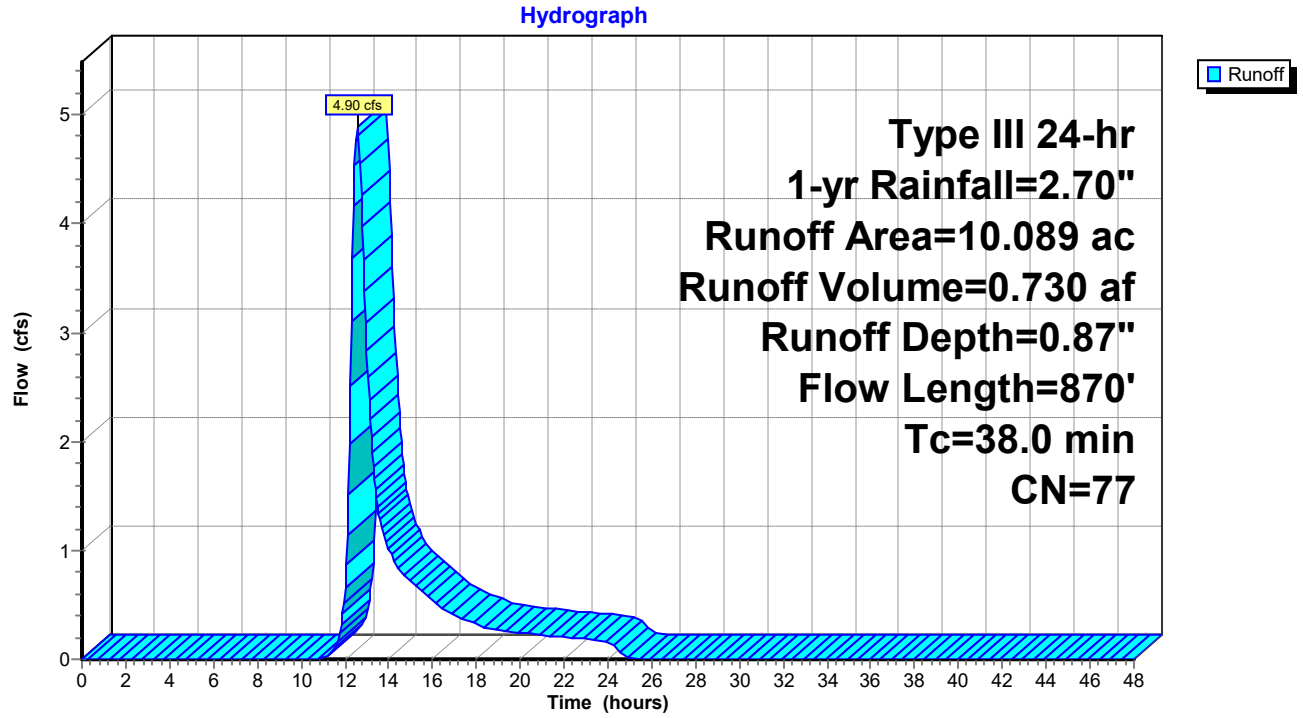
Runoff = 4.90 cfs @ 12.57 hrs, Volume= 0.730 af, Depth= 0.87"
Routed to Link DP3 : Wetland D

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 1-yr Rainfall=2.70"

Area (ac)	CN	Description
1.158	80	>75% Grass cover, Good, HSG D
0.074	96	Gravel surface, HSG D
0.076	98	Unconnected pavement, HSG D
0.413	55	Woods, Good, HSG B
8.367	77	Woods, Good, HSG D
10.089	77	Weighted Average
10.013		99.24% Pervious Area
0.076		0.76% Impervious Area
0.076		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	100	0.0246	0.09		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 3.32"
18.6	770	0.0190	0.69		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
38.0	870	Total			

Subcatchment 102: Subcat 102



Summary for Subcatchment 103: Subcat 103

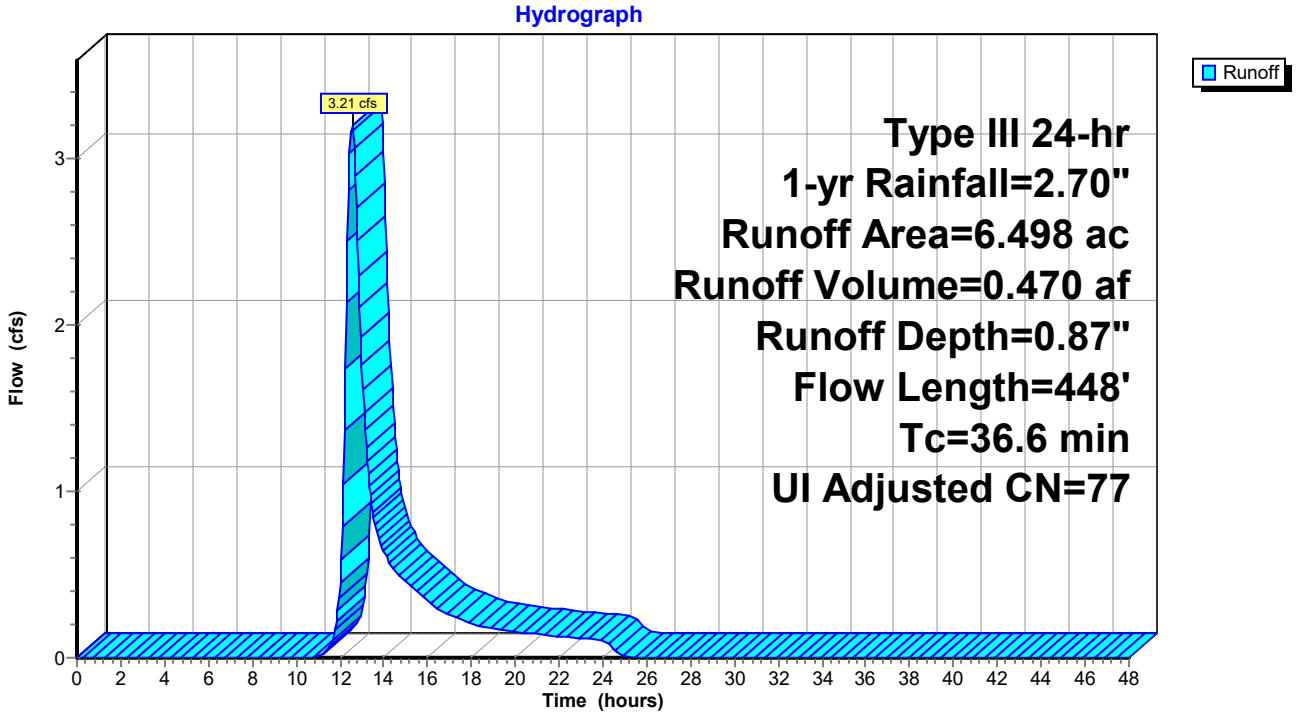
Runoff = 3.21 cfs @ 12.55 hrs, Volume= 0.470 af, Depth= 0.87"
Routed to Link DP4 : Southern Wetland (Flags E, F, A, G, H)

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 1-yr Rainfall=2.70"

Area (ac)	CN	Adj	Description
0.346	80		>75% Grass cover, Good, HSG D
0.103	96		Gravel surface, HSG D
0.013	98		Unconnected pavement, HSG D
6.035	77		Woods, Good, HSG D
6.498	78	77	Weighted Average, UI Adjusted
6.484			99.79% Pervious Area
0.013			0.21% Impervious Area
0.013			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.8	100	0.0100	0.06		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 3.32"
8.8	348	0.0172	0.66		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
36.6	448	Total			

Subcatchment 103: Subcat 103



Summary for Subcatchment 104: Subcat 104

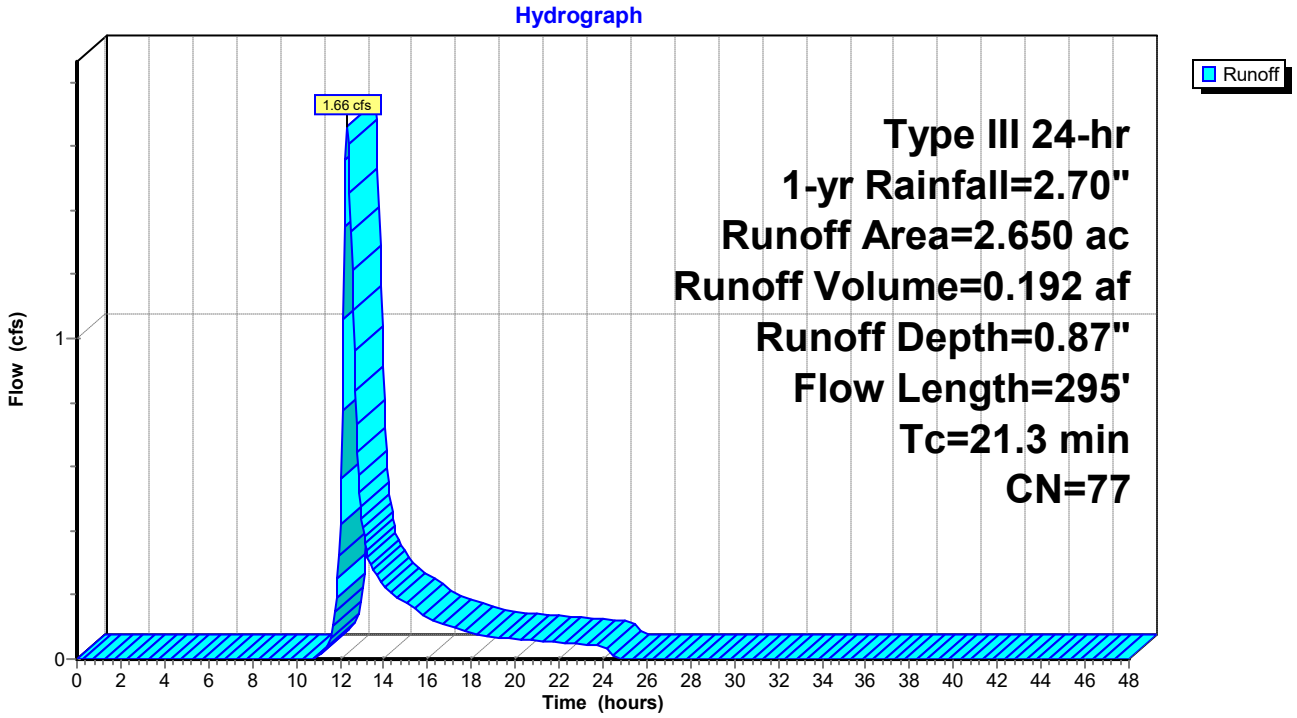
Runoff = 1.66 cfs @ 12.32 hrs, Volume= 0.192 af, Depth= 0.87"
Routed to Link DP4 : Southern Wetland (Flags E, F, A, G, H)

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 1-yr Rainfall=2.70"

Area (ac)	CN	Description
2.650	77	Woods, Good, HSG D
2.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	100	0.0350	0.10		**Sheet Flow, sheet** Woods: Light underbrush n= 0.400 P2= 3.32"
4.4	195	0.0219	0.74		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
21.3	295	Total			

Subcatchment 104: Subcat 104



Summary for Subcatchment 105: Subcat 105

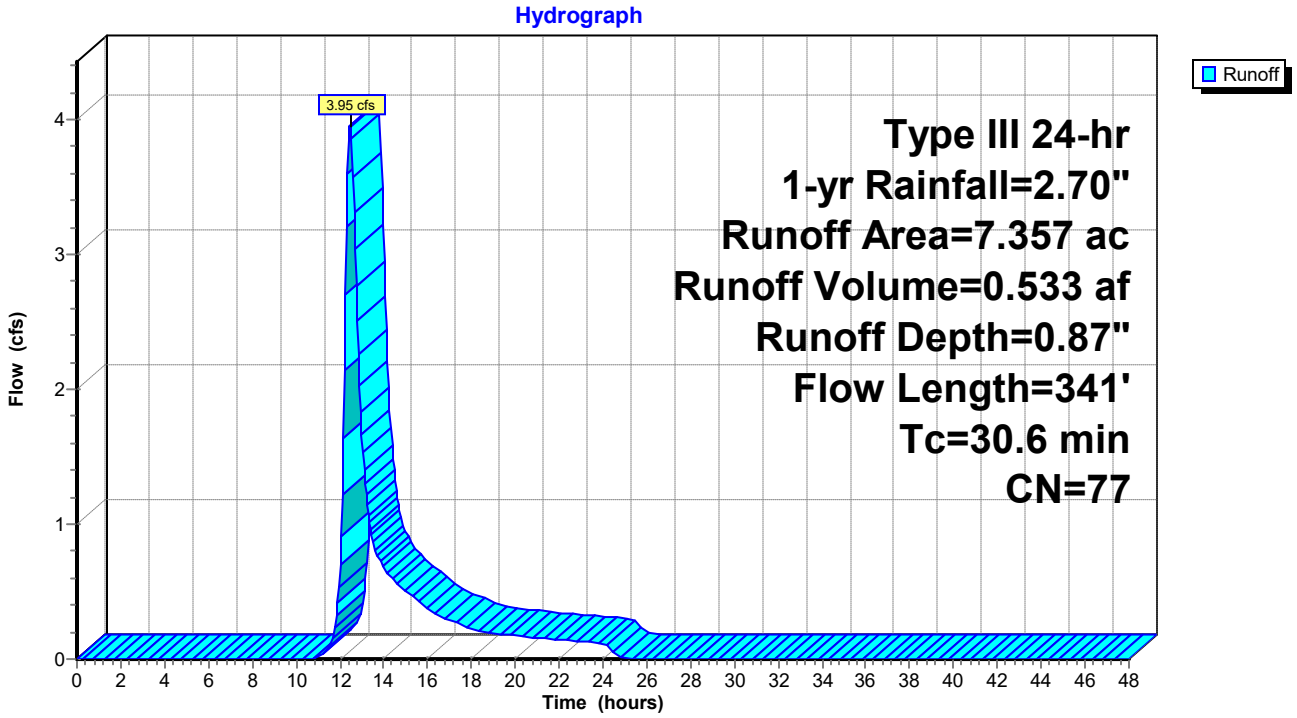
Runoff = 3.95 cfs @ 12.47 hrs, Volume= 0.533 af, Depth= 0.87"
Routed to Link DP4 : Southern Wetland (Flags E, F, A, G, H)

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 1-yr Rainfall=2.70"

Area (ac)	CN	Description
7.357	77	Woods, Good, HSG D
7.357		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.8	100	0.0147	0.07		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.32"
6.8	241	0.0138	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
30.6	341	Total			

Subcatchment 105: Subcat 105



Summary for Subcatchment 106: Subcat 106

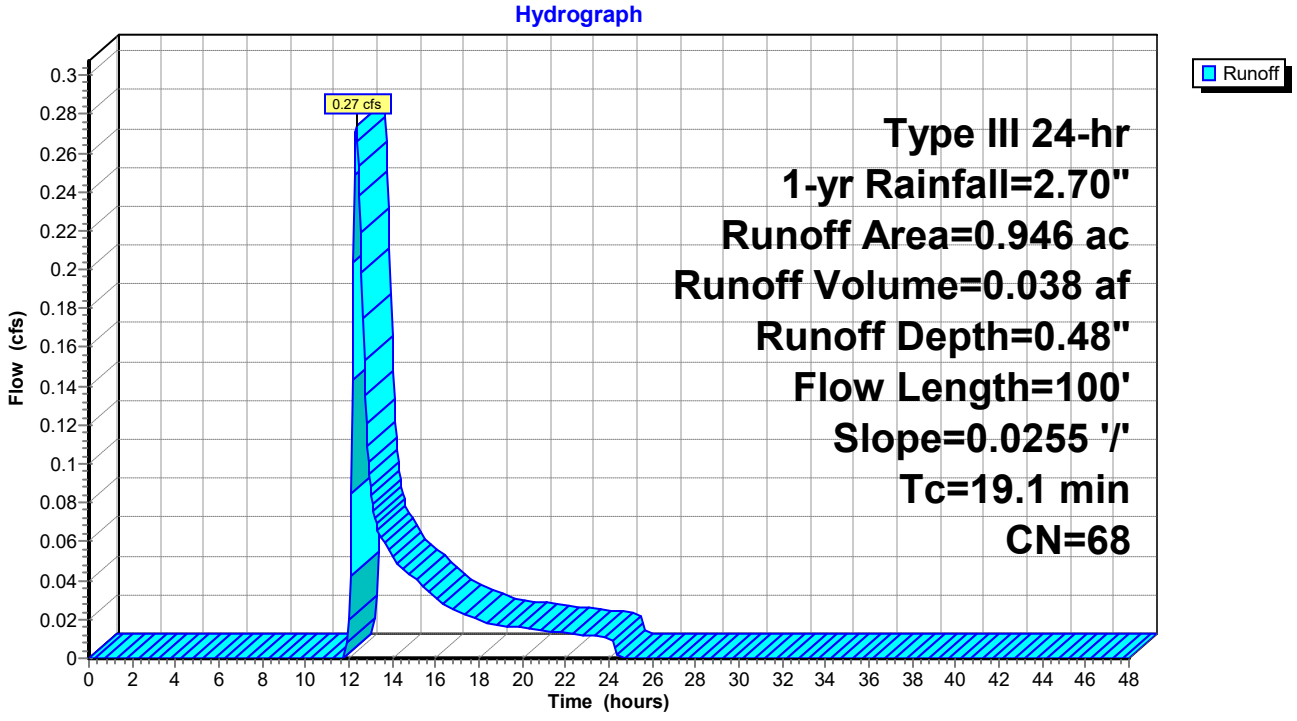
Runoff = 0.27 cfs @ 12.34 hrs, Volume= 0.038 af, Depth= 0.48"
Routed to Link DP2 : Offsite B

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 1-yr Rainfall=2.70"

Area (ac)	CN	Description
0.394	55	Woods, Good, HSG B
0.552	77	Woods, Good, HSG D
0.946	68	Weighted Average
0.946		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.1	100	0.0255	0.09		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.32"

Subcatchment 106: Subcat 106



Summary for Subcatchment 107: Subcat 107

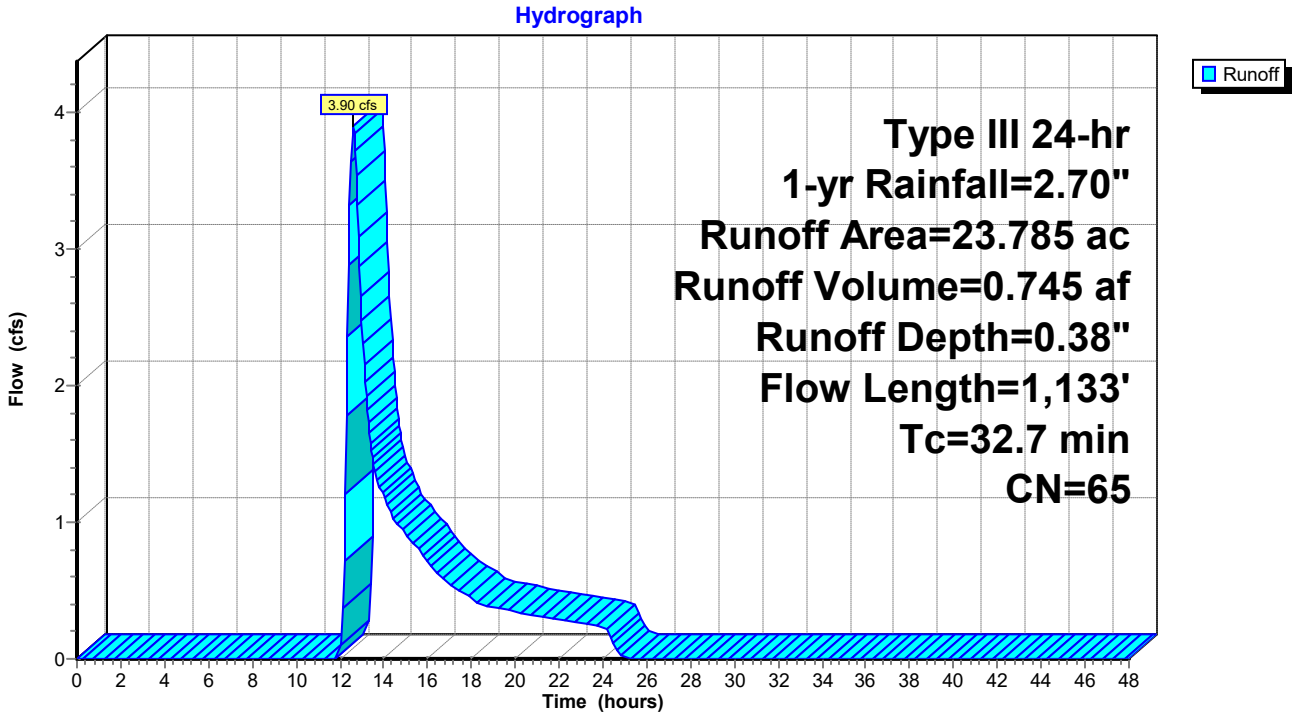
Runoff = 3.90 cfs @ 12.60 hrs, Volume= 0.745 af, Depth= 0.38"
Routed to Link DP4 : Southern Wetland (Flags E, F, A, G, H)

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 1-yr Rainfall=2.70"

Area (ac)	CN	Description
12.690	55	Woods, Good, HSG B
11.095	77	Woods, Good, HSG D
23.785	65	Weighted Average
23.785		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0318	0.10		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.32"
15.2	1,033	0.0511	1.13		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
32.7	1,133	Total			

Subcatchment 107: Subcat 107

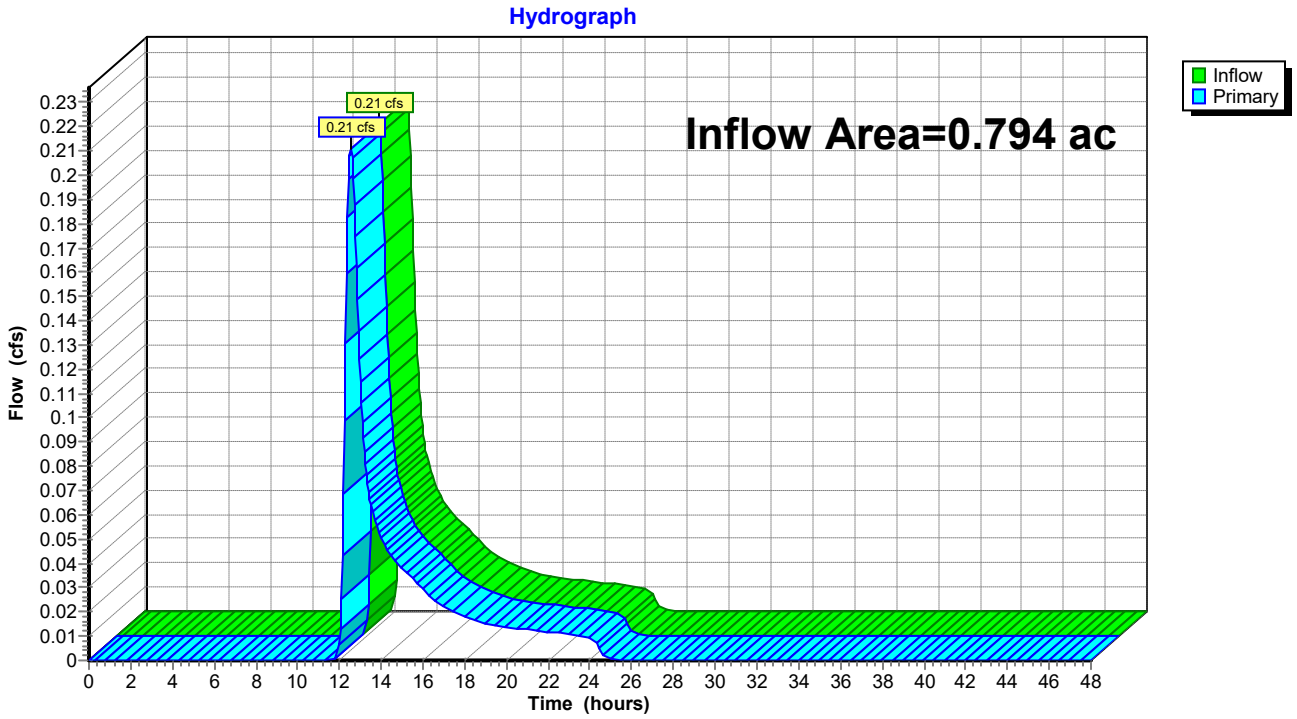


Summary for Link DP1: Offsite A

Inflow Area = 0.794 ac, 0.00% Impervious, Inflow Depth = 0.52" for 1-yr event
Inflow = 0.21 cfs @ 12.55 hrs, Volume= 0.034 af
Primary = 0.21 cfs @ 12.55 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP1: Offsite A

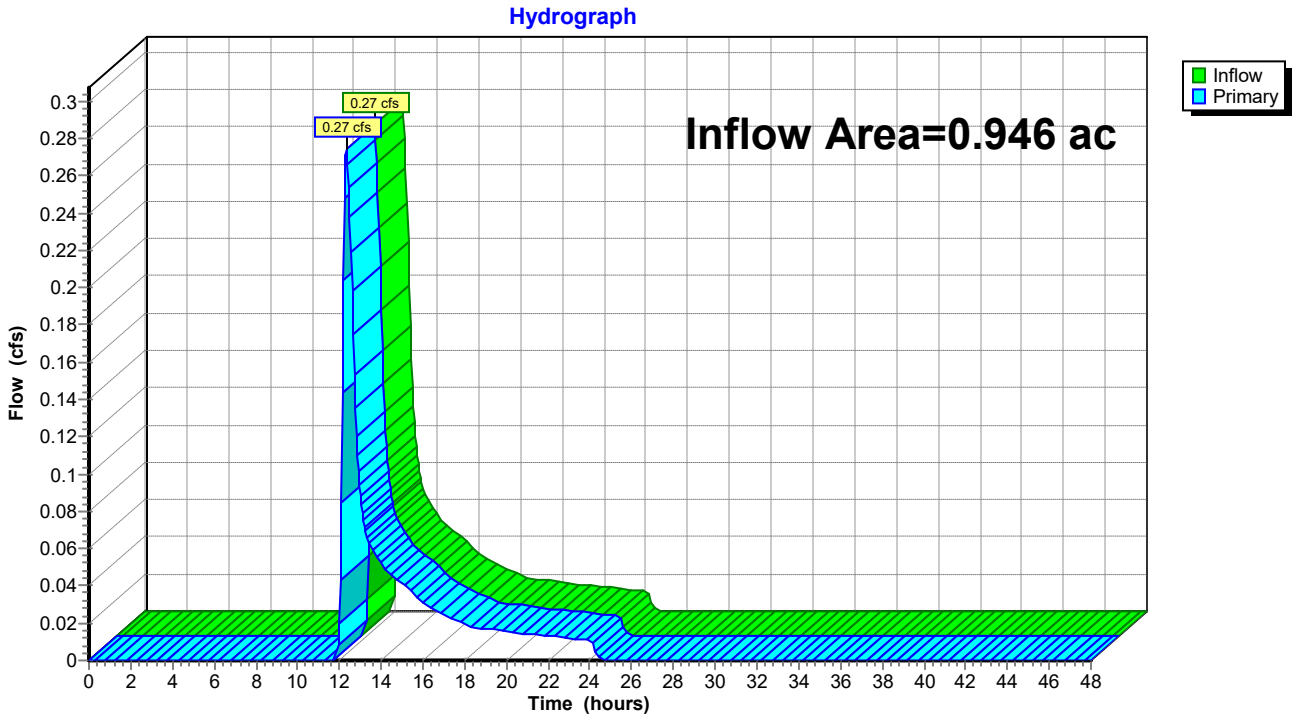


Summary for Link DP2: Offsite B

Inflow Area = 0.946 ac, 0.00% Impervious, Inflow Depth = 0.48" for 1-yr event
Inflow = 0.27 cfs @ 12.34 hrs, Volume= 0.038 af
Primary = 0.27 cfs @ 12.34 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP2: Offsite B

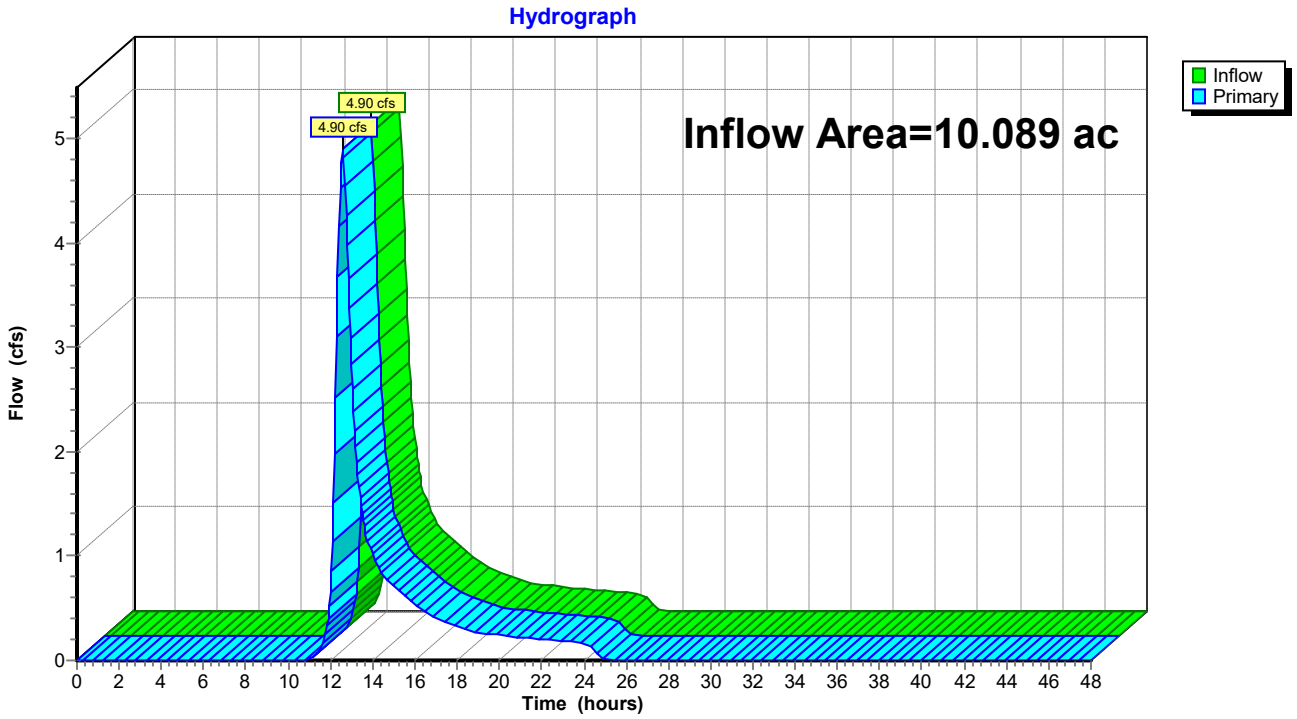


Summary for Link DP3: Wetland D

Inflow Area = 10.089 ac, 0.76% Impervious, Inflow Depth = 0.87" for 1-yr event
Inflow = 4.90 cfs @ 12.57 hrs, Volume= 0.730 af
Primary = 4.90 cfs @ 12.57 hrs, Volume= 0.730 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP3: Wetland D

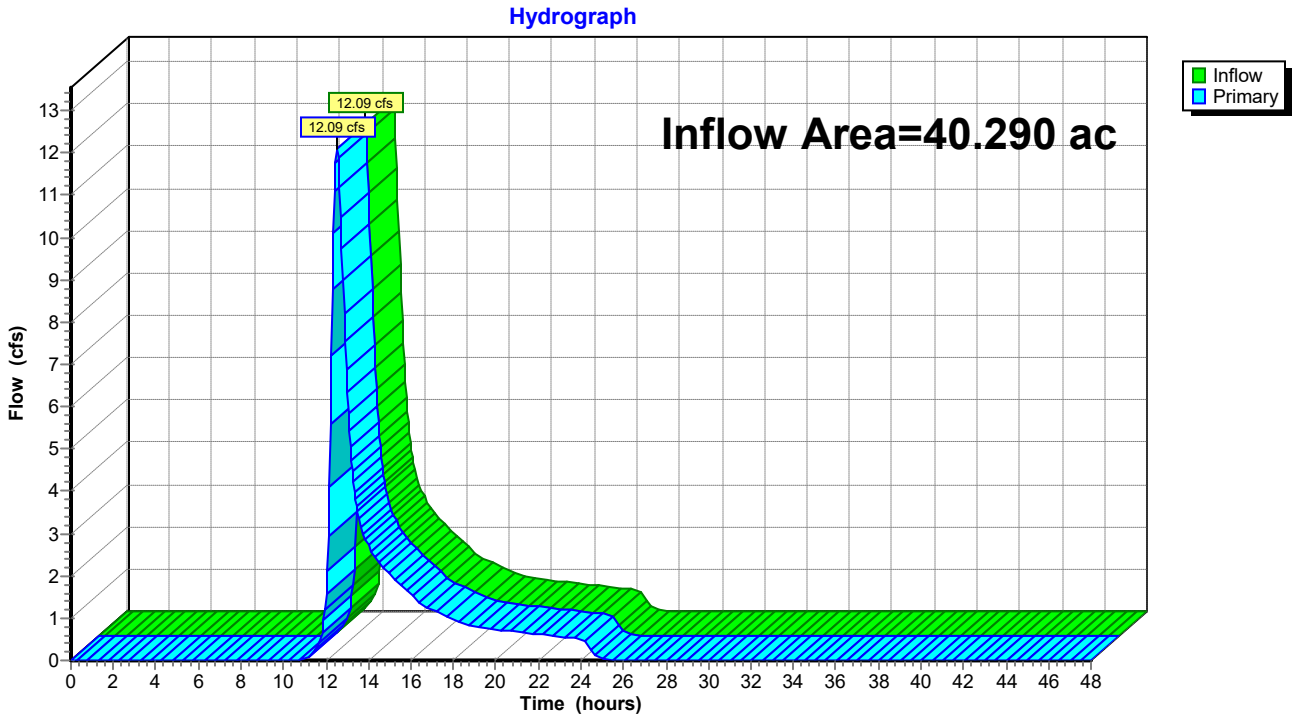


Summary for Link DP4: Southern Wetland (Flags E, F, A, G, H)

Inflow Area = 40.290 ac, 0.03% Impervious, Inflow Depth = 0.58" for 1-yr event
Inflow = 12.09 cfs @ 12.52 hrs, Volume= 1.940 af
Primary = 12.09 cfs @ 12.52 hrs, Volume= 1.940 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP4: Southern Wetland (Flags E, F, A, G, H)



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 Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment 101: Subcat 101 Runoff Area=0.794 ac 0.00% Impervious Runoff Depth=0.02"
Flow Length=379' Tc=32.2 min CN=69 Runoff=0.00 cfs 0.001 af

Subcatchment 102: Subcat 102 Runoff Area=10.089 ac 0.76% Impervious Runoff Depth=0.10"
Flow Length=870' Tc=38.0 min CN=77 Runoff=0.29 cfs 0.085 af

Subcatchment 103: Subcat 103 Runoff Area=6.498 ac 0.21% Impervious Runoff Depth=0.10"
Flow Length=448' Tc=36.6 min UI Adjusted CN=77 Runoff=0.19 cfs 0.055 af

Subcatchment 104: Subcat 104 Runoff Area=2.650 ac 0.00% Impervious Runoff Depth=0.10"
Flow Length=295' Tc=21.3 min CN=77 Runoff=0.10 cfs 0.022 af

Subcatchment 105: Subcat 105 Runoff Area=7.357 ac 0.00% Impervious Runoff Depth=0.10"
Flow Length=341' Tc=30.6 min CN=77 Runoff=0.24 cfs 0.062 af

Subcatchment 106: Subcat 106 Runoff Area=0.946 ac 0.00% Impervious Runoff Depth=0.01"
Flow Length=100' Slope=0.0255 '/' Tc=19.1 min CN=68 Runoff=0.00 cfs 0.001 af

Subcatchment 107: Subcat 107 Runoff Area=23.785 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,133' Tc=32.7 min CN=65 Runoff=0.01 cfs 0.005 af

Link DP1: Offsite A Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Link DP2: Offsite B Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Link DP3: Wetland D Inflow=0.29 cfs 0.085 af
Primary=0.29 cfs 0.085 af

Link DP4: Southern Wetland (Flags E, F, A, G, H) Inflow=0.51 cfs 0.145 af
Primary=0.51 cfs 0.145 af

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 Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment 101: Subcat 101 Runoff Area=0.794 ac 0.00% Impervious Runoff Depth=1.81"
Flow Length=379' Tc=32.2 min CN=69 Runoff=0.89 cfs 0.120 af

Subcatchment 102: Subcat 102 Runoff Area=10.089 ac 0.76% Impervious Runoff Depth=2.46"
Flow Length=870' Tc=38.0 min CN=77 Runoff=14.64 cfs 2.065 af

Subcatchment 103: Subcat 103 Runoff Area=6.498 ac 0.21% Impervious Runoff Depth=2.46"
Flow Length=448' Tc=36.6 min UI Adjusted CN=77 Runoff=9.60 cfs 1.330 af

Subcatchment 104: Subcat 104 Runoff Area=2.650 ac 0.00% Impervious Runoff Depth=2.46"
Flow Length=295' Tc=21.3 min CN=77 Runoff=4.99 cfs 0.543 af

Subcatchment 105: Subcat 105 Runoff Area=7.357 ac 0.00% Impervious Runoff Depth=2.46"
Flow Length=341' Tc=30.6 min CN=77 Runoff=11.82 cfs 1.506 af

Subcatchment 106: Subcat 106 Runoff Area=0.946 ac 0.00% Impervious Runoff Depth=1.74"
Flow Length=100' Slope=0.0255 '/' Tc=19.1 min CN=68 Runoff=1.27 cfs 0.137 af

Subcatchment 107: Subcat 107 Runoff Area=23.785 ac 0.00% Impervious Runoff Depth=1.52"
Flow Length=1,133' Tc=32.7 min CN=65 Runoff=21.67 cfs 3.017 af

Link DP1: Offsite A Inflow=0.89 cfs 0.120 af
Primary=0.89 cfs 0.120 af

Link DP2: Offsite B Inflow=1.27 cfs 0.137 af
Primary=1.27 cfs 0.137 af

Link DP3: Wetland D Inflow=14.64 cfs 2.065 af
Primary=14.64 cfs 2.065 af

Link DP4: Southern Wetland (Flags E, F, A, G, H) Inflow=46.74 cfs 6.395 af
Primary=46.74 cfs 6.395 af

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 Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment 101: Subcat 101 Runoff Area=0.794 ac 0.00% Impervious Runoff Depth=4.95"
Flow Length=379' Tc=32.2 min CN=69 Runoff=2.52 cfs 0.328 af

Subcatchment 102: Subcat 102 Runoff Area=10.089 ac 0.76% Impervious Runoff Depth=5.92"
Flow Length=870' Tc=38.0 min CN=77 Runoff=35.07 cfs 4.977 af

Subcatchment 103: Subcat 103 Runoff Area=6.498 ac 0.21% Impervious Runoff Depth=5.92"
Flow Length=448' Tc=36.6 min UI Adjusted CN=77 Runoff=23.02 cfs 3.206 af

Subcatchment 104: Subcat 104 Runoff Area=2.650 ac 0.00% Impervious Runoff Depth=5.92"
Flow Length=295' Tc=21.3 min CN=77 Runoff=11.95 cfs 1.308 af

Subcatchment 105: Subcat 105 Runoff Area=7.357 ac 0.00% Impervious Runoff Depth=5.92"
Flow Length=341' Tc=30.6 min CN=77 Runoff=28.37 cfs 3.629 af

Subcatchment 106: Subcat 106 Runoff Area=0.946 ac 0.00% Impervious Runoff Depth=4.83"
Flow Length=100' Slope=0.0255 '/' Tc=19.1 min CN=68 Runoff=3.67 cfs 0.381 af

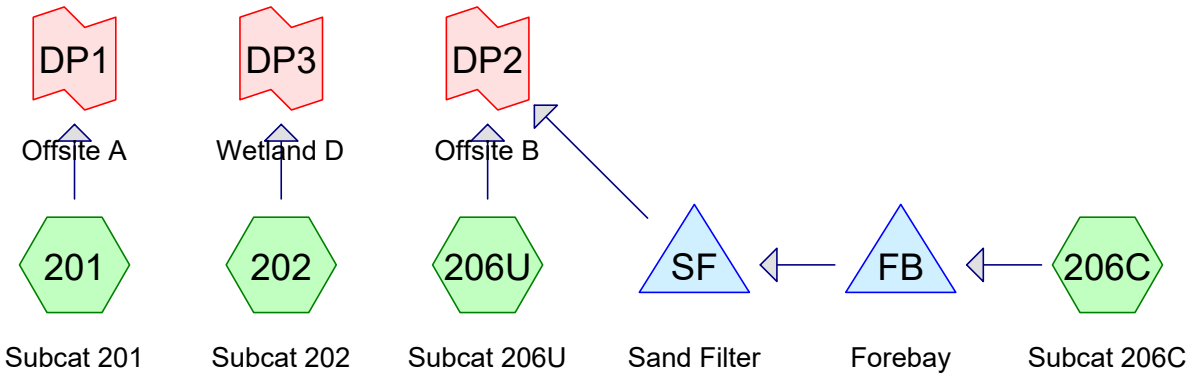
Subcatchment 107: Subcat 107 Runoff Area=23.785 ac 0.00% Impervious Runoff Depth=4.47"
Flow Length=1,133' Tc=32.7 min CN=65 Runoff=67.49 cfs 8.855 af

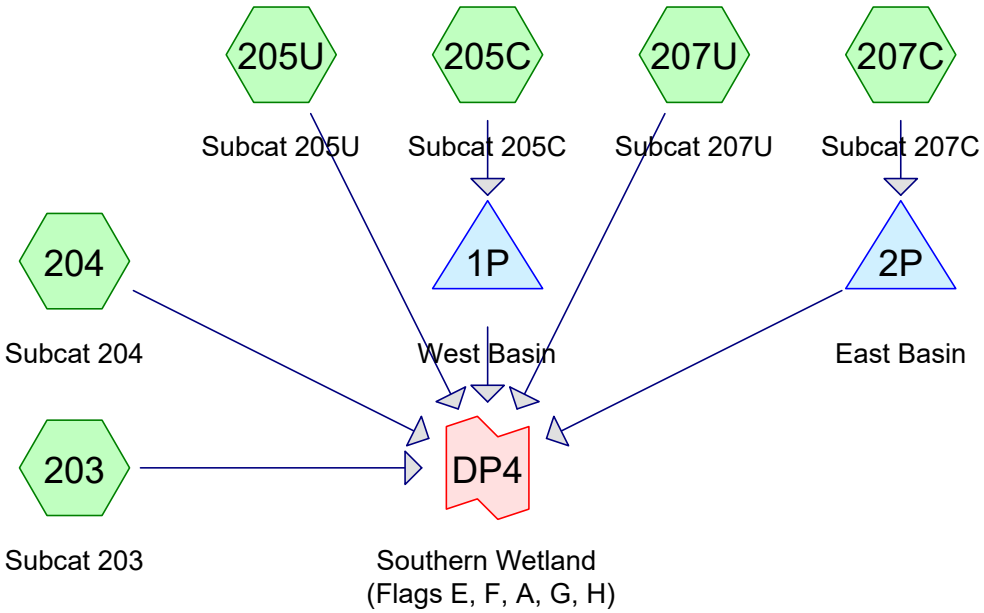
Link DP1: Offsite A Inflow=2.52 cfs 0.328 af
Primary=2.52 cfs 0.328 af

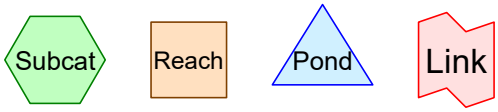
Link DP2: Offsite B Inflow=3.67 cfs 0.381 af
Primary=3.67 cfs 0.381 af

Link DP3: Wetland D Inflow=35.07 cfs 4.977 af
Primary=35.07 cfs 4.977 af

Link DP4: Southern Wetland (Flags E, F, A, G, H) Inflow=127.81 cfs 16.998 af
Primary=127.81 cfs 16.998 af







Routing Diagram for 500563 Moo Cow Proposed
Prepared by TRC Companies, Printed 4/15/2024

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	Type III 24-hr		Default	24.00	1	2.70	2

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 Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment201: Subcat 201 Runoff Area=0.794 ac 0.00% Impervious Runoff Depth=0.52"
Flow Length=379' Tc=32.2 min CN=69 Runoff=0.21 cfs 0.034 af

Subcatchment202: Subcat 202 Runoff Area=10.071 ac 0.00% Impervious Runoff Depth=0.87"
Flow Length=870' Tc=38.0 min CN=77 Runoff=4.89 cfs 0.729 af

Subcatchment203: Subcat 203 Runoff Area=6.498 ac 0.14% Impervious Runoff Depth=0.87"
Flow Length=448' Tc=36.6 min UI Adjusted CN=77 Runoff=3.21 cfs 0.470 af

Subcatchment204: Subcat 204 Runoff Area=2.650 ac 0.00% Impervious Runoff Depth=0.87"
Flow Length=295' Tc=21.3 min CN=77 Runoff=1.66 cfs 0.192 af

Subcatchment205C: Subcat 205C Runoff Area=1.711 ac 1.03% Impervious Runoff Depth=1.09"
Flow Length=224' Tc=16.0 min CN=81 Runoff=1.56 cfs 0.155 af

Subcatchment205U: Subcat 205U Runoff Area=5.302 ac 0.02% Impervious Runoff Depth=0.92"
Flow Length=283' Tc=29.4 min CN=78 Runoff=3.11 cfs 0.407 af

Subcatchment206C: Subcat 206C Runoff Area=0.489 ac 3.41% Impervious Runoff Depth=0.97"
Flow Length=185' Tc=15.3 min CN=79 Runoff=0.40 cfs 0.040 af

Subcatchment206U: Subcat 206U Runoff Area=0.847 ac 0.00% Impervious Runoff Depth=0.52"
Flow Length=128' Tc=24.2 min CN=69 Runoff=0.25 cfs 0.036 af

Subcatchment207C: Subcat 207C Runoff Area=6.941 ac 0.00% Impervious Runoff Depth=0.68"
Flow Length=761' Tc=17.8 min CN=73 Runoff=3.41 cfs 0.393 af

Subcatchment207U: Subcat 207U Runoff Area=16.815 ac 0.00% Impervious Runoff Depth=0.38"
Flow Length=1,133' Tc=32.9 min CN=65 Runoff=2.75 cfs 0.527 af

Pond 1P: West Basin Peak Elev=575.10' Storage=1,180 cf Inflow=1.56 cfs 0.155 af
Discarded=0.63 cfs 0.155 af Primary=0.00 cfs 0.000 af Outflow=0.63 cfs 0.155 af

Pond 2P: East Basin Peak Elev=552.43' Storage=8,890 cf Inflow=3.41 cfs 0.393 af
Discarded=0.26 cfs 0.393 af Primary=0.00 cfs 0.000 af Outflow=0.26 cfs 0.393 af

Pond FB: Forebay Peak Elev=574.54' Storage=203 cf Inflow=0.40 cfs 0.040 af
Outflow=0.42 cfs 0.035 af

Pond SF: Sand Filter Peak Elev=573.34' Storage=566 cf Inflow=0.42 cfs 0.035 af
Discarded=0.05 cfs 0.035 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.035 af

Link DP1: Offsite A Inflow=0.21 cfs 0.034 af
Primary=0.21 cfs 0.034 af

Link DP2: Offsite B Inflow=0.25 cfs 0.036 af
Primary=0.25 cfs 0.036 af

Link DP3: Wetland D Inflow=4.89 cfs 0.729 af
Primary=4.89 cfs 0.729 af

Link DP4: Southern Wetland (Flags E, F, A, G, H) Inflow=10.10 cfs 1.596 af
Primary=10.10 cfs 1.596 af

Total Runoff Area = 52.119 ac Runoff Volume = 2.983 af Average Runoff Depth = 0.69"
99.92% Pervious = 52.075 ac 0.08% Impervious = 0.044 ac

Summary for Subcatchment 201: Subcat 201

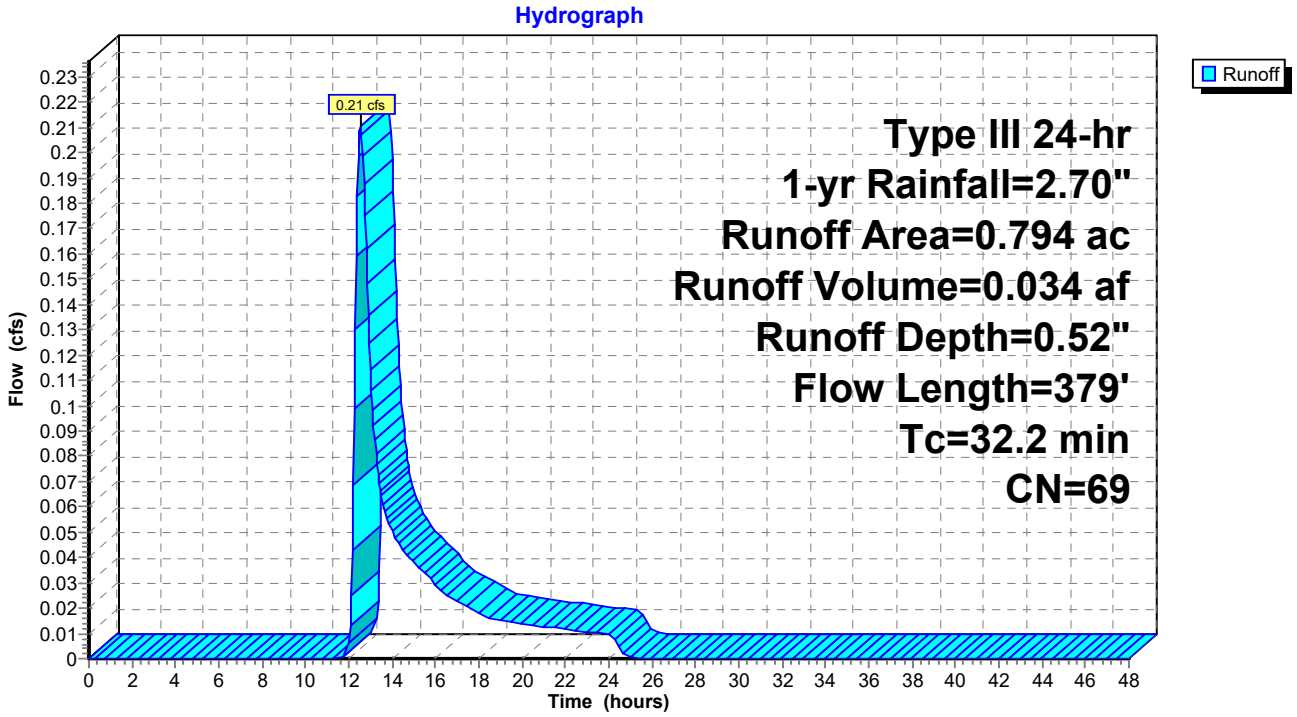
Runoff = 0.21 cfs @ 12.55 hrs, Volume= 0.034 af, Depth= 0.52"
Routed to Link DP1 : Offsite A

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 1-yr Rainfall=2.70"

Area (ac)	CN	Description
0.273	55	Woods, Good, HSG B
0.521	77	Woods, Good, HSG D
0.794	69	Weighted Average
0.794		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.0	100	0.0108	0.06		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.32"
5.2	279	0.0314	0.89		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
32.2	379	Total			

Subcatchment 201: Subcat 201



Summary for Subcatchment 202: Subcat 202

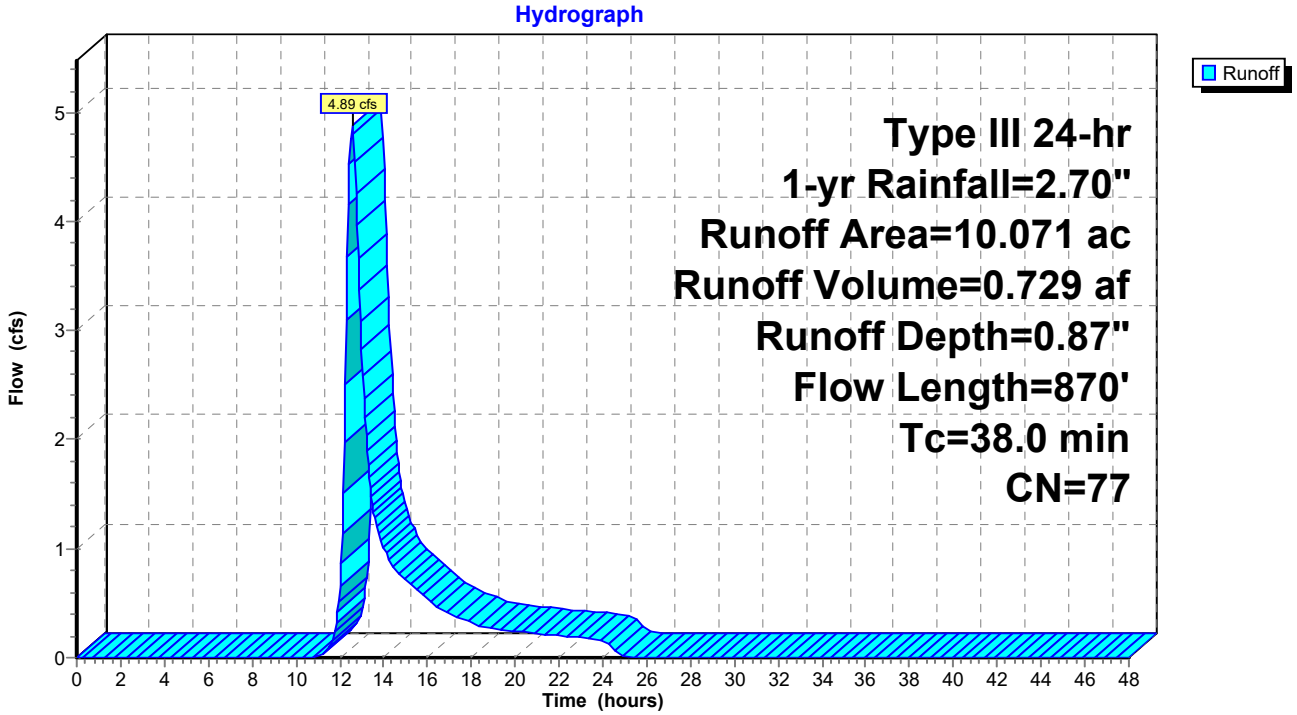
Runoff = 4.89 cfs @ 12.57 hrs, Volume= 0.729 af, Depth= 0.87"
Routed to Link DP3 : Wetland D

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 1-yr Rainfall=2.70"

Area (ac)	CN	Description
0.929	80	>75% Grass cover, Good, HSG D
0.524	96	Gravel surface, HSG D
0.413	55	Woods, Good, HSG B
8.206	77	Woods, Good, HSG D
10.071	77	Weighted Average
10.071		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	100	0.0246	0.09		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.32"
18.6	770	0.0190	0.69		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
38.0	870	Total			

Subcatchment 202: Subcat 202



Summary for Subcatchment 203: Subcat 203

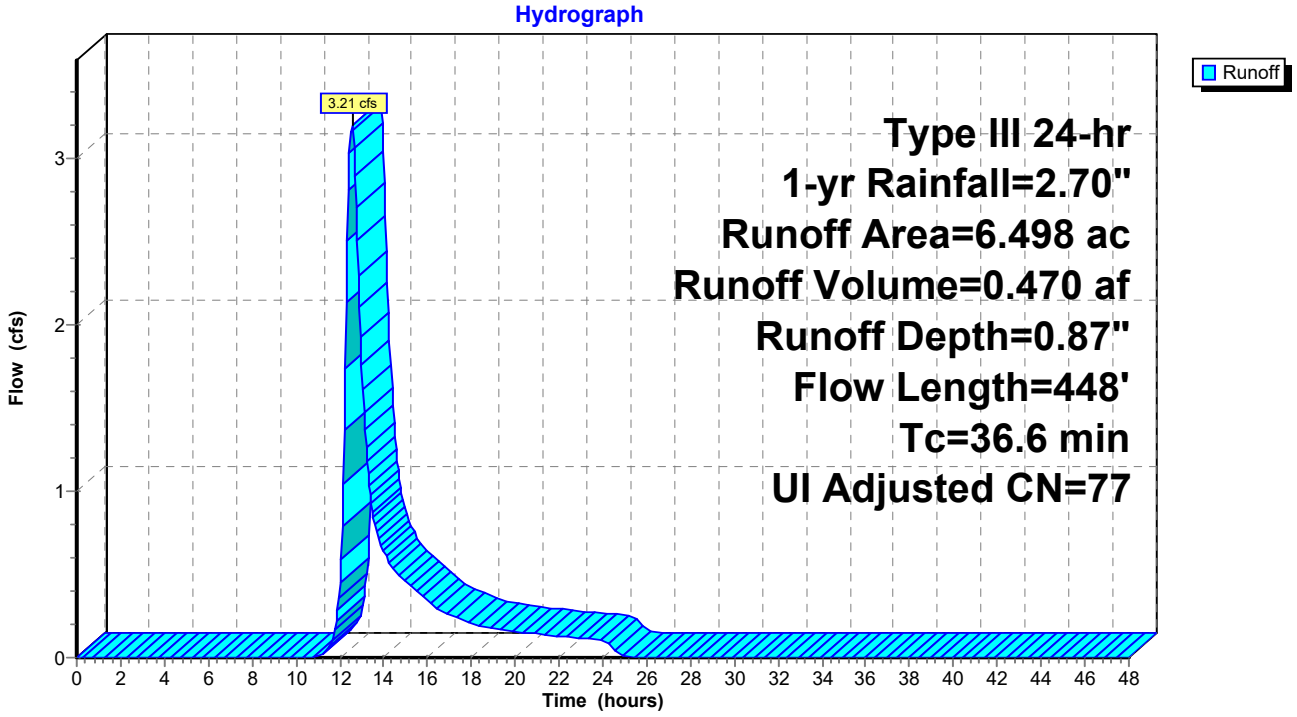
Runoff = 3.21 cfs @ 12.55 hrs, Volume= 0.470 af, Depth= 0.87"
Routed to Link DP4 : Southern Wetland (Flags E, F, A, G, H)

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 1-yr Rainfall=2.70"

Area (ac)	CN	Adj	Description
0.302	80		>75% Grass cover, Good, HSG D
0.118	96		Gravel surface, HSG D
0.009	98		Unconnected pavement, HSG D
6.069	77		Woods, Good, HSG D
6.498	78	77	Weighted Average, UI Adjusted
6.489			99.86% Pervious Area
0.009			0.14% Impervious Area
0.009			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.8	100	0.0100	0.06		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.32"
8.8	348	0.0172	0.66		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
36.6	448	Total			

Subcatchment 203: Subcat 203



Summary for Subcatchment 204: Subcat 204

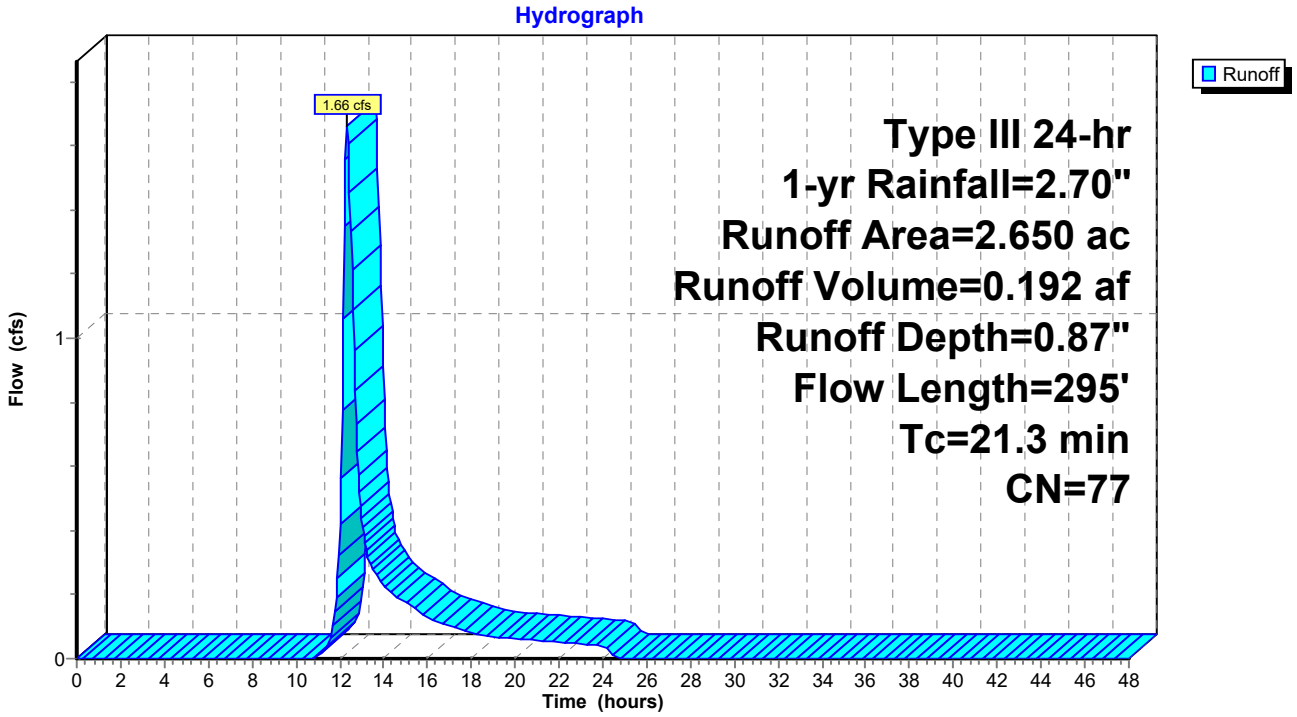
Runoff = 1.66 cfs @ 12.32 hrs, Volume= 0.192 af, Depth= 0.87"
Routed to Link DP4 : Southern Wetland (Flags E, F, A, G, H)

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 1-yr Rainfall=2.70"

Area (ac)	CN	Description
0.007	96	Gravel surface, HSG D
2.643	77	Woods, Good, HSG D
2.650	77	Weighted Average
2.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	100	0.0350	0.10		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.32"
4.4	195	0.0219	0.74		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
21.3	295	Total			

Subcatchment 204: Subcat 204



Summary for Subcatchment 205C: Subcat 205C

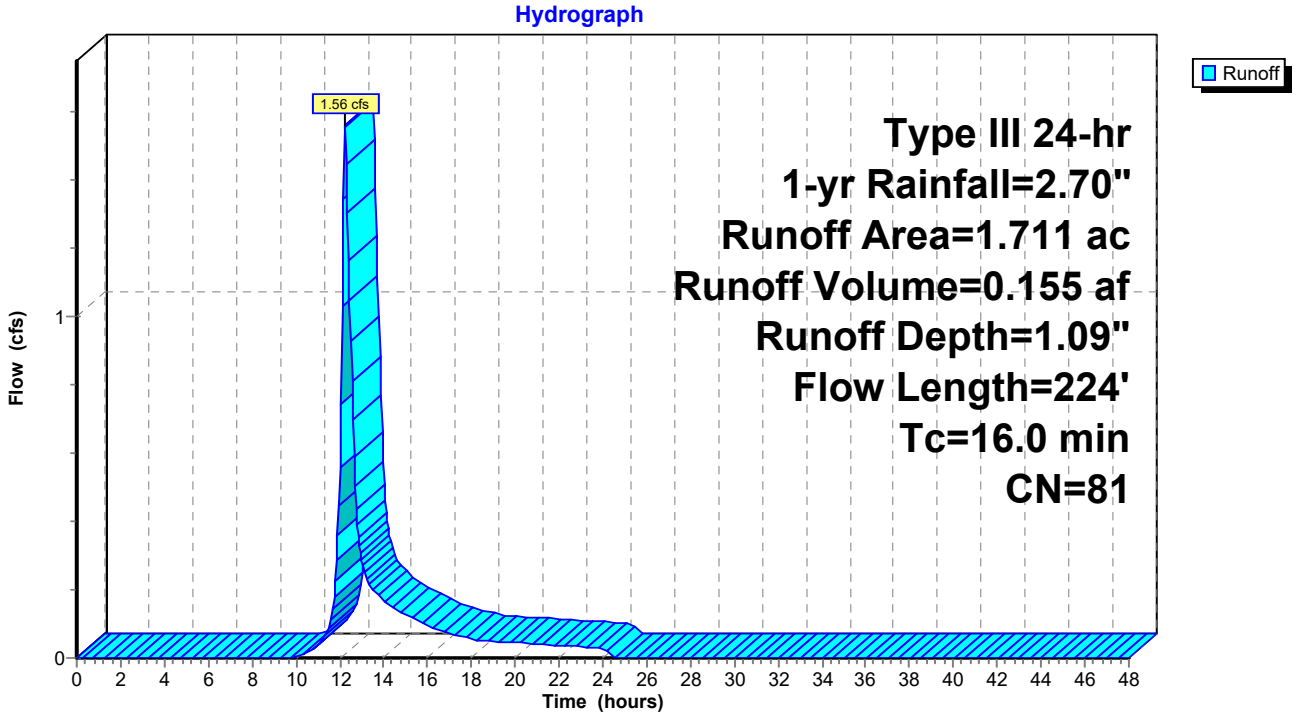
Runoff = 1.56 cfs @ 12.23 hrs, Volume= 0.155 af, Depth= 1.09"
Routed to Pond 1P : West Basin

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 1-yr Rainfall=2.70"

Area (ac)	CN	Description
1.647	80	>75% Grass cover, Good, HSG D
0.047	96	Gravel surface, HSG D
0.018	98	Unconnected pavement, HSG D
1.711	81	Weighted Average
1.694		98.97% Pervious Area
0.018		1.03% Impervious Area
0.018		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	100	0.0100	0.13		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.32"
3.3	124	0.0080	0.63		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
16.0	224	Total			

Subcatchment 205C: Subcat 205C



Summary for Subcatchment 205U: Subcat 205U

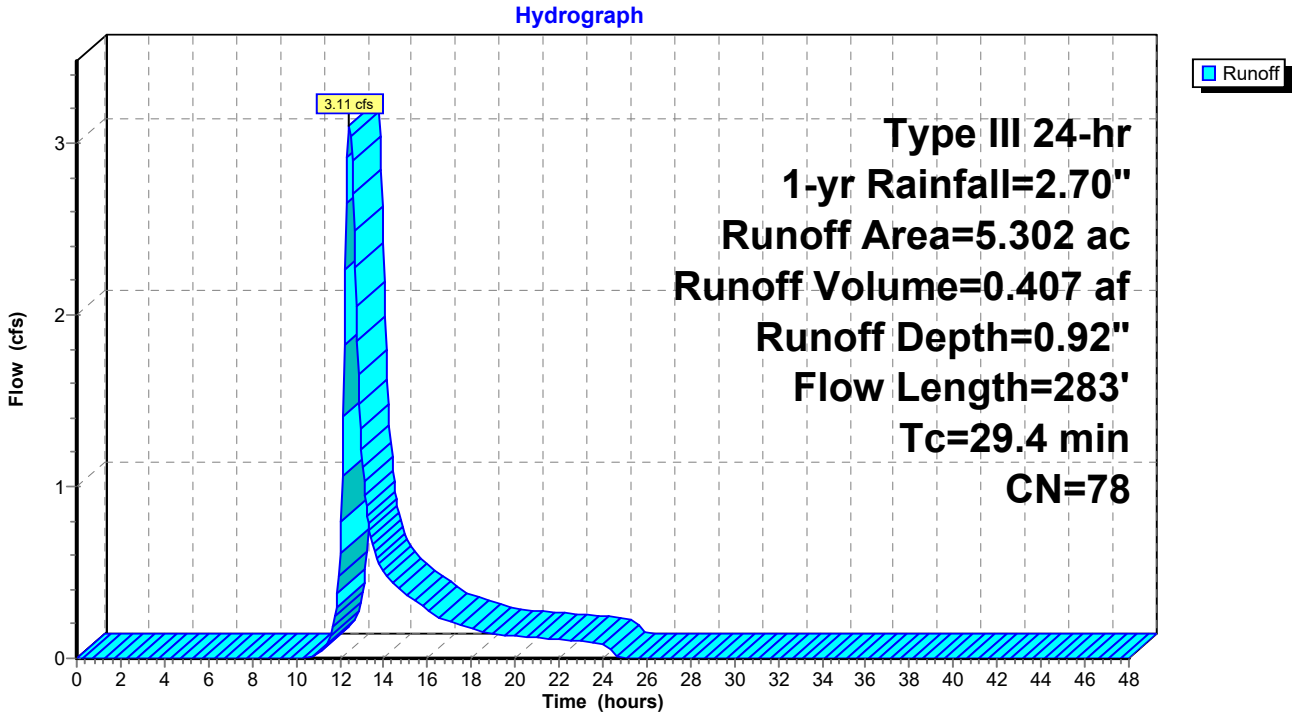
Runoff = 3.11 cfs @ 12.44 hrs, Volume= 0.407 af, Depth= 0.92"
Routed to Link DP4 : Southern Wetland (Flags E, F, A, G, H)

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 1-yr Rainfall=2.70"

Area (ac)	CN	Description
0.898	80	>75% Grass cover, Good, HSG D
0.113	96	Gravel surface, HSG D
0.001	98	Unconnected pavement, HSG D
4.290	77	Woods, Good, HSG D
5.302	78	Weighted Average
5.301		99.98% Pervious Area
0.001		0.02% Impervious Area
0.001		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.8	100	0.0234	0.08		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.32"
2.8	99	0.0137	0.59		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
0.6	25	0.0020	0.72		**Shallow Concentrated Flow, road** Unpaved Kv= 16.1 fps
6.2	59	0.0010	0.16		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
29.4	283	Total			

Subcatchment 205U: Subcat 205U



Summary for Subcatchment 206C: Subcat 206C

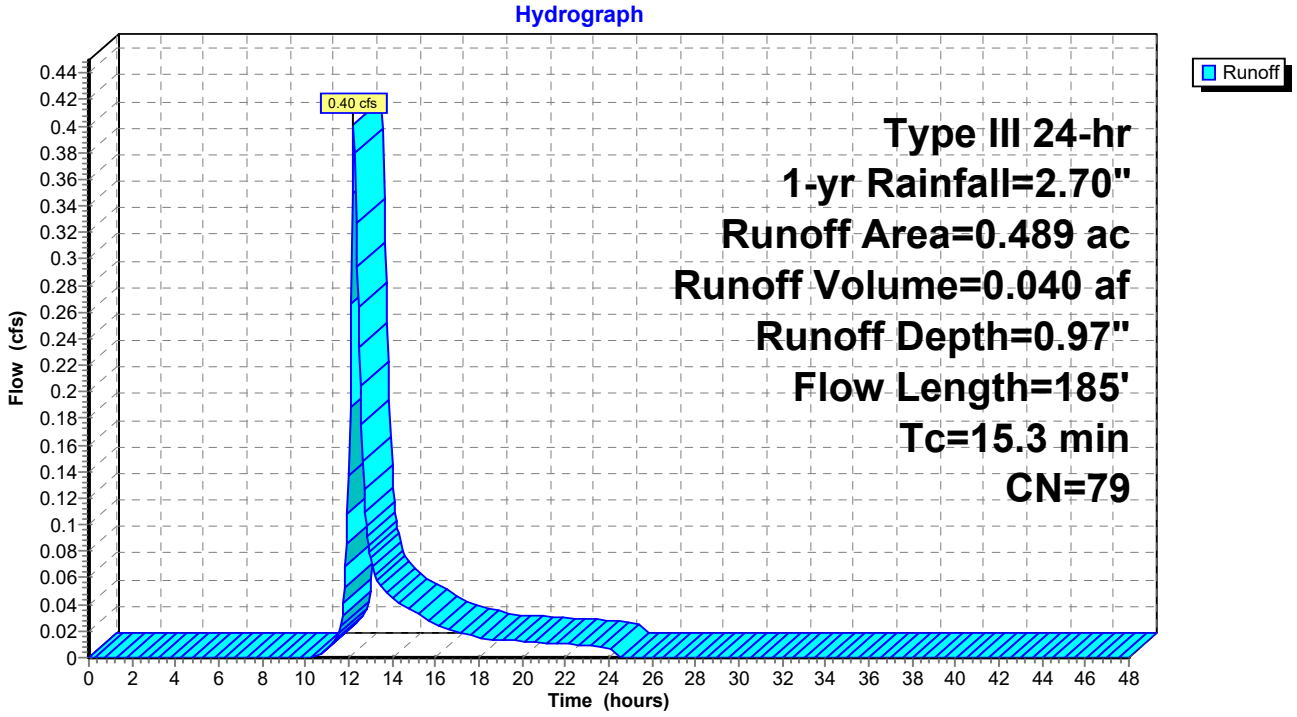
Runoff = 0.40 cfs @ 12.22 hrs, Volume= 0.040 af, Depth= 0.97"
Routed to Pond FB : Forebay

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 1-yr Rainfall=2.70"

Area (ac)	CN	Description
0.030	61	>75% Grass cover, Good, HSG B
0.442	80	>75% Grass cover, Good, HSG D
0.017	98	Unconnected pavement, HSG D
0.000	77	Woods, Good, HSG D
0.489	79	Weighted Average
0.473		96.59% Pervious Area
0.017		3.41% Impervious Area
0.017		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	100	0.0100	0.13		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.32"
2.6	85	0.0060	0.54		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
15.3	185	Total			

Subcatchment 206C: Subcat 206C



Summary for Subcatchment 206U: Subcat 206U

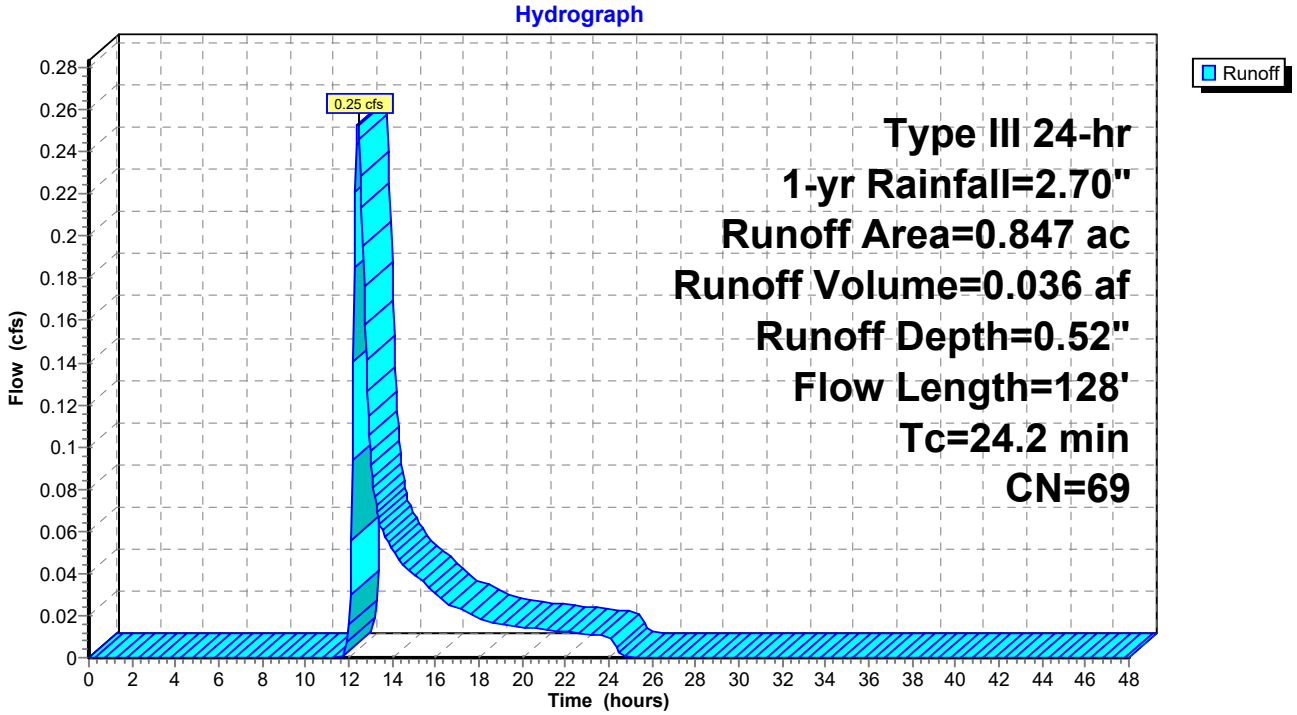
Runoff = 0.25 cfs @ 12.42 hrs, Volume= 0.036 af, Depth= 0.52"
Routed to Link DP2 : Offsite B

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 1-yr Rainfall=2.70"

Area (ac)	CN	Description
0.148	61	>75% Grass cover, Good, HSG B
0.203	80	>75% Grass cover, Good, HSG D
0.211	55	Woods, Good, HSG B
0.286	77	Woods, Good, HSG D
0.847	69	Weighted Average
0.847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.6	100	0.0151	0.07		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.32"
0.6	28	0.0271	0.82		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
24.2	128	Total			

Subcatchment 206U: Subcat 206U



Summary for Subcatchment 207C: Subcat 207C

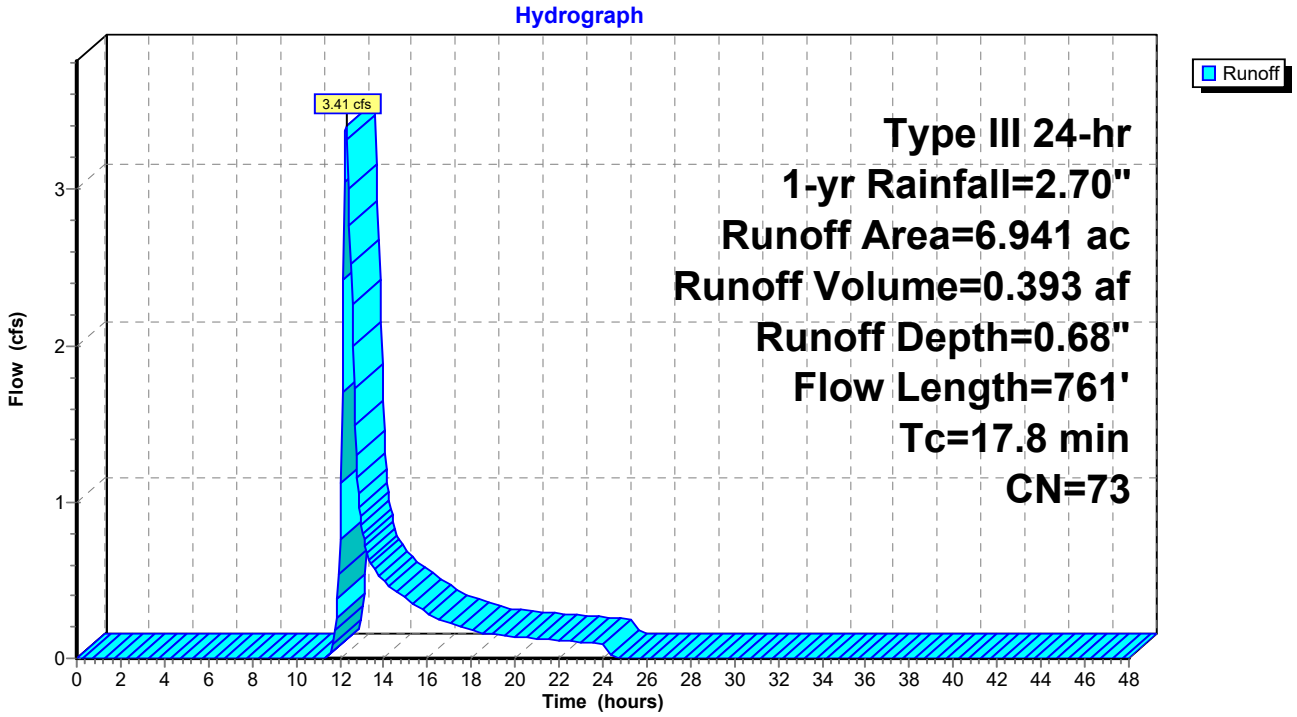
Runoff = 3.41 cfs @ 12.28 hrs, Volume= 0.393 af, Depth= 0.68"
Routed to Pond 2P : East Basin

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 1-yr Rainfall=2.70"

Area (ac)	CN	Description
2.237	61	>75% Grass cover, Good, HSG B
3.971	80	>75% Grass cover, Good, HSG D
0.210	96	Gravel surface, HSG B
0.127	96	Gravel surface, HSG D
0.396	55	Woods, Good, HSG B
6.941	73	Weighted Average
6.941		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	100	0.0244	0.19		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.32"
3.7	253	0.0259	1.13		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	22	0.0200	2.28		**Shallow Concentrated Flow, road** Unpaved Kv= 16.1 fps
5.0	386	0.0340	1.29		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
17.8	761	Total			

Subcatchment 207C: Subcat 207C



Summary for Subcatchment 207U: Subcat 207U

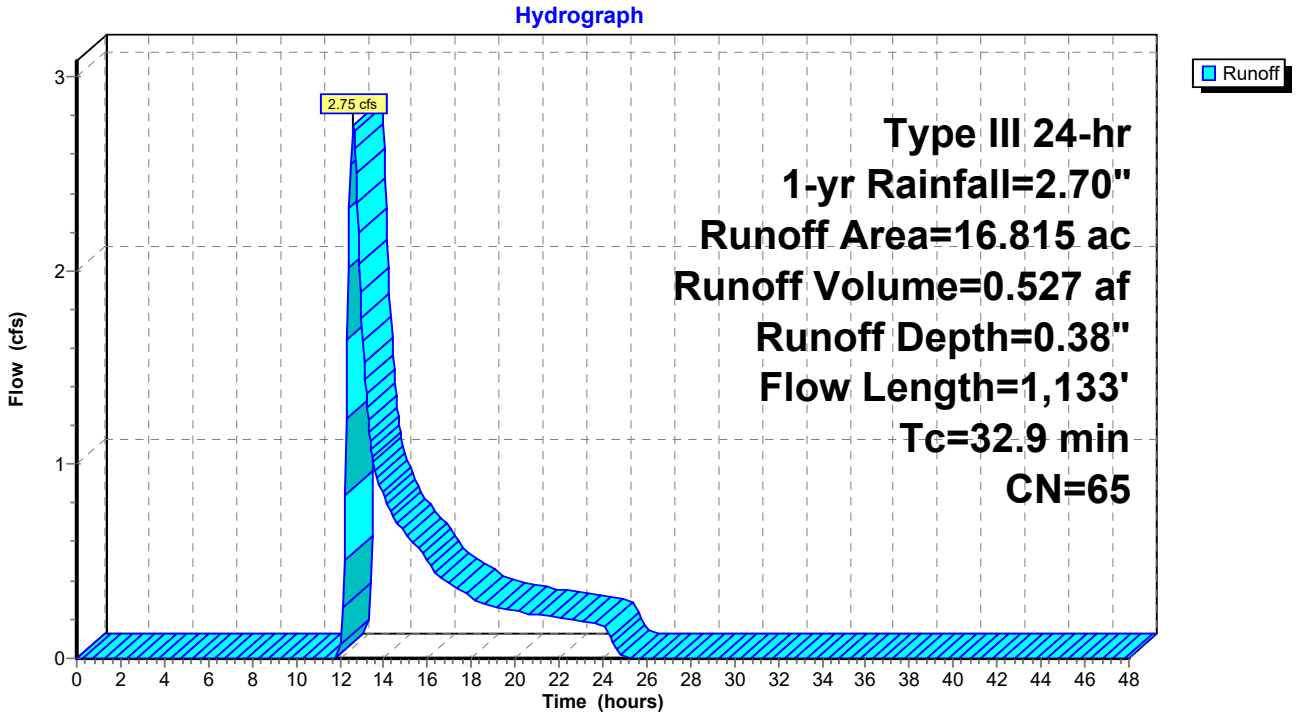
Runoff = 2.75 cfs @ 12.61 hrs, Volume= 0.527 af, Depth= 0.38"
Routed to Link DP4 : Southern Wetland (Flags E, F, A, G, H)

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 1-yr Rainfall=2.70"

Area (ac)	CN	Description
0.838	61	>75% Grass cover, Good, HSG B
2.238	80	>75% Grass cover, Good, HSG D
9.014	55	Woods, Good, HSG B
4.726	77	Woods, Good, HSG D
16.815	65	Weighted Average
16.815		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0318	0.10		**Sheet Flow, woods** Woods: Light underbrush n= 0.400 P2= 3.32"
6.8	303	0.0223	0.75		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
2.7	280	0.0624	1.75		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
5.9	450	0.0654	1.28		**Shallow Concentrated Flow, woods** Woodland Kv= 5.0 fps
32.9	1,133	Total			

Subcatchment 207U: Subcat 207U



Summary for Pond 1P: West Basin

Inflow Area = 1.711 ac, 1.03% Impervious, Inflow Depth = 1.09" for 1-yr event
Inflow = 1.56 cfs @ 12.23 hrs, Volume= 0.155 af
Outflow = 0.63 cfs @ 12.63 hrs, Volume= 0.155 af, Atten= 59%, Lag= 23.9 min
Discarded = 0.63 cfs @ 12.63 hrs, Volume= 0.155 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP4 : Southern Wetland (Flags E, F, A, G, H)

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 575.10' @ 12.63 hrs Surf.Area= 11,351 sf Storage= 1,180 cf

Plug-Flow detention time= 11.2 min calculated for 0.155 af (100% of inflow)
Center-of-Mass det. time= 11.2 min (868.9 - 857.7)

Volume	Invert	Avail.Storage	Storage Description
#1	575.00'	11,954 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

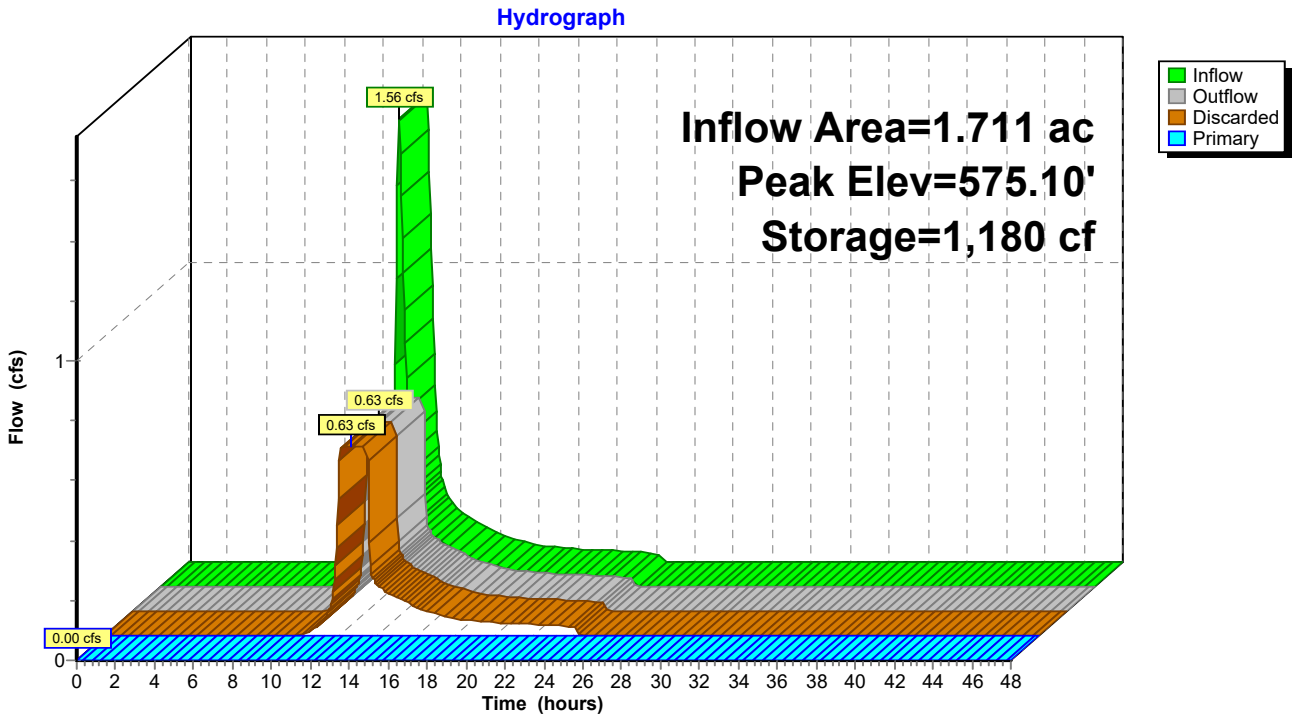
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
575.00	11,195	0	0	11,195
576.00	12,730	11,954	11,954	12,778

Device	Routing	Invert	Outlet Devices
#1	Discarded	575.00'	**2.410 in/hr Exfiltration over Surface area above 568.19'** Excluded Surface area = 0 sf
#2	Primary	575.50'	**50.0' long + 3.0 '/' SideZ 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=0.63 cfs @ 12.63 hrs HW=575.10' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.63 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=575.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: West Basin



Summary for Pond 2P: East Basin

Inflow Area = 6.941 ac, 0.00% Impervious, Inflow Depth = 0.68" for 1-yr event
Inflow = 3.41 cfs @ 12.28 hrs, Volume= 0.393 af
Outflow = 0.26 cfs @ 16.30 hrs, Volume= 0.393 af, Atten= 92%, Lag= 241.2 min
Discarded = 0.26 cfs @ 16.30 hrs, Volume= 0.393 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP4 : Southern Wetland (Flags E, F, A, G, H)

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 552.43' @ 16.30 hrs Surf.Area= 21,441 sf Storage= 8,890 cf
Flood Elev= 555.00' Surf.Area= 29,000 sf Storage= 73,563 cf

Plug-Flow detention time= 388.6 min calculated for 0.392 af (100% of inflow)
Center-of-Mass det. time= 388.7 min (1,277.1 - 888.4)

Volume	Invert	Avail.Storage	Storage Description
#1	552.00'	73,563 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

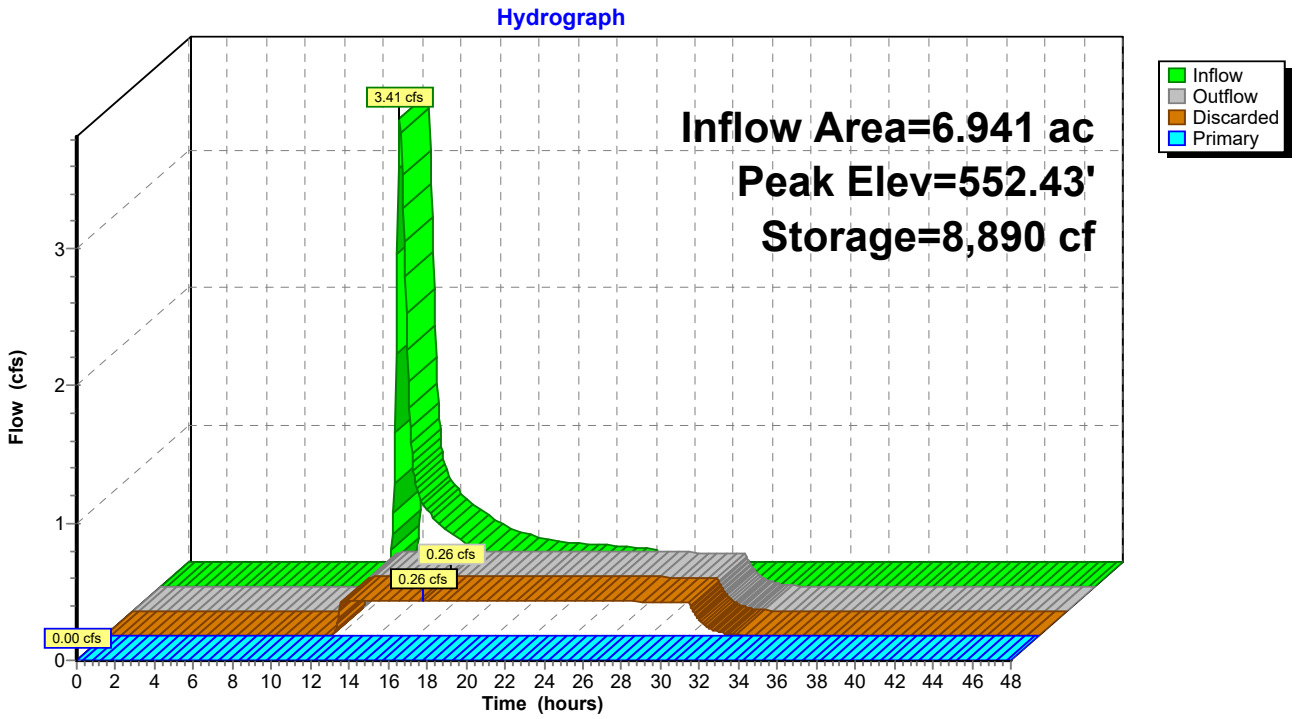
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
552.00	20,300	0	0	20,300
555.00	29,000	73,563	73,563	29,158

Device	Routing	Invert	Outlet Devices
#1	Primary	554.00'	**20.0' long + 3.0 '/' SideZ 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
#2	Discarded	552.00'	**0.520 in/hr Exfiltration over Surface area above 546.66'** Excluded Surface area = 0 sf

Discarded OutFlow Max=0.26 cfs @ 16.30 hrs HW=552.43' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=552.00' (Free Discharge)
↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: East Basin



Summary for Pond FB: Forebay

Inflow Area = 0.489 ac, 3.41% Impervious, Inflow Depth = 0.97" for 1-yr event
Inflow = 0.40 cfs @ 12.22 hrs, Volume= 0.040 af
Outflow = 0.42 cfs @ 12.25 hrs, Volume= 0.035 af, Atten= 0%, Lag= 1.7 min
Primary = 0.42 cfs @ 12.25 hrs, Volume= 0.035 af
Routed to Pond SF : Sand Filter

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 574.54' @ 12.25 hrs Surf.Area= 431 sf Storage= 203 cf
Flood Elev= 574.00' Surf.Area= 319 sf Storage= 0 cf

Plug-Flow detention time= 70.8 min calculated for 0.035 af (89% of inflow)
Center-of-Mass det. time= 19.8 min (883.8 - 864.1)

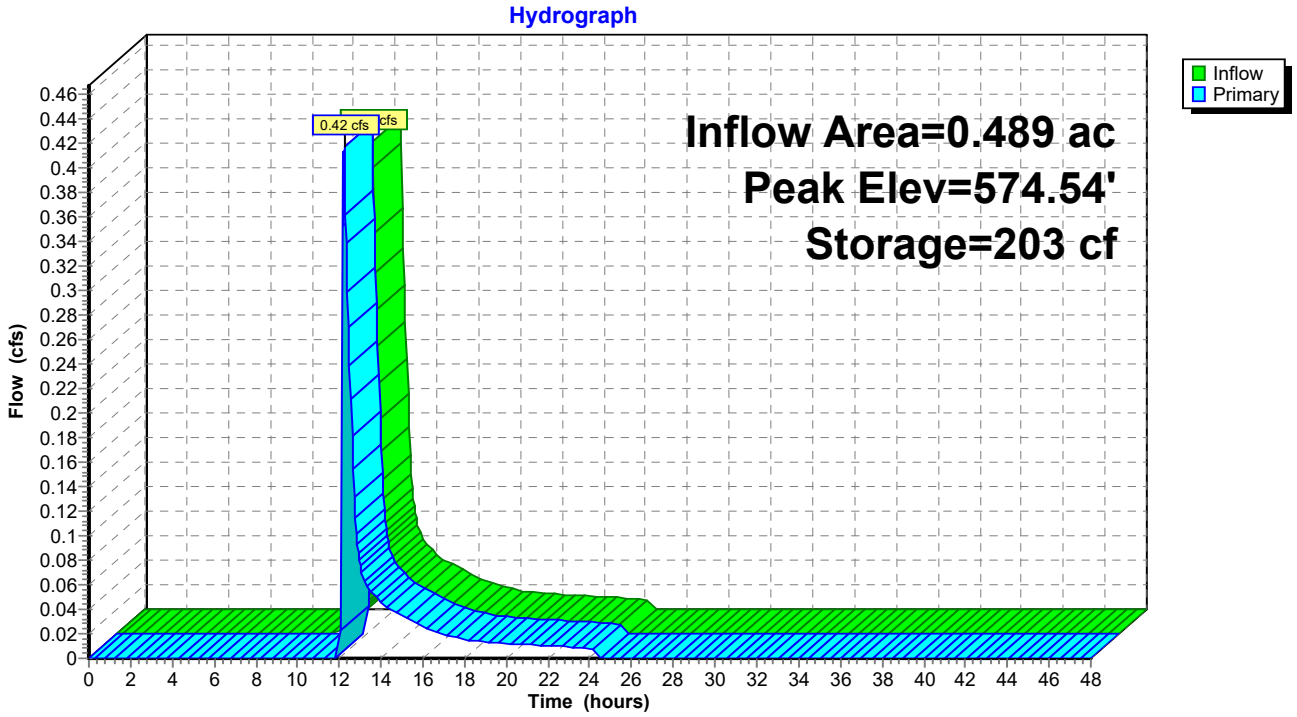
Volume	Invert	Avail.Storage	Storage Description
#1	574.00'	424 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
574.00	319	0	0	319
575.00	539	424	424	551

Device	Routing	Invert	Outlet Devices
#1	Primary	574.50'	**14.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.41 cfs @ 12.25 hrs HW=574.54' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 0.41 cfs @ 0.68 fps)

Pond FB: Forebay



Summary for Pond SF: Sand Filter

Inflow Area = 0.489 ac, 3.41% Impervious, Inflow Depth = 0.87" for 1-yr event
Inflow = 0.42 cfs @ 12.25 hrs, Volume= 0.035 af
Outflow = 0.05 cfs @ 13.66 hrs, Volume= 0.035 af, Atten= 88%, Lag= 84.6 min
Discarded = 0.05 cfs @ 13.66 hrs, Volume= 0.035 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP2 : Offsite B

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 573.34' @ 13.66 hrs Surf.Area= 2,018 sf Storage= 566 cf
Flood Elev= 575.00' Surf.Area= 3,113 sf Storage= 3,565 cf

Plug-Flow detention time= 110.1 min calculated for 0.035 af (100% of inflow)
Center-of-Mass det. time= 110.0 min (993.9 - 883.8)

Volume	Invert	Avail.Storage	Storage Description
#1	572.49'	7,238 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

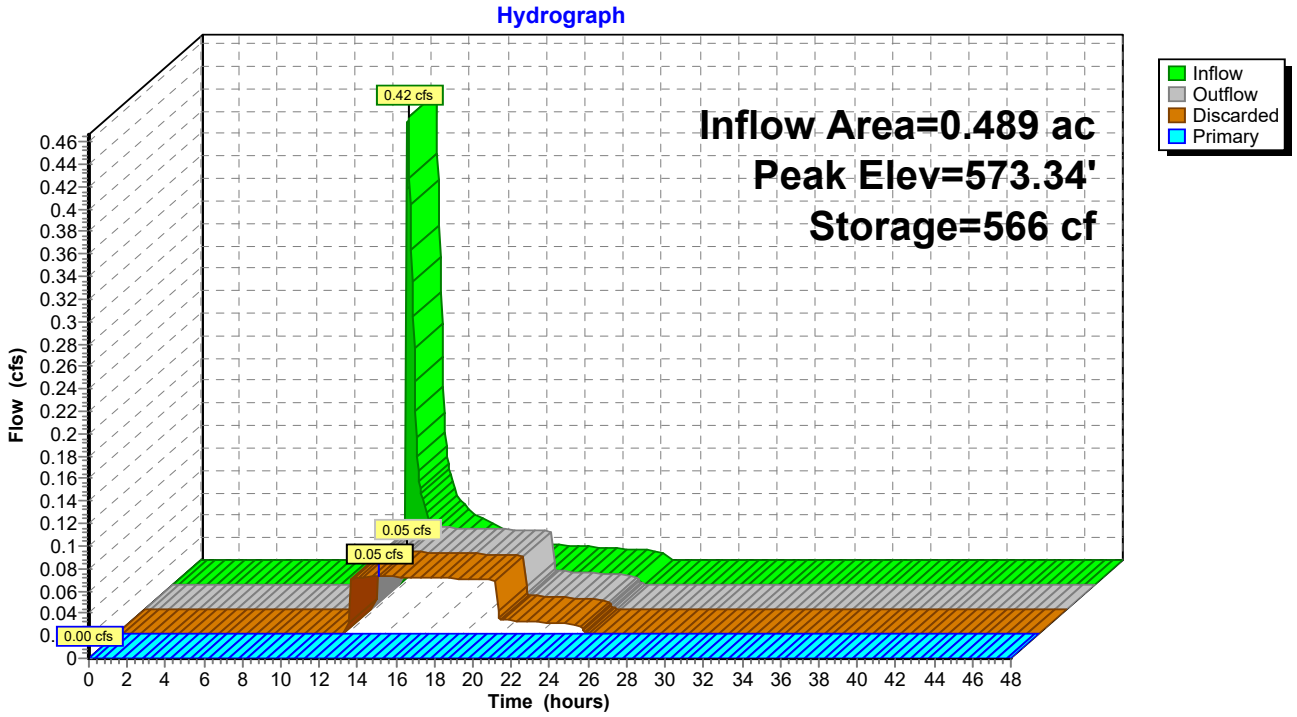
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
572.49	2,018	0.0	0	0	2,018
572.50	2,018	33.0	7	7	2,020
573.99	2,018	33.0	992	999	2,257
574.00	2,018	100.0	20	1,019	2,258
575.00	3,113	100.0	2,546	3,565	3,368
576.00	4,264	100.0	3,673	7,238	4,539

Device	Routing	Invert	Outlet Devices
#1	Discarded	572.49'	**1.020 in/hr Exfiltration over Wetted area above 571.00'** Excluded Wetted area = 0 sf
#2	Primary	575.50'	**135.0 deg x 10.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.48 (C= 3.10)

Discarded OutFlow Max=0.05 cfs @ 13.66 hrs HW=573.34' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=572.49' (Free Discharge)
↑—**2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond SF: Sand Filter

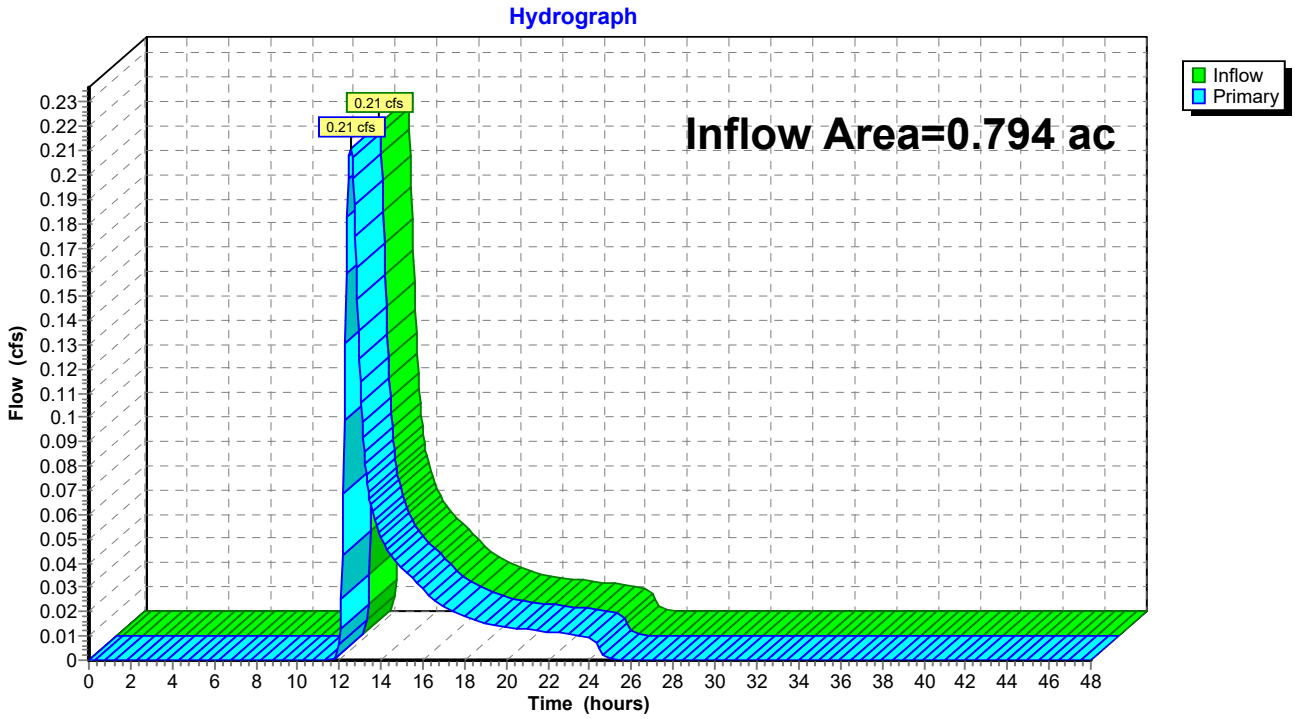


Summary for Link DP1: Offsite A

Inflow Area = 0.794 ac, 0.00% Impervious, Inflow Depth = 0.52" for 1-yr event
Inflow = 0.21 cfs @ 12.55 hrs, Volume= 0.034 af
Primary = 0.21 cfs @ 12.55 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP1: Offsite A

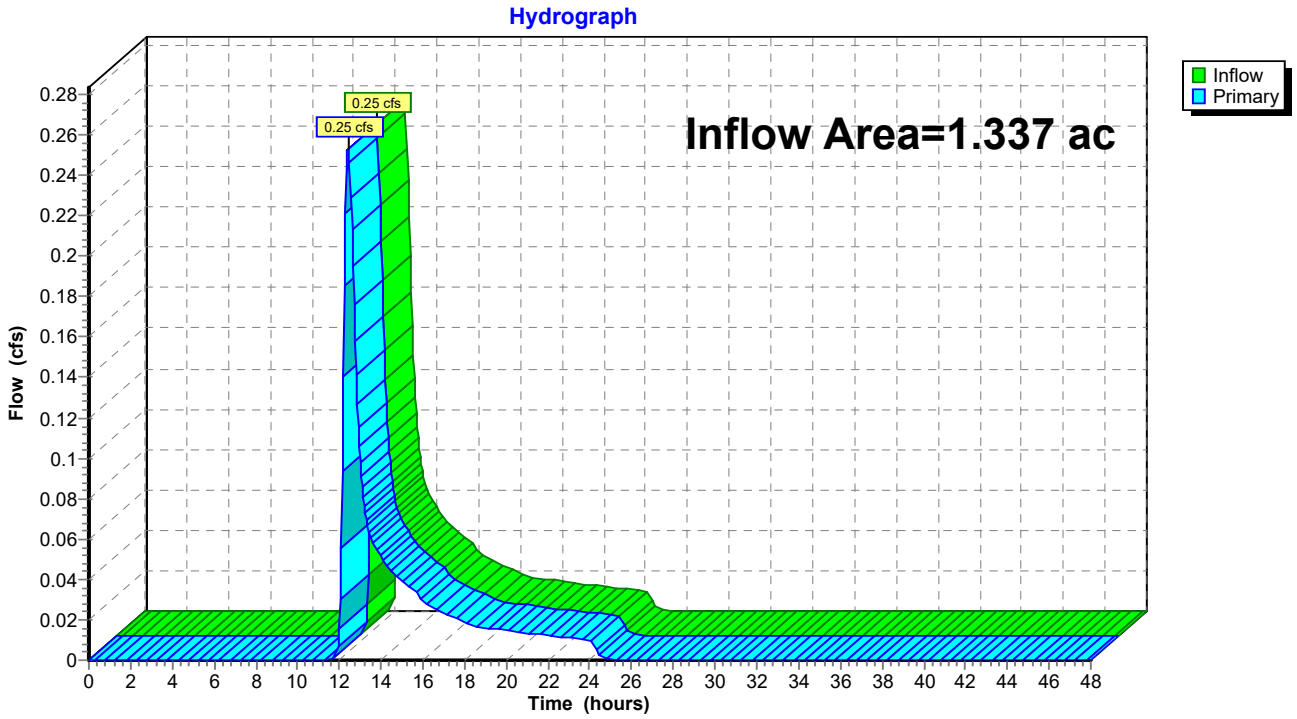


Summary for Link DP2: Offsite B

Inflow Area = 1.337 ac, 1.25% Impervious, Inflow Depth = 0.33" for 1-yr event
Inflow = 0.25 cfs @ 12.42 hrs, Volume= 0.036 af
Primary = 0.25 cfs @ 12.42 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP2: Offsite B

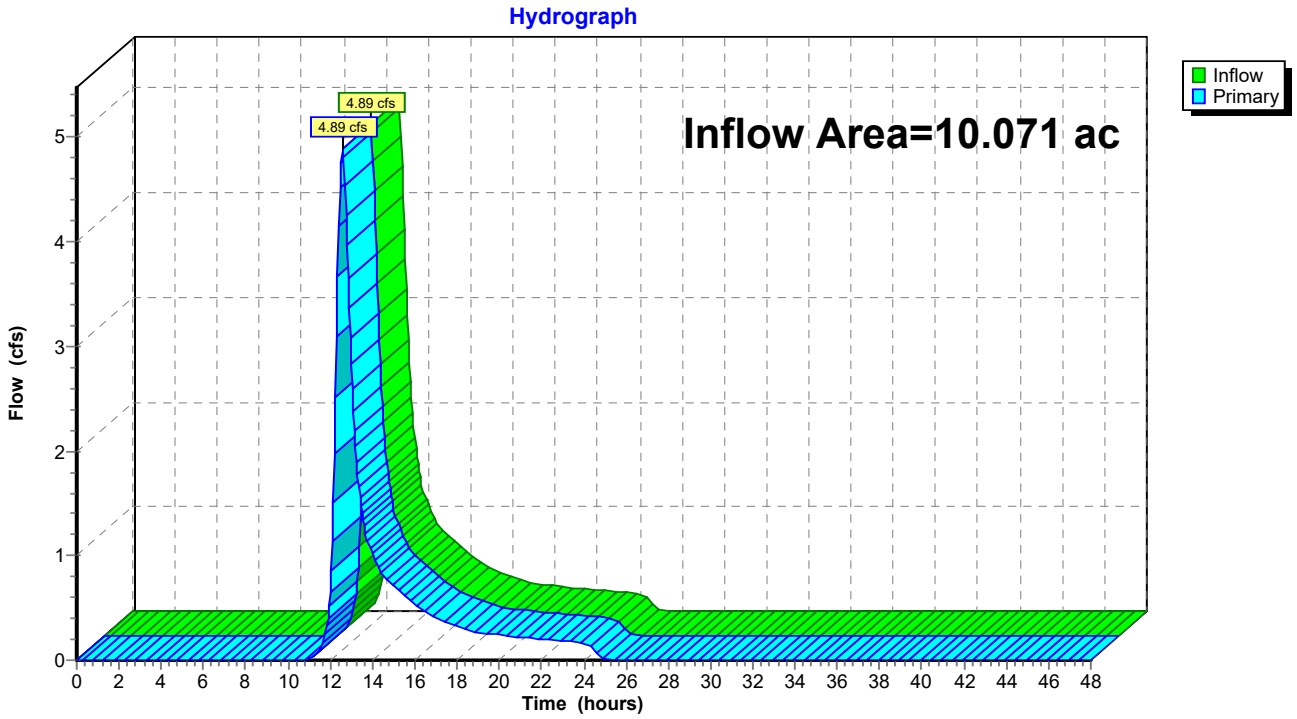


Summary for Link DP3: Wetland D

Inflow Area = 10.071 ac, 0.00% Impervious, Inflow Depth = 0.87" for 1-yr event
Inflow = 4.89 cfs @ 12.57 hrs, Volume= 0.729 af
Primary = 4.89 cfs @ 12.57 hrs, Volume= 0.729 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP3: Wetland D

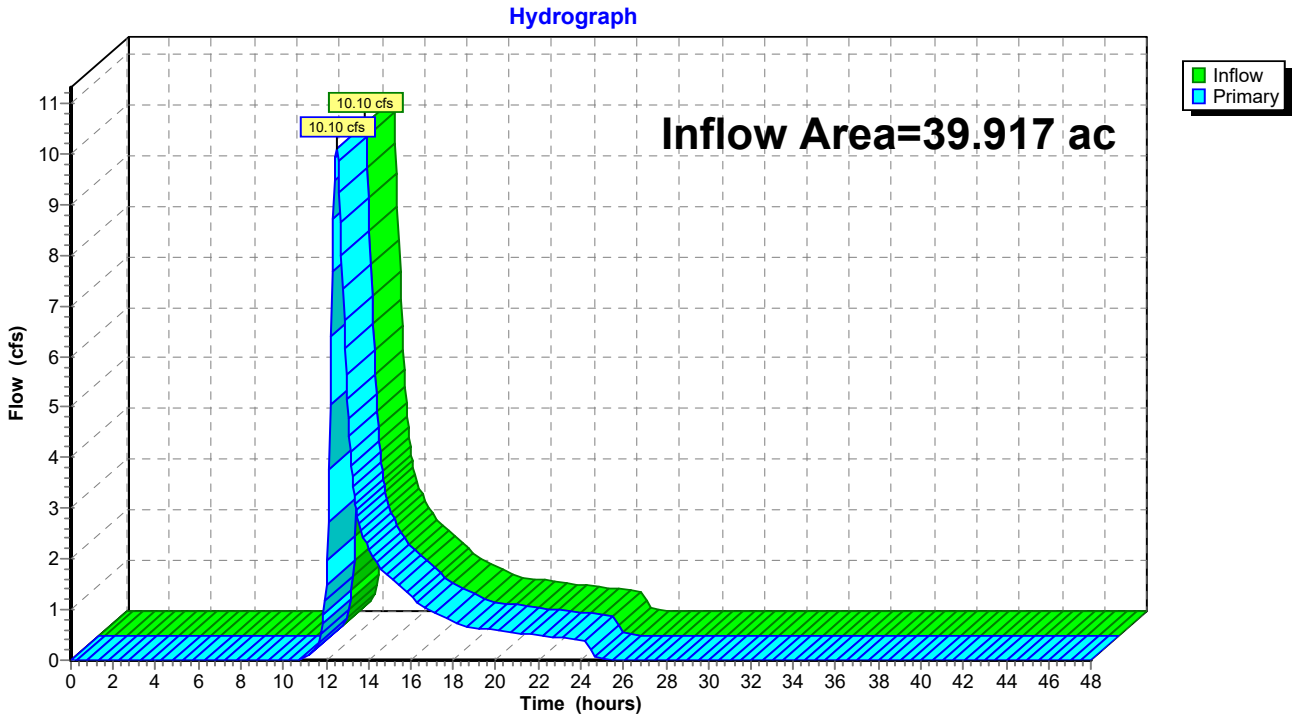


Summary for Link DP4: Southern Wetland (Flags E, F, A, G, H)

Inflow Area = 39.917 ac, 0.07% Impervious, Inflow Depth = 0.48" for 1-yr event
Inflow = 10.10 cfs @ 12.51 hrs, Volume= 1.596 af
Primary = 10.10 cfs @ 12.51 hrs, Volume= 1.596 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link DP4: Southern Wetland (Flags E, F, A, G, H)



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 Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment201: Subcat 201 Runoff Area=0.794 ac 0.00% Impervious Runoff Depth=0.02"
Flow Length=379' Tc=32.2 min CN=69 Runoff=0.00 cfs 0.001 af

Subcatchment202: Subcat 202 Runoff Area=10.071 ac 0.00% Impervious Runoff Depth=0.10"
Flow Length=870' Tc=38.0 min CN=77 Runoff=0.29 cfs 0.085 af

Subcatchment203: Subcat 203 Runoff Area=6.498 ac 0.14% Impervious Runoff Depth=0.10"
Flow Length=448' Tc=36.6 min UI Adjusted CN=77 Runoff=0.19 cfs 0.055 af

Subcatchment204: Subcat 204 Runoff Area=2.650 ac 0.00% Impervious Runoff Depth=0.10"
Flow Length=295' Tc=21.3 min CN=77 Runoff=0.10 cfs 0.022 af

Subcatchment205C: Subcat 205C Runoff Area=1.711 ac 1.03% Impervious Runoff Depth=0.17"
Flow Length=224' Tc=16.0 min CN=81 Runoff=0.17 cfs 0.025 af

Subcatchment205U: Subcat 205U Runoff Area=5.302 ac 0.02% Impervious Runoff Depth=0.12"
Flow Length=283' Tc=29.4 min CN=78 Runoff=0.22 cfs 0.052 af

Subcatchment206C: Subcat 206C Runoff Area=0.489 ac 3.41% Impervious Runoff Depth=0.13"
Flow Length=185' Tc=15.3 min CN=79 Runoff=0.03 cfs 0.005 af

Subcatchment206U: Subcat 206U Runoff Area=0.847 ac 0.00% Impervious Runoff Depth=0.02"
Flow Length=128' Tc=24.2 min CN=69 Runoff=0.00 cfs 0.001 af

Subcatchment207C: Subcat 207C Runoff Area=6.941 ac 0.00% Impervious Runoff Depth=0.05"
Flow Length=761' Tc=17.8 min CN=73 Runoff=0.06 cfs 0.029 af

Subcatchment207U: Subcat 207U Runoff Area=16.815 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,133' Tc=32.9 min CN=65 Runoff=0.01 cfs 0.004 af

Pond 1P: West Basin Peak Elev=575.00' Storage=29 cf Inflow=0.17 cfs 0.025 af
Discarded=0.16 cfs 0.025 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.025 af

Pond 2P: East Basin Peak Elev=552.01' Storage=118 cf Inflow=0.06 cfs 0.029 af
Discarded=0.05 cfs 0.029 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.029 af

Pond FB: Forebay Peak Elev=574.50' Storage=185 cf Inflow=0.03 cfs 0.005 af
Outflow=0.00 cfs 0.001 af

Pond SF: Sand Filter Peak Elev=572.49' Storage=0 cf Inflow=0.00 cfs 0.001 af
Discarded=0.00 cfs 0.001 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.001 af

Link DP1: Offsite A Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Link DP2: Offsite B Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Link DP3: Wetland D Inflow=0.29 cfs 0.085 af
Primary=0.29 cfs 0.085 af

Link DP4: Southern Wetland (Flags E, F, A, G, H) Inflow=0.49 cfs 0.133 af
Primary=0.49 cfs 0.133 af

Total Runoff Area = 52.119 ac Runoff Volume = 0.280 af Average Runoff Depth = 0.06"
99.92% Pervious = 52.075 ac 0.08% Impervious = 0.044 ac

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 Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment201: Subcat 201 Runoff Area=0.794 ac 0.00% Impervious Runoff Depth=1.81"
Flow Length=379' Tc=32.2 min CN=69 Runoff=0.89 cfs 0.120 af

Subcatchment202: Subcat 202 Runoff Area=10.071 ac 0.00% Impervious Runoff Depth=2.46"
Flow Length=870' Tc=38.0 min CN=77 Runoff=14.61 cfs 2.062 af

Subcatchment203: Subcat 203 Runoff Area=6.498 ac 0.14% Impervious Runoff Depth=2.46"
Flow Length=448' Tc=36.6 min UI Adjusted CN=77 Runoff=9.60 cfs 1.330 af

Subcatchment204: Subcat 204 Runoff Area=2.650 ac 0.00% Impervious Runoff Depth=2.46"
Flow Length=295' Tc=21.3 min CN=77 Runoff=4.99 cfs 0.543 af

Subcatchment205C: Subcat 205C Runoff Area=1.711 ac 1.03% Impervious Runoff Depth=2.81"
Flow Length=224' Tc=16.0 min CN=81 Runoff=4.15 cfs 0.401 af

Subcatchment205U: Subcat 205U Runoff Area=5.302 ac 0.02% Impervious Runoff Depth=2.54"
Flow Length=283' Tc=29.4 min CN=78 Runoff=9.00 cfs 1.123 af

Subcatchment206C: Subcat 206C Runoff Area=0.489 ac 3.41% Impervious Runoff Depth=2.63"
Flow Length=185' Tc=15.3 min CN=79 Runoff=1.13 cfs 0.107 af

Subcatchment206U: Subcat 206U Runoff Area=0.847 ac 0.00% Impervious Runoff Depth=1.81"
Flow Length=128' Tc=24.2 min CN=69 Runoff=1.08 cfs 0.128 af

Subcatchment207C: Subcat 207C Runoff Area=6.941 ac 0.00% Impervious Runoff Depth=2.12"
Flow Length=761' Tc=17.8 min CN=73 Runoff=12.03 cfs 1.229 af

Subcatchment207U: Subcat 207U Runoff Area=16.815 ac 0.00% Impervious Runoff Depth=1.52"
Flow Length=1,133' Tc=32.9 min CN=65 Runoff=15.28 cfs 2.133 af

Pond 1P: West Basin Peak Elev=575.51' Storage=5,909 cf Inflow=4.15 cfs 0.401 af
Discarded=0.67 cfs 0.397 af Primary=0.12 cfs 0.003 af Outflow=0.79 cfs 0.401 af

Pond 2P: East Basin Peak Elev=553.74' Storage=39,569 cf Inflow=12.03 cfs 1.229 af
Discarded=0.30 cfs 0.889 af Primary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.889 af

Pond FB: Forebay Peak Elev=574.58' Storage=221 cf Inflow=1.13 cfs 0.107 af
Outflow=1.13 cfs 0.103 af

Pond SF: Sand Filter Peak Elev=574.64' Storage=2,510 cf Inflow=1.13 cfs 0.103 af
Discarded=0.07 cfs 0.103 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.103 af

Link DP1: Offsite A Inflow=0.89 cfs 0.120 af
Primary=0.89 cfs 0.120 af

Link DP2: Offsite B Inflow=1.08 cfs 0.128 af
Primary=1.08 cfs 0.128 af

Link DP3: Wetland D Inflow=14.61 cfs 2.062 af
Primary=14.61 cfs 2.062 af

Link DP4: Southern Wetland (Flags E, F, A, G, H) Inflow=37.46 cfs 5.132 af
Primary=37.46 cfs 5.132 af

Total Runoff Area = 52.119 ac Runoff Volume = 9.175 af Average Runoff Depth = 2.11"
99.92% Pervious = 52.075 ac 0.08% Impervious = 0.044 ac

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 Muskingum-Cunge method - Pond routing by Stor-Ind method

Subcatchment201: Subcat 201 Runoff Area=0.794 ac 0.00% Impervious Runoff Depth=4.95"
Flow Length=379' Tc=32.2 min CN=69 Runoff=2.52 cfs 0.328 af

Subcatchment202: Subcat 202 Runoff Area=10.071 ac 0.00% Impervious Runoff Depth=5.92"
Flow Length=870' Tc=38.0 min CN=77 Runoff=35.01 cfs 4.969 af

Subcatchment203: Subcat 203 Runoff Area=6.498 ac 0.14% Impervious Runoff Depth=5.92"
Flow Length=448' Tc=36.6 min UI Adjusted CN=77 Runoff=23.02 cfs 3.206 af

Subcatchment204: Subcat 204 Runoff Area=2.650 ac 0.00% Impervious Runoff Depth=5.92"
Flow Length=295' Tc=21.3 min CN=77 Runoff=11.95 cfs 1.308 af

Subcatchment205C: Subcat 205C Runoff Area=1.711 ac 1.03% Impervious Runoff Depth=6.41"
Flow Length=224' Tc=16.0 min CN=81 Runoff=9.27 cfs 0.913 af

Subcatchment205U: Subcat 205U Runoff Area=5.302 ac 0.02% Impervious Runoff Depth=6.04"
Flow Length=283' Tc=29.4 min CN=78 Runoff=21.18 cfs 2.669 af

Subcatchment206C: Subcat 206C Runoff Area=0.489 ac 3.41% Impervious Runoff Depth=6.16"
Flow Length=185' Tc=15.3 min CN=79 Runoff=2.61 cfs 0.251 af

Subcatchment206U: Subcat 206U Runoff Area=0.847 ac 0.00% Impervious Runoff Depth=4.95"
Flow Length=128' Tc=24.2 min CN=69 Runoff=3.05 cfs 0.350 af

Subcatchment207C: Subcat 207C Runoff Area=6.941 ac 0.00% Impervious Runoff Depth=5.43"
Flow Length=761' Tc=17.8 min CN=73 Runoff=31.09 cfs 3.143 af

Subcatchment207U: Subcat 207U Runoff Area=16.815 ac 0.00% Impervious Runoff Depth=4.47"
Flow Length=1,133' Tc=32.9 min CN=65 Runoff=47.57 cfs 6.260 af

Pond 1P: West Basin Peak Elev=575.66' Storage=7,716 cf Inflow=9.27 cfs 0.913 af
Discarded=0.68 cfs 0.617 af Primary=7.54 cfs 0.297 af Outflow=8.22 cfs 0.913 af

Pond 2P: East Basin Peak Elev=554.43' Storage=57,649 cf Inflow=31.09 cfs 3.143 af
Discarded=0.33 cfs 0.974 af Primary=15.24 cfs 1.678 af Outflow=15.57 cfs 2.652 af

Pond FB: Forebay Peak Elev=574.65' Storage=250 cf Inflow=2.61 cfs 0.251 af
Outflow=2.61 cfs 0.247 af

Pond SF: Sand Filter Peak Elev=575.56' Storage=5,484 cf Inflow=2.61 cfs 0.247 af
Discarded=0.09 cfs 0.204 af Primary=0.49 cfs 0.043 af Outflow=0.58 cfs 0.247 af

Link DP1: Offsite A Inflow=2.52 cfs 0.328 af
Primary=2.52 cfs 0.328 af

Link DP2: Offsite B Inflow=3.05 cfs 0.393 af
Primary=3.05 cfs 0.393 af

Link DP3: Wetland D Inflow=35.01 cfs 4.969 af
Primary=35.01 cfs 4.969 af

Link DP4: Southern Wetland (Flags E, F, A, G, H) Inflow=118.31 cfs 15.417 af
Primary=118.31 cfs 15.417 af

Total Runoff Area = 52.119 ac Runoff Volume = 23.397 af Average Runoff Depth = 5.39"
99.92% Pervious = 52.075 ac 0.08% Impervious = 0.044 ac

Attachment B: Water Quality Calculations

Moo Cow Solar
Coventry, RI
DA 205C
1/22/2024

Water Quality Volume (WQV)		
Disturbed Area, DA, (ac)	1.66	
Impervious Area,IA, (ac)	0.018	
WQV, (cf)	64	IA * 1/12 * 43560
Min WQV, (cf)	1,204	DA*0.2/12*43560
Design WQV, (cf)	**1,204**	Max WQV

West Basin		
Min Forebay Area Required (sf)	20	5,750 * 0.25WQV/86400
Forebay Area Provided (sf)	330	165' L x 2' W
Forebay Vol Rqd (cf)	301	0.25 * WQv
Forebay Vol Provided (cf)	330	165' L x 2' W x 1' D
Basin Vol Provided (cf)	5,785	From HydroCAD @ Elev 575.50'

Total WQV provided (cf)	**5,785**	Vol. @ Elev. 575.50' includes Forebay

Moo Cow Solar
Coventry, RI
DA 205U
1/22/2024

Water Quality Volume (WQV)		
Disturbed Area, DA, (ac)	1.02	
Impervious Area,IA, (ac)	0.001	
WQV, (cf)	3	IA * 1/12 * 43560
Min WQV, (cf)	739	DA*0.2/12*43560
Design WQV, (cf)	**739**	Max WQV

Moo Cow Solar
Coventry, RI
DA 206C
1/22/2024

Water Quality Volume (WQV)		
Disturbed Area, DA, (ac)	0.47	
Impervious Area,IA, (ac)	0.017	
WQV, (cf)	61	IA * 1/12 * 43560
Min WQV, (cf)	345	DA*0.2/12*43560
Design WQV, (cf)	**345**	Max WQV

Sand Filter		
Min Forebay Area Required (sf)	6	5,750 * 0.25WQV/86400
Forebay Area Provided (sf)	319	
Forebay Vol Rqd (cf)	86.15	0.25 * WQv
Forebay Vol Provided (cf)	185	From HydroCAD @ Elev 574.50
Sand Filter Vol Required (cf)	258	0.75 * WQv
Sand Filter Vol Provided (cf)	5,258	From HydroCAD @ Elev 575.50

Total WQV provided (cf)	**5,258**	Vol. @ 575.50 includes Forebay

Moo Cow Solar
Coventry, RI
DA 206U
1/22/2024

Water Quality Volume (WQV)		
Disturbed Area, DA, (ac)	0.35	
Impervious Area,IA, (ac)	-	
WQV, (cf)	-	IA * 1/12 * 43560
Min WQV, (cf)	255	DA*0.2/12*43560
Design WQV, (cf)	**255**	Max WQV

Moo Cow Solar
Coventry, RI
DA 207C
1/22/2024

Water Quality Volume (WQV)		
Disturbed Area, DA, (ac)	6.54	
Impervious Area,IA, (ac)	-	
WQV, (cf)	-	IA * 1/12 * 43560
Min WQV, (cf)	4,751	DA*0.2/12*43560
Design WQV, (cf)	**4,751**	Max WQV

East Basin		
Min Forebay Area Required (sf)	79.05	5,750 * 0.25WQV/86400
Forebay Area Provided (sf)	1,269	423' L x 3' W
Forebay Vol Rqd (cf)	1187.83	0.25 * WQv
Forebay Vol Provided (cf)	1,269	423' L x 3' W x 1' D
Basin Vol Provided (cf)	46,113	From HydroCAD @ Elev 554

Total WQV provided (cf)	**46,113**	Vol. @ Elev. 554 includes forebay

Moo Cow Solar
Coventry, RI
DA 207U
1/22/2024

Water Quality Volume (WQV)		
Disturbed Area, DA, (ac)	3.08	
Impervious Area,IA, (ac)	-	
WQV, (cf)	-	IA * 1/12 * 43560
Min WQV, (cf)	2,233	DA*0.2/12*43560
Design WQV, (cf)	**2,233**	Max WQV

Moo Cow Solar
Coventry, RI
Design Point 2
1/22/2024

Water Quality Volume (WQV)		
Disturbed Area, DA, (ac)	0.83	
Impervious Area,IA, (ac)	0.017	
WQV, (cf)	61	IA * 1/12 * 43560
Min WQV, (cf)	599	DA*0.2/12*43560
Design WQV, (cf)	**599**	Max WQV

Sand Filter		
Min Forebay Area Required (sf)	9.97	5,750 * 0.25WQV/86400
Forebay Area Provided (sf)	319	
Forebay Vol Rqd (cf)	149.83	0.25 * WQv
Forebay Vol Provided (cf)	185	
Sand Filter Vol Provided (cf)	5,258	From HydroCAD @ Elev 575.50

Total WQV provided (cf)	**5,258**	Vol. @ 575.50 includes Forebay

Moo Cow Solar
Coventry, RI
Design Point 4
1/22/2024

Water Quality Volume (WQV)		
Disturbed Area, DA, (ac)	12.30	
Impervious Area,IA, (ac)	0.002	
WQV, (cf)	7	IA * 1/12 * 43560
Min WQV, (cf)	8,927	DA*0.2/12*43560
Design WQV, (cf)	**8,927**	Max WQV

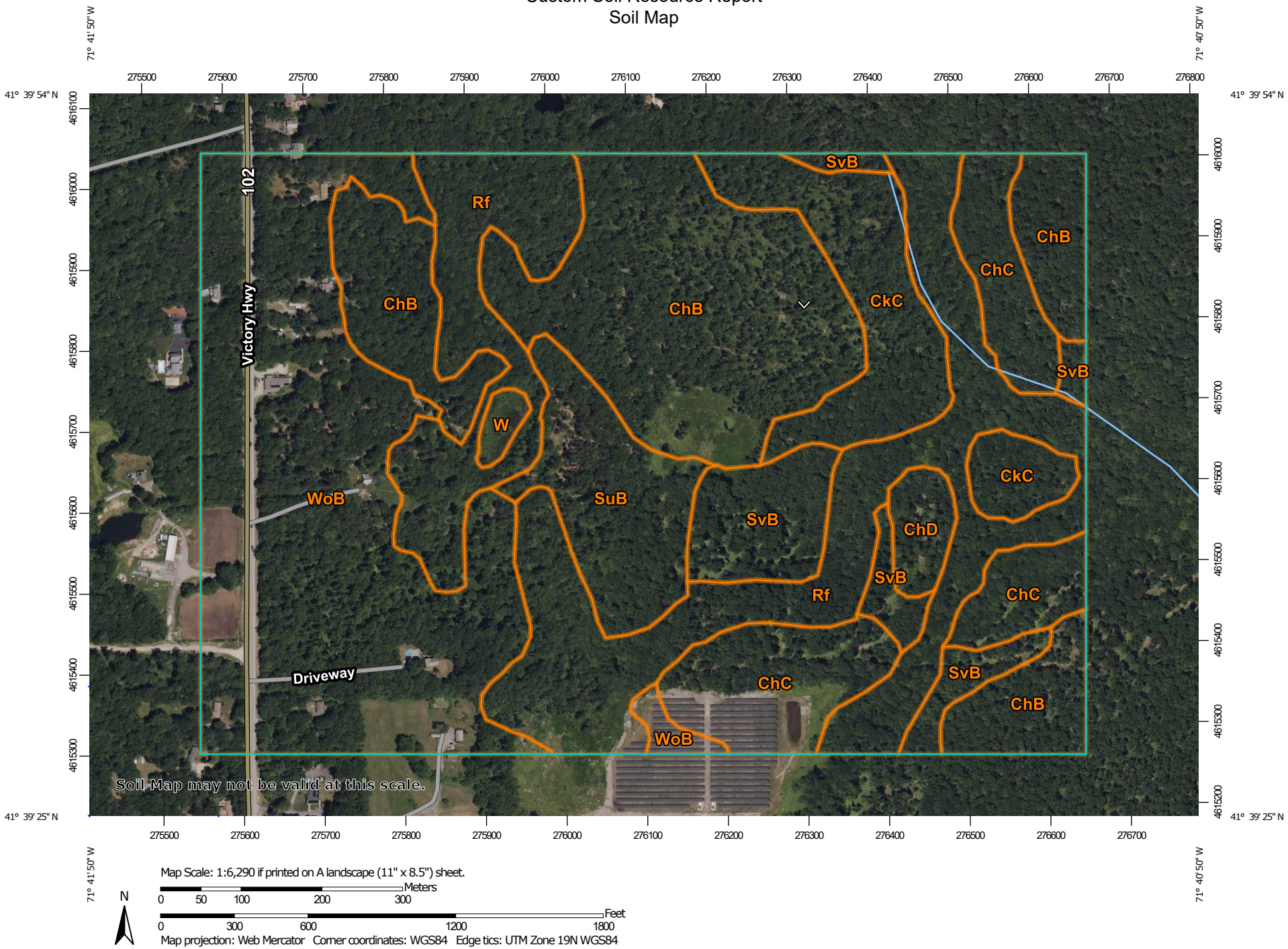
West Basin		
Min Forebay Area Required (sf)	148.53	5,750 * 0.25WQV/86400
Forebay Area Provided (sf)	330	
Forebay Vol Rqd (cf)	2231.86	0.25 * WQv
Forebay Vol Provided (cf)	330	
Basin Vol Provided (cf)	5,785	From HydroCAD @ Elev 554

East Basin		
Min Forebay Area Required (sf)	148.53	5,750 * 0.25WQV/86400
Forebay Area Provided (sf)	1,269	
Forebay Vol Rqd (cf)	2231.86	0.25 * WQv
Forebay Vol Provided (cf)	1,269	
Basin Vol Provided (cf)	46,113	From HydroCAD @ Elev 575.50

Total WQV provided (cf)	**51,898**	Vol. includes forebays

Attachment C: NRCS Soils Map

Custom Soil Resource Report
Soil Map



Map Scale: 1:6,290 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

Attachment D: Test Pit Logs

TEST PIT LOG

TRC

SITE:	Coventry RI	**TEST PIT NO:**	TP-1
CLIENT:	Moo Cow Solar	**DATE:**	6/8/2023
CONTRACTOR:	Geosearch, Inc.	**TRC INSPECTOR:**	Michele Grenier
METHOD:	Mini-Excavator	**SURFACE ELEV:**	NM
WEATHER:	Partly Cloudy, 70˚ F	**DEPTH TO WATER:**	N/A

Depth (feet)	Soil Texture Class	NRCS Hydrologic Soil Group/ Rawls Rate	Depth (feet)	Materials Description Moisture, Color, density, size, major and minor constituents	Depth (feet)	Unit	Notes
0.5	Loamy Sand	C/0.27	0.5	Moist, dark brown SILT AND ORGANICS (roots)	0.5	Native Soil	
1.0	Loamy Sand	A/2.41	1.0	Dry, dark yellowish brown FINE TO COARSE SAND, little silt and clay, trace gravel (contains cobbles and boulders)	1.0		
1.5	Sandy Loam	B/1.02	1.5	Moist, yellowish brown FINE TO COARSE SAND AND SILT, some clay, trace gravel (contains cobbles and boulders)	1.5		
2.0			2.0		2.0		
2.5			2.5		2.5		
3.0	Sand	A/8.27	3.0	Wet, brown FINE TO COARSE SAND, trace silt and gravel (contains cobbles and boulders)	3.0		
3.5			3.5		3.5		
4.0			4.0		4.0		
4.5			4.5		4.5		
5.0			5.0		5.0		
5.5			5.5		5.5		
6.0			6.0		6.0		
6.5			6.5		6.5		
7.0			7.0		7.0		
7.5			7.5		7.5		
8.0			8.0	Excavation Terminated	8.0		Groundwater Table ▼
8.5			8.5		8.5		
9.0			9.0		9.0		
9.5			9.5		9.5		
10.0			10.0		10.0		

PROPORTIONS USED

Trace	<10%
Little	10-20%
Some	20-35%
And	35-50%

MOISTURE

Dry
Damp
Moist
Wet

LEGEND:

NM = Not Measured
NA = Not Available
bgs = below ground surface

COMMENTS:

- A significant amount of large boulders and cobbles encountered from surface elevation to total depth.
- No redoximorphic features observed .
- Groundwater encountered at ~8 ft bgs.
- Excavation terminated at ~8.0 ft bgs (limit of equipment).

TEST PIT LOG

TRC

SITE:	Coventry RI	**TEST PIT NO:**	TP-2
CLIENT:	Moo Cow Solar	**DATE:**	6/8/2023
CONTRACTOR:	Geosearch, Inc.	**TRC INSPECTOR:**	Michele Grenier
METHOD:	Mini-Excavator	**SURFACE ELEV:**	NM
WEATHER:	Partly Cloudy, 70˚ F	**DEPTH TO WATER:**	N/A

Depth (feet)	Soil Texture Class	NRCS Hydrologic Soil Group/ Rawls Rate	Depth (feet)	Materials Description Moisture, Color, density, size, major and minor constituents	Depth (feet)	Unit	Notes
0.5	Silt Loam	C/0.27	0.5	Moist, dark brown SILT AND ORGANICS (roots)	0.5		
1.0	Loamy Sand	A/2.41	1.0	Dry, dark yellowish brown FINE TO COARSE SAND, little silt and clay, trace gravel (contains cobbles and boulders)	1.0		
1.5	Sand	A/8.27	1.5	Dry, yellowish brown FINE TO COARSE SAND, trace silt and gravel (contains cobbles and boulders)	1.5		
2.0			2.0		2.0		
2.5			2.5		2.5		
3.0			3.0		3.0		
3.5			3.5		3.5		
4.0			4.0		4.0		
4.5			4.5		4.5		
5.0			5.0		5.0		
5.5			5.5		5.5		
6.0			6.0		6.0		
6.5			6.5		6.5		
7.0			7.0		7.0		
7.5			7.5	Excavation Terminated	7.5		
8.0			8.0		8.0		
8.5			8.5		8.5		
9.0			9.0		9.0		
9.5			9.5		9.5		
10.0			10.0		10.0		

PROPORTIONS USED

Trace	<10%
Little	10-20%
Some	20-35%
And	35-50%

MOISTURE

Dry
Damp
Moist
Wet

LEGEND:

NM = Not Measured
NA = Not Available
bgs = below ground surface

COMMENTS:

- A significant amount of large boulders and cobbles encountered from surface elevation to total depth.
- No redoximorphic features observed .
- No groundwater encountered.
- Excavation terminated at ~7.0 ft bgs (limit of equipment).

TEST PIT LOG

TRC

SITE:	Coventry RI	**TEST PIT NO:**	TP-3
CLIENT:	Moo Cow Solar	**DATE:**	6/14/2023
CONTRACTOR:	Geosearch, Inc.	**TRC INSPECTOR:**	Craig Paradis
METHOD:	Excavator	**SURFACE ELEV:**	NM
WEATHER:	Partly Cloudy, 70˚ F	**DEPTH TO WATER:**	N/A

Depth (feet)	Soil Texture Class	NRCS Hydrologic Soil Group/ Rawls Rate	Depth (feet)	Materials Description Moisture, Color, density, size, major and minor constituents	Depth (feet)	Unit	Notes
0.5	Loam	B/0.52	0.5	Dry, dark brown SILT AND FINE SAND	0.5	Native Soil	
1.0	Silt Loam	C/0.27	1.0	Moist, orange brown FINE SAND AND SILT, trace medium and coarse sand, some coarse gravel, little fine gravel	1.0		
1.5			1.5		1.5		
2.0			2.0		2.0		
2.5			2.5		2.5		Seasonal High Groundwater ▼
3.0	Sandy Loam	B/1.02	3.0	Moist, grayish brown FINE SAND, some medium and coarse sand, little fine and coarse gravel and silt	3.0		
3.5			3.5		3.5		
4.0			4.0		4.0		
4.5	Loamy Sand	A/2.41	4.5	Moist to damp grayish brown MEDIUM SAND, some fine and coarse sand, fine gravel, little coarse gravel, cobbles, and silt	4.5		
5.0			5.0		5.0		
5.5			5.5		5.5		
6.0			6.0		6.0		
6.5			6.5	Refusal	6.5		
7.0			7.0		7.0		
7.5			7.5		7.5		
8.0			8.0		8.0		
8.5			8.5		8.5		
9.0			9.0		9.0		
9.5			9.5		9.5		
10.0			10.0		10.0		

PROPORTIONS USED

Trace	<10%
Little	10-20%
Some	20-35%
And	35-50%

MOISTURE

Dry
Damp
Moist
Wet

LEGEND:

NM = Not Measured
NA = Not Available
bgs = below ground surface

COMMENTS:

- A significant amount of large boulders and cobbles encountered from surface elevation to total depth.
- Redoximorphic features observed at 2.5 feet bgs.
- No ground water encountered
- Refusal encountered at ~6.0 ft bgs (assumed bedrock).

TEST PIT LOG

TRC

SITE:	Coventry RI	**TEST PIT NO:**	TP-5
CLIENT:	Moo Cow Solar	**DATE:**	6/14/2023
CONTRACTOR:	Geosearch, Inc.	**TRC INSPECTOR:**	Craig Paradis
METHOD:	Excavator	**SURFACE ELEV:**	NM
WEATHER:	Partly Cloudy, 70˚ F	**DEPTH TO WATER:**	N/A

Depth (feet)	Soil Texture Class	NRCS Hydrologic Soil Group/ Rawls Rate	Depth (feet)	Materials Description Moisture, Color, density, size, major and minor constituents	Depth (feet)	Unit	Notes
0.5	Loamy Sand	C/0.27	0.5	Dry, dark brown SILT AND ORGANICS (roots)	0.5	Native Soil	
1.0	Loam	B/0.52	1.0	Moist to damp, brown to grayish brown FINE SAND, some silt and medium sand, little coarse sand, little to trace fine and coarse gravel (contains cobbles and boulders)	1.0		
1.5			1.5		1.5		
2.0			2.0		2.0		
2.5			2.5		2.5		
3.0			3.0		3.0		Seasonal High Groundwater ▼
3.5			3.5		3.5		
4.0			4.0		4.0		
4.5			4.5		4.5		
5.0			5.0		5.0		
5.5	Sandy Loam	B/1.02	5.5	Moist, brown FINE AND MEDIUM SAND, some coarse gravel little coarse and fine sand, cobbles	5.5		
6.0			6.0		6.0		
6.5			6.5		6.5		
7.0			7.0		7.0		
7.5			7.5		7.5		
8.0			8.0	Refusal	8.0		
8.5			8.5		8.5		
9.0			9.0		9.0		
9.5			9.5		9.5		
10.0			10.0		10.0		

PROPORTIONS USED

Trace	<10%
Little	10-20%
Some	20-35%
And	35-50%

MOISTURE

Dry
Damp
Moist
Wet

LEGEND:

NM = Not Measured
NA = Not Available
bgs = below ground surface

COMMENTS:

- No redoximorphic features observed.
- No groundwater encountered.
- Refusal encountered at ~8.0 ft bgs (assumed bedrock).

TEST PIT LOG

TRC

SITE:	Coventry RI	**TEST PIT NO:**	TP-6
CLIENT:	Moo Cow Solar	**DATE:**	6/14/2023
CONTRACTOR:	Geosearch, Inc.	**TRC INSPECTOR:**	Craig Paradis
METHOD:	Excavator	**SURFACE ELEV:**	NM
WEATHER:	Partly Cloudy, 70˚ F	**DEPTH TO WATER:**	~6 feet

Depth (feet)	Soil Texture Class	NRCS Hydrologic Soil Group/ Rawls Rate	Depth (feet)	Materials Description Moisture, Color, density, size, major and minor constituents	Depth (feet)	Unit	Notes
	Silt Loam	C/0.27		Moist, dark brown SILT AND ORGANICS (roots)			
0.5	Loam	B/0.52	0.5	Moist, light brown FINE SAND, some silt and medium sand, little coarse sand, little to trace fine and coarse gravel (contains cobbles and boulders)	0.5		
1.0			1.0		1.0		
1.5			1.5		1.5		
2.0			2.0		2.0		
2.5			2.5		2.5		
3.0	Sandy Loam	B/1.02	3.0	Moist to wet, yellowish brown MEDIUM SAND, some fine sand, little silt, coarse sand, and fine and coarse gravel (contains cobbles and boulders)	3.0		Seasonal High Groundwater ▼
3.5			3.5		3.5	Native Soil	
4.0			4.0		4.0		
4.5			4.5		4.5		
5.0			5.0		5.0		
5.5			5.5		5.5		
6.0			6.0		6.0		Groundwater Table ▼
6.5			6.5		6.5		
7.0			7.0		7.0		
7.5			7.5		7.5		
8.0			8.0	Refusal	8.0		
8.5			8.5		8.5		
9.0			9.0		9.0		
9.5			9.5		9.5		
10.0			10.0		10.0		

PROPORTIONS USED

Trace	<10%
Little	10-20%
Some	20-35%
And	35-50%

MOISTURE

Dry
Damp
Moist
Wet

LEGEND:

NM = Not Measured
NA = Not Available
bgs = below ground surface

COMMENTS:

- Redoximorphic features observed at 3.2 feet bgs.
- Groundwater in-flow at ~6.0 ft bgs.
- Refusal encountered at ~7.8 ft bgs (assumed bedrock).

TEST PIT LOG

TRC

SITE:	Coventry RI	**TEST PIT NO:**	TP-7
CLIENT:	Moo Cow Solar	**DATE:**	6/14/2023
CONTRACTOR:	Geosearch, Inc.	**TRC INSPECTOR:**	Craig Paradis
METHOD:	Excavator	**SURFACE ELEV:**	NM
WEATHER:	Partly Cloudy, 70˚ F	**DEPTH TO WATER:**	~10.25 ft

Depth (feet)	Soil Texture Class	NRCS Hydrologic Soil Group/ Rawls Rate	Depth (feet)	Materials Description Moisture, Color, density, size, major and minor constituents	Depth (feet)	Unit	Notes
0.5	Sandy Loam	B/1.02	0.5	Moist, brown SILT AND FINE SAND, some medium sand and organics (roots), trace coarse sand	0.5	Native Soil	
1.0	Sandy Loam	B/1.02	1.0	Damp, light brown FINE SAND, some silt, little medium and coarse sand and organics, trace fine and coarse gravel (contains cobbles)	1.0		
1.5			1.5		1.5		
2.0			2.0		2.0		
2.5	Loamy Sand	A/2.41	2.5	Moist, light brown MEDIUM AND COARSE SAND, some fine and coarse gravel, trace silt and fine sand (contains cobbles)	2.5		Seasonal High Groundwater ▼
3.0			3.0		3.0		
3.5			3.5		3.5		
4.0	Sandy Loam	B/1.02	4.0	Moist, light brown FINE SAND, trace medium and coarse sand, fine and coarse gravel, and silt (contains cobbles and boulders)	4.0		
4.5			4.5		4.5		
5.0			5.0		5.0		
5.5			5.5		5.5		
6.0	Loamy Sand	A/2.41	6.0	Moist to wet, grayish brown MEDIUM SAND, some fine and coarse sand and fine and coarse gravel, little silt	6.0		
6.5			6.5		6.5		
7.0			7.0		7.0		
7.5			7.5		7.5		
8.0			8.0		8.0		
8.5			8.5		8.5		
9.0			9.0		9.0		
9.5			9.5		9.5		
10.0			10.0		10.0		

PROPORTIONS USED

Trace	<10%
Little	10-20%
Some	20-35%
And	35-50%

MOISTURE

Dry
Damp
Moist
Wet

LEGEND:

NM = Not Measured
NA = Not Available
bgs = below ground surface

COMMENTS:

- Redoximorphic features observed at 3.0 feet bgs.
- Significant in-flow of groundwater at ~10.25 ft bgs.
- Test pit terminated at ~10.5 feet bgs.

TEST PIT LOG

TRC

SITE:	Coventry RI	**TEST PIT NO:**	TP-7
CLIENT:	Moo Cow Solar	**DATE:**	6/14/2023
CONTRACTOR:	Geosearch, Inc.	**TRC INSPECTOR:**	Craig Paradis
METHOD:	Excavator	**SURFACE ELEV:**	NM
WEATHER:	Partly Cloudy, 70˚ F	**DEPTH TO WATER:**	~10.25 ft

Depth (feet)	Soil Texture Class	NRCS Hydrologic Soil Group/ Rawls Rate	Depth (feet)	Materials Description Moisture, Color, density, size, major and minor constituents	Depth (feet)	Unit	Notes
10.5	Loamy Sand	A/2.41	10.5	Moist to wet, grayish brown MEDIUM SAND, some fine and coarse sand and fine and coarse gravel, little silt	10.5	Native Soil	Groundwater Table ▼
				Excavation Terminated			
11.0			11.0		11.0		
11.5			11.5		11.5		
12.0			12.0		12.0		
12.5			12.5		12.5		
13.0			13.0		13.0		
13.5			13.5		13.5		
14.0			14.0		14.0		
14.5			14.5		14.5		
15.0			15.0		15.0		
15.5			15.5		15.5		
16.0			16.0		16.0		
16.5			16.5		16.5		
17.0			17.0		17.0		
17.5			17.5		17.5		
18.0			18.0		18.0		
18.5			18.5		18.5		
19.0			19.0		19.0		
19.5			19.5		19.5		
20.0			20.0		20.0		

PROPORTIONS USED

Trace	<10%
Little	10-20%
Some	20-35%
And	35-50%

MOISTURE

Dry
Damp
Moist
Wet

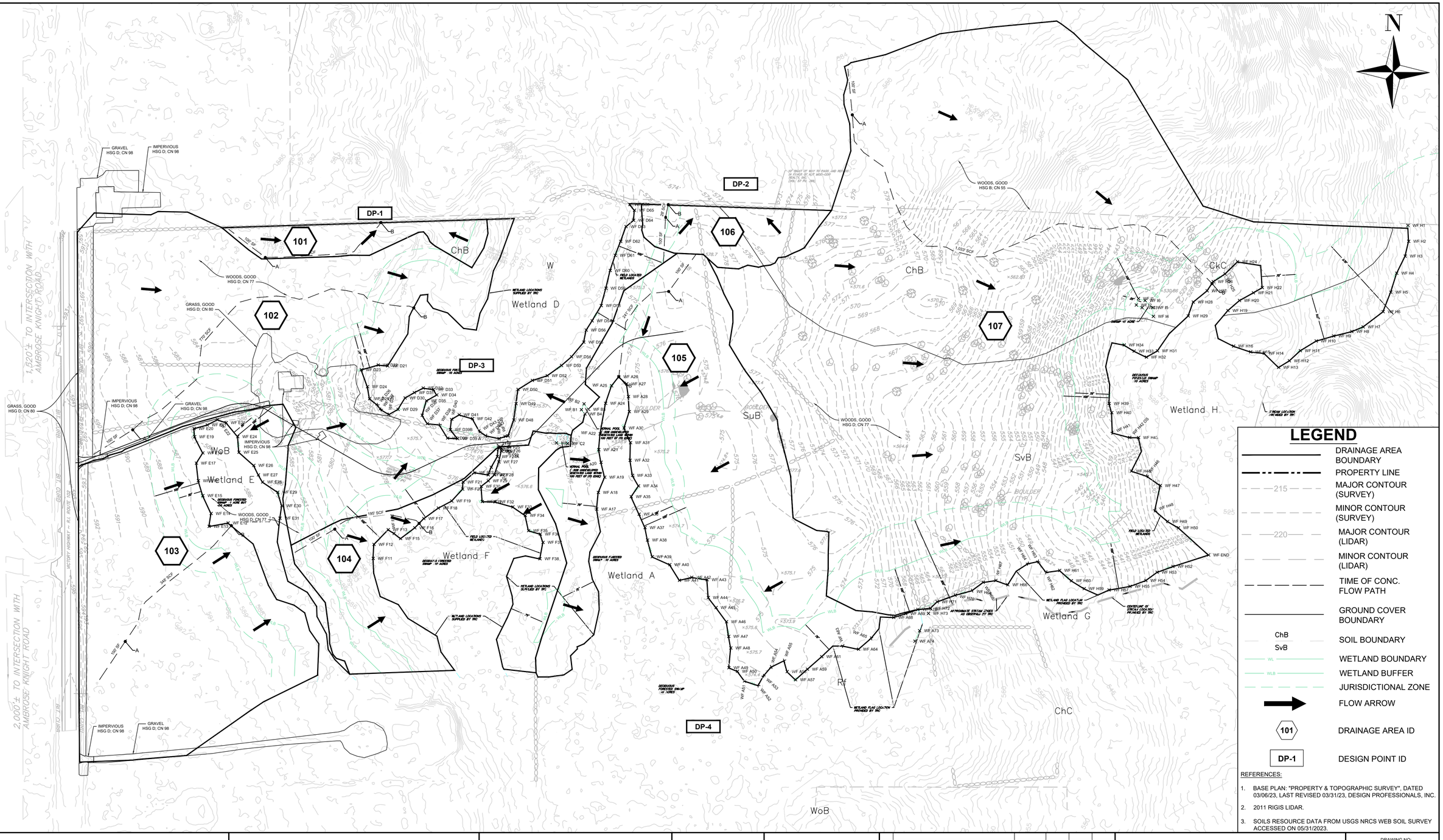
LEGEND:

NM = Not Measured
NA = Not Available
bgs = below ground surface

COMMENTS:

- Redoximorphic features observed at 3.0 feet bgs.
- Significant in-flow of groundwater at ~10.25 ft bgs.
- Test pit terminated at ~10.5 feet bgs.

Attachment E: Drainage Area Maps



REFERENCES:

1. BASE PLAN: "PROPERTY & TOPOGRAPHIC SURVEY", DATED 03/06/23, LAST REVISED 03/31/23, DESIGN PROFESSIONALS, INC.
2. 2011 RIGIS LIDAR.
3. SOILS RESOURCE DATA FROM USGS NRCS WEB SOIL SURVEY ACCESSED ON 05/31/2023.

TRC
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NEW YORK, NEW YORK
10017

MOO COW SOLAR
AP 304, LOTS 27.1 and 28
2446 VICTORY HIGHWAY
COVENTRY, RHODE ISLAND

Not Valid Without Signature

0 100 200
SCALE: 1" = 100'

No.	REVISION	DATE	DRAWN	DESIGN	CHK

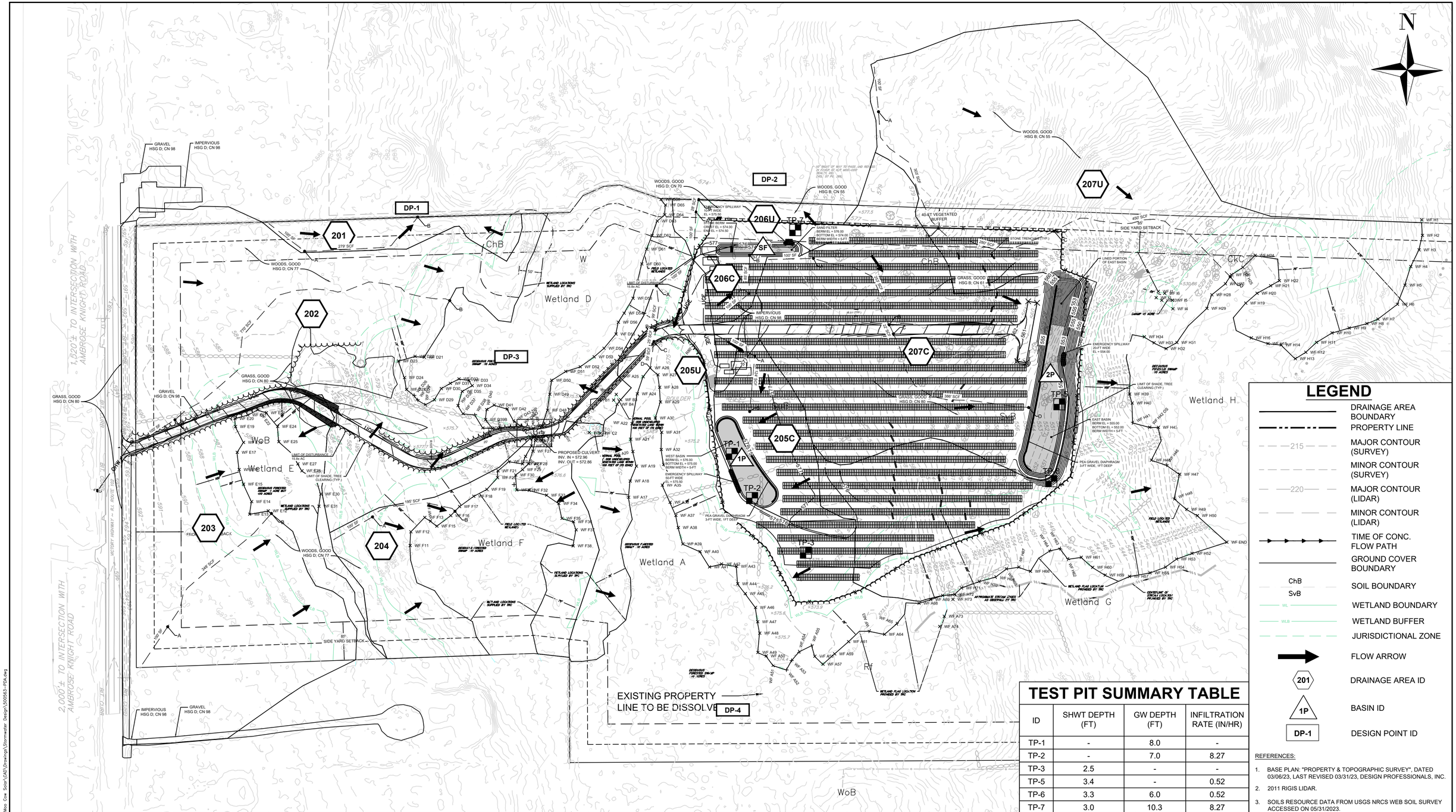
DRAWN BY: TD/TL | DESIGNED BY: TD/TL | CHECKED BY:

PRE-DEVELOPMENT DRAINAGE AREA MAP

DRAWING NO:
EDA

PROJECT NO: 500563
DATE OF ISSUE: 4/XX/2024
SHEET NO: 1 OF 1

DATE: Mar 28, 2024 – 1:52PM
ITEMID: N:\Working\Jobs\500563.EDPR Moo Cow Solar\CAD\Drawings\Stormwater Design\500563–EDA.dwg



LEGEND

- DRAINAGE AREA BOUNDARY
- PROPERTY LINE
- 215 — MAJOR CONTOUR (SURVEY)
- MINOR CONTOUR (SURVEY)
- 220 — MAJOR CONTOUR (LIDAR)
- MINOR CONTOUR (LIDAR)
- TIME OF CONC. FLOW PATH
- GROUND COVER BOUNDARY
- ChB / SvB — SOIL BOUNDARY
- WL — WETLAND BOUNDARY
- WLB — WETLAND BUFFER
- JURISDICTIONAL ZONE
- FLOW ARROW
- 201 — DRAINAGE AREA ID
- 1P — BASIN ID
- DP-1 — DESIGN POINT ID

TEST PIT SUMMARY TABLE

ID	SHWT DEPTH (FT)	GW DEPTH (FT)	INFILTRATION RATE (IN/HR)
TP-1	-	8.0	-
TP-2	-	7.0	8.27
TP-3	2.5	-	-
TP-5	3.4	-	0.52
TP-6	3.3	6.0	0.52
TP-7	3.0	10.3	8.27

REFERENCES:

1. BASE PLAN: "PROPERTY & TOPOGRAPHIC SURVEY", DATED 03/06/23, LAST REVISED 03/31/23, DESIGN PROFESSIONALS, INC.
2. 2011 RIGIS LIDAR.
3. SOILS RESOURCE DATA FROM USGS NRCS WEB SOIL SURVEY ACCESSED ON 05/31/2023.

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MOO COW SOLAR
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COVENTRY, RHODE ISLAND

Not Valid Without Signature

0 100 200
SCALE: 1" = 100'

No.	REVISION	DATE	DRAWN	DESIGN	CHK

DRAWN BY: TD/TL | DESIGNED BY: TD/TL | CHECKED BY: ACT

POST-DEVELOPMENT DRAINAGE AREA MAP

DRAWING NO:
PDA

PROJECT NO: 500563
DATE OF ISSUE: 04/24/2024
SHEET NO: 1 OF 1

DATE: Apr 24, 2024 – 2:00PM
DRAWING: G:\Waltham\500\500563 EDPR Moo Cow Solar\CAD\Drawings\Stormwater Design\500563–PDA.dwg