

EROSION CONTROL AND STORM WATER MANAGEMENT PLAN

for
City of La Crosse

**Live Well Chiropractic Clinic New Building
(Phase 2 of STH 16 Clinics project)
City of La Crosse
La Crosse County, Wisconsin**

Amended March 12, 2026

**Prepared for:
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Onalaska, WI. 54650
Tel: (507) 458-6131**



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EROSION CONTROL PLAN

Live Well Chiropractic Clinic New Building – La Crosse

This report references Construction Plans titled HIGHWAY 16 CLINICS, September 26, 2025 by Paragon Associates, Inc. The following outlines the required information for Erosion Control Plans as outlined in NR 216.46(4).

WISCONSIN DEPARTMENT OF NATURAL RESOURCES REQUIREMENTS (IN ACCORDANCE WITH WISCONSIN ADMINISTRATIVE CODE: NR 216.46(4))

Construction Site Description: Aerial photos which have the site outlined have been included in **Appendix A**. The site currently consists of two adjacent parcels of land that are primarily fallow farm fields adjacent to the STH 16 Frontage Road. The north parcel has no assigned address but the south parcel is at 1822 STH 16 and previously contained a residential house and garage with a driveway onto the STH 16 Frontage Road. The 2 parcels currently share a single driveway via an easement across the south parcel, and each parcel also contains a billboard via easements. A map of nearby water resources have also been included in **Appendix A**.

The project will occur on the 2 separately owned parcels in 2 phases, with each phase being primarily the construction of a new commercial building on 1 of the parcels. The 2 phases will occur nearly simultaneously, with construction start dates within 1-2 months of each other, and both will utilize the same general contractor and same construction manager. The 2 phases are interconnected by both the shared driveway and also the shared use of stormwater management structures. By mutual agreement of the owners, some stormwater from the north parcel will flow onto and be treated by biofilters and underground storage chambers on the south parcel. Because of this interconnection, the site development plan sheets included in this Erosion Control & Stormwater Management Plan show the development of both parcels. **However, this submittal is only intended to cover the land disturbances associated with phase 2 on the south parcel.** A separate submittal has previously been made for phase 1.

Phase 2 is the construction of the new Live Well Chiropractic Clinic on the south parcel at 1822 STH 16. Phase 2 will include a new parking lot, utility installations, re-grading of most of the parcel, installation of permanent BMP's, paving and landscaping. The grading, paving, parking lot construction, seeding, and landscaping will constitute a majority of the ground disturbing activities.

Description of intended sequence of activities: The anticipated sequence of major land disturbing construction activities are as follows: installation of temporary erosion control devices, removals and demolition, utility installation, grading, subbase preparation, paving, final stabilization, seeding and fertilizing, minor grading and site work, and final restoration.

Estimate of construction site area: The area inside the limits of the phase 2 construction is about 0.47 acres of the 0.50 acre south parcel, and 0.04 acres of STH 16 Frontage Road right-of-way, and is essentially the actual area of disturbance.

Soil data: A geotechnical report is included in **Appendix B**. Subsoils are primarily silts. Results from the Universal Soil Loss Equation calculation are added to this plan in **Appendix F**.

Groundwater Limitations: The highest groundwater elevation on the phase 2 site, excluding the STH 16 Frontage Road right-of-way, is expected to occur at the southwest corner, which is the lowest elevation on the site. Groundwater is expected to be at least 25 feet below ground surface. No portion of the phase 2 structure or storm water BMP's are expected to reach that depth.

Nearest receiving water: The closest surface water are wetlands adjacent to the La Crosse River.

The Erosion Control Plan (Sheet C300 of the Drawing Set) contains the following required information as applicable: existing topography and drainage patterns, roads and surface waters; boundary of construction site; drainage patterns and approximate slopes anticipated after major grading activities; areas of soil disturbance; location of major structural and non-structural controls identified in this plan; location of areas where stabilization practices will be employed; areas that will be vegetated following land disturbing construction activities; area and location of wetland acreage on the construction site, and locations where storm water is discharged to a surface water or wetland within one-quarter mile downstream of the construction site; and areas used for infiltration of post-construction storm water runoff.

Description of practices: Silt fence shall be installed prior to land disturbance. Existing vegetation shall be preserved where attainable. The proposed grading will direct runoff into the site minimizing the potential for sediment to leave the site. No existing storm sewer inlets exist on the site, but downslope inlets exist on STH 16 Frontage Road.

Description of overland flow management: Flow will be routed through wide, shallow swales. Silt fence will be installed along the perimeter of the site to control sheet flow leaving the site.

Trapping of sediment in channels: Ditch checks will be installed to slow runoff and trap excess sediment.

Staging of activities: Erosion control measures including tracking control and silt fence will be installed prior to major ground disturbance. Inlet protection and ditch checks shall be installed as the features they protect are completed. Erosion matting and temporary seeding and mulching shall be utilized to stabilize the site.

Downslope inlet protection: Downslope storm sewer inlets on STH 16 Frontage Road will receive inlet protection measures. It will be the Contractor's responsibility to monitor any runoff from the project site and to implement any needed controls to prevent clogging of downstream inlets.

Vehicle tracking: Vehicle tracking from the site shall be controlled as required by the Contractor. It shall be the Contractor's responsibility to maintain proper tracking control to and from the site.

Off-site sediment deposits: It may be required to clean up off-site sediment deposits that have been carried off during large rain events. If such sediment deposits occur and it is obvious that the sediment is from the construction site, the Contractor shall remove the deposits.

Proper disposal of building and waste material: Building and waste deposits shall be properly disposed of as stated in the project specifications and/or per local laws and ordinances.

Stabilization of drainageways: Drainageways and all exposed pervious areas shall be stabilized, seeded, mulched, and/or matted as soon as practicable to minimize soil loss due to erosion.

Installation of permanent stabilization practices: All permanent erosion and sediment control practices including seeding, fertilizing, mulching, and landscaping shall be installed as soon as practicable after final grading.

Dust control: It may be required that the Contractor implement the use of dust control if the construction site becomes dry. The Contractor shall take the necessary measures to ensure that dust is controlled during construction.

Materials: No solid materials, including building materials, may be discharged in violation of Ch. 30 or 31, Stats. or 33 USC 1344 or a U.S. Army Corps of Engineers Section 404 Permit issued under 33 USC 1344.

Non-erosive flow: Velocity dissipation devices will be placed at discharge locations and along outfalls to provide non-erosive flow from any proposed structures or facilities. Due to the nature of the site, locations of potential erosive flow are likely to be temporary in nature as a result of the sequence of construction and will be best managed under temporary erosion controls.

Inspection and Monitoring: The landowner, or the landowner's representative, shall inspect erosion and sediment control practices weekly, and within 24 hours following a rainfall of 0.5 inches or greater. Written documentation of each monitoring activity shall be maintained at the construction site and shall include the time, date and location of inspection, the phase of land disturbance at the construction site, person conducting the inspection, assessment of control practices, and a description of any erosion or sediment control measure installation or maintenance performed in response to the inspection.

Dewatering activity sediment reduction: Any dewatering necessary on the construction site must include measures to reduce the sediment in the water leaving the site. Dewatering BMPs may include filters, fiber rolls or gravel bag berms. Ground water is not expected to be encountered during construction.

Stockpile protection: Any soil stockpiles which are left more than 7 days must be protected by seeding and mulching, erosion mat, silt fencing, covering, or other methods. This does not include fill or topsoil piles that are in active use.

STORM WATER MANAGEMENT PLAN

Live Well Chiropractic Clinic New Building – La Crosse

The following outlines the Storm Water Management Plan Requirements as stated in NR 216.47-216.55

Applicability: This phase 2 site is subject to post-construction performance standards per NR 151.11 and is considered re-development due to the previously demolished residential house and garage.

Summary of Controls: All areas of re-development are subject to TSS removal, peak discharge reduction and infiltration, and these requirements are accomplished by installing 2 biofilters and an underground chamber storage system.

Performance Standards

Total Suspended Solids: This phase 2 site is considered re-development and requires a 40% reduction in TSS load by NR 151 as compared to no controls. WinSLAMM V10.5.0 was used to model the site and determine the amount of TSS carried in runoff from the site.

Baseline Model (Developed site without controls & without run-on)

Total TSS = 154.4 lbs.

TSS removal requirement is $154.4 \times 0.4 = 61.8$ lbs.

Modeled TSS (Developed Site, without run-on)

TSS without Controls: 154.4 lbs.

TSS with Controls: 74.3 lbs.

TSS removal with Controls: 80.1 lbs. (51.87%)

The BMP's remove 80.1 lbs. of TSS which exceeds the removal requirement of 61.8 lbs. (on a yearly basis), therefore the site is in conformance with the requirements of NR. 151. The model showed that when stormwater run-on from adjacent sites was included, TSS removal was 46.88%

Peak Discharge: This phase 2 project is classified as re-development and requires peak discharge rates to be maintained or reduced for post-construction 2-year and 10-year, 24-hour storm events as compared to those same pre-construction storm events. NOAA Atlas 14 precipitation amounts were used in HydroCAD V10.00-26 models. This requirement is accomplished by the proposed biofilters with the peak discharge rates as follows:

Storm Event	Existing Site Conditions	Proposed Site Conditions	Proposed Site + Run-on
2-year	0.37 cfs	0.37 cfs	1.08 cfs
10-year	0.95 cfs	0.69 cfs	2.12 cfs
100-year	2.56 cfs	2.28 cfs	3.68 cfs

The phase 2 project site currently receives a significant amount of stormwater run-on from adjacent commercial and residential properties to the east, which passes thru the project site to the existing Frontage Road storm sewer system. This project will accept most of that run-on into it's underground storage chambers system, but the chamber system is only designed to accept the 25-year event volume with that run-on included. Therefore the chamber system and the hydraulically connected biofilter will both overflow during events exceeding the 25-year storm, and will overflow to Frontage Road. However, the volume of run-off reaching Frontage Road will be reduced by this project's BMP's as compared to diverting the run-on flows around the BMP's. No structures or other development exists between the site's outfalls and the receiving water (La Crosse River) except for STH 16 and it's Frontage Road. Detailed modeling data is added to this plan in **Appendix C**.

Infiltration: This phase 2 project is classified as re-development with both phases disturbing a total of more than 1 acre, so infiltration performance standards are applicable. However, the soils report shows that the native soil infiltration rate of 0.03 inches/hour is less than the minimum 0.6 inches/hour specified in NR 151.124(4)(C)(1) required, so this project is exempt from infiltration requirements.

Practices During Construction: The following Management Practices shall be implemented during construction to help control total suspended solids and peak flow, enhance infiltration, and maintain or restore protective areas. Installation and maintenance of silt fence, tracking control devices, inlet protection, and dust control, if needed, shall be maintained by the Contractor during construction. Erosion control matting shall be installed as soon as practicable after grading operations have been completed. Seeding and fertilizing or sodding shall take place as soon as practicable after final grading has been completed. The use, storage, and disposal of chemicals, cement, and other compounds or construction materials used on site shall be managed by the Contractor during the construction period to prevent their entrance into waters of the state.

Protection of infiltrating BMPs: Avoid operating heavy equipment in the location of designated BMP areas to minimize soil compaction and delay excavation of BMP basins to the extent practical until all other earth work has been completed. Use low ground pressure equipment when possible. Provide silt fence around the basins so sediment cannot reach the floor or leaving the floor as native soil until it is time to over-excavate and replace with engineered soil.

Groundwater Limitations: No portion of the utilities or storm water BMP's are expected to encounter ground water.

Separation Distances: No facilities or natural features requiring a minimum separation distance are known to exist near the project site.

Long-Term Maintenance: For any permanent structures, provisions shall be made for long-term maintenance with the municipality or other responsible party. The BMPs utilized will need proper upkeep and attention to vegetation as described in the Operation and Maintenance Plan and included in **Appendix D**. A draft Long Term Maintenance Agreement is included in **Appendix E**.

Sediment Removal: Management of accumulated sediment removed from storm water management structures shall be handled or disposed of in accordance with NR 528 in a manner that protects public health, safety, the environment, and reduces the need to dispose of accumulated sediment in landfills. Except in cases where the accumulated sediment will be disposed of in a licensed landfill, the sediment manager shall properly complete the *Accumulated Sediment End Use Certification* from in accordance with NR 528.06.

Management Practices: The best management practices implemented in this project are a bio-infiltration device in order to meet the requirements of NR 151. These practices were selected for their ability to meet TSS removal requirements and to reduce peak runoff flows without significantly reducing the area available for parking.

Reporting and Monitoring Requirements

Records: The permittee shall retain records of all construction site inspections, copies of all reports and plans required by the permit, and records of all data used to obtain coverage under the permit. Minimum periods of retention are as follows:

- (a) The erosion control and storm water management plans and amendments to the erosion control and storm water management plans shall be retained at the construction site until permit coverage is terminated in accordance with s. NR 216.55.
- (b) All reports, amendments and background information used in their preparation, shall be kept for a period of at least 3 years from the date of notice of termination.

Local Approvals: A landowner operating a construction site under approved municipal sediment and erosion plans, grading plans, or storm water management plans shall also submit signed copies of the notice of intent to the local agency approving the plans. If storm water from the construction site discharges to a municipal separate storm sewer system that is regulated under a municipal storm water discharge permit, then a signed copy of the notice of intent shall also be sent to the operator of the system.

Additional Information: Upon request by the Department, the permittee or landowner shall provide a copy of the erosion control and storm water management plans, construction site inspections and any additional data requested, within 5 working days to the Department, to the operator of the municipal storm sewer system that receives the storm water discharge, and any municipal agency approving sediment and erosion plans, grading plans or storm water management plans. Additional information may be requested by the WDNR for resource waters that require additional protection such as outstanding or exceptional resource waters, or other sensitive water resources.

Inspections and Maintenance: The permittee or landowner shall:

- (a) Conduct the following construction site inspections:
 - (1) Weekly inspections of implemented erosion and sediment control best management practices.
 - (2) Inspections of erosion and sediment controls within 24 hours after a precipitation event of 0.5 inches or greater. A precipitation event may be considered to be the total amount of precipitation recorded in any continuous 24-hour period.
- (b) Repair or replace erosion and sediment control best management practices as necessary within 24 hours of an inspection or Department notification that repair or replacement is needed.
- (c) Maintain, at the construction site or available via an Internet website, weekly written reports of all inspections conducted by or for the permittee or landowner. The landowner shall notify the Wisconsin Department of Safety and Professional Services of all appropriate Internet addresses to access the weekly inspection records.

Weekly inspection reports shall include all of the following:

- (1) The date, time, and location of the construction site inspection.
- (2) The name of the individual who performed the inspection.
- (3) An assessment of the condition of erosion and sediment controls.
- (4) A description of any erosion and sediment control best management practice implementation and maintenance performed.
- (5) A description of the present phase of land disturbing construction activity at the construction site.

Conformance with other applicable regulations

Local compliance: The erosion control and storm water management plans shall document applicable municipal regulatory provisions, compliance with which will also meet the requirements of the permit. If these municipal provisions are more stringent than those provisions appearing in a permit issued pursuant to NR 216, the erosion control and storm water management plans shall include a description of how compliance with municipal provisions

will be achieved. This plan is in compliance with DNR and Department of Safety and Professional Services regulations.

Plumbing regulations: The erosion control and storm water management plans shall be in compliance with applicable state plumbing regulations.

Amendments

Landowner initiated: The permittee or landowner required to submit a notice of intent under this subchapter shall amend the erosion control and storm water management plans if either of the following occurs:

- (a) There is a change in design, construction, operation, or maintenance at the construction site which has the reasonable potential for the discharge of pollutants and which has not otherwise been addressed in the erosion control and storm water management plans.
- (b) The actions required by the plan fail to reduce the impacts of pollutants carried by storm water runoff.

Submittal requirements: For construction sites for which there has been earlier department review of the erosion control and storm water management plans, if the permittee or landowner identifies changes needed in either plan, the permittee or the landowner shall notify the WDNR 5 working days prior to making the changes to the plan.

Permit modification: The WDNR may, upon request of a permittee or upon finding of just cause, modify the compliance and reporting schedules or any requirement of a storm water discharge permit.

Use of information

All information contained in the notice of intent other than that specified as confidential shall be available to the public for inspection and copying. All confidential information, so identified, shall be in separate documents. Effluent data is not confidential information. Confidential treatment will be considered only for that information identified as confidential in documents separate from non-confidential information and which meets the requirements of s. 283.55(2)(c), Stats., and for which written application for confidentiality has been made pursuant to s. NR 2.19.

Transfers

A landowner who has submitted a completed notice of intent and does not intend to control the permitted activities on the construction site may transfer authorization of construction site storm water discharge permit coverage to the person who will control the permitted activities. The transfer shall occur upon written notification, signed by both the current permittee and the proposed permittee and sent via certified or registered mail to the Department. Unless the Department notifies the permittee to the contrary, the WDNR will recognize this permit coverage transfer upon receipt of written notification. The WDNR may require additional information to be filed prior to granting coverage under the general WPDES permit. The WDNR may, if appropriate, require an application for an individual WPDES storm water permit.

Notice of termination

When to file: When a construction site has undergone final stabilization, temporary erosion and sediment control best management practices have been removed, all land disturbing construction activities have ceased, and all storm water discharges associated with the construction site activities that were required to have WPDES permit coverage have ceased, the permittee shall submit a signed notice of termination to the WDNR.

Forms: A notice of termination shall be submitted to the WDNR. Data submitted in the notice of termination forms shall be used as a basis for terminating coverage of a storm water discharge permit.

Signature requirements: The notice of termination form shall be signed as required for the notice of intent.

Required information: The notice of termination shall include the following information:

- (a) The mailing address and location of the construction site for which the notice of termination is submitted.
- (b) The name, mailing address, and telephone number of the current permittee, as well as any transferee.
- (c) The name, mailing address, and telephone number of the general Contractor.
- (d) The following signed certification:

“I certify under penalty of law that disturbed soils at the identified site have undergone final stabilization and temporary erosion and sediment control measures have been removed or that all storm water discharges associated with the construction activity that are authorized by a general WPDES permit have otherwise been eliminated. I understand that by submitting this notice of termination, I am no longer authorized to discharge storm water associated with construction activity by the general WPDES permit, and that discharging pollutants in storm water associated with construction activity to waters of Wisconsin is unlawful where the discharge is not authorized by a general WPDES permit.”

Effective Date: Termination of coverage under the permit shall be effective upon written confirmation of the permit termination by the WDNR to the permittee.

LIVE WELL CHIROPRACTIC CLINIC NEW BUILDING

PHASE 2 OF STH 16 CLINICS DEVELOPMENT – LA CROSSE

Storm Water Management Plan

APPENDIX A – Aerial Photos & Maps of Project Site

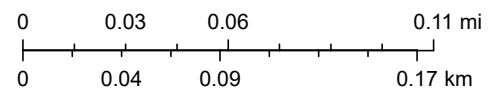
ArcGIS Web Map



8/26/2025, 10:14:45 AM

1:4,514

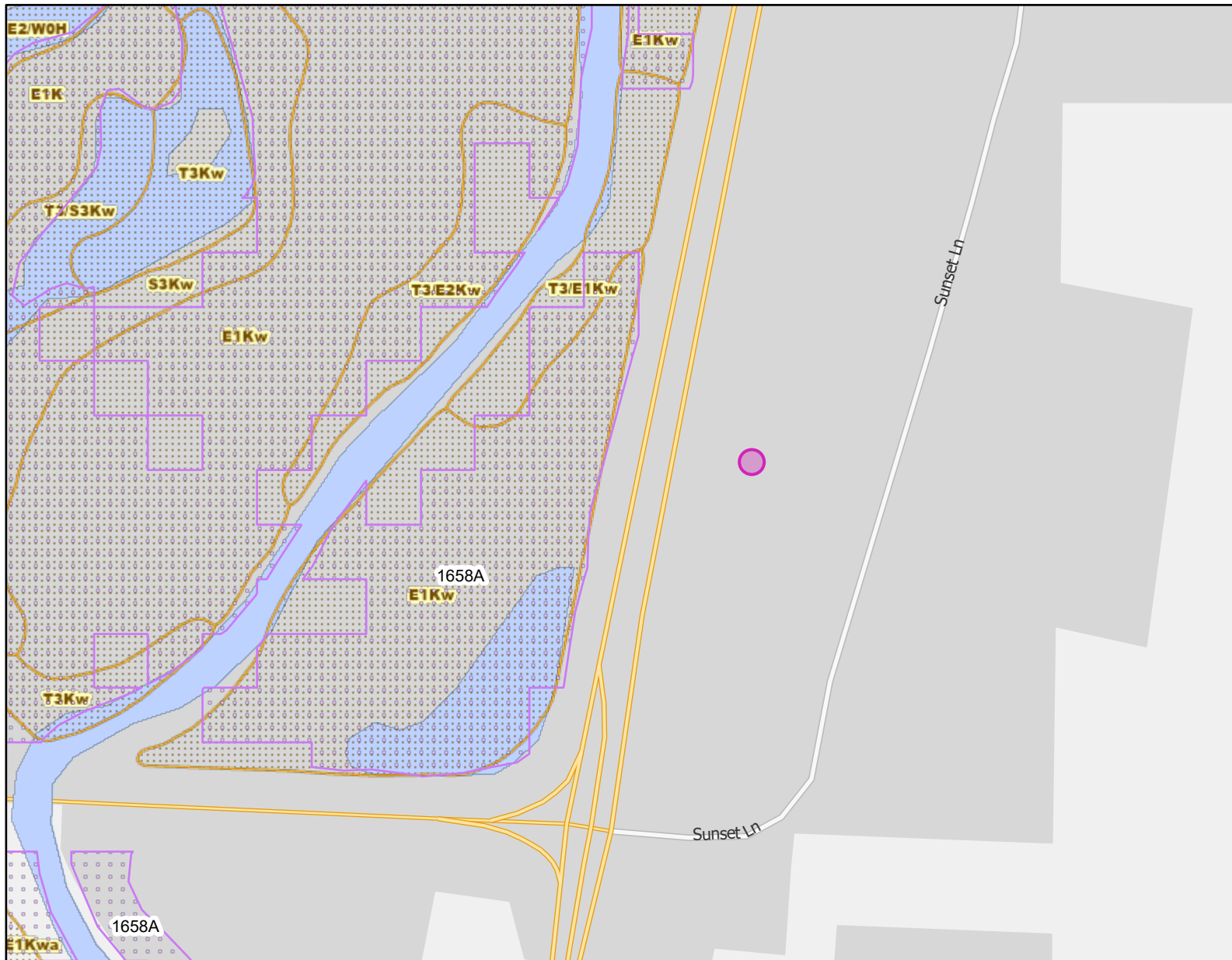
- Municipality Limits Labels
- Municipality Limits
- Road Centerlines
- State Highway
- County Highway
- Local Road
- Named Private Drive
- Property Owners with Assessments
- Lakes & Rivers
- Lake & River Labels



La Crosse County WI Zoning Planning and Land Information Department
212 6th St N, Suite 1300
La Crosse, WI 54601
<https://lacrossecounty.org/zoning>
608-785-9722

Web AppBuilder for ArcGIS

Representative Fraction (RF) or Natural Scale: 1:1200 (this is the same as 1/1200) The RF says that 1 of any measurement on the map equals 1200 of the same measurement on the original surface;



Legend: (some map layers may not be displayed)

-  Wetland Indicators
-  Wetland Class Areas
-  Rivers and Streams
-  Intermittent Streams
-  Open Water
-  24K Lakes and Open Water

Notes:



Map: 0 250 500 Feet
0 70 140 Meters

Service Layer Credits:
DNR Basic Feature Vector Tile Layer WTM: , Surface Water (Cached): WiDNR, USGS, and other data, Wetland Inventory NWI (Dynamic): Calvin Lawrence, Dennis Weise, Nina Rihn

Map projection: NAD 1983 HARN Wisconsin TM

This map is a product generated by a DNR web mapping application.

This map is for informational purposes only and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. The user is solely responsible for verifying the accuracy of information before using for any purpose. By using this product for any purpose user agrees to be bound by all disclaimers found here: <https://dnr.wisconsin.gov/legal>

Date Printed: 10/2/2025 1:12 PM

LIVE WELL CHIROPRACTIC CLINIC NEW BUILDING

PHASE 2 OF STH 16 CLINICS DEVELOPMENT – LA CROSSE

Storm Water Management Plan

APPENDIX B – Soils Report

NOTE: All Space Matters, Inc. recently sold the south parcel to Dr. Angela Frank

SOIL EVALUATION - STORM

in accordance with SPS 382.365 and 385, Wis. Adm. Code

Attach complete site plan on paper not less than 8 1/2 x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent slope, scale or dimensions, north arrow, and BM referenced to nearest road.

Please print all information.

Personal information you provide may be used for secondary purposes (Privacy Law, s. 15.04 (1) (m)).

County La Crosse	
Parcel I.D. 17-10460-130 and 17-10460-110	
Reviewed by	Date

Property Owner All Space Matters and LAXVC Holdings				Property Location Govt. Lot SE 1/4 NE 1/4 S 21 T 16 N R 07 EXX W			
Property Owner's Mailing Address W4917 Battleground Rd				Lot #	Block #	Subd. Name or CSM#	
City La Crosse	State WI	Zip Code 54601	Phone Number (414) 897-3500	☒ City ☐ Village ☐ Town		Nearest Road La Crosse SR-16	

Drainage area _____ ☐ sq. ft. ☐ acres Optional: Test Site Suitable for (check all that apply) ☐ Irrigation ☐ Bioretention trench ☐ Trench(es) ☐ Rain garden ☐ Grassed swale ☐ Reuse ☐ Infiltration trench ☐ SDS (> 15' wide) ☐ Other _____	Hydraulic Application Test Method: ☒ Morphological Evaluation ☐ Double-Ring Infiltrometer ☐ Other (specify) _____
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1	Obs. #	☐ Boring ☒ Pit	Ground surface elev. 678.0 ft.	Depth to limiting factor 125 in.	Hydraulic App. Rate				
Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Inches/Hr
1	0-20	10YR 3/3		sil	2msbk	mfr	cs	0	0.13
2	20-53	10YR 4/4		sil	2mabk	mfr	gs	0	0.13
3	53-91	10YR 4/4		sil	1msbk	mfr	cs	0	0.13
4	91-125	10YR 6/4 & 7.5YR 5/8		lfs	0sg	ml	-	0	0.50

2	Obs. #	☐ Boring ☒ Pit	Ground surface elev. 679.0 ft.	Depth to limiting factor 125 in.	Hydraulic App. Rate				
Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Inches/Hr
1	0-20	10YR 3/3		sil	2msbk	mfr	cs	0	0.13
2	20-54	10YR 4/4		sil	2mabk	mfr	gs	0	0.13
3	54-125	10YR 5/4		sil	1csbk	mfr	-	0	0.13

CST/PSS Name (Please Print) Mark Palmer	Signature 	CST/PSS Number 224736
Address PO Box 176, Galesville, WI 54630	Date Evaluation Conducted 09-17-2025	Telephone Number 608-582-2205

Property Owner _____

Parcel ID # _____

Page _____ of _____

[illegible][illegible]

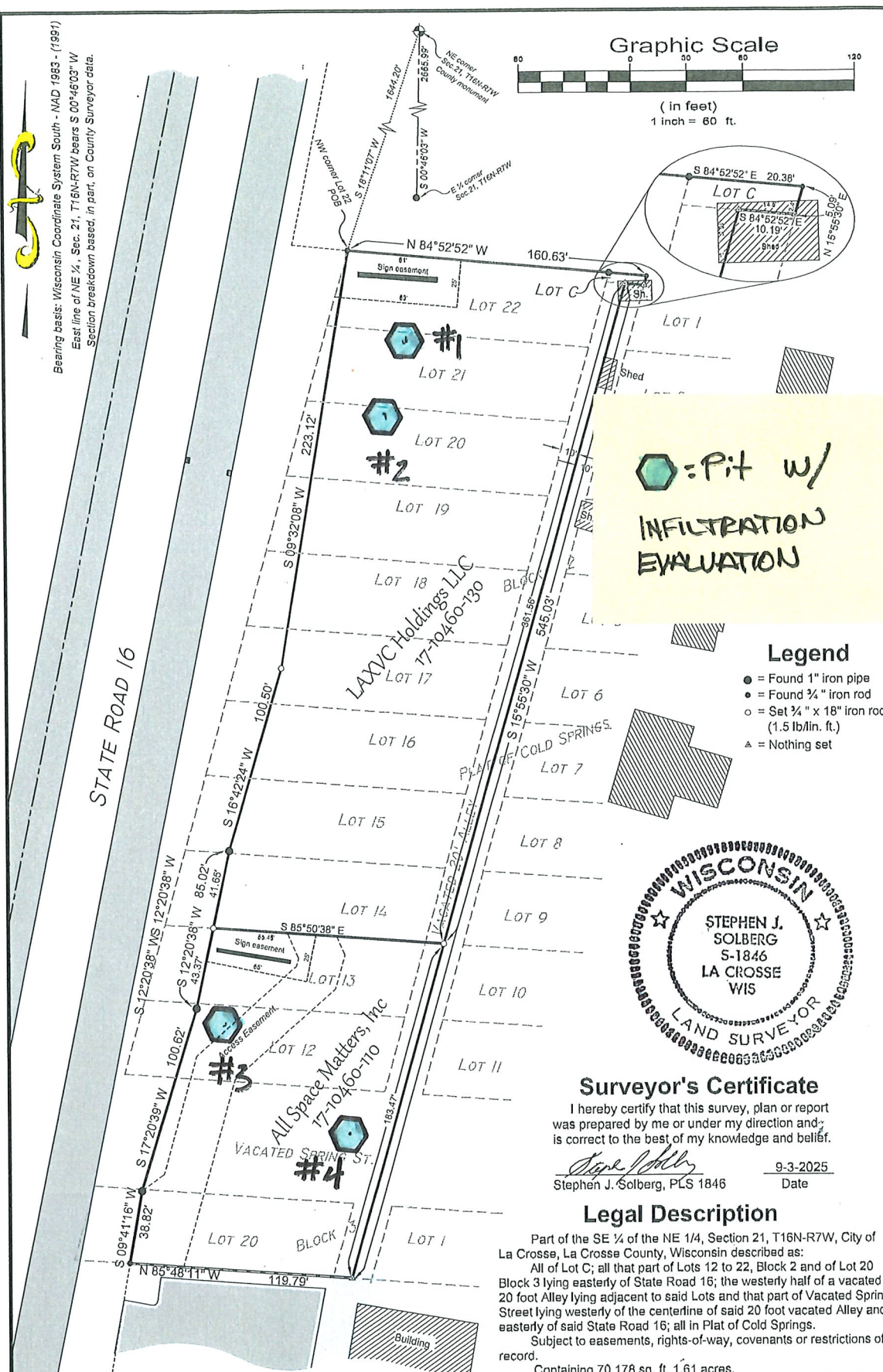
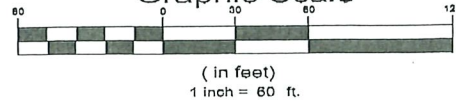
Test Results and/or Summary Comments

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Bearing basis: Wisconsin Coordinate System South - NAD 1983 - (1991)
East line of NE 1/4, Sec. 21, T16N-R7W bears S 00°46'03" W
Section breakdown based, in part, on County Surveyor data.



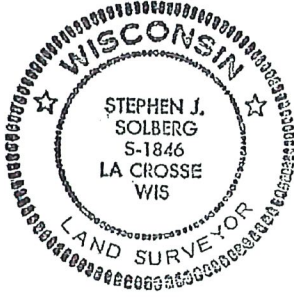
Graphic Scale



**# = Pit w/
INFILTRATION
EVALUATION**

Legend

- = Found 1" iron pipe
- = Found 3/4" iron rod
- = Set 3/4" x 18" iron rod (1.5 lb/lin. ft.)
- △ = Nothing set



Surveyor's Certificate

I hereby certify that this survey, plan or report was prepared by me or under my direction and is correct to the best of my knowledge and belief.

Stephen J. Solberg
Stephen J. Solberg, PLS 1846 9-3-2025
Date

Legal Description

Part of the SE 1/4 of the NE 1/4, Section 21, T16N-R7W, City of La Crosse, La Crosse County, Wisconsin described as:
All of Lot C; all that part of Lots 12 to 22, Block 2 and of Lot 20 Block 3 lying easterly of State Road 16; the westerly half of a vacated 20 foot Alley lying adjacent to said Lots and that part of Vacated Spring Street lying westerly of the centerline of said 20 foot vacated Alley and easterly of said State Road 16; all in Plat of Cold Springs.
Subject to easements, rights-of-way, covenants or restrictions of record.

Containing 70,178 sq. ft. 1.61 acres.

LAXVC & All Space Matters

Part Lot 20, BI 3, part Lots 12-20 BI 2 & Lot C
Part Vacated Alley & part Vacated Spring St
SE 1/4 of the NE 1/4, Section 21, T16N-R7W
City of La Crosse, La Crosse County, WI
Parcel Nos.: 17-10460-110 & 17-10460-130



HIGH CLIFF CONSULTING LLC

P.O. Box 176, Galesville, WI 54630
608-582-2205 survey@highcliffconsulting.com
www.highcliffconsulting.com

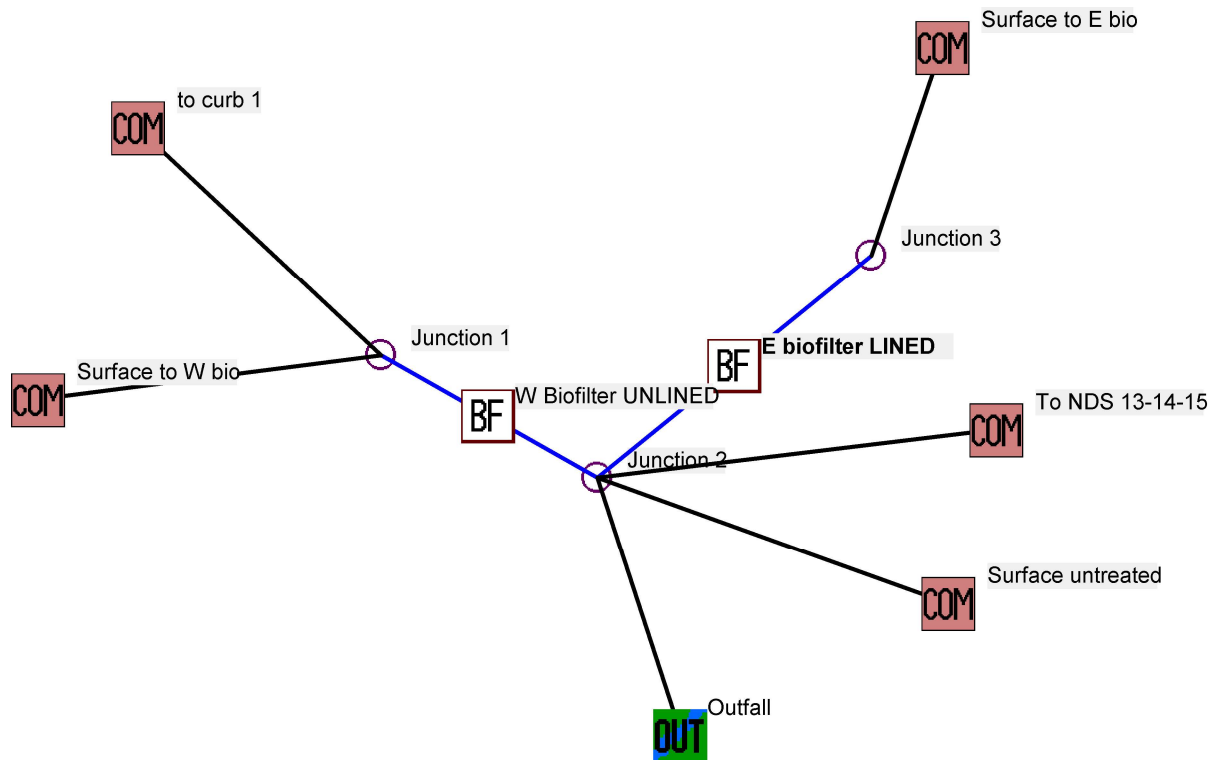
Drawn by: SJS	Date: 9-3-2025	Job No: COLDSPRINGS	Sheet: 1 of 1
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LIVE WELL CHIROPRACTIC CLINIC NEW BUILDING

PHASE 2 OF STH 16 CLINICS DEVELOPMENT – LA CROSSE

Storm Water Management Plan

APPENDIX C – Modeling Results



Data file name: F:\Engineering\Engineering Dwg\2025\25-089 Hwy 16 Clinics -Dale Jacobson\Storm\models\Chiro\Mar '26 updates\Chiro SLAMM proposed V6 No Run
WinSLAMM Version 10.5.0

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN

Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx

Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx

Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std

Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False

Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx

Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv

Cost Data file name:

Seed for random number generator: -42

Study period starting date: 01/01/81

Study period ending date: 12/31/81

Start of Winter Season: 12/02

End of Winter Season: 03/12

Date: 03-11-2026

Time: 10:27:38

Site information:

LU# 1 - Commercial: Surface to E bio Total area (ac): 0.043

1 - Roofs 1: 0.014 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

31 - Sidewalks 1: 0.005 ac. Disconnected Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

32 - Sidewalks 2: 0.001 ac. Disconnected Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

51 - Small Landscaped Areas 1: 0.018 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 0.005 ac. PSD File: Source Area PSD File:

LU# 2 - Commercial: Surface untreated Total area (ac): 0.198

1 - Roofs 1: 0.042 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 0.055 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

31 - Sidewalks 1: 0.006 ac. Disconnected Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

51 - Small Landscaped Areas 1: 0.078 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

52 - Small Landscaped Areas 2: 0.017 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 3 - Commercial: to curb 1 Total area (ac): 0.115

13 - Paved Parking 1: 0.073 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

31 - Sidewalks 1: 0.004 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

32 - Sidewalks 2: 0.002 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

51 - Small Landscaped Areas 1: 0.018 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

52 - Small Landscaped Areas 2: 0.018 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 4 - Commercial: Surface to W bio Total area (ac): 0.104

13 - Paved Parking 1: 0.005 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 0.046 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

51 - Small Landscaped Areas 1: 0.037 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

52 - Small Landscaped Areas 2: 0.005 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 0.011 ac. PSD File: Source Area PSD File:

LU# 5 - Commercial: To NDS 13-14-15 Total area (ac): 0.024

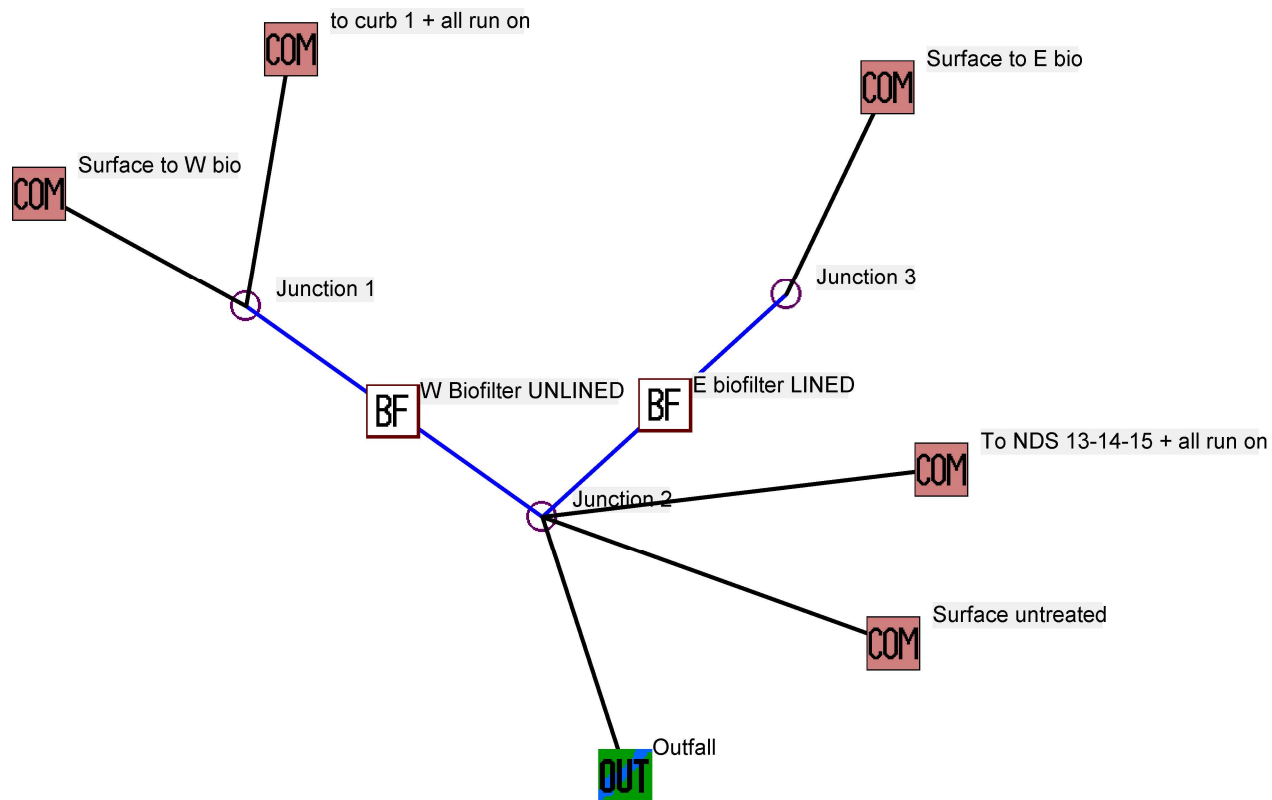
51 - Small Landscaped Areas 1: 0.011 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

52 - Small Landscaped Areas 2: 0.013 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

Data file name: F:\Engineering\Engineering Dwg\2025\25-089 Hwy 16 Clinics -Dale Jacobson\Storm\models\Chiro\Mar '26 updates\Chiro SLAMM proposed V6 No Run
WinSLAMM Version 10.5.0
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppd
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/01/81 Study period ending date: 12/31/81
Start of Winter Season: 12/02 End of Winter Season: 03/12
Model Run Start Date: 01/01/81 Model Run End Date: 12/31/81
Date of run: 03-11-2026 Time of run: 10:27:05
Total Area Modeled (acres): 0.484
Years in Model Run: 1.00

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	22509	-	109.9	154.4	-
Outfall Total with Controls:	19330	14.12%	61.59	74.32	51.87%
Annualized Total After Outfall Controls:	19383			74.52	

Biofilter # 1 is expected to clog in 7.35 years.. Percent Solids Reduction due to Engineered Media = 80
Biofilter # 2 is expected to clog in 73.56 years.. Percent Solids Reduction due to Engineered Media = 60



Data file name: F:\Engineering\Engineering Dwg\2025\25-089 Hwy 16 Clinics -Dale Jacobson\Storm\models\Chiro\Mar '26 updates\Chiro SLAMM proposed V9 + Run o
WinSLAMM Version 10.5.0

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN

Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx

Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx

Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std

Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std

Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std

Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False

Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx

Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv

Cost Data file name:

Seed for random number generator: -42

Study period starting date: 01/01/81

Study period ending date: 12/31/81

Start of Winter Season: 12/02

End of Winter Season: 03/12

Date: 03-11-2026

Time: 11:28:52

Site information:

LU# 1 - Commercial: Surface to E bio Total area (ac): 0.042

1 - Roofs 1: 0.014 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

51 - Small Landscaped Areas 1: 0.013 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

52 - Small Landscaped Areas 2: 0.011 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 0.004 ac. PSD File: Source Area PSD File:

LU# 2 - Commercial: Surface untreated Total area (ac): 0.226

1 - Roofs 1: 0.042 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 0.055 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

31 - Sidewalks 1: 0.011 ac. Disconnected Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

51 - Small Landscaped Areas 1: 0.096 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

52 - Small Landscaped Areas 2: 0.022 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 3 - Commercial: to curb 1 + all run on Total area (ac): 0.564

1 - Roofs 1: 0.032 ac. Pitched Disconnected Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.c

2 - Roofs 2: 0.034 ac. Pitched Disconnected Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.c

13 - Paved Parking 1: 0.052 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

14 - Paved Parking 2: 0.017 ac. Disconnected Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.c

15 - Paved Parking 3: 0.073 ac. Disconnected Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.c

31 - Sidewalks 1: 0.006 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

51 - Small Landscaped Areas 1: 0.011 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

52 - Small Landscaped Areas 2: 0.018 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

53 - Small Landscaped Areas 3: 0.018 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

54 - Small Landscaped Areas 4: 0.046 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

55 - Small Landscaped Areas 5: 0.142 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

56 - Small Landscaped Areas 6: 0.115 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 4 - Commercial: Surface to W bio + LAXVC SW run on Total area (ac): 0.104

13 - Paved Parking 1: 0.005 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

25 - Driveways 1: 0.046 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

51 - Small Landscaped Areas 1: 0.037 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

52 - Small Landscaped Areas 2: 0.011 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

70 - Water Body Areas: 0.005 ac. PSD File: Source Area PSD File:

LU# 5 - Commercial: To NDS 13-14-15 + all run on Total area (ac): 0.402

1 - Roofs 1: 0.034 ac. Pitched Disconnected Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.c

13 - Paved Parking 1: 0.184 ac. Disconnected Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.c

51 - Small Landscaped Areas 1: 0.011 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

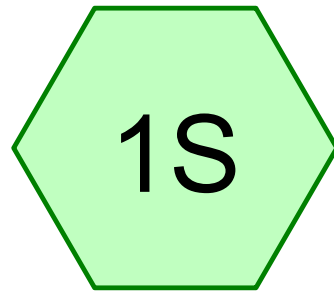
52 - Small Landscaped Areas 2: 0.161 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

53 - Small Landscaped Areas 3: 0.012 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

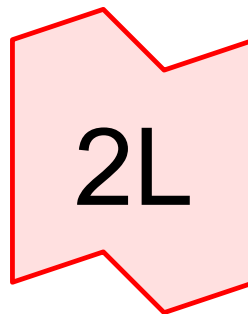
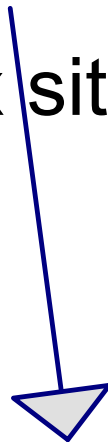
Data file name: F:\Engineering\Engineering Dwg\2025\25-089 Hwy 16 Clinics -Dale Jacobson\Storm\models\Chiro\Mar '26 updates\Chiro SLAMM proposed V9 + Run o
WinSLAMM Version 10.5.0
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Madison WI 1981.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppd
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/01/81 Study period ending date: 12/31/81
Start of Winter Season: 12/02 End of Winter Season: 03/12
Model Run Start Date: 01/01/81 Model Run End Date: 12/31/81
Date of run: 03-11-2026 Time of run: 11:28:04
Total Area Modeled (acres): 1.338
Years in Model Run: 1.00

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	25719	-	125.8	202.0	-
Outfall Total with Controls:	22666	11.87%	75.83	107.3	46.88%
Annualized Total After Outfall Controls:	22728			107.6	

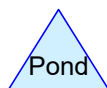
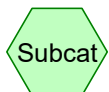
Biofilter # 1 is expected to clog in 6.16 years.. Percent Solids Reduction due to Engineered Media = 80
Biofilter # 2 is expected to clog in 68.19 years.. Percent Solids Reduction due to Engineered Media = 60



all ex site



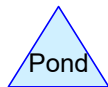
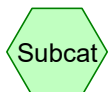
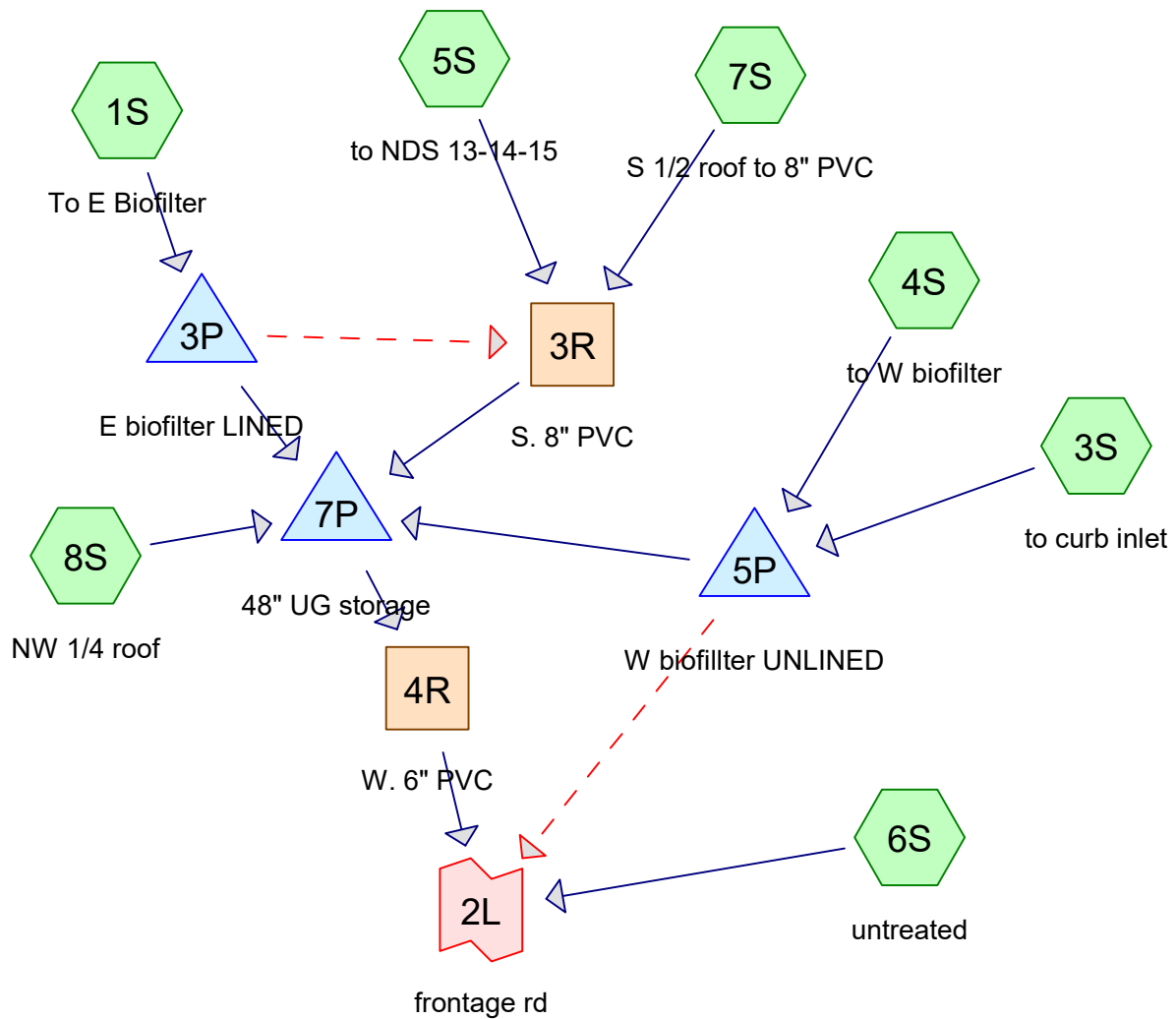
frontage rd



Routing Diagram for Chiro HCAD Existing

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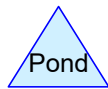
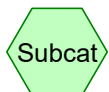
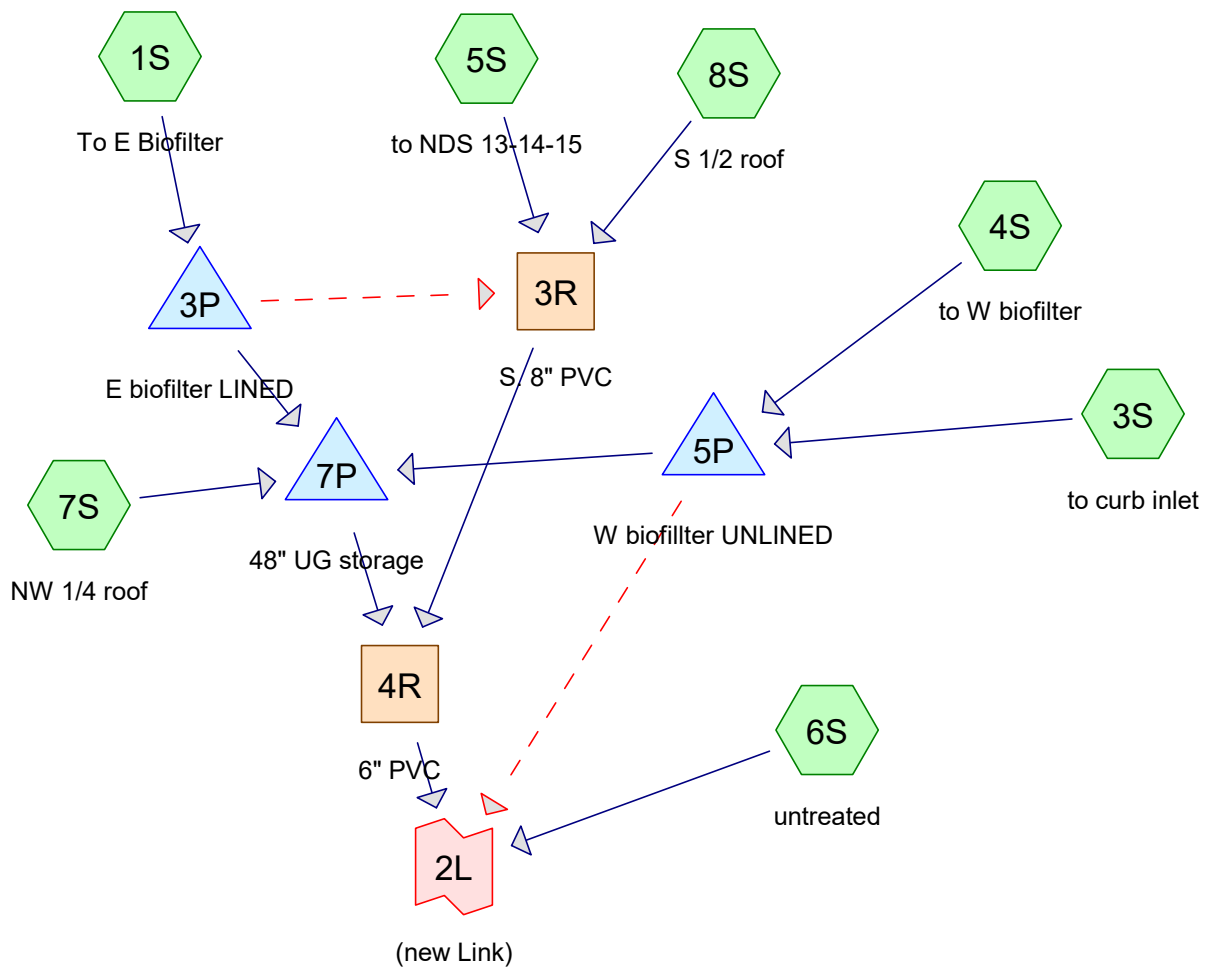
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Routing Diagram for Chiro HCAD Proposed Chiro only AMENDED

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Routing Diagram for Chiro HCAD Proposed + Run On
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Chiro HCAD Proposed + Run On

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.046	98	N part driveway (4S)
0.005	98	N part parking lot (4S)
0.011	61	NDS 13 lawn (5S)
0.013	61	NDS 14-15 lawn berm, HSG B, good (5S)
0.015	98	NE 1/4 roof (1S)
0.014	98	NW 1/4 roof (7S)
0.027	98	S 1/2 roof (8S)
0.055	98	S driveway (6S)
0.073	98	S part parking lot (3S)
0.004	98	SW (3S)
0.022	61	bark mulch landscape (4S, 6S)
0.015	100	bio media (1S, 4S)
0.018	61	lawn above wall (3S)
0.161	61	lawn run on 1825 (5S)
0.142	61	lawn run on 1835 (3S)
0.046	61	lawn run on 1845 (3S)
0.151	61	lawn, HSG B, good (1S, 3S, 4S, 6S)
0.115	61	lawn run on 1825 (3S)
0.014	98	retain wall (1S, 3S, 6S)
0.321	98	roof+drive run on 1825 (3S, 5S)
0.049	98	roof+drive run on 1835 (3S)
1.317	79	TOTAL AREA

Chiro HCAD Proposed + Run On

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Page 3

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.164	HSG B	1S, 3S, 4S, 5S, 6S
0.000	HSG C	
0.000	HSG D	
1.153	Other	1S, 3S, 4S, 5S, 6S, 7S, 8S
1.317		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	0.046	0.046	N part driveway	4S
0.000	0.000	0.000	0.000	0.005	0.005	N part parking lot	4S
0.000	0.000	0.000	0.000	0.011	0.011	NDS 13 lawn	5S
0.000	0.013	0.000	0.000	0.000	0.013	NDS 14-15 lawn berm	5S
0.000	0.000	0.000	0.000	0.015	0.015	NE 1/4 roof	1S
0.000	0.000	0.000	0.000	0.014	0.014	NW 1/4 roof	7S
0.000	0.000	0.000	0.000	0.027	0.027	S 1/2 roof	8S
0.000	0.000	0.000	0.000	0.055	0.055	S driveway	6S
0.000	0.000	0.000	0.000	0.073	0.073	S part parking lot	3S
0.000	0.000	0.000	0.000	0.004	0.004	SW	3S
0.000	0.000	0.000	0.000	0.022	0.022	bark mulch landscape	4S, 6S
0.000	0.000	0.000	0.000	0.015	0.015	bio media	1S, 4S
0.000	0.151	0.000	0.000	0.000	0.151	lawn	1S, 3S, 4S, 6S
0.000	0.000	0.000	0.000	0.018	0.018	lawn above wall	3S
0.000	0.000	0.000	0.000	0.161	0.161	lawn run on 1825	5S
0.000	0.000	0.000	0.000	0.142	0.142	lawn run on 1835	3S
0.000	0.000	0.000	0.000	0.046	0.046	lawn run on 1845	3S
0.000	0.000	0.000	0.000	0.115	0.115	lawn run on 1825	3S
0.000	0.000	0.000	0.000	0.014	0.014	retain wall	1S, 3S, 6S
0.000	0.000	0.000	0.000	0.321	0.321	roof+drive run on 1825	3S, 5S
0.000	0.000	0.000	0.000	0.049	0.049	roof+drive run on 1835	3S
0.000	0.164	0.000	0.000	1.153	1.317	TOTAL AREA	

Chiro HCAD Proposed + Run On

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	3R	676.38	675.93	87.0	0.0052	0.010	8.0	0.0	0.0
2	4R	668.80	658.52	77.0	0.1335	0.010	6.0	0.0	0.0
3	7P	669.82	669.80	4.0	0.0050	0.010	5.0	0.0	0.0

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Notes Listing (all nodes)

Line#	Node Number	Notes
1	Project	Rainfall events imported from "NRCS-Rain.txt" for 9170 WI La Crosse
2		Rainfall events imported from "NRCS-Rain.txt" for 9170 WI La Crosse

Chiro HCAD Proposed + Run On

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Chiro HCAD Propose + Run On AMENDED Mar. '26

MSE 24-hr 4 2-Year Rainfall=2.94"

Printed 3/11/2026

Page 7

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: To E Biofilter

Runoff Area=1,875 sf 57.33% Impervious Runoff Depth>1.63"
Flow Length=25' Tc=8.0 min CN=WQ Runoff=0.09 cfs 0.006 af

Subcatchment 3S: to curb inlet

Runoff Area=24,840 sf 40.58% Impervious Runoff Depth>1.23"
Flow Length=300' Tc=30.0 min CN=WQ Runoff=0.50 cfs 0.058 af

Subcatchment 4S: to W biofilter

Runoff Area=4,490 sf 59.91% Impervious Runoff Depth>1.68"
Flow Length=140' Tc=6.0 min CN=WQ Runoff=0.24 cfs 0.014 af

Subcatchment 5S: to NDS 13-14-15

Runoff Area=17,550 sf 54.13% Impervious Runoff Depth>1.53"
Flow Length=275' Tc=30.0 min CN=WQ Runoff=0.46 cfs 0.051 af

Subcatchment 6S: untreated

Runoff Area=6,820 sf 39.15% Impervious Runoff Depth>1.20"
Flow Length=100' Tc=15.0 min CN=WQ Runoff=0.19 cfs 0.016 af

Subcatchment 7S: NW 1/4 roof

Runoff Area=595 sf 100.00% Impervious Runoff Depth>2.58"
Flow Length=25' Tc=5.0 min CN=98 Runoff=0.05 cfs 0.003 af

Subcatchment 8S: S 1/2 roof

Runoff Area=1,190 sf 100.00% Impervious Runoff Depth>2.58"
Flow Length=25' Tc=5.0 min CN=98 Runoff=0.10 cfs 0.006 af

Reach 3R: S. 8" PVC

Avg. Flow Depth=0.30' Max Vel=3.10 fps Inflow=0.48 cfs 0.057 af
8.0" Round Pipe n=0.010 L=87.0' S=0.0052 '/' Capacity=1.13 cfs Outflow=0.47 cfs 0.057 af

Reach 4R: 6" PVC

Avg. Flow Depth=0.20' Max Vel=12.09 fps Inflow=0.86 cfs 0.125 af
6.0" Round Pipe n=0.010 L=77.0' S=0.1335 '/' Capacity=2.67 cfs Outflow=0.86 cfs 0.125 af

Pond 3P: E biofilter LINED

Peak Elev=680.51' Storage=121 cf Inflow=0.09 cfs 0.006 af
Discarded=0.00 cfs 0.000 af Primary=0.03 cfs 0.005 af Secondary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.005 af

Pond 5P: W biofilter UNLINED

Peak Elev=676.18' Storage=1,047 cf Inflow=0.56 cfs 0.073 af
Discarded=0.00 cfs 0.001 af Primary=0.49 cfs 0.060 af Secondary=0.16 cfs 0.002 af Outflow=0.67 cfs 0.063 af

Pond 7P: 48" UG storage

Peak Elev=670.69' Storage=90 cf Inflow=0.55 cfs 0.068 af
5.0" Round Culvert n=0.010 L=4.0' S=0.0050 '/' Outflow=0.42 cfs 0.067 af

Link 2L: (new Link)

Inflow=1.08 cfs 0.142 af
Primary=1.08 cfs 0.142 af

Total Runoff Area = 1.317 ac Runoff Volume = 0.154 af Average Runoff Depth = 1.41"
51.53% Pervious = 0.679 ac 48.47% Impervious = 0.638 ac

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MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Subcatchment 1S: To E Biofilter

Runoff = 0.09 cfs @ 12.15 hrs, Volume= 0.006 af, Depth> 1.63"

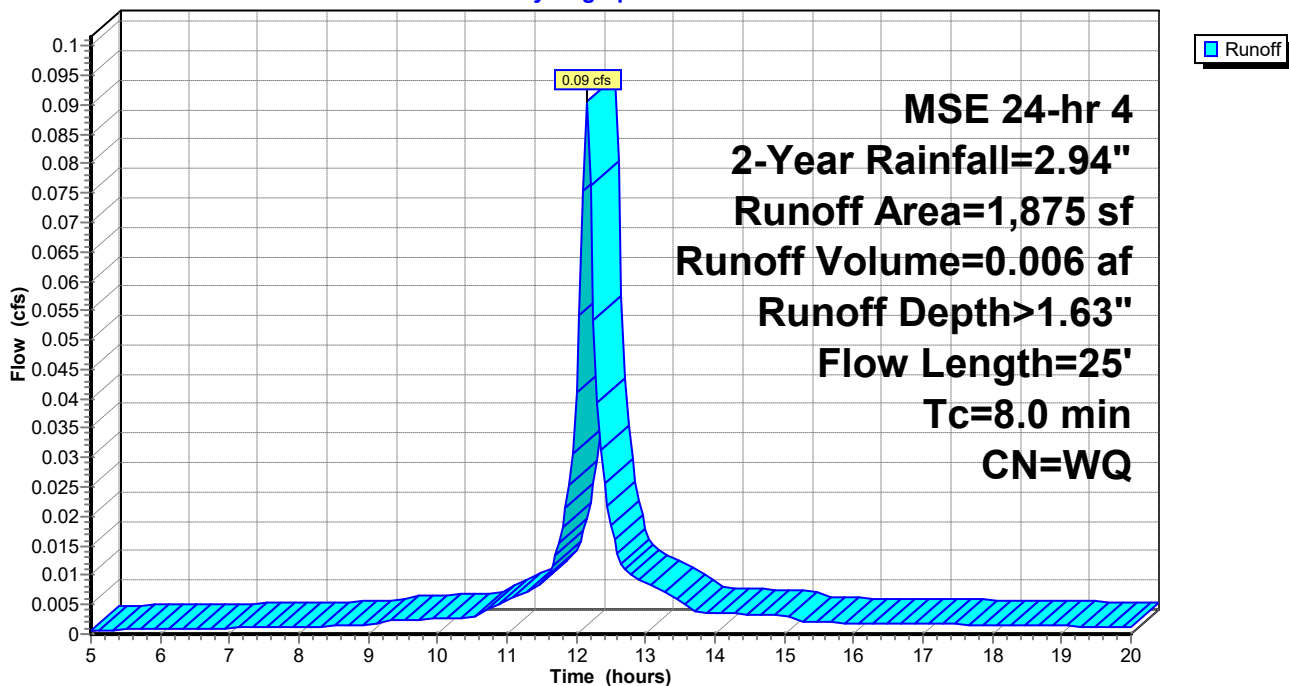
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
*	800	61	lawn, HSG B, good
*	645	98	NE 1/4 roof
*	210	100	bio media
*	220	98	retain wall
	1,875		Weighted Average
	800		42.67% Pervious Area
	1,075		57.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	25		0.05		Direct Entry, lawn above wall to E bio

Subcatchment 1S: To E Biofilter

Hydrograph



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Hydrograph for Subcatchment 1S: To E Biofilter

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.13	0.00	0.00	17.75	2.75	1.18	0.00
5.25	0.15	0.00	0.00	18.00	2.76	1.19	0.00
5.50	0.16	0.00	0.00	18.25	2.77	1.20	0.00
5.75	0.17	0.00	0.00	18.50	2.78	1.21	0.00
6.00	0.18	0.00	0.00	18.75	2.79	1.22	0.00
6.25	0.19	0.00	0.00	19.00	2.81	1.23	0.00
6.50	0.21	0.00	0.00	19.25	2.82	1.24	0.00
6.75	0.22	0.00	0.00	19.50	2.83	1.24	0.00
7.00	0.23	0.00	0.00	19.75	2.84	1.25	0.00
7.25	0.25	0.00	0.00	20.00	2.84	1.26	0.00
7.50	0.26	0.00	0.00				
7.75	0.28	0.00	0.00				
8.00	0.29	0.00	0.00				
8.25	0.31	0.00	0.00				
8.50	0.32	0.00	0.00				
8.75	0.34	0.00	0.00				
9.00	0.36	0.00	0.00				
9.25	0.38	0.00	0.00				
9.50	0.41	0.00	0.00				
9.75	0.44	0.00	0.00				
10.00	0.47	0.00	0.00				
10.25	0.50	0.00	0.00				
10.50	0.53	0.00	0.00				
10.75	0.57	0.01	0.00				
11.00	0.64	0.02	0.01				
11.25	0.71	0.03	0.01				
11.50	0.80	0.05	0.01				
11.75	0.96	0.10	0.02				
12.00	1.38	0.28	0.04				
12.25	1.98	0.63	0.05				
12.50	2.14	0.74	0.02				
12.75	2.23	0.80	0.01				
13.00	2.30	0.86	0.01				
13.25	2.37	0.90	0.01				
13.50	2.41	0.94	0.01				
13.75	2.44	0.96	0.00				
14.00	2.47	0.98	0.00				
14.25	2.50	1.00	0.00				
14.50	2.53	1.02	0.00				
14.75	2.56	1.04	0.00				
15.00	2.58	1.06	0.00				
15.25	2.60	1.07	0.00				
15.50	2.62	1.08	0.00				
15.75	2.63	1.10	0.00				
16.00	2.65	1.11	0.00				
16.25	2.66	1.12	0.00				
16.50	2.68	1.13	0.00				
16.75	2.69	1.14	0.00				
17.00	2.71	1.15	0.00				
17.25	2.72	1.16	0.00				
17.50	2.73	1.17	0.00				

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Summary for Subcatchment 3S: to curb inlet

Runoff = 0.50 cfs @ 12.43 hrs, Volume= 0.058 af, Depth> 1.23"

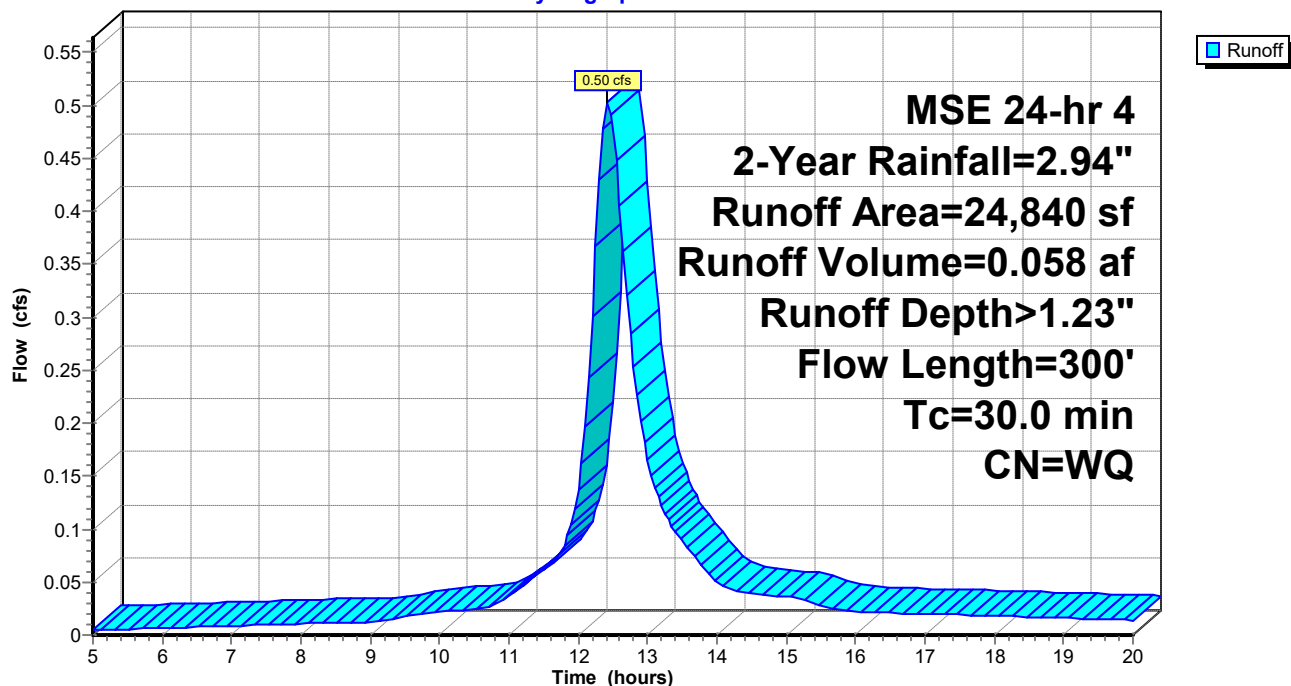
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
*	3,200	98	S part parking lot
*	160	98	SW
*	780	61	lawn, HSG B, good
*	780	61	lawn above wall
*	100	98	retain wall
*	2,000	61	lawn run on 1845
*	6,200	61	lawn run on 1835
*	2,120	98	roof+drive run on 1835
*	4,500	98	roof+drive run on 1825
*	5,000	61	lawn run on 1825
	24,840		Weighted Average
	14,760		59.42% Pervious Area
	10,080		40.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.0	300		0.17		Direct Entry, 1845 lawn run on

Subcatchment 3S: to curb inlet

Hydrograph



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MSE 24-hr 4 2-Year Rainfall=2.94"

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Hydrograph for Subcatchment 3S: to curb inlet

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.13	0.00	0.00	17.75	2.75	0.85	0.02
5.25	0.15	0.00	0.00	18.00	2.76	0.86	0.02
5.50	0.16	0.00	0.01	18.25	2.77	0.86	0.02
5.75	0.17	0.00	0.01	18.50	2.78	0.87	0.02
6.00	0.18	0.00	0.01	18.75	2.79	0.88	0.02
6.25	0.19	0.00	0.01	19.00	2.81	0.89	0.02
6.50	0.21	0.00	0.01	19.25	2.82	0.89	0.02
6.75	0.22	0.00	0.01	19.50	2.83	0.90	0.01
7.00	0.23	0.00	0.01	19.75	2.84	0.91	0.01
7.25	0.25	0.00	0.01	20.00	2.84	0.91	0.01
7.50	0.26	0.00	0.01				
7.75	0.28	0.00	0.01				
8.00	0.29	0.00	0.01				
8.25	0.31	0.00	0.01				
8.50	0.32	0.00	0.01				
8.75	0.34	0.00	0.01				
9.00	0.36	0.00	0.01				
9.25	0.38	0.00	0.01				
9.50	0.41	0.00	0.02				
9.75	0.44	0.00	0.02				
10.00	0.47	0.00	0.02				
10.25	0.50	0.00	0.02				
10.50	0.53	0.00	0.02				
10.75	0.57	0.00	0.03				
11.00	0.64	0.00	0.04				
11.25	0.71	0.00	0.05				
11.50	0.80	0.01	0.06				
11.75	0.96	0.03	0.08				
12.00	1.38	0.14	0.14				
12.25	1.98	0.40	0.37				
12.50	2.14	0.49	0.48				
12.75	2.23	0.54	0.29				
13.00	2.30	0.58	0.17				
13.25	2.37	0.61	0.11				
13.50	2.41	0.64	0.09				
13.75	2.44	0.66	0.07				
14.00	2.47	0.68	0.05				
14.25	2.50	0.70	0.04				
14.50	2.53	0.71	0.04				
14.75	2.56	0.73	0.04				
15.00	2.58	0.75	0.04				
15.25	2.60	0.76	0.03				
15.50	2.62	0.77	0.03				
15.75	2.63	0.78	0.02				
16.00	2.65	0.79	0.02				
16.25	2.66	0.80	0.02				
16.50	2.68	0.81	0.02				
16.75	2.69	0.81	0.02				
17.00	2.71	0.82	0.02				
17.25	2.72	0.83	0.02				
17.50	2.73	0.84	0.02				

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MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Subcatchment 4S: to W biofilter

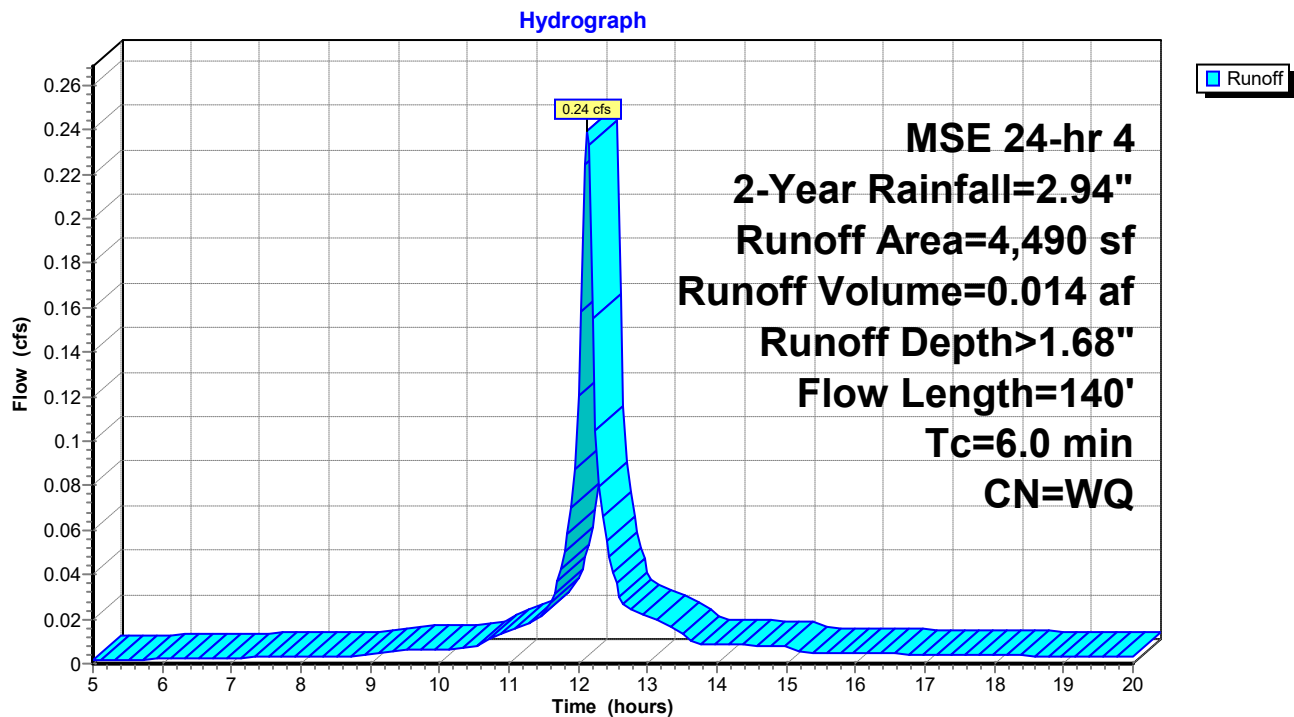
Runoff = 0.24 cfs @ 12.13 hrs, Volume= 0.014 af, Depth> 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
*	2,000	98	N part driveway
*	230	98	N part parking lot
*	1,600	61	lawn, HSG B, good
*	460	100	bio media
*	200	61	bark mulch landscape
	4,490		Weighted Average
	1,800		40.09% Pervious Area
	2,690		59.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	140		0.39		Direct Entry, lawn via parking

Subcatchment 4S: to W biofilter



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MSE 24-hr 4 2-Year Rainfall=2.94"

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Hydrograph for Subcatchment 4S: to W biofilter

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.13	0.00	0.00	17.75	2.75	1.25	0.00
5.25	0.15	0.00	0.00	18.00	2.76	1.26	0.00
5.50	0.16	0.00	0.00	18.25	2.77	1.26	0.00
5.75	0.17	0.00	0.00	18.50	2.78	1.27	0.00
6.00	0.18	0.00	0.00	18.75	2.79	1.28	0.00
6.25	0.19	0.00	0.00	19.00	2.81	1.29	0.00
6.50	0.21	0.00	0.00	19.25	2.82	1.30	0.00
6.75	0.22	0.00	0.00	19.50	2.83	1.31	0.00
7.00	0.23	0.00	0.00	19.75	2.84	1.32	0.00
7.25	0.25	0.00	0.00	20.00	2.84	1.32	0.00
7.50	0.26	0.00	0.00				
7.75	0.28	0.00	0.00				
8.00	0.29	0.00	0.00				
8.25	0.31	0.00	0.00				
8.50	0.32	0.00	0.00				
8.75	0.34	0.00	0.00				
9.00	0.36	0.00	0.00				
9.25	0.38	0.00	0.01				
9.50	0.41	0.00	0.01				
9.75	0.44	0.00	0.01				
10.00	0.47	0.00	0.01				
10.25	0.50	0.00	0.01				
10.50	0.53	0.01	0.01				
10.75	0.57	0.01	0.01				
11.00	0.64	0.02	0.01				
11.25	0.71	0.04	0.02				
11.50	0.80	0.06	0.02				
11.75	0.96	0.12	0.04				
12.00	1.38	0.31	0.12				
12.25	1.98	0.68	0.10				
12.50	2.14	0.79	0.04				
12.75	2.23	0.86	0.02				
13.00	2.30	0.91	0.02				
13.25	2.37	0.96	0.02				
13.50	2.41	0.99	0.01				
13.75	2.44	1.01	0.01				
14.00	2.47	1.04	0.01				
14.25	2.50	1.06	0.01				
14.50	2.53	1.08	0.01				
14.75	2.56	1.10	0.01				
15.00	2.58	1.12	0.01				
15.25	2.60	1.13	0.01				
15.50	2.62	1.15	0.00				
15.75	2.63	1.16	0.00				
16.00	2.65	1.17	0.00				
16.25	2.66	1.18	0.00				
16.50	2.68	1.19	0.00				
16.75	2.69	1.20	0.00				
17.00	2.71	1.21	0.00				
17.25	2.72	1.23	0.00				
17.50	2.73	1.24	0.00				

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MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Subcatchment 5S: to NDS 13-14-15

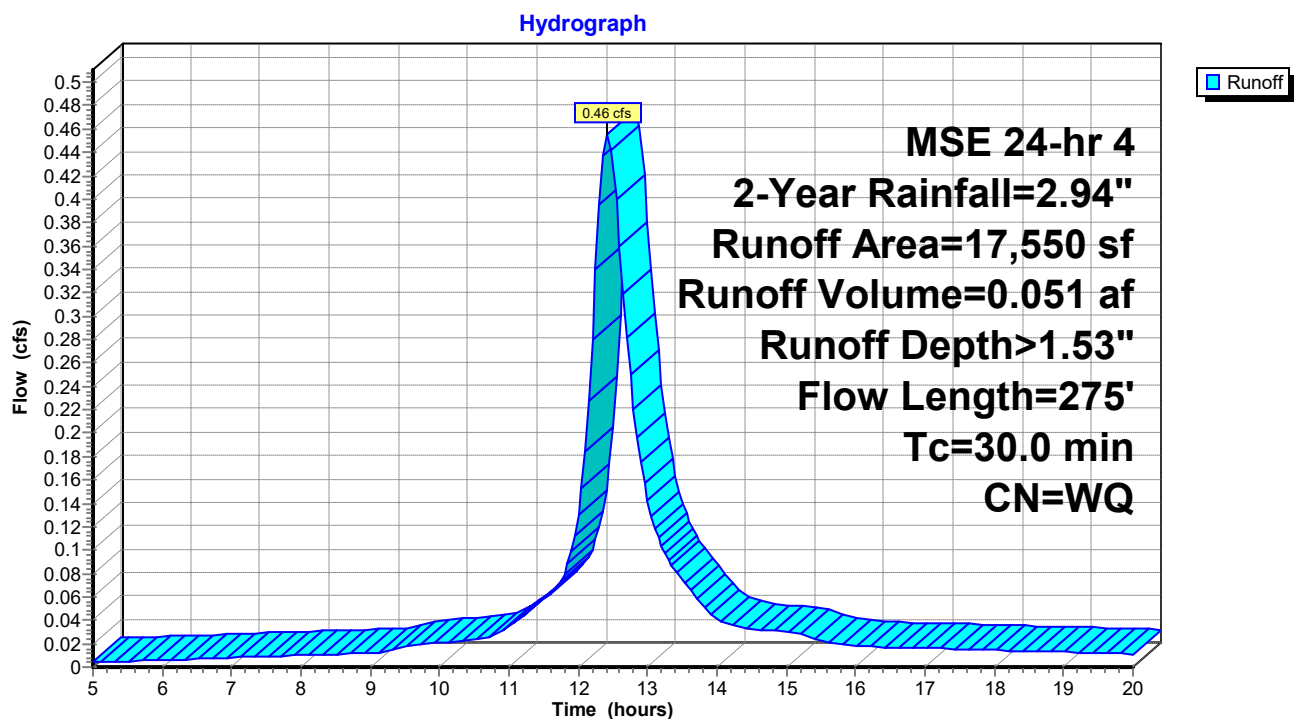
Runoff = 0.46 cfs @ 12.42 hrs, Volume= 0.051 af, Depth> 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
*	550	61	NDS 14-15 lawn berm, HSG B, good
*	500	61	NDS 13 lawn
*	9,500	98	roof+drive run on 1825
*	7,000	61	lawn run on 1825
	17,550		Weighted Average
	8,050		45.87% Pervious Area
	9,500		54.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.0	275		0.15		Direct Entry, lawn run on 1825

Subcatchment 5S: to NDS 13-14-15



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MSE 24-hr 4 2-Year Rainfall=2.94"

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Hydrograph for Subcatchment 5S: to NDS 13-14-15

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.13	0.00	0.00	17.75	2.75	1.12	0.02
5.25	0.15	0.00	0.00	18.00	2.76	1.13	0.01
5.50	0.16	0.00	0.01	18.25	2.77	1.14	0.01
5.75	0.17	0.00	0.01	18.50	2.78	1.15	0.01
6.00	0.18	0.00	0.01	18.75	2.79	1.16	0.01
6.25	0.19	0.00	0.01	19.00	2.81	1.17	0.01
6.50	0.21	0.00	0.01	19.25	2.82	1.17	0.01
6.75	0.22	0.00	0.01	19.50	2.83	1.18	0.01
7.00	0.23	0.00	0.01	19.75	2.84	1.19	0.01
7.25	0.25	0.00	0.01	20.00	2.84	1.20	0.01
7.50	0.26	0.00	0.01				
7.75	0.28	0.00	0.01				
8.00	0.29	0.00	0.01				
8.25	0.31	0.00	0.01				
8.50	0.32	0.00	0.01				
8.75	0.34	0.00	0.01				
9.00	0.36	0.00	0.01				
9.25	0.38	0.00	0.01				
9.50	0.41	0.00	0.02				
9.75	0.44	0.00	0.02				
10.00	0.47	0.00	0.02				
10.25	0.50	0.00	0.02				
10.50	0.53	0.00	0.02				
10.75	0.57	0.00	0.03				
11.00	0.64	0.01	0.04				
11.25	0.71	0.02	0.05				
11.50	0.80	0.04	0.06				
11.75	0.96	0.09	0.07				
12.00	1.38	0.25	0.13				
12.25	1.98	0.59	0.34				
12.50	2.14	0.70	0.43				
12.75	2.23	0.75	0.25				
13.00	2.30	0.81	0.14				
13.25	2.37	0.85	0.10				
13.50	2.41	0.88	0.07				
13.75	2.44	0.90	0.06				
14.00	2.47	0.92	0.04				
14.25	2.50	0.94	0.03				
14.50	2.53	0.96	0.03				
14.75	2.56	0.98	0.03				
15.00	2.58	1.00	0.03				
15.25	2.60	1.01	0.03				
15.50	2.62	1.03	0.02				
15.75	2.63	1.04	0.02				
16.00	2.65	1.05	0.02				
16.25	2.66	1.06	0.02				
16.50	2.68	1.07	0.02				
16.75	2.69	1.08	0.02				
17.00	2.71	1.09	0.02				
17.25	2.72	1.10	0.02				
17.50	2.73	1.11	0.02				

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Summary for Subcatchment 6S: untreated

Runoff = 0.19 cfs @ 12.24 hrs, Volume= 0.016 af, Depth> 1.20"

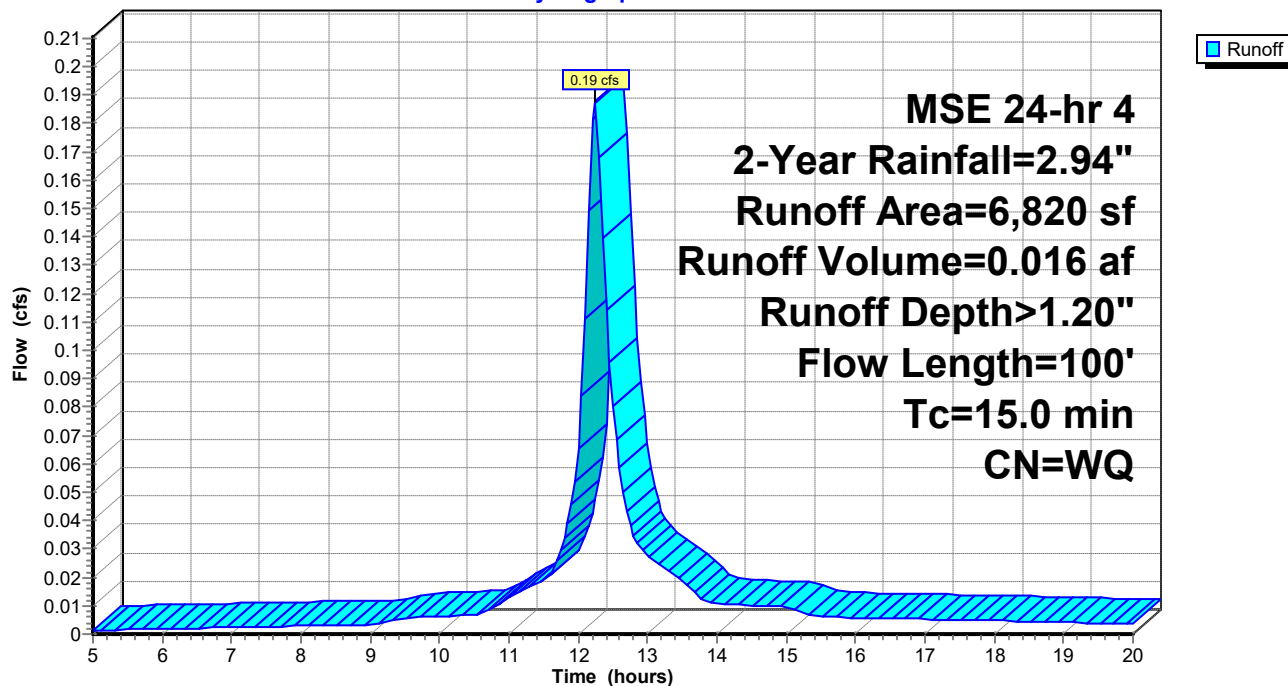
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
*	2,400	98	S driveway
*	3,400	61	lawn, HSG B, good
*	750	61	bark mulch landscape
*	270	98	retain wall
	6,820		Weighted Average
	4,150		60.85% Pervious Area
	2,670		39.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100		0.11		Direct Entry, landscape to street

Subcatchment 6S: untreated

Hydrograph



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MSE 24-hr 4 2-Year Rainfall=2.94"

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Hydrograph for Subcatchment 6S: untreated

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.13	0.00	0.00	17.75	2.75	0.80	0.00
5.25	0.15	0.00	0.00	18.00	2.76	0.81	0.00
5.50	0.16	0.00	0.00	18.25	2.77	0.81	0.00
5.75	0.17	0.00	0.00	18.50	2.78	0.82	0.00
6.00	0.18	0.00	0.00	18.75	2.79	0.83	0.00
6.25	0.19	0.00	0.00	19.00	2.81	0.84	0.00
6.50	0.21	0.00	0.00	19.25	2.82	0.84	0.00
6.75	0.22	0.00	0.00	19.50	2.83	0.85	0.00
7.00	0.23	0.00	0.00	19.75	2.84	0.85	0.00
7.25	0.25	0.00	0.00	20.00	2.84	0.86	0.00
7.50	0.26	0.00	0.00				
7.75	0.28	0.00	0.00				
8.00	0.29	0.00	0.00				
8.25	0.31	0.00	0.00				
8.50	0.32	0.00	0.00				
8.75	0.34	0.00	0.00				
9.00	0.36	0.00	0.00				
9.25	0.38	0.00	0.00				
9.50	0.41	0.00	0.01				
9.75	0.44	0.00	0.01				
10.00	0.47	0.00	0.01				
10.25	0.50	0.00	0.01				
10.50	0.53	0.00	0.01				
10.75	0.57	0.00	0.01				
11.00	0.64	0.00	0.01				
11.25	0.71	0.00	0.02				
11.50	0.80	0.00	0.02				
11.75	0.96	0.02	0.03				
12.00	1.38	0.12	0.07				
12.25	1.98	0.37	0.19				
12.50	2.14	0.45	0.08				
12.75	2.23	0.50	0.04				
13.00	2.30	0.54	0.03				
13.25	2.37	0.57	0.02				
13.50	2.41	0.60	0.02				
13.75	2.44	0.62	0.01				
14.00	2.47	0.64	0.01				
14.25	2.50	0.65	0.01				
14.50	2.53	0.67	0.01				
14.75	2.56	0.68	0.01				
15.00	2.58	0.70	0.01				
15.25	2.60	0.71	0.01				
15.50	2.62	0.72	0.01				
15.75	2.63	0.73	0.01				
16.00	2.65	0.74	0.01				
16.25	2.66	0.75	0.01				
16.50	2.68	0.76	0.01				
16.75	2.69	0.77	0.01				
17.00	2.71	0.77	0.01				
17.25	2.72	0.78	0.01				
17.50	2.73	0.79	0.01				

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MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Subcatchment 7S: NW 1/4 roof

[49] Hint: $T_c < 2dt$ may require smaller dt

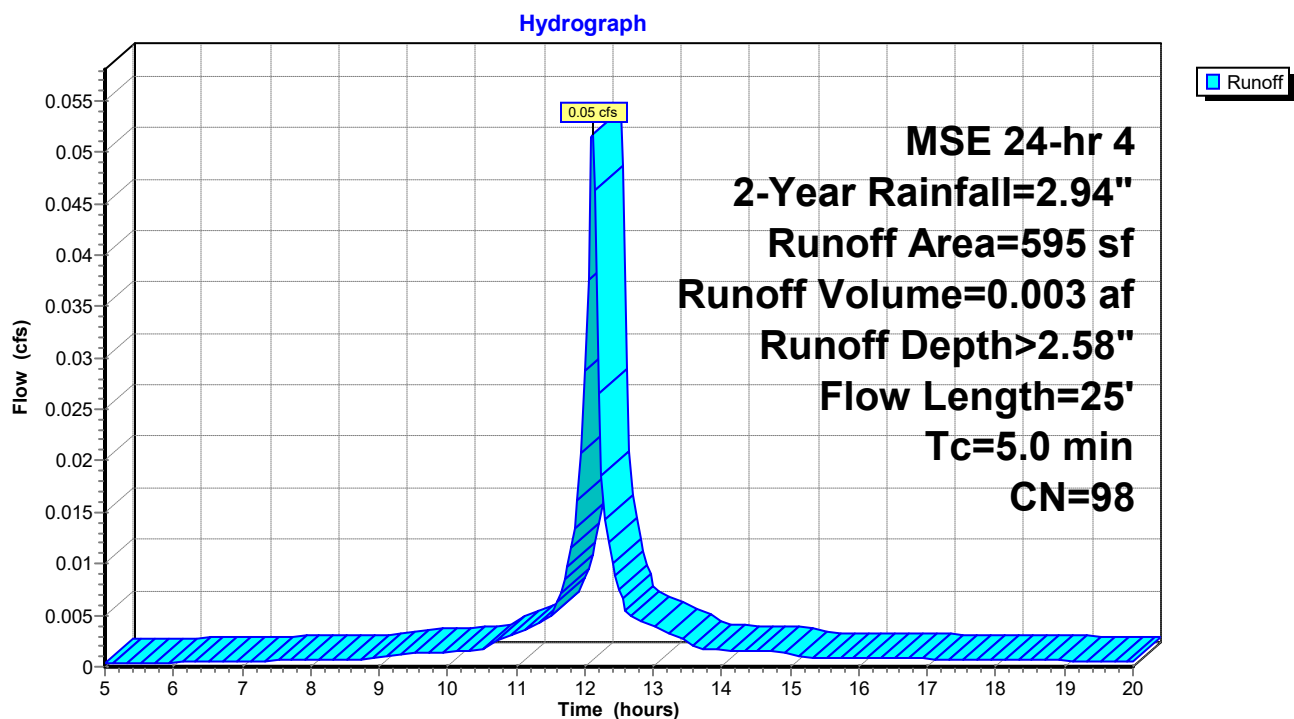
Runoff = 0.05 cfs @ 12.11 hrs, Volume= 0.003 af, Depth> 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, $dt= 0.05$ hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
*	595	98	NW 1/4 roof
	595		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	25		0.08		Direct Entry, NW 1/4 roof

Subcatchment 7S: NW 1/4 roof



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MSE 24-hr 4 2-Year Rainfall=2.94"

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Hydrograph for Subcatchment 7S: NW 1/4 roof

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.13	0.03	0.00	17.75	2.75	2.52	0.00
5.25	0.15	0.04	0.00	18.00	2.76	2.53	0.00
5.50	0.16	0.04	0.00	18.25	2.77	2.54	0.00
5.75	0.17	0.05	0.00	18.50	2.78	2.55	0.00
6.00	0.18	0.06	0.00	18.75	2.79	2.56	0.00
6.25	0.19	0.07	0.00	19.00	2.81	2.57	0.00
6.50	0.21	0.07	0.00	19.25	2.82	2.58	0.00
6.75	0.22	0.08	0.00	19.50	2.83	2.59	0.00
7.00	0.23	0.09	0.00	19.75	2.84	2.60	0.00
7.25	0.25	0.10	0.00	20.00	2.84	2.61	0.00
7.50	0.26	0.11	0.00				
7.75	0.28	0.13	0.00				
8.00	0.29	0.14	0.00				
8.25	0.31	0.15	0.00				
8.50	0.32	0.16	0.00				
8.75	0.34	0.18	0.00				
9.00	0.36	0.19	0.00				
9.25	0.38	0.21	0.00				
9.50	0.41	0.24	0.00				
9.75	0.44	0.26	0.00				
10.00	0.47	0.29	0.00				
10.25	0.50	0.31	0.00				
10.50	0.53	0.34	0.00				
10.75	0.57	0.39	0.00				
11.00	0.64	0.44	0.00				
11.25	0.71	0.51	0.00				
11.50	0.80	0.60	0.00				
11.75	0.96	0.76	0.01				
12.00	1.38	1.16	0.03				
12.25	1.98	1.75	0.02				
12.50	2.14	1.91	0.01				
12.75	2.23	2.00	0.00				
13.00	2.30	2.08	0.00				
13.25	2.37	2.14	0.00				
13.50	2.41	2.19	0.00				
13.75	2.44	2.22	0.00				
14.00	2.47	2.25	0.00				
14.25	2.50	2.27	0.00				
14.50	2.53	2.30	0.00				
14.75	2.56	2.33	0.00				
15.00	2.58	2.35	0.00				
15.25	2.60	2.37	0.00				
15.50	2.62	2.39	0.00				
15.75	2.63	2.40	0.00				
16.00	2.65	2.42	0.00				
16.25	2.66	2.43	0.00				
16.50	2.68	2.45	0.00				
16.75	2.69	2.46	0.00				
17.00	2.71	2.48	0.00				
17.25	2.72	2.49	0.00				
17.50	2.73	2.50	0.00				

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MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Subcatchment 8S: S 1/2 roof

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.10 cfs @ 12.11 hrs, Volume= 0.006 af, Depth> 2.58"

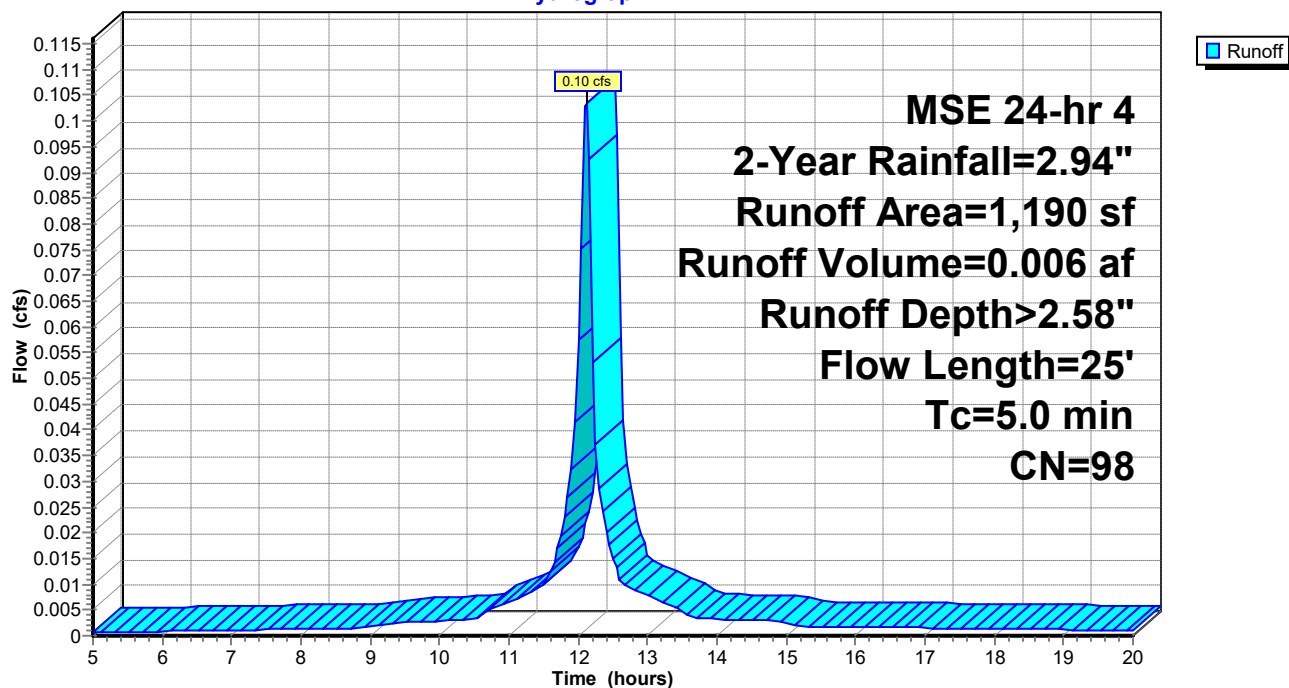
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, $dt= 0.05$ hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
*	1,190	98	S 1/2 roof
	1,190		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	25		0.08		Direct Entry, S 1/2 roof

Subcatchment 8S: S 1/2 roof

Hydrograph



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Hydrograph for Subcatchment 8S: S 1/2 roof

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.13	0.03	0.00	17.75	2.75	2.52	0.00
5.25	0.15	0.04	0.00	18.00	2.76	2.53	0.00
5.50	0.16	0.04	0.00	18.25	2.77	2.54	0.00
5.75	0.17	0.05	0.00	18.50	2.78	2.55	0.00
6.00	0.18	0.06	0.00	18.75	2.79	2.56	0.00
6.25	0.19	0.07	0.00	19.00	2.81	2.57	0.00
6.50	0.21	0.07	0.00	19.25	2.82	2.58	0.00
6.75	0.22	0.08	0.00	19.50	2.83	2.59	0.00
7.00	0.23	0.09	0.00	19.75	2.84	2.60	0.00
7.25	0.25	0.10	0.00	20.00	2.84	2.61	0.00
7.50	0.26	0.11	0.00				
7.75	0.28	0.13	0.00				
8.00	0.29	0.14	0.00				
8.25	0.31	0.15	0.00				
8.50	0.32	0.16	0.00				
8.75	0.34	0.18	0.00				
9.00	0.36	0.19	0.00				
9.25	0.38	0.21	0.00				
9.50	0.41	0.24	0.00				
9.75	0.44	0.26	0.00				
10.00	0.47	0.29	0.00				
10.25	0.50	0.31	0.00				
10.50	0.53	0.34	0.00				
10.75	0.57	0.39	0.01				
11.00	0.64	0.44	0.01				
11.25	0.71	0.51	0.01				
11.50	0.80	0.60	0.01				
11.75	0.96	0.76	0.02				
12.00	1.38	1.16	0.06				
12.25	1.98	1.75	0.04				
12.50	2.14	1.91	0.02				
12.75	2.23	2.00	0.01				
13.00	2.30	2.08	0.01				
13.25	2.37	2.14	0.01				
13.50	2.41	2.19	0.01				
13.75	2.44	2.22	0.00				
14.00	2.47	2.25	0.00				
14.25	2.50	2.27	0.00				
14.50	2.53	2.30	0.00				
14.75	2.56	2.33	0.00				
15.00	2.58	2.35	0.00				
15.25	2.60	2.37	0.00				
15.50	2.62	2.39	0.00				
15.75	2.63	2.40	0.00				
16.00	2.65	2.42	0.00				
16.25	2.66	2.43	0.00				
16.50	2.68	2.45	0.00				
16.75	2.69	2.46	0.00				
17.00	2.71	2.48	0.00				
17.25	2.72	2.49	0.00				
17.50	2.73	2.50	0.00				

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MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Reach 3R: S. 8" PVC

[52] Hint: Inlet/Outlet conditions not evaluated

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.430 ac, 57.04% Impervious, Inflow Depth > 1.60" for 2-Year event
Inflow = 0.48 cfs @ 12.41 hrs, Volume= 0.057 af
Outflow = 0.47 cfs @ 12.42 hrs, Volume= 0.057 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 3.10 fps, Min. Travel Time= 0.5 min

Avg. Velocity= 1.35 fps, Avg. Travel Time= 1.1 min

Peak Storage= 13 cf @ 12.42 hrs

Average Depth at Peak Storage= 0.30'

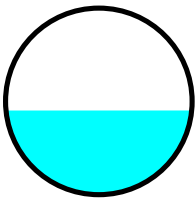
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.13 cfs

8.0" Round Pipe

n= 0.010 PVC, smooth interior

Length= 87.0' Slope= 0.0052 '/'

Inlet Invert= 676.38', Outlet Invert= 675.93'



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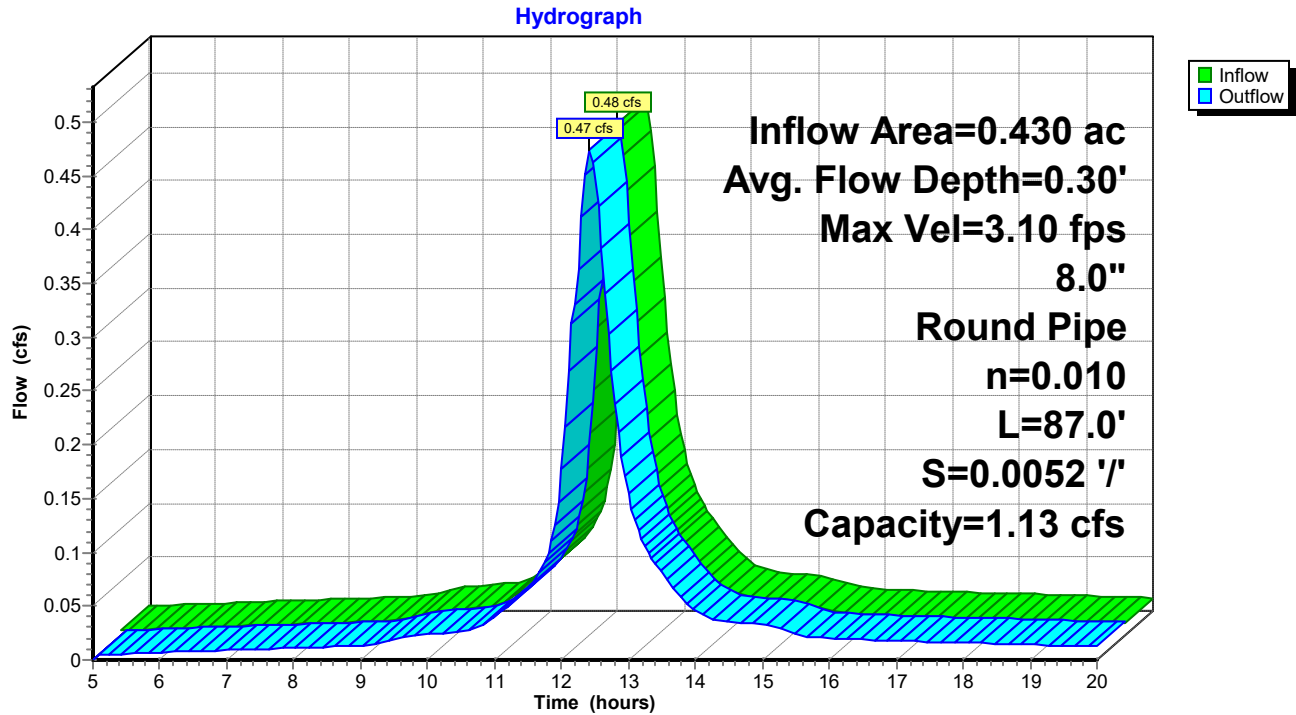
Chiro HCAD Propose + Run On AMENDED Mar. '26

MSE 24-hr 4 2-Year Rainfall=2.94"

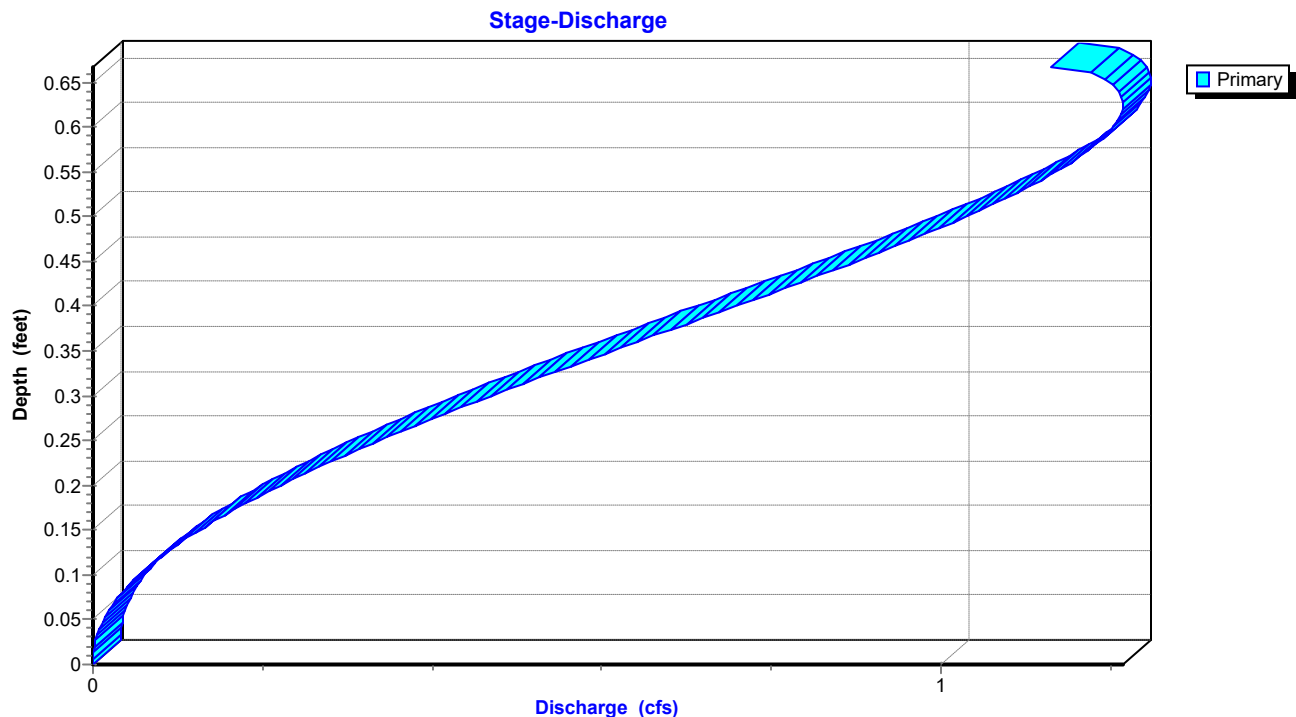
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Reach 3R: S. 8" PVC



Reach 3R: S. 8" PVC



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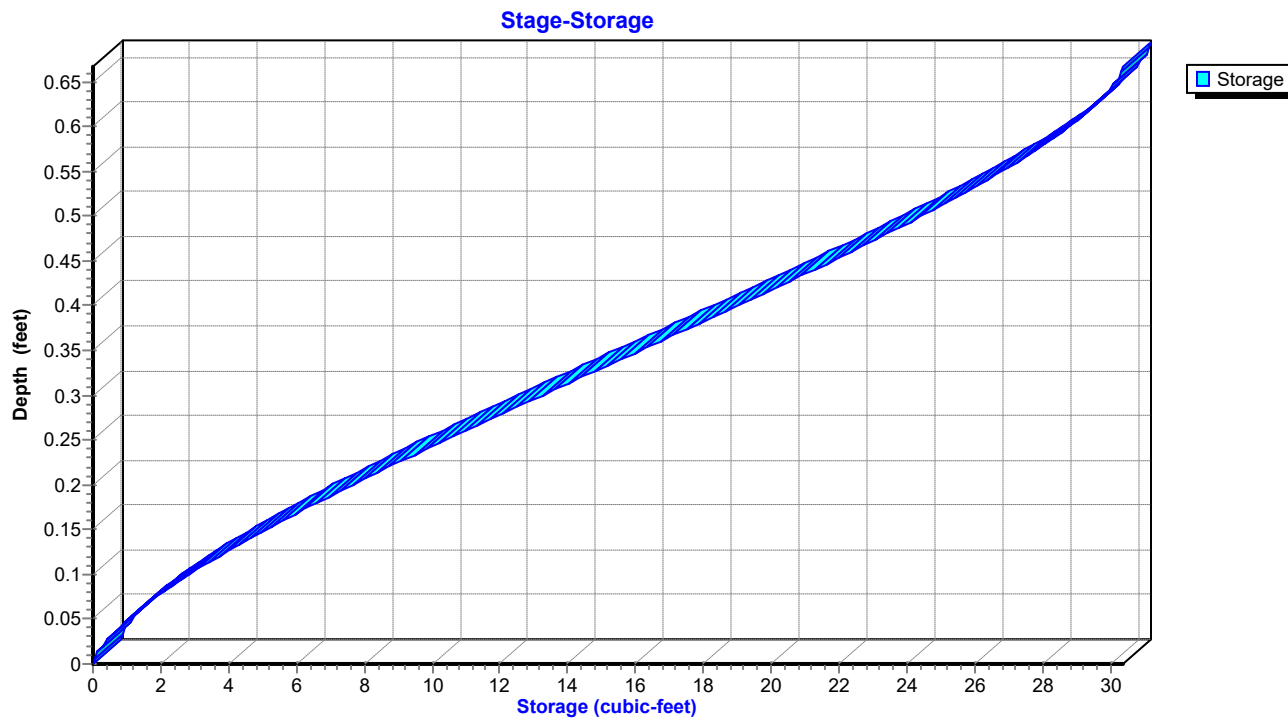
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MSE 24-hr 4 2-Year Rainfall=2.94"

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Reach 3R: S. 8" PVC



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MSE 24-hr 4 2-Year Rainfall=2.94"

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Hydrograph for Reach 3R: S. 8" PVC

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	676.38	0.00
5.50	0.01	1	676.41	0.01
6.00	0.01	1	676.42	0.01
6.50	0.01	1	676.42	0.01
7.00	0.01	1	676.42	0.01
7.50	0.01	1	676.42	0.01
8.00	0.01	1	676.43	0.01
8.50	0.01	1	676.43	0.01
9.00	0.01	1	676.43	0.01
9.50	0.02	1	676.44	0.02
10.00	0.02	2	676.45	0.02
10.50	0.03	2	676.45	0.03
11.00	0.04	2	676.47	0.04
11.50	0.07	3	676.49	0.07
12.00	0.19	7	676.56	0.18
12.50	0.45	13	676.67	0.45
13.00	0.15	6	676.54	0.15
13.50	0.08	4	676.50	0.08
14.00	0.04	2	676.47	0.05
14.50	0.04	2	676.46	0.04
15.00	0.03	2	676.46	0.03
15.50	0.02	2	676.45	0.02
16.00	0.02	1	676.44	0.02
16.50	0.02	1	676.44	0.02
17.00	0.02	1	676.44	0.02
17.50	0.02	1	676.44	0.02
18.00	0.02	1	676.44	0.02
18.50	0.02	1	676.43	0.02
19.00	0.01	1	676.43	0.01
19.50	0.01	1	676.43	0.01
20.00	0.01	1	676.43	0.01

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Stage-Discharge for Reach 3R: S. 8" PVC

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)	Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
676.38	0.00	0.00	676.89	3.68	1.05
676.39	0.37	0.00	676.90	3.68	1.08
676.40	0.60	0.00	676.91	3.69	1.10
676.41	0.78	0.00	676.92	3.69	1.12
676.42	0.94	0.01	676.93	3.69	1.14
676.43	1.08	0.01	676.94	3.69	1.15
676.44	1.21	0.02	676.95	3.68	1.17
676.45	1.34	0.03	676.96	3.67	1.18
676.46	1.46	0.03	676.97	3.66	1.19
676.47	1.57	0.04	676.98	3.64	1.20
676.48	1.67	0.05	676.99	3.62	1.21
676.49	1.77	0.07	677.00	3.59	1.21
676.50	1.87	0.08	677.01	3.56	1.21
676.51	1.96	0.09	677.02	3.51	1.21
676.52	2.05	0.11	677.03	3.46	1.20
676.53	2.13	0.13	677.04	3.38	1.18
676.54	2.22	0.14	677.05	3.17	1.11
676.55	2.29	0.16			
676.56	2.37	0.18			
676.57	2.44	0.20			
676.58	2.51	0.22			
676.59	2.58	0.24			
676.60	2.65	0.27			
676.61	2.71	0.29			
676.62	2.77	0.31			
676.63	2.83	0.34			
676.64	2.88	0.36			
676.65	2.94	0.39			
676.66	2.99	0.42			
676.67	3.04	0.44			
676.68	3.09	0.47			
676.69	3.14	0.50			
676.70	3.18	0.53			
676.71	3.22	0.56			
676.72	3.26	0.58			
676.73	3.30	0.61			
676.74	3.34	0.64			
676.75	3.38	0.67			
676.76	3.41	0.70			
676.77	3.44	0.73			
676.78	3.47	0.76			
676.79	3.50	0.79			
676.80	3.53	0.82			
676.81	3.55	0.85			
676.82	3.57	0.87			
676.83	3.59	0.90			
676.84	3.61	0.93			
676.85	3.63	0.95			
676.86	3.64	0.98			
676.87	3.66	1.01			
676.88	3.67	1.03			

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Chiro HCAD Propose + Run On AMENDED Mar. '26

MSE 24-hr 4 2-Year Rainfall=2.94"

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Stage-Area-Storage for Reach 3R: S. 8" PVC

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
676.38	0.0	0	676.89	0.3	25
676.39	0.0	0	676.90	0.3	25
676.40	0.0	0	676.91	0.3	26
676.41	0.0	0	676.92	0.3	26
676.42	0.0	1	676.93	0.3	27
676.43	0.0	1	676.94	0.3	27
676.44	0.0	1	676.95	0.3	28
676.45	0.0	2	676.96	0.3	28
676.46	0.0	2	676.97	0.3	28
676.47	0.0	2	676.98	0.3	29
676.48	0.0	3	676.99	0.3	29
676.49	0.0	3	677.00	0.3	29
676.50	0.0	4	677.01	0.3	30
676.51	0.0	4	677.02	0.3	30
676.52	0.1	5	677.03	0.3	30
676.53	0.1	5	677.04	0.3	30
676.54	0.1	6	677.05	0.3	30
676.55	0.1	6			
676.56	0.1	7			
676.57	0.1	7			
676.58	0.1	8			
676.59	0.1	8			
676.60	0.1	9			
676.61	0.1	9			
676.62	0.1	10			
676.63	0.1	10			
676.64	0.1	11			
676.65	0.1	12			
676.66	0.1	12			
676.67	0.1	13			
676.68	0.2	13			
676.69	0.2	14			
676.70	0.2	14			
676.71	0.2	15			
676.72	0.2	16			
676.73	0.2	16			
676.74	0.2	17			
676.75	0.2	17			
676.76	0.2	18			
676.77	0.2	18			
676.78	0.2	19			
676.79	0.2	20			
676.80	0.2	20			
676.81	0.2	21			
676.82	0.2	21			
676.83	0.3	22			
676.84	0.3	22			
676.85	0.3	23			
676.86	0.3	23			
676.87	0.3	24			
676.88	0.3	24			

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MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Reach 4R: 6" PVC

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.160 ac, 49.72% Impervious, Inflow Depth > 1.29" for 2-Year event
Inflow = 0.86 cfs @ 12.50 hrs, Volume= 0.125 af
Outflow = 0.86 cfs @ 12.50 hrs, Volume= 0.125 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 12.09 fps, Min. Travel Time= 0.1 min

Avg. Velocity= 5.57 fps, Avg. Travel Time= 0.2 min

Peak Storage= 5 cf @ 12.50 hrs

Average Depth at Peak Storage= 0.20'

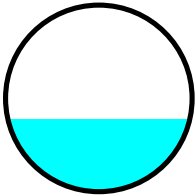
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 2.67 cfs

6.0" Round Pipe

n= 0.010

Length= 77.0' Slope= 0.1335 '/'

Inlet Invert= 668.80', Outlet Invert= 658.52'



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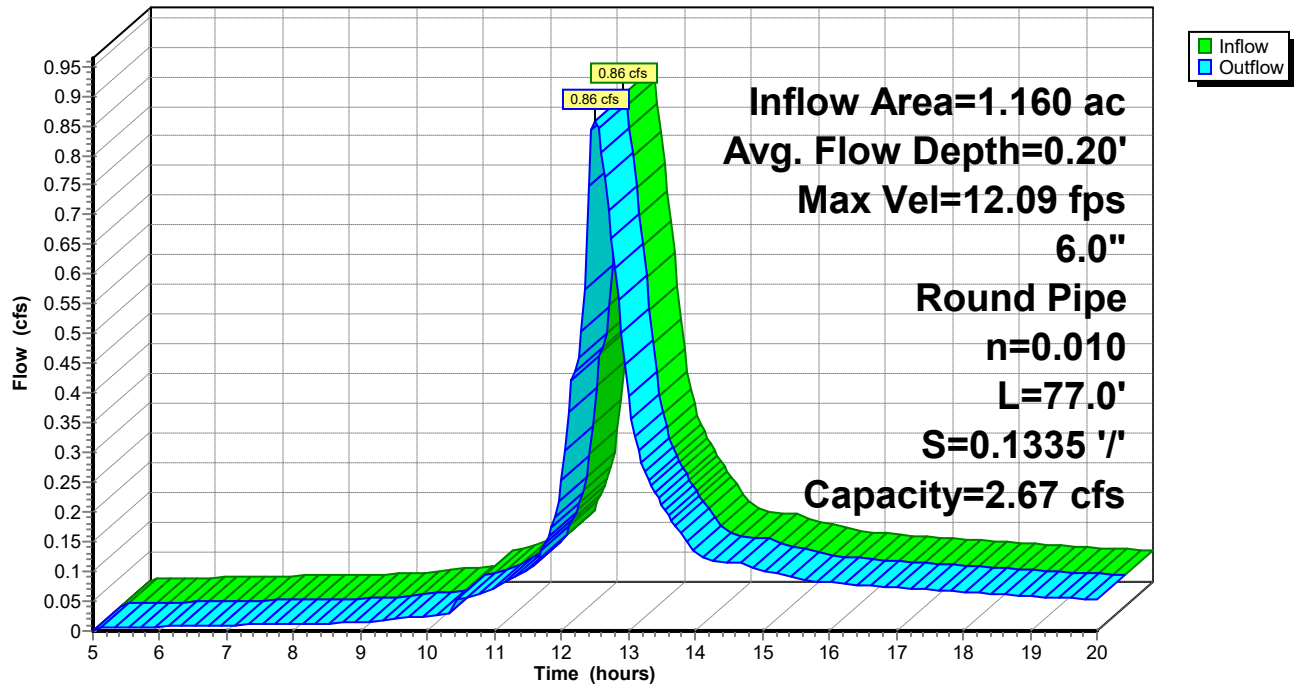
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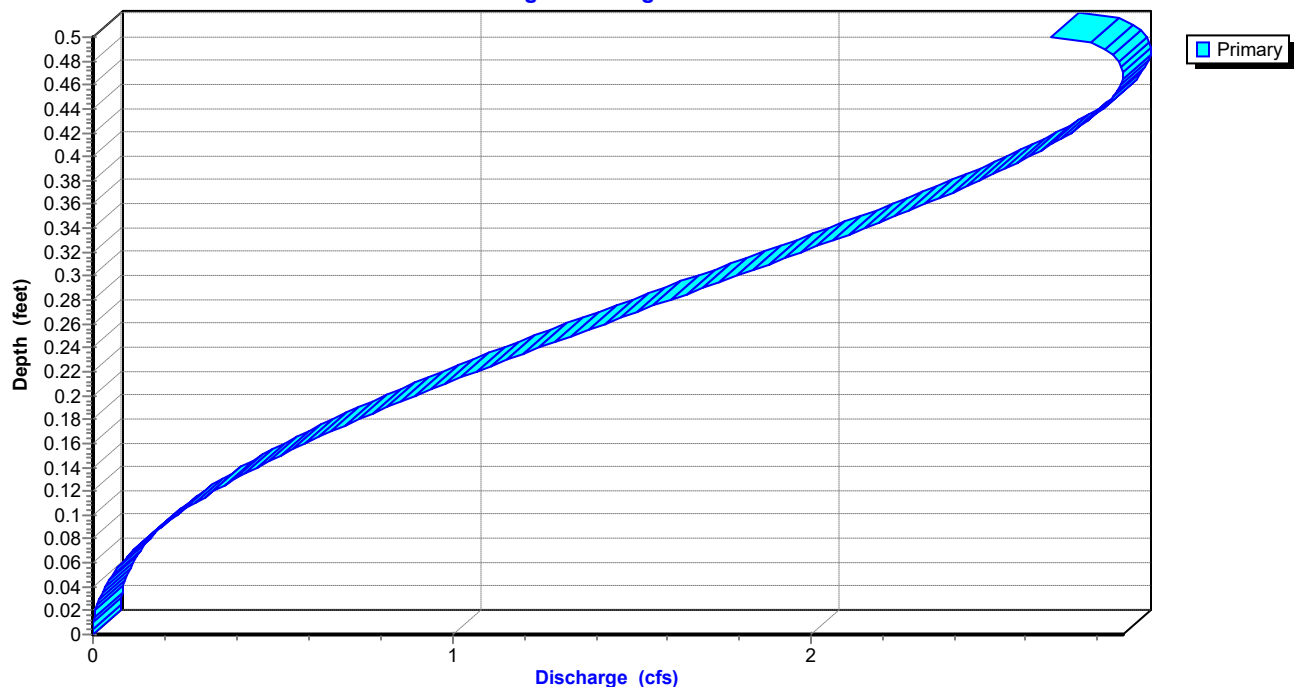
Reach 4R: 6" PVC

Hydrograph



Reach 4R: 6" PVC

Stage-Discharge



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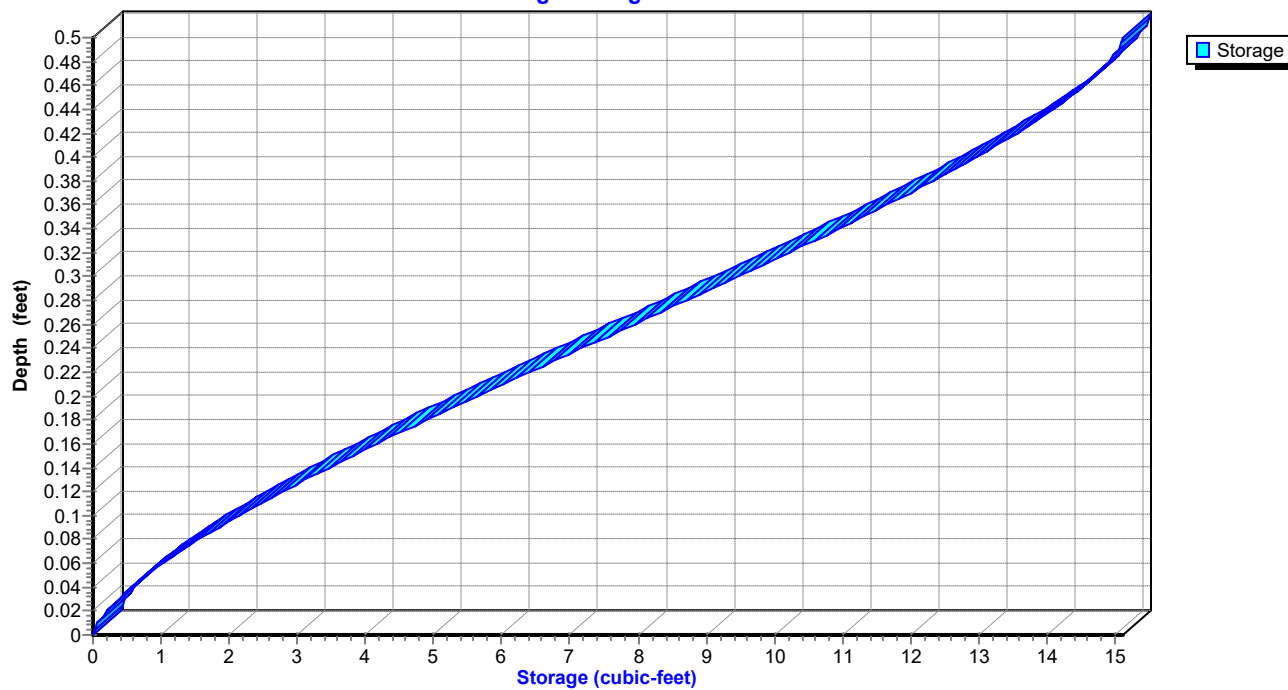
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Reach 4R: 6" PVC

Stage-Storage



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Hydrograph for Reach 4R: 6" PVC

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	668.80	0.00
5.50	0.01	0	668.82	0.01
6.00	0.01	0	668.82	0.01
6.50	0.01	0	668.82	0.01
7.00	0.01	0	668.82	0.01
7.50	0.01	0	668.82	0.01
8.00	0.01	0	668.82	0.01
8.50	0.01	0	668.83	0.01
9.00	0.01	0	668.83	0.01
9.50	0.02	0	668.83	0.02
10.00	0.03	0	668.83	0.03
10.50	0.05	1	668.85	0.05
11.00	0.07	1	668.86	0.07
11.50	0.10	1	668.87	0.10
12.00	0.26	2	668.90	0.25
12.50	0.86	5	669.00	0.86
13.00	0.39	3	668.93	0.40
13.50	0.21	2	668.90	0.21
14.00	0.13	1	668.88	0.13
14.50	0.12	1	668.87	0.12
15.00	0.10	1	668.87	0.10
15.50	0.09	1	668.86	0.09
16.00	0.08	1	668.86	0.08
16.50	0.08	1	668.86	0.08
17.00	0.07	1	668.86	0.07
17.50	0.07	1	668.86	0.07
18.00	0.07	1	668.85	0.07
18.50	0.06	1	668.85	0.06
19.00	0.06	1	668.85	0.06
19.50	0.06	1	668.85	0.06
20.00	0.05	1	668.85	0.05

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Stage-Discharge for Reach 4R: 6" PVC

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
668.80	0.00	0.00
668.81	1.91	0.00
668.82	3.01	0.01
668.83	3.93	0.02
668.84	4.72	0.03
668.85	5.45	0.06
668.86	6.11	0.08
668.87	6.72	0.11
668.88	7.30	0.15
668.89	7.84	0.19
668.90	8.35	0.23
668.91	8.83	0.28
668.92	9.29	0.34
668.93	9.73	0.39
668.94	10.14	0.46
668.95	10.54	0.52
668.96	10.91	0.59
668.97	11.27	0.66
668.98	11.61	0.74
668.99	11.94	0.82
669.00	12.25	0.90
669.01	12.54	0.98
669.02	12.82	1.07
669.03	13.09	1.15
669.04	13.34	1.24
669.05	13.57	1.33
669.06	13.80	1.42
669.07	14.01	1.52
669.08	14.20	1.61
669.09	14.39	1.70
669.10	14.56	1.79
669.11	14.71	1.88
669.12	14.86	1.97
669.13	14.98	2.06
669.14	15.10	2.15
669.15	15.20	2.23
669.16	15.29	2.31
669.17	15.36	2.39
669.18	15.41	2.47
669.19	15.45	2.54
669.20	15.47	2.61
669.21	15.47	2.67
669.22	15.46	2.72
669.23	15.42	2.77
669.24	15.35	2.81
669.25	15.26	2.84
669.26	15.14	2.86
669.27	14.97	2.87
669.28	14.74	2.86
669.29	14.41	2.82
669.30	13.57	2.67

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Stage-Area-Storage for Reach 4R: 6" PVC

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
668.80	0.0	0
668.81	0.0	0
668.82	0.0	0
668.83	0.0	0
668.84	0.0	1
668.85	0.0	1
668.86	0.0	1
668.87	0.0	1
668.88	0.0	2
668.89	0.0	2
668.90	0.0	2
668.91	0.0	2
668.92	0.0	3
668.93	0.0	3
668.94	0.0	3
668.95	0.0	4
668.96	0.1	4
668.97	0.1	5
668.98	0.1	5
668.99	0.1	5
669.00	0.1	6
669.01	0.1	6
669.02	0.1	6
669.03	0.1	7
669.04	0.1	7
669.05	0.1	8
669.06	0.1	8
669.07	0.1	8
669.08	0.1	9
669.09	0.1	9
669.10	0.1	9
669.11	0.1	10
669.12	0.1	10
669.13	0.1	11
669.14	0.1	11
669.15	0.1	11
669.16	0.2	12
669.17	0.2	12
669.18	0.2	12
669.19	0.2	13
669.20	0.2	13
669.21	0.2	13
669.22	0.2	14
669.23	0.2	14
669.24	0.2	14
669.25	0.2	14
669.26	0.2	15
669.27	0.2	15
669.28	0.2	15
669.29	0.2	15
669.30	0.2	15

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Summary for Pond 3P: E biofilter LINED

[82] Warning: Early inflow requires earlier time span

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=7)

Inflow Area = 0.043 ac, 57.33% Impervious, Inflow Depth > 1.63" for 2-Year event
Inflow = 0.09 cfs @ 12.15 hrs, Volume= 0.006 af
Outflow = 0.03 cfs @ 12.38 hrs, Volume= 0.005 af, Atten= 69%, Lag= 13.8 min
Discarded = 0.00 cfs @ 12.38 hrs, Volume= 0.000 af
Primary = 0.03 cfs @ 12.38 hrs, Volume= 0.005 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 680.51' @ 12.38 hrs Surf.Area= 490 sf Storage= 121 cf

Plug-Flow detention time= 131.8 min calculated for 0.005 af (79% of inflow)
Center-of-Mass det. time= 78.8 min (827.9 - 749.1)

Volume	Invert	Avail.Storage	Storage Description
#1	678.00'	54 cf	10.50'W x 15.50'L x 1.00'H sand invert 163 cf Overall x 33.0% Voids
#2	679.00'	66 cf	10.50'W x 15.50'L x 1.50'H media 244 cf Overall x 27.0% Voids
#3	680.50'	128 cf	10.50'W x 15.50'L x 0.60'H top media Z=3.0
#4	681.10'	192 cf	39.25'W x 19.25'L x 0.24'H NDS drain Z=3.0
#5	681.34'	82 cf	40.00'W x 20.00'L x 0.10'H weir overflow Z=3.0
		521 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Secondary	681.34'	6.0' long x 3.0' 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 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	681.10'	0.5" x 2.0" Horiz. NDS drain X 50.00 C= 0.600 in 12.0" x 12.0" Grate (35% open area) Limited to weir flow at low heads
#3	Primary	678.00'	3.600 in/hr underdrain over Horizontal area above 678.00' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 163 sf Phase-In= 0.50'
#4	Discarded	678.00'	0.001 in/hr Exfiltration over Horizontal area above 678.00' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 163 sf Phase-In= 0.50'

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Discarded OutFlow Max=0.00 cfs @ 12.38 hrs HW=680.51' (Free Discharge)

↑ **4=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.03 cfs @ 12.38 hrs HW=680.51' (Free Discharge)

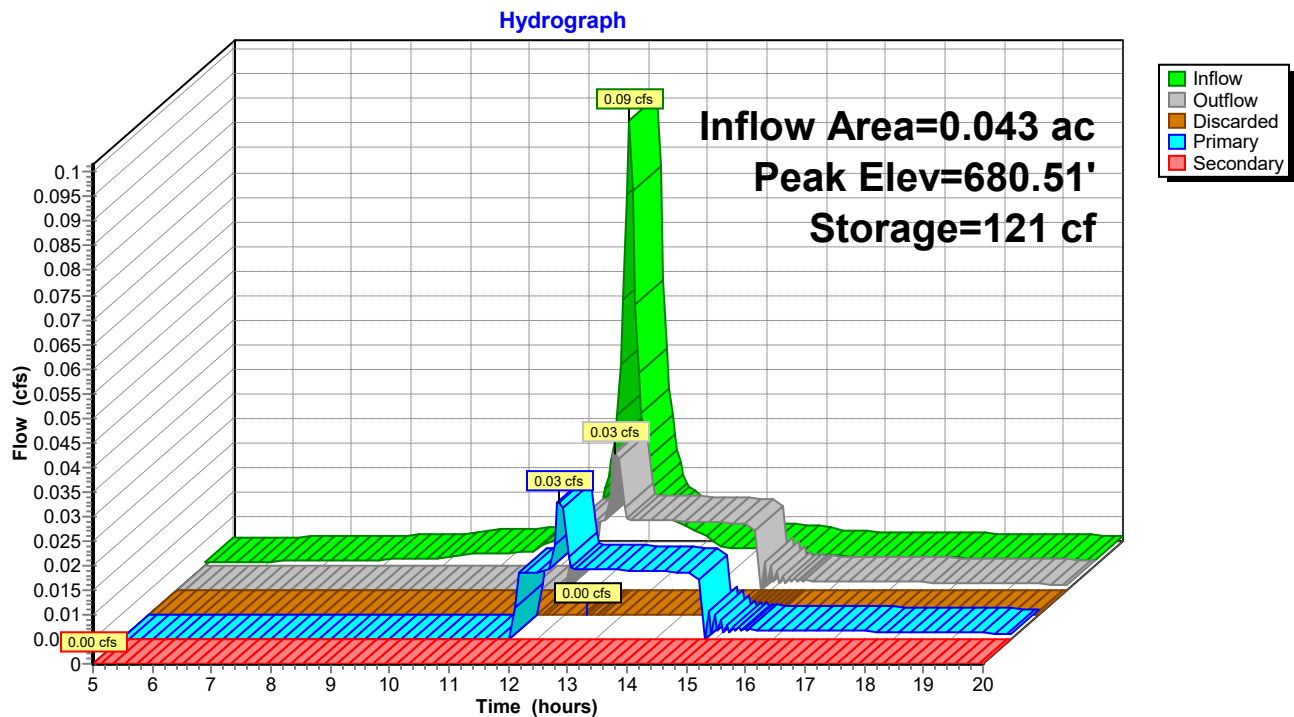
↑ **2=NDS drain** (Controls 0.00 cfs)

↑ **3=underdrain** (Controls 0.03 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=678.00' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: E biofilter LINED



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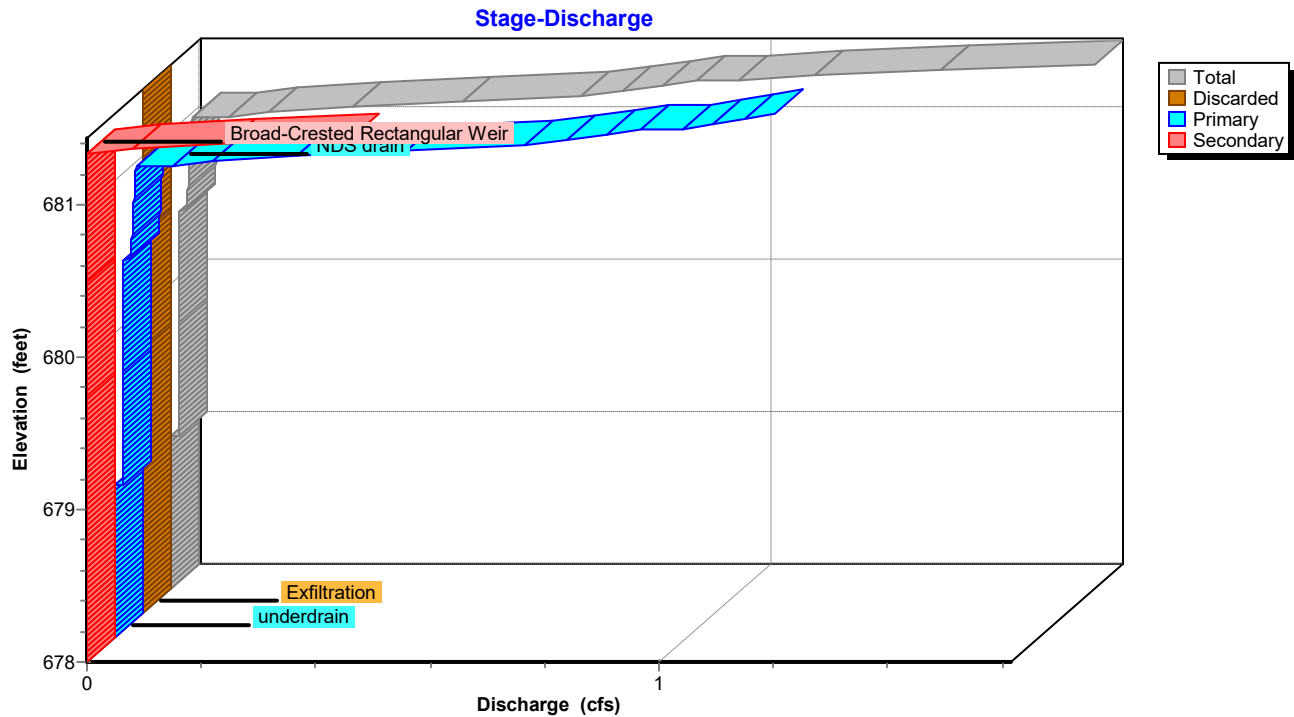
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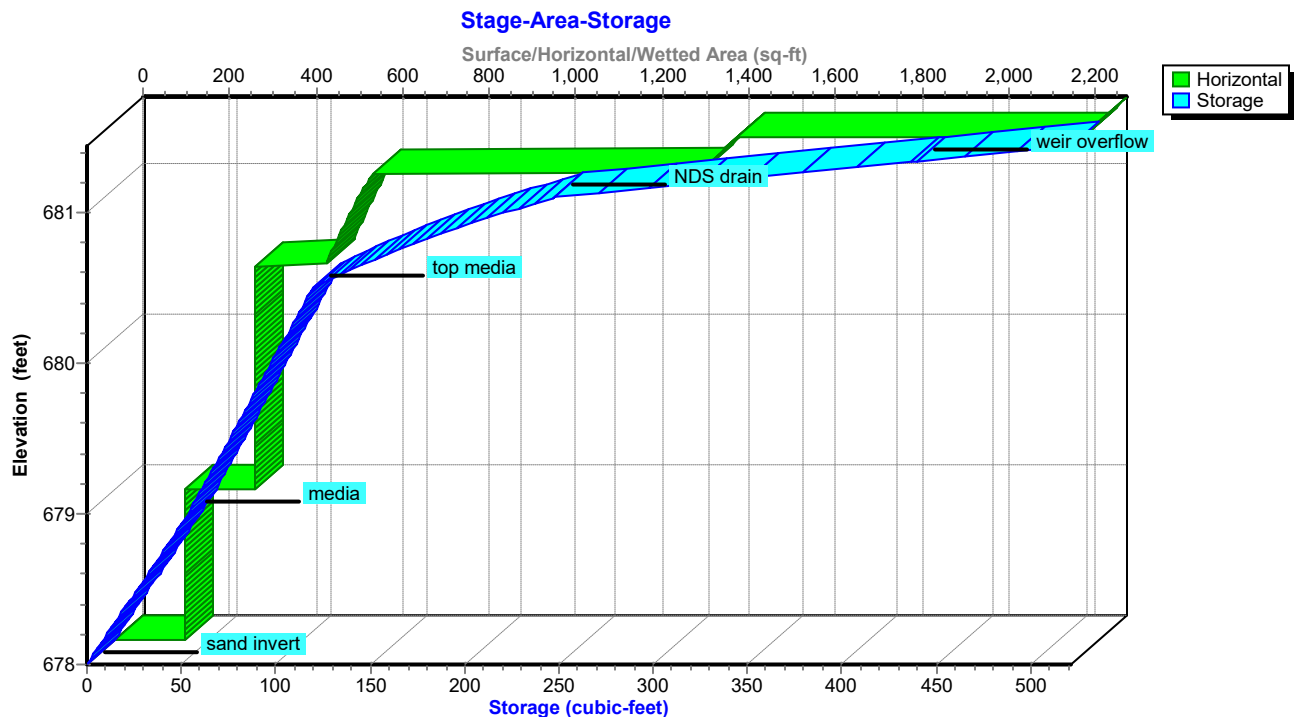
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Pond 3P: E biofilter LINED



Pond 3P: E biofilter LINED



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Hydrograph for Pond 3P: E biofilter LINED

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	0	678.00	0.00	0.00	0.00	0.00
5.50	0.00	1	678.02	0.00	0.00	0.00	0.00
6.00	0.00	3	678.05	0.00	0.00	0.00	0.00
6.50	0.00	4	678.08	0.00	0.00	0.00	0.00
7.00	0.00	6	678.11	0.00	0.00	0.00	0.00
7.50	0.00	8	678.15	0.00	0.00	0.00	0.00
8.00	0.00	10	678.19	0.00	0.00	0.00	0.00
8.50	0.00	13	678.24	0.00	0.00	0.00	0.00
9.00	0.00	15	678.28	0.00	0.00	0.00	0.00
9.50	0.00	19	678.35	0.00	0.00	0.00	0.00
10.00	0.00	24	678.44	0.00	0.00	0.00	0.00
10.50	0.00	28	678.53	0.00	0.00	0.00	0.00
11.00	0.01	36	678.67	0.00	0.00	0.00	0.00
11.50	0.01	49	678.91	0.00	0.00	0.00	0.00
12.00	0.04	64	679.24	0.01	0.00	0.01	0.00
12.50	0.02	119	680.49	0.02	0.00	0.02	0.00
13.00	0.01	113	680.35	0.01	0.00	0.01	0.00
13.50	0.01	101	680.07	0.01	0.00	0.01	0.00
14.00	0.00	83	679.66	0.01	0.00	0.01	0.00
14.50	0.00	64	679.24	0.01	0.00	0.01	0.00
15.00	0.00	54	679.00	0.00	0.00	0.00	0.00
15.50	0.00	54	679.00	0.00	0.00	0.00	0.00
16.00	0.00	54	679.00	0.00	0.00	0.00	0.00
16.50	0.00	54	679.00	0.00	0.00	0.00	0.00
17.00	0.00	54	679.00	0.00	0.00	0.00	0.00
17.50	0.00	54	679.00	0.00	0.00	0.00	0.00
18.00	0.00	54	679.00	0.00	0.00	0.00	0.00
18.50	0.00	54	679.00	0.00	0.00	0.00	0.00
19.00	0.00	54	679.00	0.00	0.00	0.00	0.00
19.50	0.00	54	679.00	0.00	0.00	0.00	0.00
20.00	0.00	54	679.00	0.00	0.00	0.00	0.00

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Stage-Discharge for Pond 3P: E biofilter LINED

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
678.00	0.00	0.00	0.00	0.00
678.10	0.00	0.00	0.00	0.00
678.20	0.00	0.00	0.00	0.00
678.30	0.00	0.00	0.00	0.00
678.40	0.00	0.00	0.00	0.00
678.50	0.00	0.00	0.00	0.00
678.60	0.00	0.00	0.00	0.00
678.70	0.00	0.00	0.00	0.00
678.80	0.00	0.00	0.00	0.00
678.90	0.00	0.00	0.00	0.00
679.00	0.01	0.00	0.01	0.00
679.10	0.01	0.00	0.01	0.00
679.20	0.01	0.00	0.01	0.00
679.30	0.01	0.00	0.01	0.00
679.40	0.01	0.00	0.01	0.00
679.50	0.01	0.00	0.01	0.00
679.60	0.01	0.00	0.01	0.00
679.70	0.01	0.00	0.01	0.00
679.80	0.01	0.00	0.01	0.00
679.90	0.01	0.00	0.01	0.00
680.00	0.01	0.00	0.01	0.00
680.10	0.01	0.00	0.01	0.00
680.20	0.01	0.00	0.01	0.00
680.30	0.01	0.00	0.01	0.00
680.40	0.01	0.00	0.01	0.00
680.50	0.03	0.00	0.03	0.00
680.60	0.03	0.00	0.03	0.00
680.70	0.03	0.00	0.03	0.00
680.80	0.03	0.00	0.03	0.00
680.90	0.03	0.00	0.03	0.00
681.00	0.04	0.00	0.04	0.00
681.10	0.10	0.00	0.10	0.00
681.20	0.52	0.00	0.52	0.00
681.30	0.85	0.00	0.85	0.00
681.40	1.31	0.00	1.09	0.22

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Stage-Area-Storage for Pond 3P: E biofilter LINED

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
678.00	163	0	680.55	496	128
678.05	163	3	680.60	504	137
678.10	163	5	680.65	512	146
678.15	163	8	680.70	521	155
678.20	163	11	680.75	530	165
678.25	163	13	680.80	538	176
678.30	163	16	680.85	547	187
678.35	163	19	680.90	556	198
678.40	163	21	680.95	566	210
678.45	163	24	681.00	575	222
678.50	163	27	681.05	585	235
678.55	163	30	681.10	1,350	248
678.60	163	32	681.15	1,368	286
678.65	163	35	681.20	1,386	325
678.70	163	38	681.25	1,404	365
678.75	163	40	681.30	1,422	406
678.80	163	43	681.35	2,240	448
678.85	163	46	681.40	2,258	488
678.90	163	48			
678.95	163	51			
679.00	326	54			
679.05	326	56			
679.10	326	58			
679.15	326	60			
679.20	326	62			
679.25	326	65			
679.30	326	67			
679.35	326	69			
679.40	326	71			
679.45	326	73			
679.50	326	76			
679.55	326	78			
679.60	326	80			
679.65	326	82			
679.70	326	84			
679.75	326	87			
679.80	326	89			
679.85	326	91			
679.90	326	93			
679.95	326	95			
680.00	326	98			
680.05	326	100			
680.10	326	102			
680.15	326	104			
680.20	326	106			
680.25	326	109			
680.30	326	111			
680.35	326	113			
680.40	326	115			
680.45	326	117			
680.50	488	120			

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Summary for Pond 5P: W biofillter UNLINED

[82] Warning: Early inflow requires earlier time span

[93] Warning: Storage range exceeded by 0.02'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 0.673 ac, 43.54% Impervious, Inflow Depth > 1.30" for 2-Year event
Inflow = 0.56 cfs @ 12.41 hrs, Volume= 0.073 af
Outflow = 0.67 cfs @ 12.41 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.3 min
Discarded = 0.00 cfs @ 12.40 hrs, Volume= 0.001 af
Primary = 0.49 cfs @ 12.40 hrs, Volume= 0.060 af
Secondary = 0.16 cfs @ 12.41 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 676.18' @ 12.40 hrs Surf.Area= 2,824 sf Storage= 1,047 cf

Plug-Flow detention time= 135.3 min calculated for 0.062 af (86% of inflow)
Center-of-Mass det. time= 93.8 min (863.2 - 769.4)

Volume	Invert	Avail.Storage	Storage Description
#1	671.75'	107 cf	8.30'W x 39.20'L x 1.00'H sand invert 325 cf Overall x 33.0% Voids
#2	672.75'	176 cf	8.30'W x 39.20'L x 2.00'H media 651 cf Overall x 27.0% Voids
#3	674.75'	728 cf	8.30'W x 39.20'L x 1.35'H top media Z=3.0
#4	676.10'	27 cf	12.30'W x 43.20'L x 0.05'H NDS drain Z=3.0
#5	676.15'	8 cf	18.00'W x 47.00'L x 0.01'H weir overflow Z=3.0
		1,047 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Secondary	676.15'	10.0' long x 3.0' 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 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	676.10'	0.5" x 2.0" Horiz. NDS drain X 50.00 C= 0.600 in 12.0" x 12.0" Grate (35% open area) Limited to weir flow at low heads
#3	Primary	672.75'	3.600 in/hr underdrain over Horizontal area above 672.75' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 651 sf Phase-In= 0.50'
#4	Discarded	671.75'	0.030 in/hr Exfiltration over Horizontal area above 671.75' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 325 sf Phase-In= 0.50'

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MSE 24-hr 4 2-Year Rainfall=2.94"

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Discarded OutFlow Max=0.00 cfs @ 12.40 hrs HW=676.18' (Free Discharge)

↳ **4=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.48 cfs @ 12.40 hrs HW=676.18' (Free Discharge)

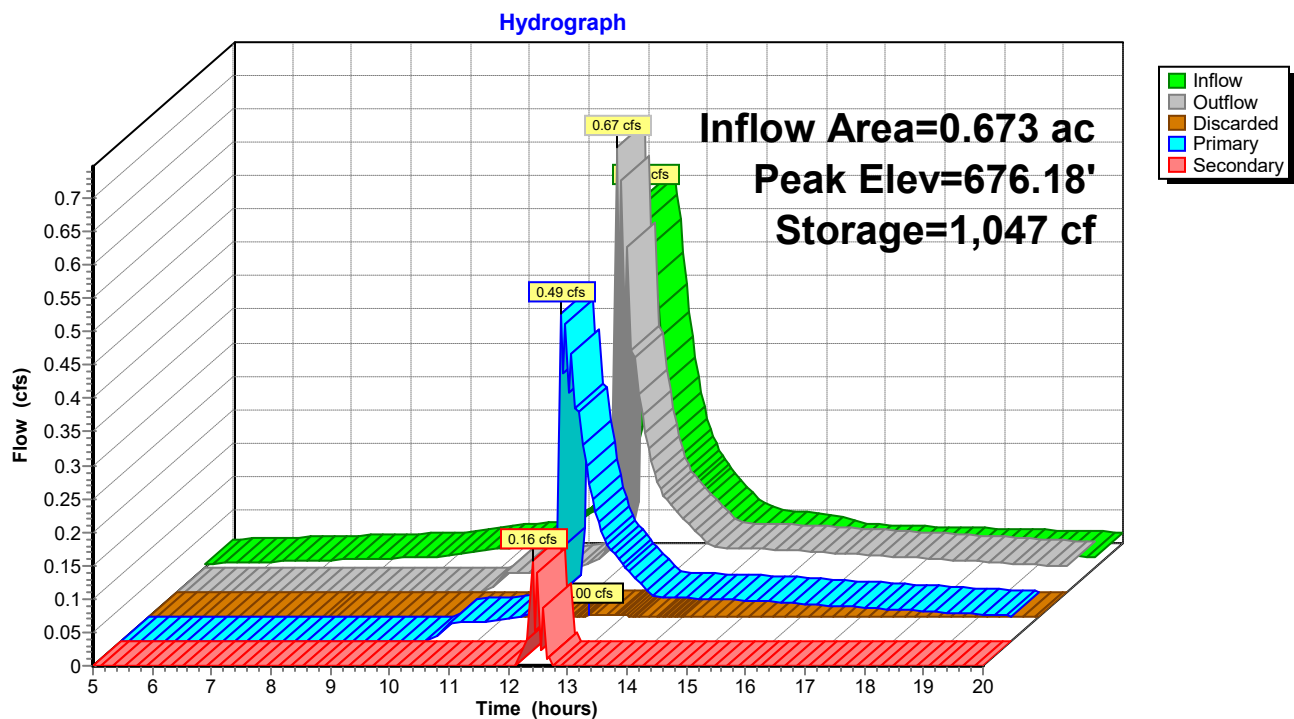
↳ **2=NDS drain** (Weir Controls 0.30 cfs @ 0.93 fps)

↳ **3=underdrain** (Controls 0.18 cfs)

Secondary OutFlow Max=0.12 cfs @ 12.41 hrs HW=676.18' (Free Discharge)

↳ **1=Broad-Crested Rectangular Weir** (Weir Controls 0.12 cfs @ 0.41 fps)

Pond 5P: W biofilter UNLINED



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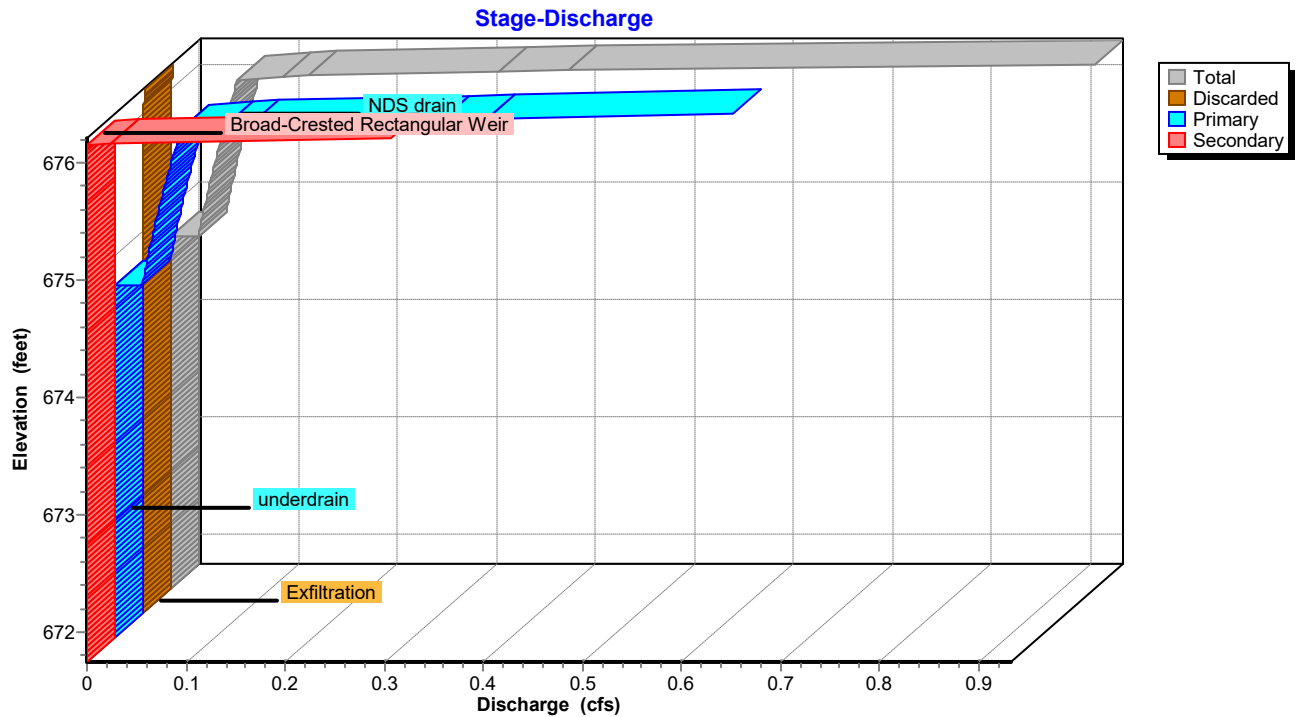
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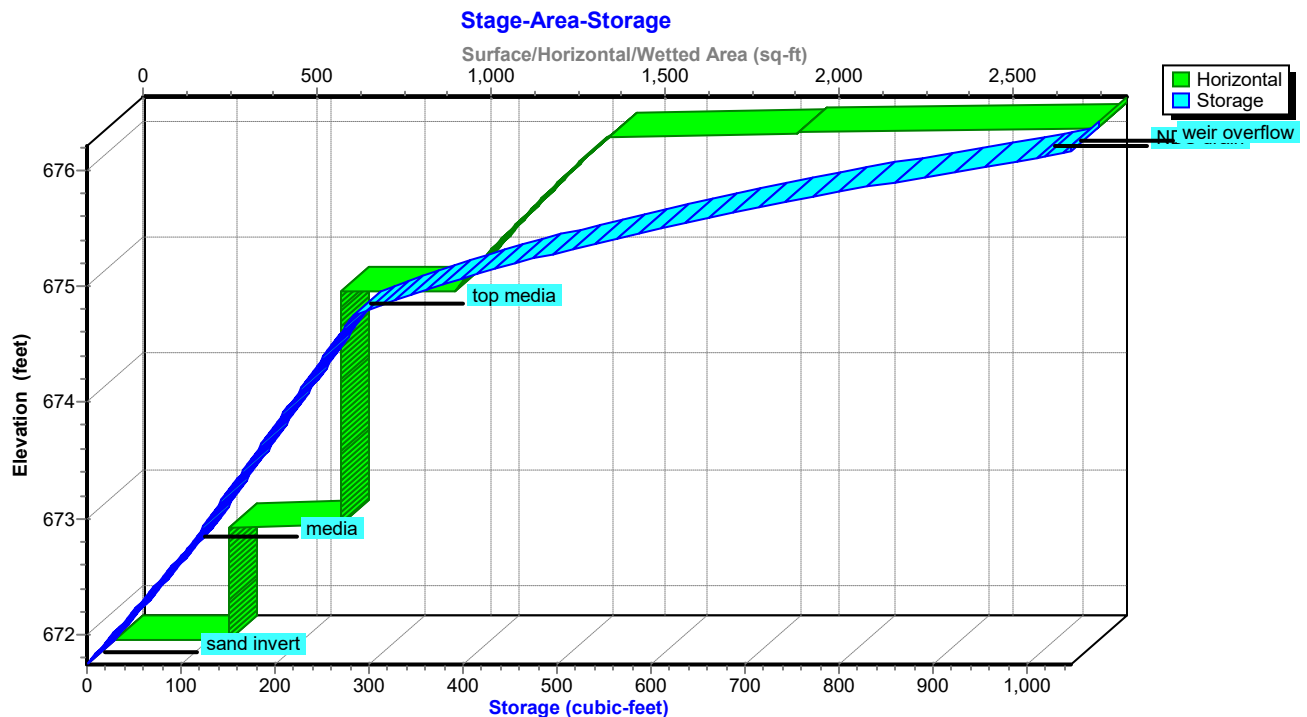
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Pond 5P: W biofilter UNLINED



Pond 5P: W biofilter UNLINED



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Hydrograph for Pond 5P: W biofilter UNLINED

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.01	1	671.75	0.00	0.00	0.00	0.00
5.50	0.01	12	671.86	0.00	0.00	0.00	0.00
6.00	0.01	27	672.00	0.00	0.00	0.00	0.00
6.50	0.01	43	672.15	0.00	0.00	0.00	0.00
7.00	0.01	62	672.33	0.00	0.00	0.00	0.00
7.50	0.01	83	672.52	0.00	0.00	0.00	0.00
8.00	0.01	107	672.74	0.00	0.00	0.00	0.00
8.50	0.01	132	673.03	0.00	0.00	0.00	0.00
9.00	0.02	160	673.34	0.00	0.00	0.00	0.00
9.50	0.02	195	673.75	0.00	0.00	0.00	0.00
10.00	0.03	243	674.29	0.00	0.00	0.00	0.00
10.50	0.03	285	674.75	0.03	0.00	0.03	0.00
11.00	0.05	306	674.82	0.03	0.00	0.03	0.00
11.50	0.08	370	674.99	0.03	0.00	0.03	0.00
12.00	0.26	545	675.37	0.04	0.00	0.04	0.00
12.50	0.52	1,047	676.18	0.62	0.00	0.48	0.14
13.00	0.19	1,025	676.13	0.20	0.00	0.19	0.00
13.50	0.10	1,011	676.10	0.11	0.00	0.11	0.00
14.00	0.06	990	676.07	0.07	0.00	0.07	0.00
14.50	0.05	964	676.04	0.07	0.00	0.06	0.00
15.00	0.04	929	675.99	0.06	0.00	0.06	0.00
15.50	0.03	885	675.93	0.06	0.00	0.06	0.00
16.00	0.03	828	675.85	0.06	0.00	0.06	0.00
16.50	0.03	770	675.76	0.06	0.00	0.06	0.00
17.00	0.02	716	675.68	0.05	0.00	0.05	0.00
17.50	0.02	664	675.59	0.05	0.00	0.05	0.00
18.00	0.02	615	675.50	0.05	0.00	0.05	0.00
18.50	0.02	568	675.42	0.05	0.00	0.05	0.00
19.00	0.02	523	675.33	0.04	0.00	0.04	0.00
19.50	0.02	481	675.25	0.04	0.00	0.04	0.00
20.00	0.02	441	675.16	0.04	0.00	0.04	0.00

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Stage-Discharge for Pond 5P: W biofilter UNLINED

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
671.75	0.00	0.00	0.00	0.00
671.85	0.00	0.00	0.00	0.00
671.95	0.00	0.00	0.00	0.00
672.05	0.00	0.00	0.00	0.00
672.15	0.00	0.00	0.00	0.00
672.25	0.00	0.00	0.00	0.00
672.35	0.00	0.00	0.00	0.00
672.45	0.00	0.00	0.00	0.00
672.55	0.00	0.00	0.00	0.00
672.65	0.00	0.00	0.00	0.00
672.75	0.00	0.00	0.00	0.00
672.85	0.00	0.00	0.00	0.00
672.95	0.00	0.00	0.00	0.00
673.05	0.00	0.00	0.00	0.00
673.15	0.00	0.00	0.00	0.00
673.25	0.00	0.00	0.00	0.00
673.35	0.00	0.00	0.00	0.00
673.45	0.00	0.00	0.00	0.00
673.55	0.00	0.00	0.00	0.00
673.65	0.00	0.00	0.00	0.00
673.75	0.00	0.00	0.00	0.00
673.85	0.00	0.00	0.00	0.00
673.95	0.00	0.00	0.00	0.00
674.05	0.00	0.00	0.00	0.00
674.15	0.00	0.00	0.00	0.00
674.25	0.00	0.00	0.00	0.00
674.35	0.00	0.00	0.00	0.00
674.45	0.00	0.00	0.00	0.00
674.55	0.00	0.00	0.00	0.00
674.65	0.00	0.00	0.00	0.00
674.75	0.03	0.00	0.03	0.00
674.85	0.03	0.00	0.03	0.00
674.95	0.03	0.00	0.03	0.00
675.05	0.04	0.00	0.03	0.00
675.15	0.04	0.00	0.04	0.00
675.25	0.04	0.00	0.04	0.00
675.35	0.04	0.00	0.04	0.00
675.45	0.05	0.00	0.05	0.00
675.55	0.05	0.00	0.05	0.00
675.65	0.05	0.00	0.05	0.00
675.75	0.06	0.00	0.06	0.00
675.85	0.06	0.00	0.06	0.00
675.95	0.06	0.00	0.06	0.00
676.05	0.07	0.00	0.07	0.00
676.15	0.33	0.00	0.33	0.00

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Stage-Area-Storage for Pond 5P: W biofillter UNLINED

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
671.75	325	0	674.30	651	244
671.80	325	5	674.35	651	248
671.85	325	11	674.40	651	252
671.90	325	16	674.45	651	257
671.95	325	21	674.50	651	261
672.00	325	27	674.55	651	265
672.05	325	32	674.60	651	270
672.10	325	38	674.65	651	274
672.15	325	43	674.70	651	279
672.20	325	48	674.75	976	283
672.25	325	54	674.80	990	300
672.30	325	59	674.85	1,005	317
672.35	325	64	674.90	1,020	335
672.40	325	70	674.95	1,035	354
672.45	325	75	675.00	1,050	373
672.50	325	81	675.05	1,065	394
672.55	325	86	675.10	1,080	415
672.60	325	91	675.15	1,096	437
672.65	325	97	675.20	1,112	459
672.70	325	102	675.25	1,128	483
672.75	651	107	675.30	1,144	507
672.80	651	112	675.35	1,160	532
672.85	651	116	675.40	1,177	558
672.90	651	121	675.45	1,193	585
672.95	651	125	675.50	1,210	612
673.00	651	129	675.55	1,227	641
673.05	651	134	675.60	1,244	670
673.10	651	138	675.65	1,262	700
673.15	651	143	675.70	1,279	731
673.20	651	147	675.75	1,297	763
673.25	651	151	675.80	1,315	796
673.30	651	156	675.85	1,333	829
673.35	651	160	675.90	1,351	864
673.40	651	164	675.95	1,370	899
673.45	651	169	676.00	1,389	936
673.50	651	173	676.05	1,407	973
673.55	651	178	676.10	1,958	1,012
673.60	651	182	676.15	2,821	1,039
673.65	651	186	676.20	2,824	1,047
673.70	651	191			
673.75	651	195			
673.80	651	200			
673.85	651	204			
673.90	651	208			
673.95	651	213			
674.00	651	217			
674.05	651	222			
674.10	651	226			
674.15	651	230			
674.20	651	235			
674.25	651	239			

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MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Pond 7P: 48" UG storage

Inflow Area = 0.730 ac, 45.41% Impervious, Inflow Depth > 1.11" for 2-Year event
Inflow = 0.55 cfs @ 12.41 hrs, Volume= 0.068 af
Outflow = 0.42 cfs @ 12.58 hrs, Volume= 0.067 af, Atten= 23%, Lag= 10.1 min
Primary = 0.42 cfs @ 12.58 hrs, Volume= 0.067 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 670.69' @ 12.58 hrs Surf.Area= 160 sf Storage= 90 cf

Plug-Flow detention time= 2.2 min calculated for 0.067 af (100% of inflow)

Center-of-Mass det. time= 1.7 min (860.4 - 858.6)

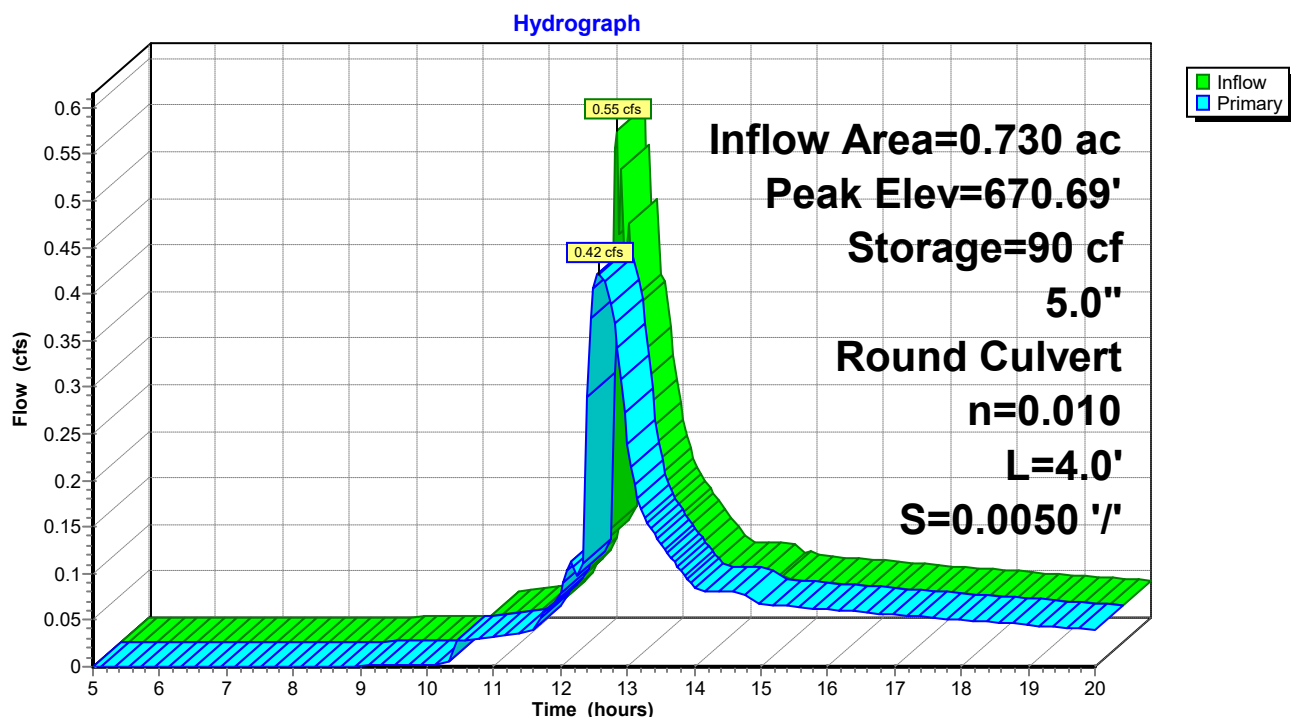
Volume	Invert	Avail.Storage	Storage Description
#1	669.82'	628 cf	48.0" Round Pipe Storage L= 50.0' S= 0.0026 '/

Device	Routing	Invert	Outlet Devices
#1	Primary	669.82'	5.0" Round Culvert L= 4.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 669.82' / 669.80' S= 0.0050 '/ Cc= 0.900 n= 0.010, Flow Area= 0.14 sf

Primary OutFlow Max=0.42 cfs @ 12.58 hrs HW=670.69' (Free Discharge)

↑1=Culvert (Inlet Controls 0.42 cfs @ 3.09 fps)

Pond 7P: 48" UG storage



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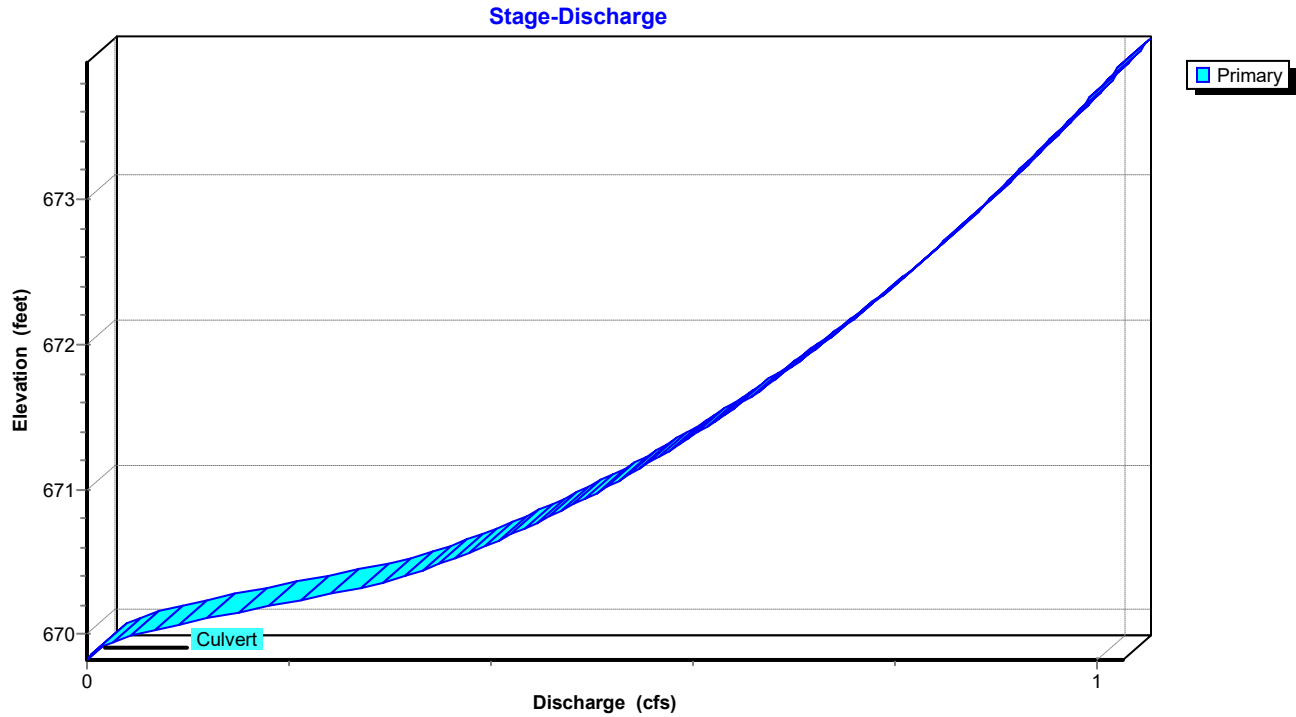
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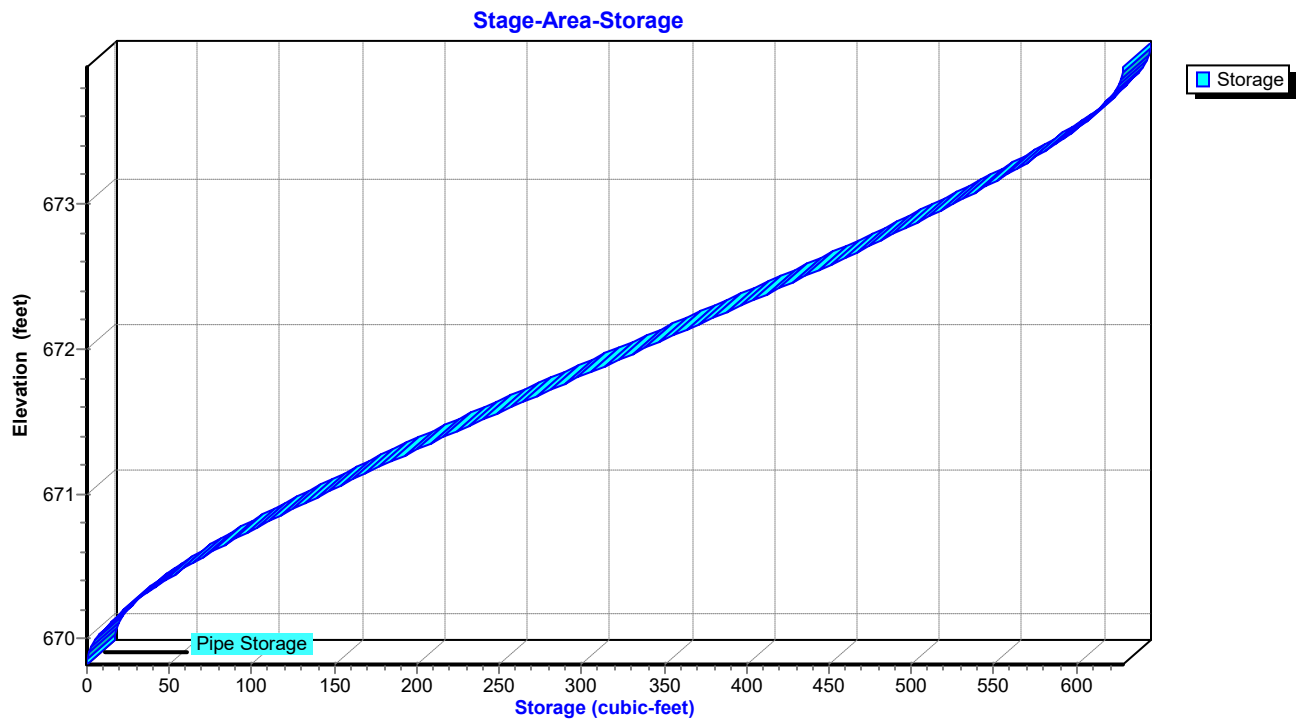
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Pond 7P: 48" UG storage



Pond 7P: 48" UG storage



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MSE 24-hr 4 2-Year Rainfall=2.94"

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Hydrograph for Pond 7P: 48" UG storage

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
5.00	0.00	0	669.82	0.00
5.50	0.00	0	669.82	0.00
6.00	0.00	0	669.83	0.00
6.50	0.00	0	669.83	0.00
7.00	0.00	0	669.83	0.00
7.50	0.00	0	669.83	0.00
8.00	0.00	0	669.83	0.00
8.50	0.00	0	669.83	0.00
9.00	0.00	0	669.83	0.00
9.50	0.00	0	669.84	0.00
10.00	0.00	0	669.84	0.00
10.50	0.03	2	669.95	0.03
11.00	0.03	3	669.96	0.03
11.50	0.04	4	669.97	0.04
12.00	0.09	9	670.05	0.08
12.50	0.51	83	670.64	0.41
13.00	0.21	31	670.27	0.24
13.50	0.13	16	670.13	0.13
14.00	0.08	10	670.06	0.09
14.50	0.08	9	670.05	0.08
15.00	0.07	7	670.03	0.07
15.50	0.06	7	670.02	0.06
16.00	0.06	7	670.02	0.06
16.50	0.06	6	670.01	0.06
17.00	0.06	6	670.01	0.06
17.50	0.05	5	670.00	0.05
18.00	0.05	5	670.00	0.05
18.50	0.05	5	669.99	0.05
19.00	0.04	4	669.99	0.04
19.50	0.04	4	669.98	0.04
20.00	0.04	4	669.97	0.04

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Stage-Discharge for Pond 7P: 48" UG storage

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
669.82	0.00	672.37	0.79
669.87	0.00	672.42	0.80
669.92	0.02	672.47	0.81
669.97	0.04	672.52	0.82
670.02	0.06	672.57	0.83
670.07	0.09	672.62	0.83
670.12	0.13	672.67	0.84
670.17	0.16	672.72	0.85
670.22	0.20	672.77	0.86
670.27	0.24	672.82	0.87
670.32	0.27	672.87	0.87
670.37	0.30	672.92	0.88
670.42	0.32	672.97	0.89
670.47	0.34	673.02	0.90
670.52	0.36	673.07	0.90
670.57	0.38	673.12	0.91
670.62	0.40	673.17	0.92
670.67	0.42	673.22	0.93
670.72	0.43	673.27	0.93
670.77	0.45	673.32	0.94
670.82	0.46	673.37	0.95
670.87	0.48	673.42	0.95
670.92	0.49	673.47	0.96
670.97	0.50	673.52	0.97
671.02	0.52	673.57	0.98
671.07	0.53	673.62	0.98
671.12	0.54	673.67	0.99
671.17	0.55	673.72	1.00
671.22	0.57	673.77	1.00
671.27	0.58	673.82	1.01
671.32	0.59	673.87	1.02
671.37	0.60	673.92	1.02
671.42	0.61		
671.47	0.62		
671.52	0.63		
671.57	0.64		
671.62	0.65		
671.67	0.66		
671.72	0.67		
671.77	0.68		
671.82	0.69		
671.87	0.70		
671.92	0.71		
671.97	0.72		
672.02	0.73		
672.07	0.74		
672.12	0.75		
672.17	0.76		
672.22	0.77		
672.27	0.78		
672.32	0.78		

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Stage-Area-Storage for Pond 7P: 48" UG storage

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
669.82	0	672.37	410
669.87	0	672.42	420
669.92	1	672.47	429
669.97	4	672.52	439
670.02	7	672.57	448
670.07	11	672.62	458
670.12	15	672.67	467
670.17	20	672.72	476
670.22	25	672.77	485
670.27	31	672.82	494
670.32	37	672.87	503
670.37	43	672.92	511
670.42	50	672.97	520
670.47	57	673.02	528
670.52	64	673.07	536
670.57	72	673.12	544
670.62	79	673.17	552
670.67	87	673.22	560
670.72	95	673.27	567
670.77	103	673.32	574
670.82	112	673.37	581
670.87	120	673.42	587
670.92	129	673.47	594
670.97	138	673.52	600
671.02	147	673.57	605
671.07	156	673.62	610
671.12	165	673.67	615
671.17	174	673.72	619
671.22	184	673.77	623
671.27	193	673.82	626
671.32	203	673.87	628
671.37	212	673.92	628
671.42	222		
671.47	232		
671.52	242		
671.57	251		
671.62	261		
671.67	271		
671.72	281		
671.77	291		
671.82	301		
671.87	311		
671.92	321		
671.97	331		
672.02	341		
672.07	351		
672.12	361		
672.17	371		
672.22	381		
672.27	391		
672.32	400		

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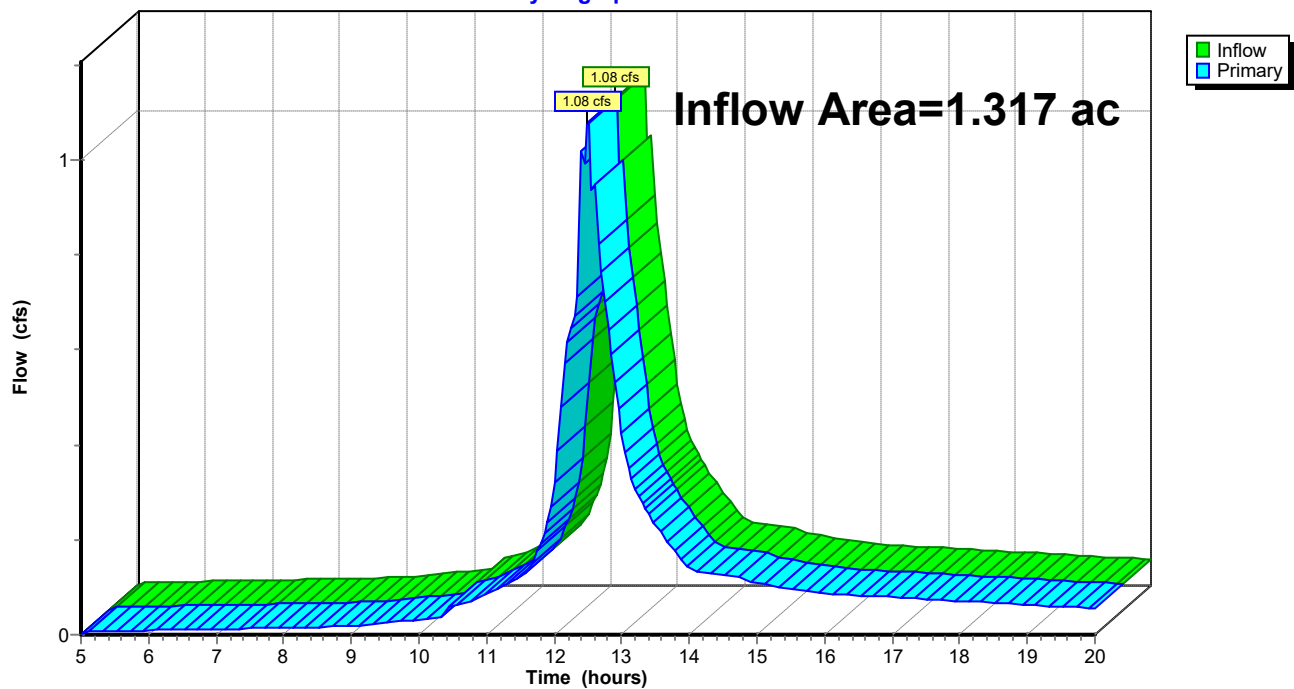
Summary for Link 2L: (new Link)

Inflow Area = 1.317 ac, 48.47% Impervious, Inflow Depth > 1.30" for 2-Year event
Inflow = 1.08 cfs @ 12.49 hrs, Volume= 0.142 af
Primary = 1.08 cfs @ 12.49 hrs, Volume= 0.142 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: (new Link)

Hydrograph



Chiro HCAD Proposed + Run On

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MSE 24-hr 4 2-Year Rainfall=2.94"

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Hydrograph for Link 2L: (new Link)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00	0.00	0.00	17.75	0.07	0.00	0.07
5.25	0.01	0.00	0.01	18.00	0.07	0.00	0.07
5.50	0.01	0.00	0.01	18.25	0.07	0.00	0.07
5.75	0.01	0.00	0.01	18.50	0.07	0.00	0.07
6.00	0.01	0.00	0.01	18.75	0.07	0.00	0.07
6.25	0.01	0.00	0.01	19.00	0.06	0.00	0.06
6.50	0.01	0.00	0.01	19.25	0.06	0.00	0.06
6.75	0.01	0.00	0.01	19.50	0.06	0.00	0.06
7.00	0.01	0.00	0.01	19.75	0.06	0.00	0.06
7.25	0.01	0.00	0.01	20.00	0.06	0.00	0.06
7.50	0.01	0.00	0.01				
7.75	0.01	0.00	0.01				
8.00	0.01	0.00	0.01				
8.25	0.02	0.00	0.02				
8.50	0.02	0.00	0.02				
8.75	0.02	0.00	0.02				
9.00	0.02	0.00	0.02				
9.25	0.02	0.00	0.02				
9.50	0.03	0.00	0.03				
9.75	0.03	0.00	0.03				
10.00	0.03	0.00	0.03				
10.25	0.03	0.00	0.03				
10.50	0.06	0.00	0.06				
10.75	0.07	0.00	0.07				
11.00	0.08	0.00	0.08				
11.25	0.10	0.00	0.10				
11.50	0.12	0.00	0.12				
11.75	0.18	0.00	0.18				
12.00	0.32	0.00	0.32				
12.25	0.65	0.00	0.65				
12.50	1.08	0.00	1.08				
12.75	0.70	0.00	0.70				
13.00	0.42	0.00	0.42				
13.25	0.29	0.00	0.29				
13.50	0.23	0.00	0.23				
13.75	0.18	0.00	0.18				
14.00	0.14	0.00	0.14				
14.25	0.13	0.00	0.13				
14.50	0.13	0.00	0.13				
14.75	0.12	0.00	0.12				
15.00	0.11	0.00	0.11				
15.25	0.10	0.00	0.10				
15.50	0.10	0.00	0.10				
15.75	0.09	0.00	0.09				
16.00	0.09	0.00	0.09				
16.25	0.09	0.00	0.09				
16.50	0.08	0.00	0.08				
16.75	0.08	0.00	0.08				
17.00	0.08	0.00	0.08				
17.25	0.08	0.00	0.08				
17.50	0.07	0.00	0.07				

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Chiro HCAD Propose + Run On AMENDED Mar. '26

MSE 24-hr 4 10-Year Rainfall=4.32"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: To E Biofilter	Runoff Area=1,875 sf 57.33% Impervious Runoff Depth>2.62" Flow Length=25' Tc=8.0 min CN=WQ Runoff=0.15 cfs 0.009 af
Subcatchment 3S: to curb inlet	Runoff Area=24,840 sf 40.58% Impervious Runoff Depth>2.10" Flow Length=300' Tc=30.0 min CN=WQ Runoff=0.90 cfs 0.100 af
Subcatchment 4S: to W biofilter	Runoff Area=4,490 sf 59.91% Impervious Runoff Depth>2.70" Flow Length=140' Tc=6.0 min CN=WQ Runoff=0.39 cfs 0.023 af
Subcatchment 5S: to NDS 13-14-15	Runoff Area=17,550 sf 54.13% Impervious Runoff Depth>2.50" Flow Length=275' Tc=30.0 min CN=WQ Runoff=0.76 cfs 0.084 af
Subcatchment 6S: untreated	Runoff Area=6,820 sf 39.15% Impervious Runoff Depth>2.06" Flow Length=100' Tc=15.0 min CN=WQ Runoff=0.34 cfs 0.027 af
Subcatchment 7S: NW 1/4 roof	Runoff Area=595 sf 100.00% Impervious Runoff Depth>3.88" Flow Length=25' Tc=5.0 min CN=98 Runoff=0.08 cfs 0.004 af
Subcatchment 8S: S 1/2 roof	Runoff Area=1,190 sf 100.00% Impervious Runoff Depth>3.88" Flow Length=25' Tc=5.0 min CN=98 Runoff=0.15 cfs 0.009 af
Reach 3R: S. 8" PVC	Avg. Flow Depth=0.41' Max Vel=3.50 fps Inflow=0.79 cfs 0.093 af 8.0" Round Pipe n=0.010 L=87.0' S=0.0052 ' ' Capacity=1.13 cfs Outflow=0.78 cfs 0.093 af
Reach 4R: 6" PVC	Avg. Flow Depth=0.25' Max Vel=13.65 fps Inflow=1.36 cfs 0.198 af 6.0" Round Pipe n=0.010 L=77.0' S=0.1335 ' ' Capacity=2.67 cfs Outflow=1.36 cfs 0.198 af
Pond 3P: E biofilter LINED	Peak Elev=680.81' Storage=178 cf Inflow=0.15 cfs 0.009 af Discarded=0.00 cfs 0.000 af Primary=0.03 cfs 0.008 af Secondary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.008 af
Pond 5P: W biofillter UNLINED	Peak Elev=676.23' Storage=1,047 cf Inflow=0.98 cfs 0.123 af Discarded=0.00 cfs 0.001 af Primary=0.74 cfs 0.093 af Secondary=0.57 cfs 0.014 af Outflow=1.31 cfs 0.108 af
Pond 7P: 48" UG storage	Peak Elev=671.38' Storage=214 cf Inflow=0.79 cfs 0.106 af 5.0" Round Culvert n=0.010 L=4.0' S=0.0050 ' ' Outflow=0.60 cfs 0.105 af
Link 2L: (new Link)	Inflow=2.12 cfs 0.239 af Primary=2.12 cfs 0.239 af

Total Runoff Area = 1.317 ac Runoff Volume = 0.257 af Average Runoff Depth = 2.34"
51.53% Pervious = 0.679 ac 48.47% Impervious = 0.638 ac

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MSE 24-hr 4 10-Year Rainfall=4.32"

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Summary for Subcatchment 1S: To E Biofilter

Runoff = 0.15 cfs @ 12.15 hrs, Volume= 0.009 af, Depth> 2.62"

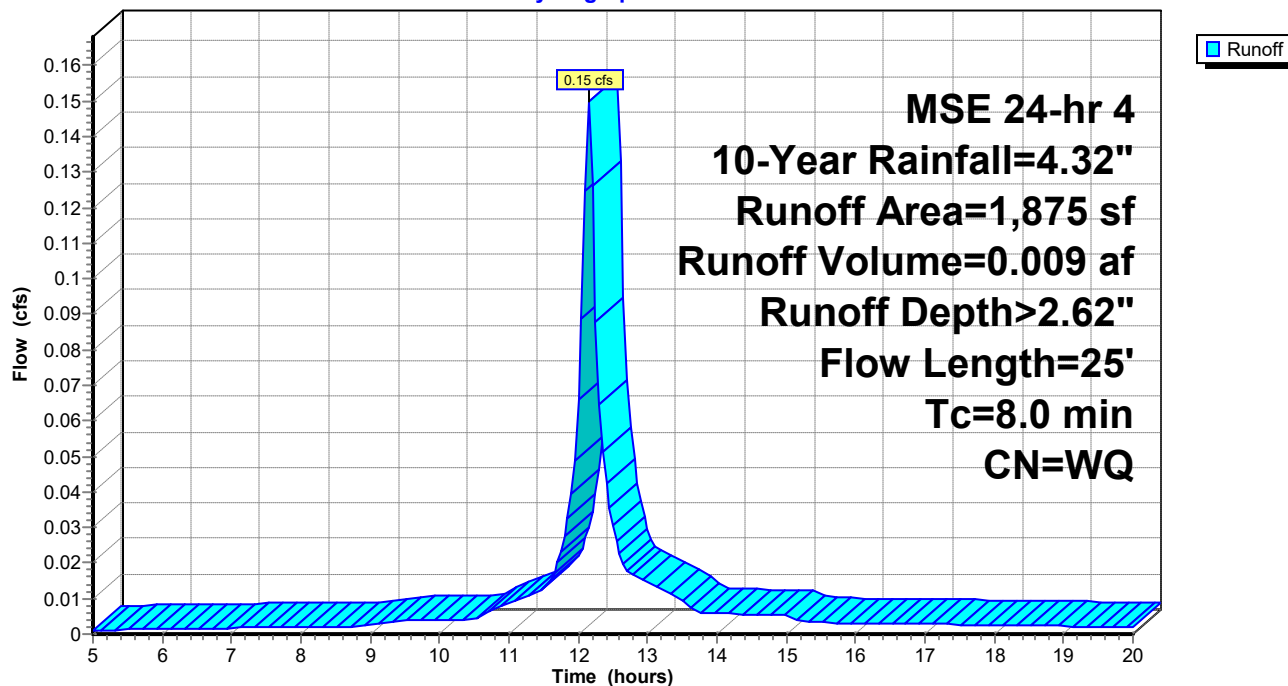
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10-Year Rainfall=4.32"

	Area (sf)	CN	Description
*	800	61	lawn, HSG B, good
*	645	98	NE 1/4 roof
*	210	100	bio media
*	220	98	retain wall
	1,875		Weighted Average
	800		42.67% Pervious Area
	1,075		57.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	25		0.05		Direct Entry, lawn above wall to E bio

Subcatchment 1S: To E Biofilter

Hydrograph



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MSE 24-hr 4 10-Year Rainfall=4.32"

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Hydrograph for Subcatchment 1S: To E Biofilter

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.00	0.00	17.75	4.04	2.23	0.00
5.25	0.21	0.00	0.00	18.00	4.05	2.25	0.00
5.50	0.23	0.00	0.00	18.25	4.07	2.26	0.00
5.75	0.25	0.00	0.00	18.50	4.09	2.28	0.00
6.00	0.27	0.00	0.00	18.75	4.11	2.29	0.00
6.25	0.28	0.00	0.00	19.00	4.12	2.31	0.00
6.50	0.30	0.00	0.00	19.25	4.14	2.32	0.00
6.75	0.32	0.00	0.00	19.50	4.15	2.33	0.00
7.00	0.34	0.00	0.00	19.75	4.17	2.35	0.00
7.25	0.36	0.00	0.00	20.00	4.18	2.36	0.00
7.50	0.38	0.00	0.00				
7.75	0.41	0.00	0.00				
8.00	0.43	0.00	0.00				
8.25	0.45	0.00	0.00				
8.50	0.47	0.00	0.00				
8.75	0.50	0.00	0.00				
9.00	0.52	0.00	0.00				
9.25	0.56	0.01	0.00				
9.50	0.60	0.01	0.00				
9.75	0.64	0.02	0.00				
10.00	0.68	0.02	0.00				
10.25	0.73	0.03	0.00				
10.50	0.77	0.04	0.00				
10.75	0.84	0.06	0.01				
11.00	0.93	0.09	0.01				
11.25	1.04	0.13	0.01				
11.50	1.17	0.18	0.01				
11.75	1.42	0.30	0.02				
12.00	2.02	0.66	0.07				
12.25	2.90	1.30	0.09				
12.50	3.15	1.50	0.03				
12.75	3.28	1.60	0.02				
13.00	3.39	1.69	0.01				
13.25	3.48	1.76	0.01				
13.50	3.55	1.82	0.01				
13.75	3.59	1.86	0.01				
14.00	3.64	1.90	0.01				
14.25	3.68	1.93	0.01				
14.50	3.72	1.96	0.01				
14.75	3.76	2.00	0.01				
15.00	3.80	2.03	0.01				
15.25	3.82	2.05	0.00				
15.50	3.85	2.07	0.00				
15.75	3.87	2.09	0.00				
16.00	3.89	2.11	0.00				
16.25	3.91	2.13	0.00				
16.50	3.94	2.15	0.00				
16.75	3.96	2.17	0.00				
17.00	3.98	2.18	0.00				
17.25	4.00	2.20	0.00				
17.50	4.02	2.22	0.00				

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MSE 24-hr 4 10-Year Rainfall=4.32"

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Summary for Subcatchment 3S: to curb inlet

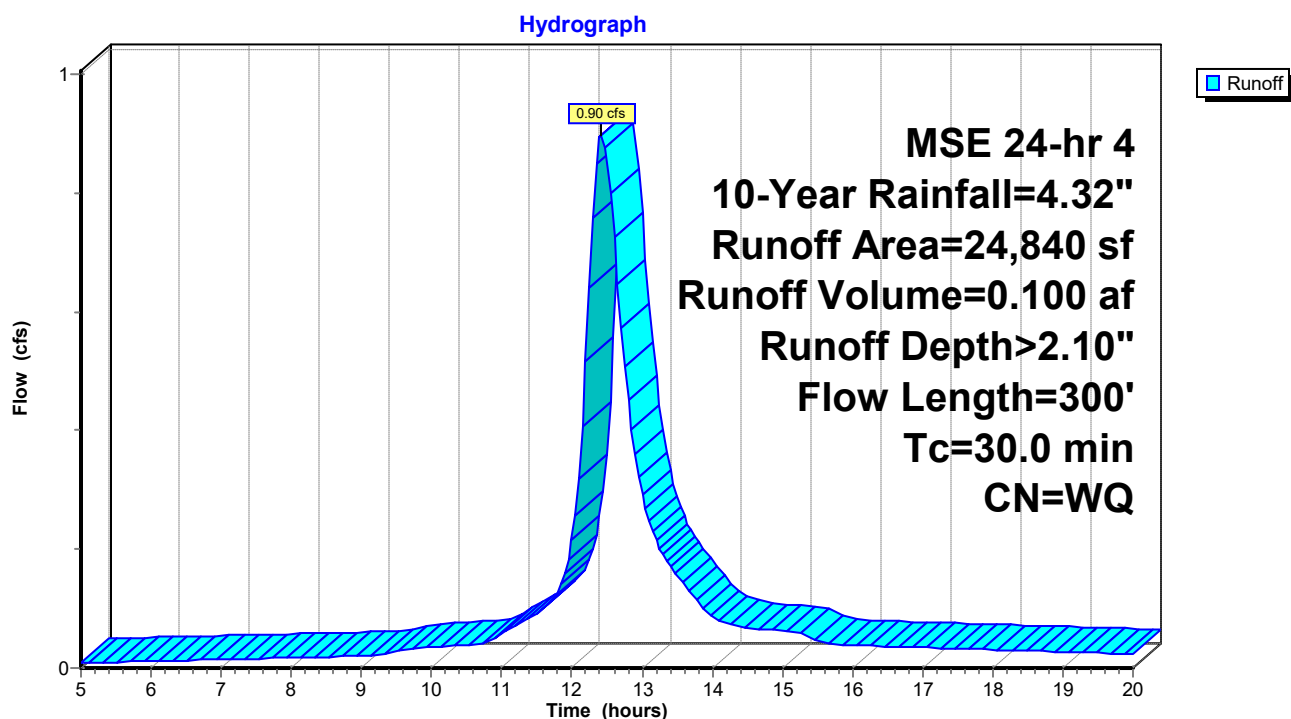
Runoff = 0.90 cfs @ 12.43 hrs, Volume= 0.100 af, Depth> 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10-Year Rainfall=4.32"

	Area (sf)	CN	Description
*	3,200	98	S part parking lot
*	160	98	SW
*	780	61	lawn, HSG B, good
*	780	61	lawn above wall
*	100	98	retain wall
*	2,000	61	lawn run on 1845
*	6,200	61	lawn run on 1835
*	2,120	98	roof+drive run on 1835
*	4,500	98	roof+drive run on 1825
*	5,000	61	lawn run on 1825
	24,840		Weighted Average
	14,760		59.42% Pervious Area
	10,080		40.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.0	300		0.17		Direct Entry, 1845 lawn run on

Subcatchment 3S: to curb inlet



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MSE 24-hr 4 10-Year Rainfall=4.32"

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Hydrograph for Subcatchment 3S: to curb inlet

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.00	0.01	17.75	4.04	1.77	0.03
5.25	0.21	0.00	0.01	18.00	4.05	1.78	0.03
5.50	0.23	0.00	0.01	18.25	4.07	1.79	0.03
5.75	0.25	0.00	0.01	18.50	4.09	1.81	0.03
6.00	0.27	0.00	0.01	18.75	4.11	1.82	0.03
6.25	0.28	0.00	0.01	19.00	4.12	1.83	0.03
6.50	0.30	0.00	0.01	19.25	4.14	1.84	0.03
6.75	0.32	0.00	0.01	19.50	4.15	1.86	0.03
7.00	0.34	0.00	0.01	19.75	4.17	1.87	0.02
7.25	0.36	0.00	0.02	20.00	4.18	1.88	0.02
7.50	0.38	0.00	0.02				
7.75	0.41	0.00	0.02				
8.00	0.43	0.00	0.02				
8.25	0.45	0.00	0.02				
8.50	0.47	0.00	0.02				
8.75	0.50	0.00	0.02				
9.00	0.52	0.00	0.02				
9.25	0.56	0.00	0.02				
9.50	0.60	0.00	0.03				
9.75	0.64	0.00	0.03				
10.00	0.68	0.00	0.03				
10.25	0.73	0.00	0.04				
10.50	0.77	0.01	0.04				
10.75	0.84	0.01	0.04				
11.00	0.93	0.03	0.06				
11.25	1.04	0.05	0.07				
11.50	1.17	0.08	0.09				
11.75	1.42	0.16	0.12				
12.00	2.02	0.43	0.21				
12.25	2.90	0.95	0.64				
12.50	3.15	1.12	0.86				
12.75	3.28	1.20	0.51				
13.00	3.39	1.28	0.29				
13.25	3.48	1.35	0.20				
13.50	3.55	1.40	0.16				
13.75	3.59	1.43	0.12				
14.00	3.64	1.46	0.09				
14.25	3.68	1.50	0.07				
14.50	3.72	1.53	0.07				
14.75	3.76	1.56	0.07				
15.00	3.80	1.58	0.06				
15.25	3.82	1.60	0.06				
15.50	3.85	1.62	0.05				
15.75	3.87	1.64	0.04				
16.00	3.89	1.66	0.04				
16.25	3.91	1.67	0.04				
16.50	3.94	1.69	0.04				
16.75	3.96	1.71	0.04				
17.00	3.98	1.72	0.03				
17.25	4.00	1.74	0.03				
17.50	4.02	1.75	0.03				

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Chiro HCAD Propose + Run On AMENDED Mar. '26

MSE 24-hr 4 10-Year Rainfall=4.32"

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Summary for Subcatchment 4S: to W biofilter

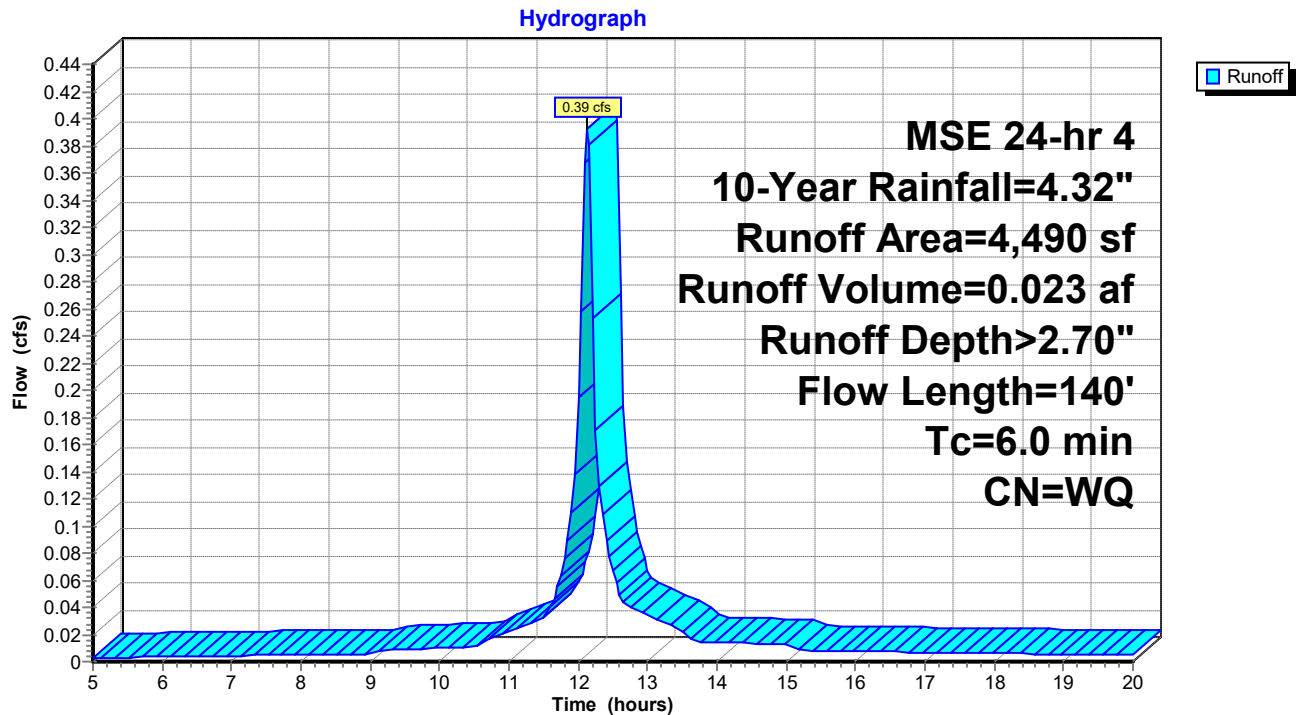
Runoff = 0.39 cfs @ 12.13 hrs, Volume= 0.023 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10-Year Rainfall=4.32"

	Area (sf)	CN	Description
*	2,000	98	N part driveway
*	230	98	N part parking lot
*	1,600	61	lawn, HSG B, good
*	460	100	bio media
*	200	61	bark mulch landscape
	4,490		Weighted Average
	1,800		40.09% Pervious Area
	2,690		59.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	140		0.39		Direct Entry, lawn via parking

Subcatchment 4S: to W biofilter



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MSE 24-hr 4 10-Year Rainfall=4.32"

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Hydrograph for Subcatchment 4S: to W biofilter

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.00	0.00	17.75	4.04	2.32	0.01
5.25	0.21	0.00	0.00	18.00	4.05	2.33	0.01
5.50	0.23	0.00	0.00	18.25	4.07	2.35	0.01
5.75	0.25	0.00	0.00	18.50	4.09	2.36	0.01
6.00	0.27	0.00	0.00	18.75	4.11	2.38	0.01
6.25	0.28	0.00	0.00	19.00	4.12	2.39	0.01
6.50	0.30	0.00	0.00	19.25	4.14	2.41	0.01
6.75	0.32	0.00	0.00	19.50	4.15	2.42	0.00
7.00	0.34	0.00	0.00	19.75	4.17	2.43	0.00
7.25	0.36	0.00	0.00	20.00	4.18	2.44	0.00
7.50	0.38	0.00	0.00				
7.75	0.41	0.00	0.00				
8.00	0.43	0.00	0.01				
8.25	0.45	0.00	0.01				
8.50	0.47	0.00	0.01				
8.75	0.50	0.00	0.01				
9.00	0.52	0.01	0.01				
9.25	0.56	0.01	0.01				
9.50	0.60	0.02	0.01				
9.75	0.64	0.02	0.01				
10.00	0.68	0.03	0.01				
10.25	0.73	0.04	0.01				
10.50	0.77	0.05	0.01				
10.75	0.84	0.08	0.02				
11.00	0.93	0.11	0.02				
11.25	1.04	0.15	0.03				
11.50	1.17	0.21	0.03				
11.75	1.42	0.33	0.06				
12.00	2.02	0.71	0.19				
12.25	2.90	1.37	0.17				
12.50	3.15	1.57	0.07				
12.75	3.28	1.67	0.04				
13.00	3.39	1.76	0.03				
13.25	3.48	1.84	0.03				
13.50	3.55	1.90	0.02				
13.75	3.59	1.94	0.01				
14.00	3.64	1.97	0.01				
14.25	3.68	2.01	0.01				
14.50	3.72	2.04	0.01				
14.75	3.76	2.08	0.01				
15.00	3.80	2.11	0.01				
15.25	3.82	2.13	0.01				
15.50	3.85	2.15	0.01				
15.75	3.87	2.17	0.01				
16.00	3.89	2.19	0.01				
16.25	3.91	2.21	0.01				
16.50	3.94	2.23	0.01				
16.75	3.96	2.25	0.01				
17.00	3.98	2.27	0.01				
17.25	4.00	2.28	0.01				
17.50	4.02	2.30	0.01				

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MSE 24-hr 4 10-Year Rainfall=4.32"

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Summary for Subcatchment 5S: to NDS 13-14-15

Runoff = 0.76 cfs @ 12.42 hrs, Volume= 0.084 af, Depth> 2.50"

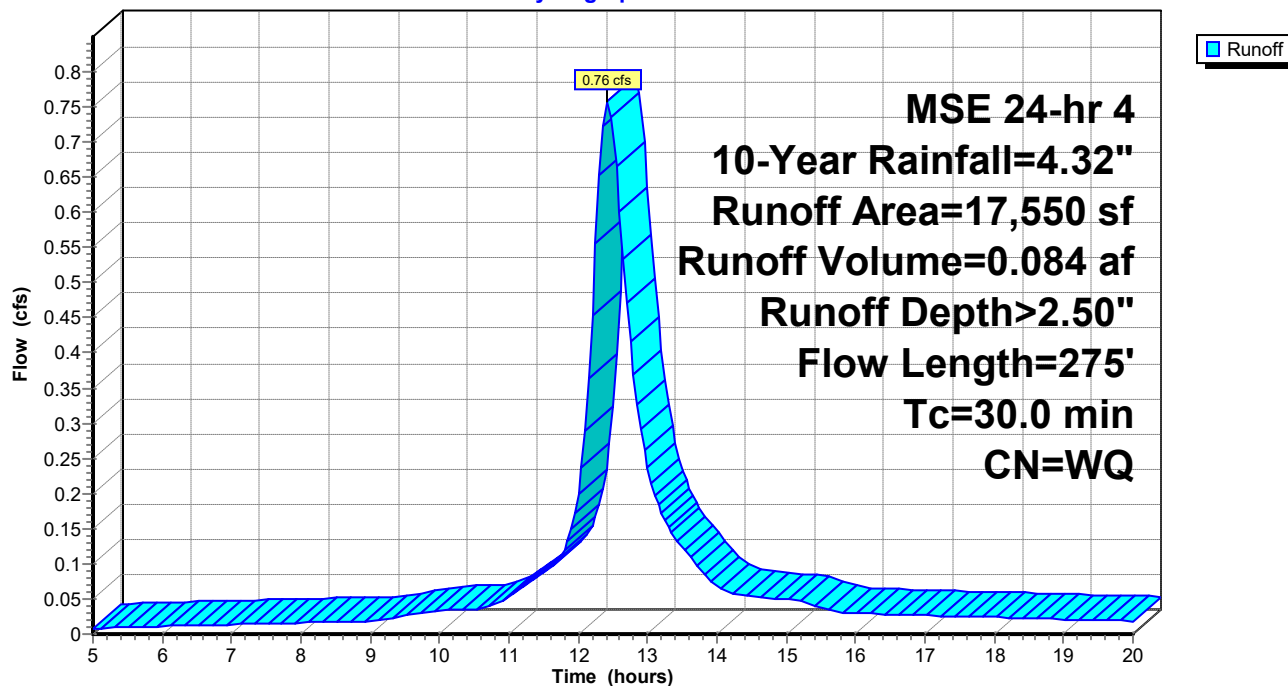
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10-Year Rainfall=4.32"

	Area (sf)	CN	Description
*	550	61	NDS 14-15 lawn berm, HSG B, good
*	500	61	NDS 13 lawn
*	9,500	98	roof+drive run on 1825
*	7,000	61	lawn run on 1825
	17,550		Weighted Average
	8,050		45.87% Pervious Area
	9,500		54.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.0	275		0.15		Direct Entry, lawn run on 1825

Subcatchment 5S: to NDS 13-14-15

Hydrograph



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Chiro HCAD Propose + Run On AMENDED Mar. '26

MSE 24-hr 4 10-Year Rainfall=4.32"

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Hydrograph for Subcatchment 5S: to NDS 13-14-15

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.00	0.01	17.75	4.04	2.15	0.02
5.25	0.21	0.00	0.01	18.00	4.05	2.17	0.02
5.50	0.23	0.00	0.01	18.25	4.07	2.18	0.02
5.75	0.25	0.00	0.01	18.50	4.09	2.20	0.02
6.00	0.27	0.00	0.01	18.75	4.11	2.21	0.02
6.25	0.28	0.00	0.01	19.00	4.12	2.22	0.02
6.50	0.30	0.00	0.01	19.25	4.14	2.24	0.02
6.75	0.32	0.00	0.01	19.50	4.15	2.25	0.02
7.00	0.34	0.00	0.01	19.75	4.17	2.26	0.02
7.25	0.36	0.00	0.01	20.00	4.18	2.27	0.02
7.50	0.38	0.00	0.02				
7.75	0.41	0.00	0.02				
8.00	0.43	0.00	0.02				
8.25	0.45	0.00	0.02				
8.50	0.47	0.00	0.02				
8.75	0.50	0.00	0.02				
9.00	0.52	0.00	0.02				
9.25	0.56	0.00	0.02				
9.50	0.60	0.01	0.03				
9.75	0.64	0.01	0.03				
10.00	0.68	0.02	0.03				
10.25	0.73	0.03	0.03				
10.50	0.77	0.03	0.04				
10.75	0.84	0.05	0.04				
11.00	0.93	0.08	0.05				
11.25	1.04	0.11	0.07				
11.50	1.17	0.16	0.09				
11.75	1.42	0.27	0.11				
12.00	2.02	0.62	0.20				
12.25	2.90	1.24	0.56				
12.50	3.15	1.43	0.72				
12.75	3.28	1.53	0.42				
13.00	3.39	1.62	0.24				
13.25	3.48	1.69	0.16				
13.50	3.55	1.75	0.12				
13.75	3.59	1.78	0.09				
14.00	3.64	1.82	0.07				
14.25	3.68	1.85	0.06				
14.50	3.72	1.89	0.05				
14.75	3.76	1.92	0.05				
15.00	3.80	1.95	0.05				
15.25	3.82	1.97	0.05				
15.50	3.85	1.99	0.04				
15.75	3.87	2.01	0.03				
16.00	3.89	2.03	0.03				
16.25	3.91	2.05	0.03				
16.50	3.94	2.07	0.03				
16.75	3.96	2.09	0.03				
17.00	3.98	2.10	0.03				
17.25	4.00	2.12	0.03				
17.50	4.02	2.14	0.03				

Chiro HCAD Proposed + Run On

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Chiro HCAD Propose + Run On AMENDED Mar. '26

MSE 24-hr 4 10-Year Rainfall=4.32"

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Summary for Subcatchment 6S: untreated

Runoff = 0.34 cfs @ 12.24 hrs, Volume= 0.027 af, Depth> 2.06"

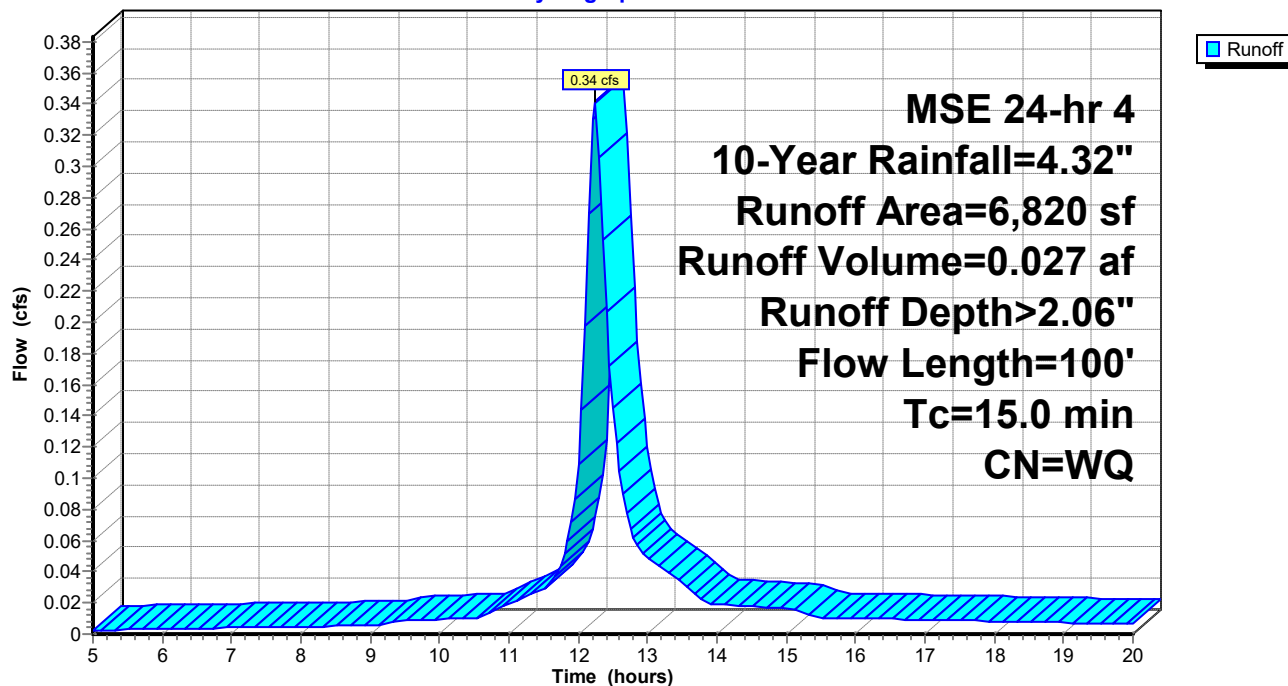
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10-Year Rainfall=4.32"

	Area (sf)	CN	Description
*	2,400	98	S driveway
*	3,400	61	lawn, HSG B, good
*	750	61	bark mulch landscape
*	270	98	retain wall
			Weighted Average
			60.85% Pervious Area
			39.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100		0.11		Direct Entry, landscape to street

Subcatchment 6S: untreated

Hydrograph



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MSE 24-hr 4 10-Year Rainfall=4.32"

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Hydrograph for Subcatchment 6S: untreated

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.00	0.00	17.75	4.04	1.69	0.01
5.25	0.21	0.00	0.00	18.00	4.05	1.71	0.01
5.50	0.23	0.00	0.00	18.25	4.07	1.72	0.01
5.75	0.25	0.00	0.00	18.50	4.09	1.73	0.01
6.00	0.27	0.00	0.00	18.75	4.11	1.75	0.01
6.25	0.28	0.00	0.00	19.00	4.12	1.76	0.01
6.50	0.30	0.00	0.00	19.25	4.14	1.77	0.01
6.75	0.32	0.00	0.00	19.50	4.15	1.78	0.01
7.00	0.34	0.00	0.00	19.75	4.17	1.79	0.01
7.25	0.36	0.00	0.00	20.00	4.18	1.80	0.01
7.50	0.38	0.00	0.00				
7.75	0.41	0.00	0.00				
8.00	0.43	0.00	0.00				
8.25	0.45	0.00	0.00				
8.50	0.47	0.00	0.01				
8.75	0.50	0.00	0.01				
9.00	0.52	0.00	0.01				
9.25	0.56	0.00	0.01				
9.50	0.60	0.00	0.01				
9.75	0.64	0.00	0.01				
10.00	0.68	0.00	0.01				
10.25	0.73	0.00	0.01				
10.50	0.77	0.00	0.01				
10.75	0.84	0.01	0.01				
11.00	0.93	0.02	0.02				
11.25	1.04	0.04	0.02				
11.50	1.17	0.07	0.03				
11.75	1.42	0.14	0.04				
12.00	2.02	0.39	0.11				
12.25	2.90	0.90	0.34				
12.50	3.15	1.06	0.14				
12.75	3.28	1.15	0.07				
13.00	3.39	1.22	0.05				
13.25	3.48	1.28	0.04				
13.50	3.55	1.34	0.03				
13.75	3.59	1.37	0.02				
14.00	3.64	1.40	0.02				
14.25	3.68	1.43	0.02				
14.50	3.72	1.46	0.02				
14.75	3.76	1.49	0.02				
15.00	3.80	1.52	0.02				
15.25	3.82	1.53	0.01				
15.50	3.85	1.55	0.01				
15.75	3.87	1.57	0.01				
16.00	3.89	1.59	0.01				
16.25	3.91	1.60	0.01				
16.50	3.94	1.62	0.01				
16.75	3.96	1.63	0.01				
17.00	3.98	1.65	0.01				
17.25	4.00	1.67	0.01				
17.50	4.02	1.68	0.01				

Chiro HCAD Proposed + Run On

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MSE 24-hr 4 10-Year Rainfall=4.32"

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Summary for Subcatchment 7S: NW 1/4 roof

[49] Hint: $T_c < 2dt$ may require smaller dt

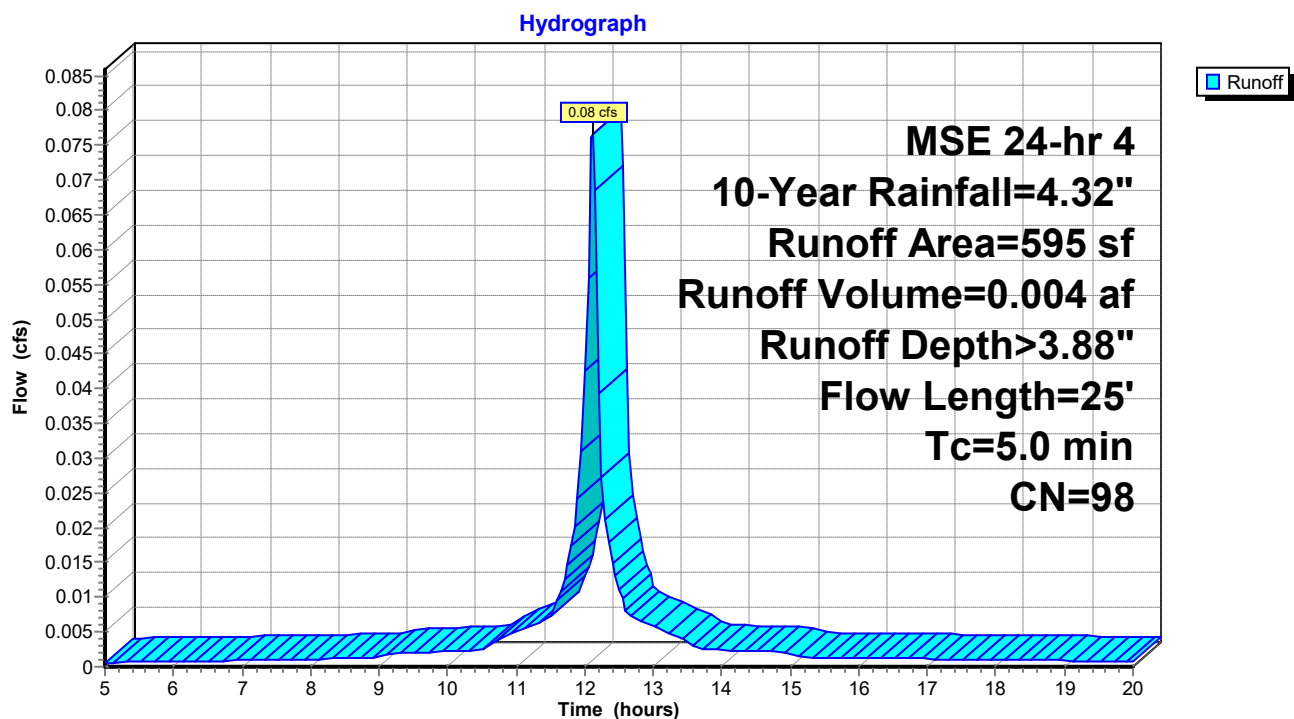
Runoff = 0.08 cfs @ 12.11 hrs, Volume= 0.004 af, Depth> 3.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, $dt=0.05$ hrs
MSE 24-hr 4 10-Year Rainfall=4.32"

	Area (sf)	CN	Description
*	595	98	NW 1/4 roof
	595		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	25		0.08		Direct Entry, NW 1/4 roof

Subcatchment 7S: NW 1/4 roof



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MSE 24-hr 4 10-Year Rainfall=4.32"

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Hydrograph for Subcatchment 7S: NW 1/4 roof

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.07	0.00	17.75	4.04	3.80	0.00
5.25	0.21	0.08	0.00	18.00	4.05	3.82	0.00
5.50	0.23	0.09	0.00	18.25	4.07	3.84	0.00
5.75	0.25	0.10	0.00	18.50	4.09	3.85	0.00
6.00	0.27	0.12	0.00	18.75	4.11	3.87	0.00
6.25	0.28	0.13	0.00	19.00	4.12	3.89	0.00
6.50	0.30	0.15	0.00	19.25	4.14	3.90	0.00
6.75	0.32	0.16	0.00	19.50	4.15	3.92	0.00
7.00	0.34	0.18	0.00	19.75	4.17	3.93	0.00
7.25	0.36	0.20	0.00	20.00	4.18	3.94	0.00
7.50	0.38	0.22	0.00				
7.75	0.41	0.23	0.00				
8.00	0.43	0.25	0.00				
8.25	0.45	0.27	0.00				
8.50	0.47	0.29	0.00				
8.75	0.50	0.32	0.00				
9.00	0.52	0.34	0.00				
9.25	0.56	0.37	0.00				
9.50	0.60	0.41	0.00				
9.75	0.64	0.45	0.00				
10.00	0.68	0.49	0.00				
10.25	0.73	0.53	0.00				
10.50	0.77	0.57	0.00				
10.75	0.84	0.64	0.00				
11.00	0.93	0.73	0.01				
11.25	1.04	0.83	0.01				
11.50	1.17	0.96	0.01				
11.75	1.42	1.20	0.01				
12.00	2.02	1.80	0.04				
12.25	2.90	2.67	0.03				
12.50	3.15	2.91	0.01				
12.75	3.28	3.04	0.01				
13.00	3.39	3.15	0.01				
13.25	3.48	3.24	0.00				
13.50	3.55	3.31	0.00				
13.75	3.59	3.36	0.00				
14.00	3.64	3.40	0.00				
14.25	3.68	3.44	0.00				
14.50	3.72	3.48	0.00				
14.75	3.76	3.52	0.00				
15.00	3.80	3.56	0.00				
15.25	3.82	3.59	0.00				
15.50	3.85	3.61	0.00				
15.75	3.87	3.63	0.00				
16.00	3.89	3.66	0.00				
16.25	3.91	3.68	0.00				
16.50	3.94	3.70	0.00				
16.75	3.96	3.72	0.00				
17.00	3.98	3.74	0.00				
17.25	4.00	3.76	0.00				
17.50	4.02	3.78	0.00				

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MSE 24-hr 4 10-Year Rainfall=4.32"

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Summary for Subcatchment 8S: S 1/2 roof

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.15 cfs @ 12.11 hrs, Volume= 0.009 af, Depth> 3.88"

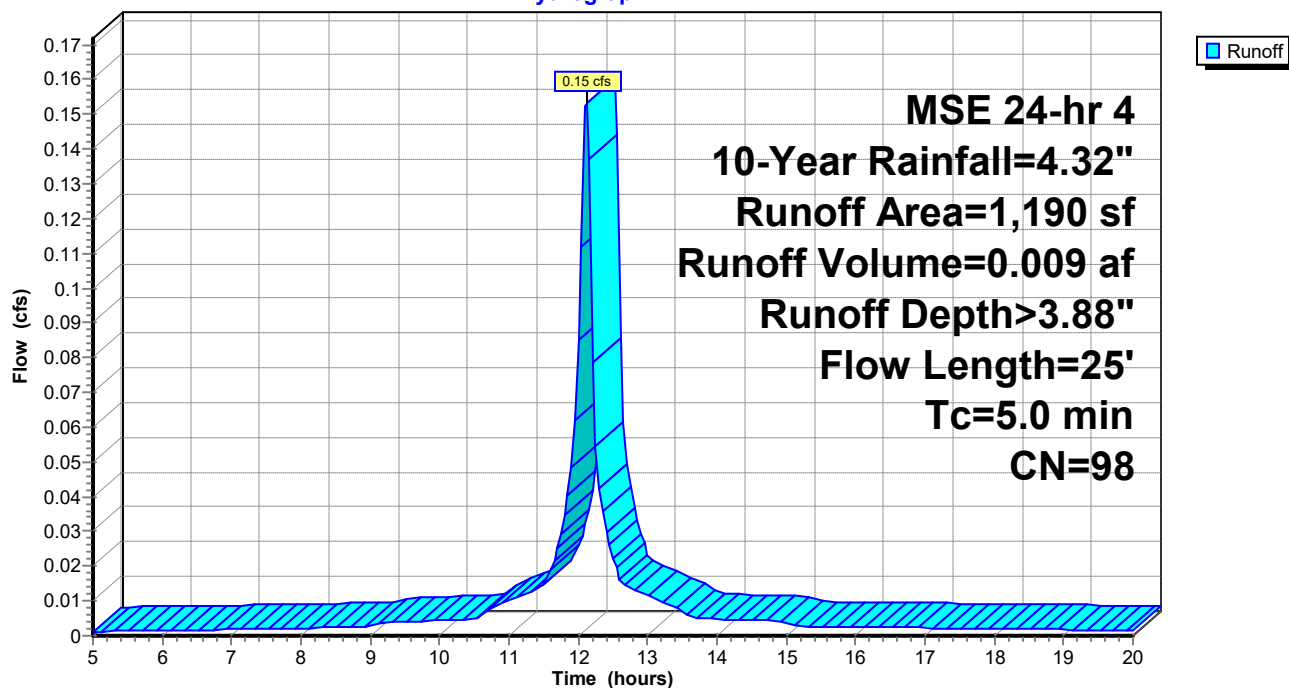
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, $dt=0.05$ hrs
MSE 24-hr 4 10-Year Rainfall=4.32"

	Area (sf)	CN	Description
*	1,190	98	S 1/2 roof
	1,190		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	25		0.08		Direct Entry, S 1/2 roof

Subcatchment 8S: S 1/2 roof

Hydrograph



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MSE 24-hr 4 10-Year Rainfall=4.32"

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Hydrograph for Subcatchment 8S: S 1/2 roof

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.07	0.00	17.75	4.04	3.80	0.00
5.25	0.21	0.08	0.00	18.00	4.05	3.82	0.00
5.50	0.23	0.09	0.00	18.25	4.07	3.84	0.00
5.75	0.25	0.10	0.00	18.50	4.09	3.85	0.00
6.00	0.27	0.12	0.00	18.75	4.11	3.87	0.00
6.25	0.28	0.13	0.00	19.00	4.12	3.89	0.00
6.50	0.30	0.15	0.00	19.25	4.14	3.90	0.00
6.75	0.32	0.16	0.00	19.50	4.15	3.92	0.00
7.00	0.34	0.18	0.00	19.75	4.17	3.93	0.00
7.25	0.36	0.20	0.00	20.00	4.18	3.94	0.00
7.50	0.38	0.22	0.00				
7.75	0.41	0.23	0.00				
8.00	0.43	0.25	0.00				
8.25	0.45	0.27	0.00				
8.50	0.47	0.29	0.00				
8.75	0.50	0.32	0.00				
9.00	0.52	0.34	0.00				
9.25	0.56	0.37	0.00				
9.50	0.60	0.41	0.00				
9.75	0.64	0.45	0.00				
10.00	0.68	0.49	0.00				
10.25	0.73	0.53	0.00				
10.50	0.77	0.57	0.00				
10.75	0.84	0.64	0.01				
11.00	0.93	0.73	0.01				
11.25	1.04	0.83	0.01				
11.50	1.17	0.96	0.01				
11.75	1.42	1.20	0.03				
12.00	2.02	1.80	0.09				
12.25	2.90	2.67	0.05				
12.50	3.15	2.91	0.02				
12.75	3.28	3.04	0.01				
13.00	3.39	3.15	0.01				
13.25	3.48	3.24	0.01				
13.50	3.55	3.31	0.01				
13.75	3.59	3.36	0.00				
14.00	3.64	3.40	0.00				
14.25	3.68	3.44	0.00				
14.50	3.72	3.48	0.00				
14.75	3.76	3.52	0.00				
15.00	3.80	3.56	0.00				
15.25	3.82	3.59	0.00				
15.50	3.85	3.61	0.00				
15.75	3.87	3.63	0.00				
16.00	3.89	3.66	0.00				
16.25	3.91	3.68	0.00				
16.50	3.94	3.70	0.00				
16.75	3.96	3.72	0.00				
17.00	3.98	3.74	0.00				
17.25	4.00	3.76	0.00				
17.50	4.02	3.78	0.00				

Chiro HCAD Proposed + Run On

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MSE 24-hr 4 10-Year Rainfall=4.32"

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Summary for Reach 3R: S. 8" PVC

[52] Hint: Inlet/Outlet conditions not evaluated

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.430 ac, 57.04% Impervious, Inflow Depth > 2.59" for 10-Year event
Inflow = 0.79 cfs @ 12.41 hrs, Volume= 0.093 af
Outflow = 0.78 cfs @ 12.43 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 3.50 fps, Min. Travel Time= 0.4 min

Avg. Velocity= 1.56 fps, Avg. Travel Time= 0.9 min

Peak Storage= 20 cf @ 12.42 hrs

Average Depth at Peak Storage= 0.41'

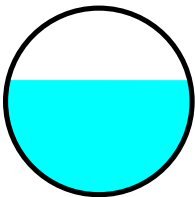
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.13 cfs

8.0" Round Pipe

n= 0.010 PVC, smooth interior

Length= 87.0' Slope= 0.0052 '/'

Inlet Invert= 676.38', Outlet Invert= 675.93'



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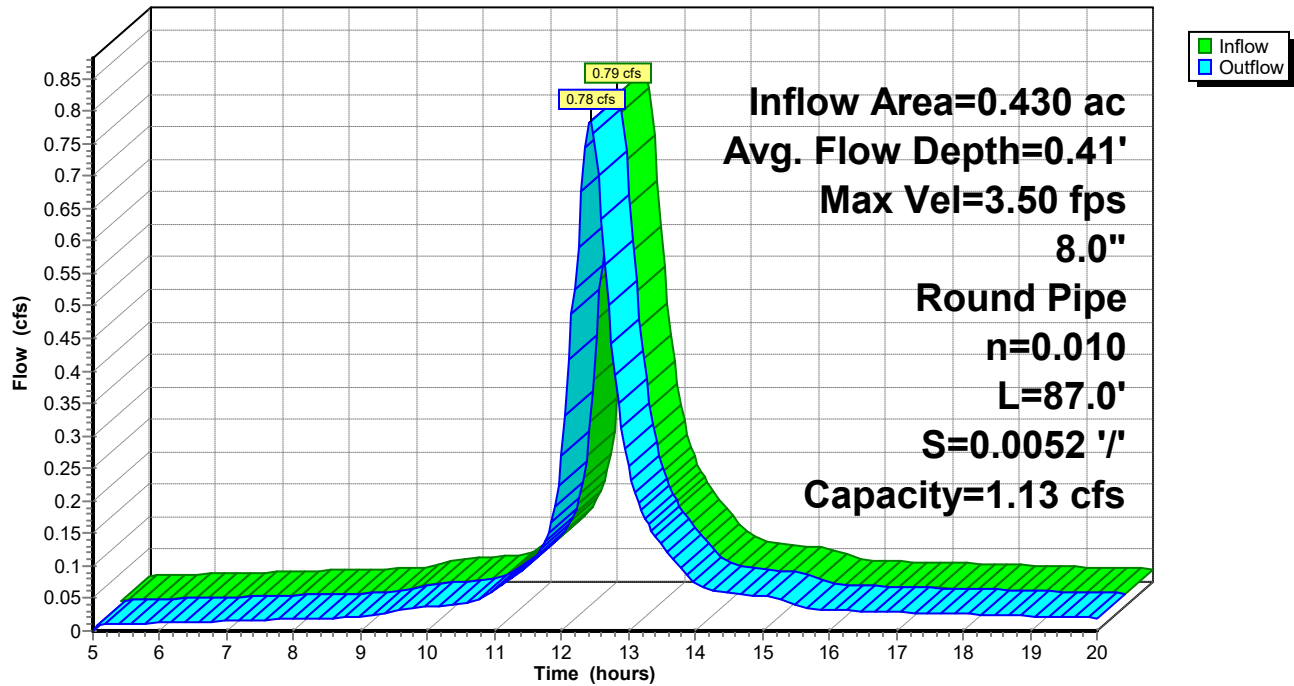
MSE 24-hr 4 10-Year Rainfall=4.32"

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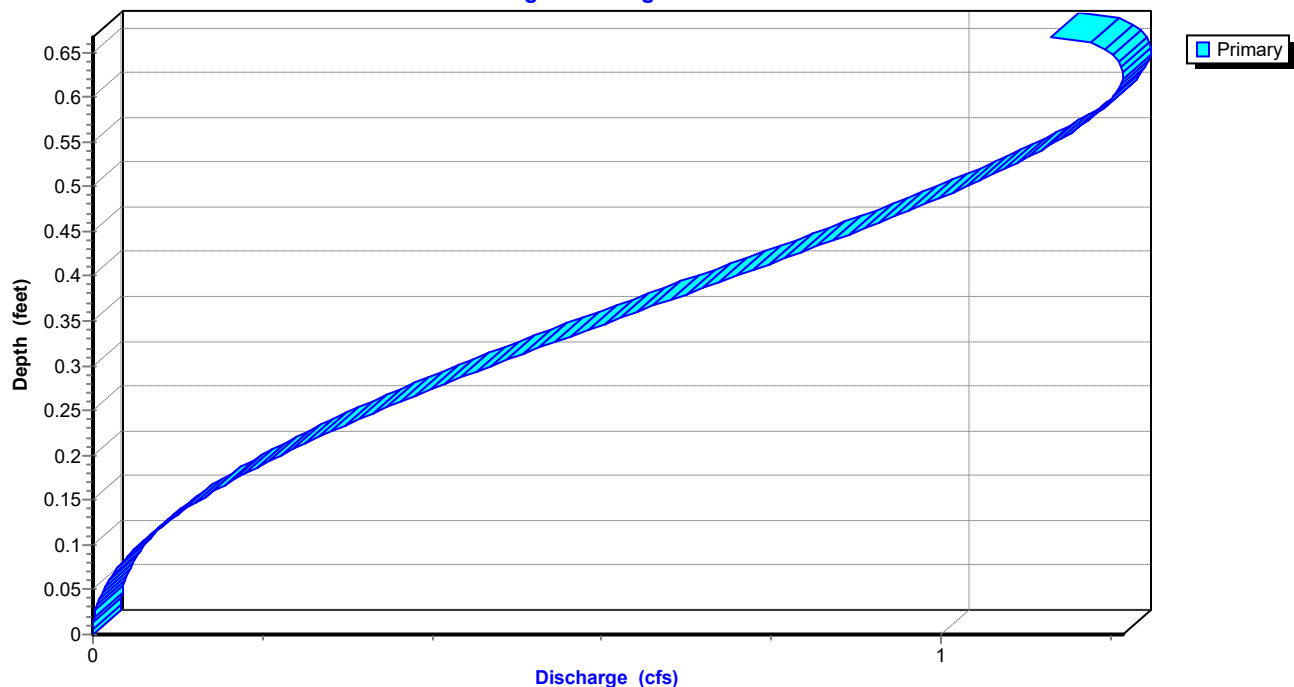
Reach 3R: S. 8" PVC

Hydrograph



Reach 3R: S. 8" PVC

Stage-Discharge



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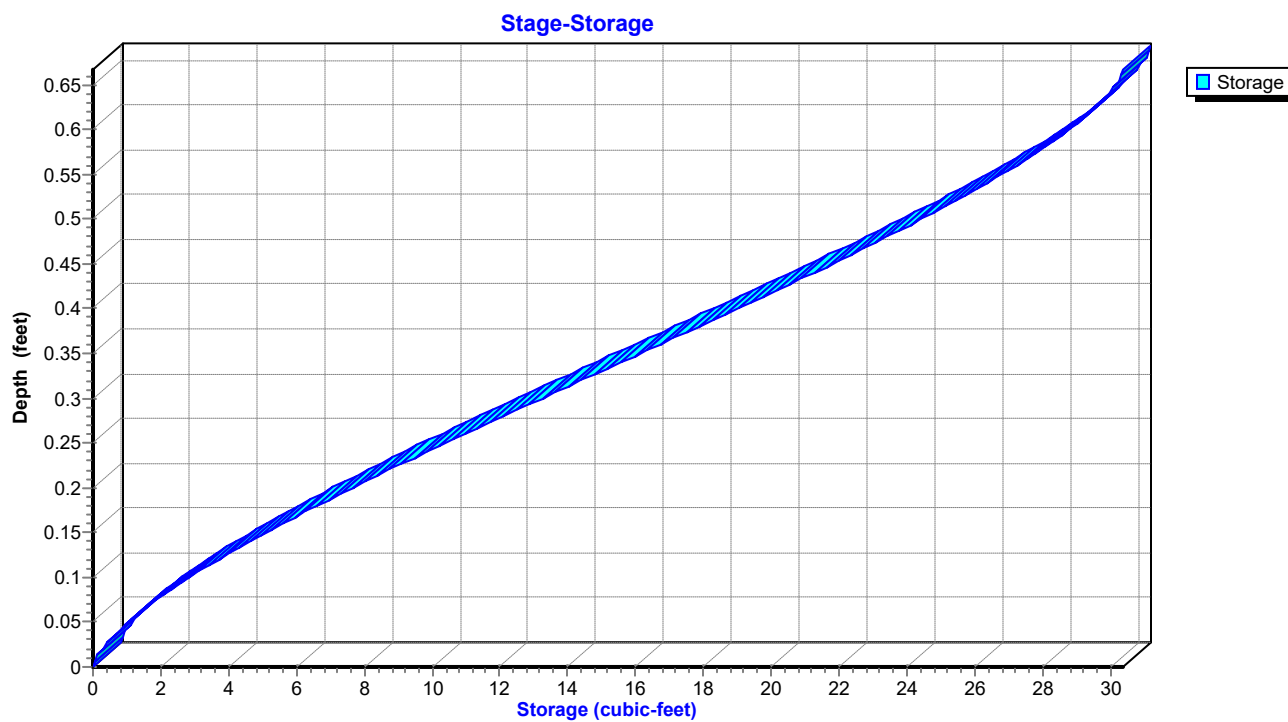
Chiro HCAD Propose + Run On AMENDED Mar. '26

MSE 24-hr 4 10-Year Rainfall=4.32"

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Reach 3R: S. 8" PVC



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MSE 24-hr 4 10-Year Rainfall=4.32"

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Hydrograph for Reach 3R: S. 8" PVC

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.01	0	676.38	0.00
5.50	0.01	1	676.43	0.01
6.00	0.01	1	676.43	0.01
6.50	0.01	1	676.43	0.01
7.00	0.02	1	676.43	0.02
7.50	0.02	1	676.44	0.02
8.00	0.02	1	676.44	0.02
8.50	0.02	1	676.44	0.02
9.00	0.02	1	676.44	0.02
9.50	0.03	2	676.46	0.03
10.00	0.04	2	676.46	0.04
10.50	0.04	2	676.47	0.04
11.00	0.06	3	676.49	0.06
11.50	0.10	4	676.51	0.10
12.00	0.28	9	676.60	0.27
12.50	0.74	19	676.78	0.75
13.00	0.25	8	676.59	0.25
13.50	0.13	5	676.53	0.13
14.00	0.07	4	676.50	0.07
14.50	0.06	3	676.48	0.06
15.00	0.05	3	676.48	0.05
15.50	0.04	2	676.47	0.04
16.00	0.03	2	676.46	0.03
16.50	0.03	2	676.46	0.03
17.00	0.03	2	676.45	0.03
17.50	0.03	2	676.45	0.03
18.00	0.03	2	676.45	0.03
18.50	0.02	2	676.45	0.02
19.00	0.02	2	676.45	0.02
19.50	0.02	1	676.44	0.02
20.00	0.02	1	676.44	0.02

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Chiro HCAD Propose + Run On AMENDED Mar. '26

MSE 24-hr 4 10-Year Rainfall=4.32"

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Stage-Discharge for Reach 3R: S. 8" PVC

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)	Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
676.38	0.00	0.00	676.89	3.68	1.05
676.39	0.37	0.00	676.90	3.68	1.08
676.40	0.60	0.00	676.91	3.69	1.10
676.41	0.78	0.00	676.92	3.69	1.12
676.42	0.94	0.01	676.93	3.69	1.14
676.43	1.08	0.01	676.94	3.69	1.15
676.44	1.21	0.02	676.95	3.68	1.17
676.45	1.34	0.03	676.96	3.67	1.18
676.46	1.46	0.03	676.97	3.66	1.19
676.47	1.57	0.04	676.98	3.64	1.20
676.48	1.67	0.05	676.99	3.62	1.21
676.49	1.77	0.07	677.00	3.59	1.21
676.50	1.87	0.08	677.01	3.56	1.21
676.51	1.96	0.09	677.02	3.51	1.21
676.52	2.05	0.11	677.03	3.46	1.20
676.53	2.13	0.13	677.04	3.38	1.18
676.54	2.22	0.14	677.05	3.17	1.11
676.55	2.29	0.16			
676.56	2.37	0.18			
676.57	2.44	0.20			
676.58	2.51	0.22			
676.59	2.58	0.24			
676.60	2.65	0.27			
676.61	2.71	0.29			
676.62	2.77	0.31			
676.63	2.83	0.34			
676.64	2.88	0.36			
676.65	2.94	0.39			
676.66	2.99	0.42			
676.67	3.04	0.44			
676.68	3.09	0.47			
676.69	3.14	0.50			
676.70	3.18	0.53			
676.71	3.22	0.56			
676.72	3.26	0.58			
676.73	3.30	0.61			
676.74	3.34	0.64			
676.75	3.38	0.67			
676.76	3.41	0.70			
676.77	3.44	0.73			
676.78	3.47	0.76			
676.79	3.50	0.79			
676.80	3.53	0.82			
676.81	3.55	0.85			
676.82	3.57	0.87			
676.83	3.59	0.90			
676.84	3.61	0.93			
676.85	3.63	0.95			
676.86	3.64	0.98			
676.87	3.66	1.01			
676.88	3.67	1.03			

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MSE 24-hr 4 10-Year Rainfall=4.32"

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Stage-Area-Storage for Reach 3R: S. 8" PVC

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
676.38	0.0	0	676.89	0.3	25
676.39	0.0	0	676.90	0.3	25
676.40	0.0	0	676.91	0.3	26
676.41	0.0	0	676.92	0.3	26
676.42	0.0	1	676.93	0.3	27
676.43	0.0	1	676.94	0.3	27
676.44	0.0	1	676.95	0.3	28
676.45	0.0	2	676.96	0.3	28
676.46	0.0	2	676.97	0.3	28
676.47	0.0	2	676.98	0.3	29
676.48	0.0	3	676.99	0.3	29
676.49	0.0	3	677.00	0.3	29
676.50	0.0	4	677.01	0.3	30
676.51	0.0	4	677.02	0.3	30
676.52	0.1	5	677.03	0.3	30
676.53	0.1	5	677.04	0.3	30
676.54	0.1	6	677.05	0.3	30
676.55	0.1	6			
676.56	0.1	7			
676.57	0.1	7			
676.58	0.1	8			
676.59	0.1	8			
676.60	0.1	9			
676.61	0.1	9			
676.62	0.1	10			
676.63	0.1	10			
676.64	0.1	11			
676.65	0.1	12			
676.66	0.1	12			
676.67	0.1	13			
676.68	0.2	13			
676.69	0.2	14			
676.70	0.2	14			
676.71	0.2	15			
676.72	0.2	16			
676.73	0.2	16			
676.74	0.2	17			
676.75	0.2	17			
676.76	0.2	18			
676.77	0.2	18			
676.78	0.2	19			
676.79	0.2	20			
676.80	0.2	20			
676.81	0.2	21			
676.82	0.2	21			
676.83	0.3	22			
676.84	0.3	22			
676.85	0.3	23			
676.86	0.3	23			
676.87	0.3	24			
676.88	0.3	24			

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MSE 24-hr 4 10-Year Rainfall=4.32"

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Summary for Reach 4R: 6" PVC

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.160 ac, 49.72% Impervious, Inflow Depth > 2.05" for 10-Year event
Inflow = 1.36 cfs @ 12.45 hrs, Volume= 0.198 af
Outflow = 1.36 cfs @ 12.46 hrs, Volume= 0.198 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 13.65 fps, Min. Travel Time= 0.1 min

Avg. Velocity= 6.36 fps, Avg. Travel Time= 0.2 min

Peak Storage= 8 cf @ 12.45 hrs

Average Depth at Peak Storage= 0.25'

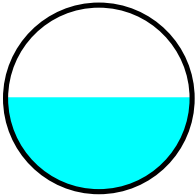
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 2.67 cfs

6.0" Round Pipe

n= 0.010

Length= 77.0' Slope= 0.1335 '/'

Inlet Invert= 668.80', Outlet Invert= 658.52'



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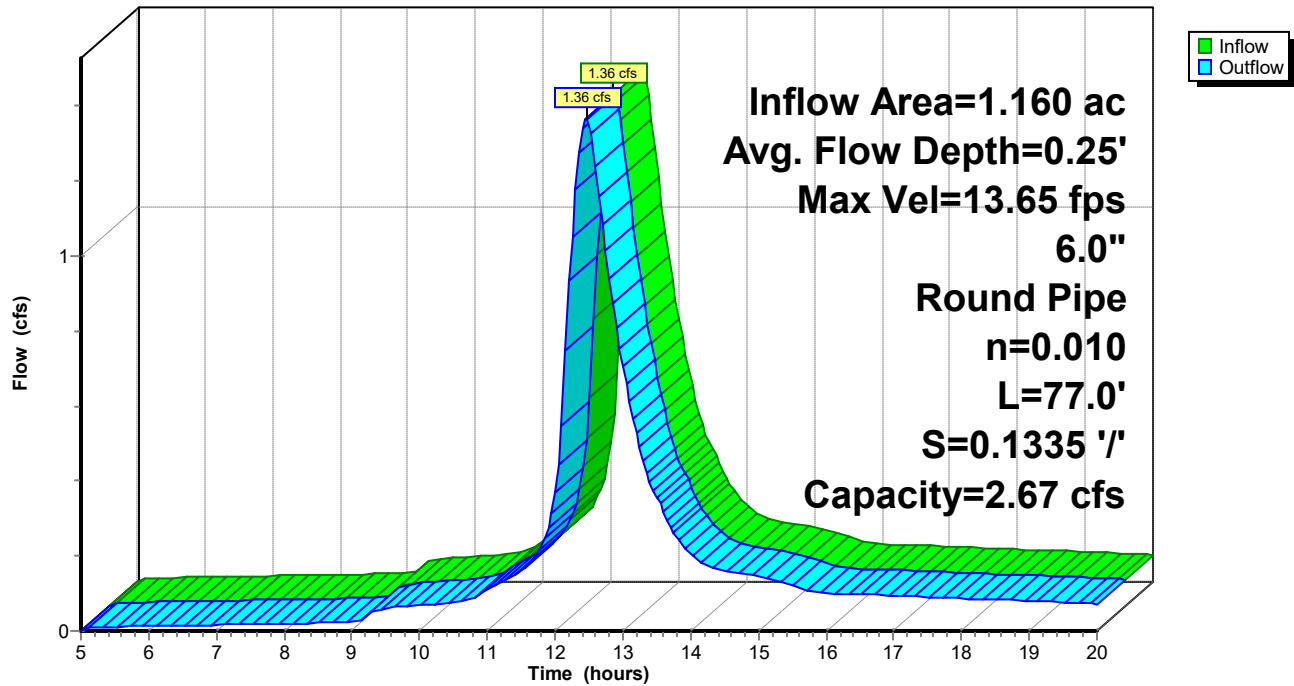
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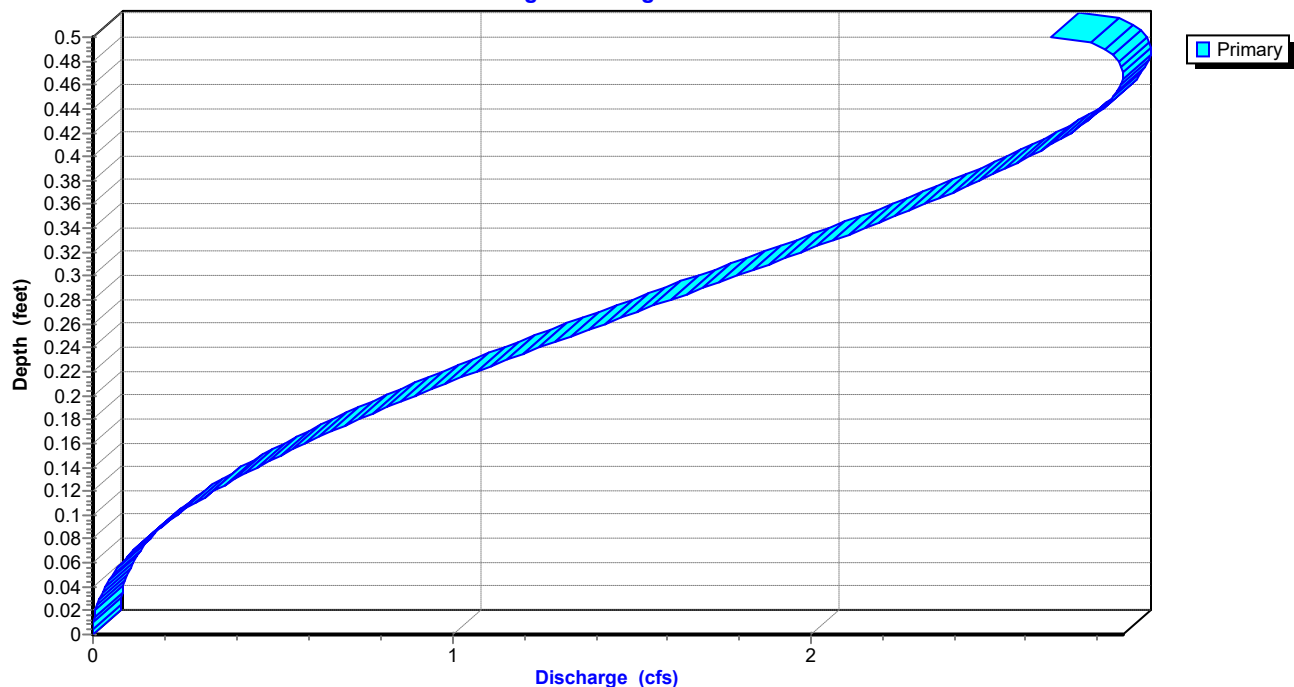
Reach 4R: 6" PVC

Hydrograph



Reach 4R: 6" PVC

Stage-Discharge



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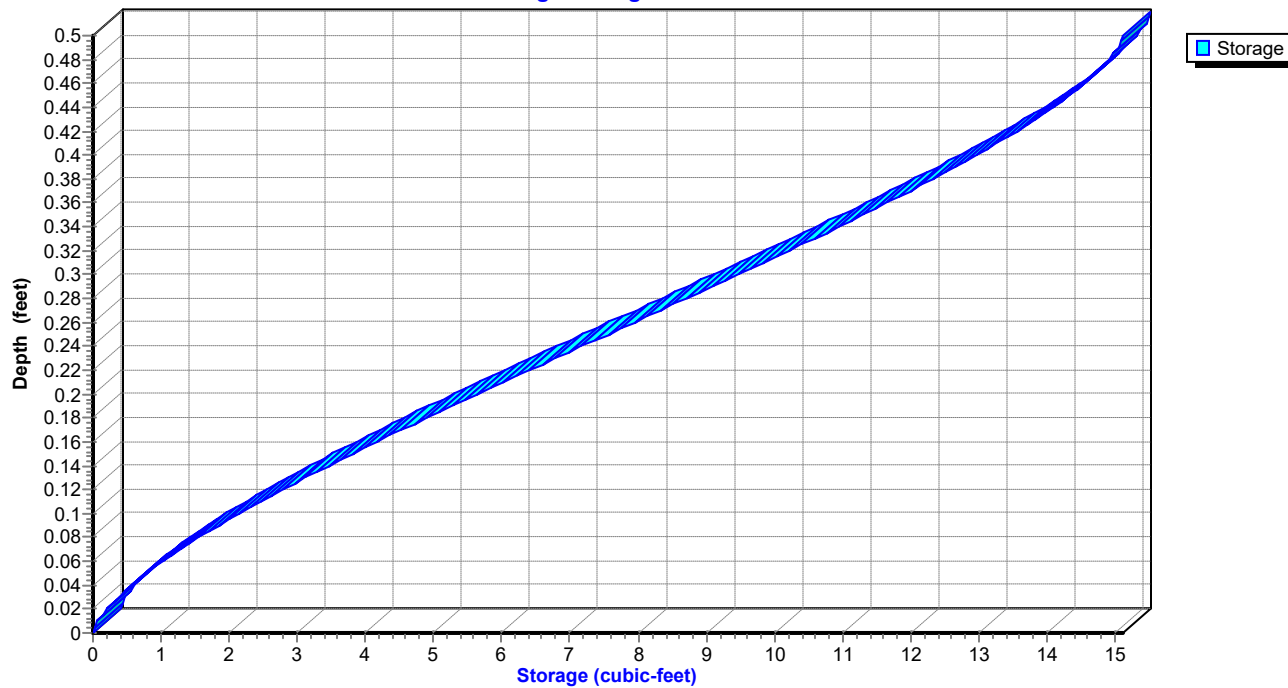
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Reach 4R: 6" PVC

Stage-Storage



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Hydrograph for Reach 4R: 6" PVC

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	668.80	0.00
5.50	0.01	0	668.82	0.01
6.00	0.01	0	668.83	0.01
6.50	0.01	0	668.83	0.01
7.00	0.02	0	668.83	0.02
7.50	0.02	0	668.83	0.02
8.00	0.02	0	668.83	0.02
8.50	0.02	0	668.83	0.02
9.00	0.02	0	668.83	0.02
9.50	0.06	1	668.85	0.06
10.00	0.07	1	668.86	0.07
10.50	0.07	1	668.86	0.07
11.00	0.11	1	668.87	0.11
11.50	0.16	2	668.88	0.16
12.00	0.37	3	668.93	0.37
12.50	1.35	8	669.05	1.35
13.00	0.70	5	668.98	0.71
13.50	0.36	3	668.92	0.36
14.00	0.21	2	668.89	0.21
14.50	0.16	2	668.88	0.16
15.00	0.15	2	668.88	0.15
15.50	0.12	1	668.87	0.12
16.00	0.10	1	668.87	0.10
16.50	0.10	1	668.87	0.10
17.00	0.09	1	668.86	0.09
17.50	0.09	1	668.86	0.09
18.00	0.09	1	668.86	0.09
18.50	0.08	1	668.86	0.08
19.00	0.08	1	668.86	0.08
19.50	0.08	1	668.86	0.08
20.00	0.07	1	668.86	0.07

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Stage-Discharge for Reach 4R: 6" PVC

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
668.80	0.00	0.00
668.81	1.91	0.00
668.82	3.01	0.01
668.83	3.93	0.02
668.84	4.72	0.03
668.85	5.45	0.06
668.86	6.11	0.08
668.87	6.72	0.11
668.88	7.30	0.15
668.89	7.84	0.19
668.90	8.35	0.23
668.91	8.83	0.28
668.92	9.29	0.34
668.93	9.73	0.39
668.94	10.14	0.46
668.95	10.54	0.52
668.96	10.91	0.59
668.97	11.27	0.66
668.98	11.61	0.74
668.99	11.94	0.82
669.00	12.25	0.90
669.01	12.54	0.98
669.02	12.82	1.07
669.03	13.09	1.15
669.04	13.34	1.24
669.05	13.57	1.33
669.06	13.80	1.42
669.07	14.01	1.52
669.08	14.20	1.61
669.09	14.39	1.70
669.10	14.56	1.79
669.11	14.71	1.88
669.12	14.86	1.97
669.13	14.98	2.06
669.14	15.10	2.15
669.15	15.20	2.23
669.16	15.29	2.31
669.17	15.36	2.39
669.18	15.41	2.47
669.19	15.45	2.54
669.20	15.47	2.61
669.21	15.47	2.67
669.22	15.46	2.72
669.23	15.42	2.77
669.24	15.35	2.81
669.25	15.26	2.84
669.26	15.14	2.86
669.27	14.97	2.87
669.28	14.74	2.86
669.29	14.41	2.82
669.30	13.57	2.67

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Stage-Area-Storage for Reach 4R: 6" PVC

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
668.80	0.0	0
668.81	0.0	0
668.82	0.0	0
668.83	0.0	0
668.84	0.0	1
668.85	0.0	1
668.86	0.0	1
668.87	0.0	1
668.88	0.0	2
668.89	0.0	2
668.90	0.0	2
668.91	0.0	2
668.92	0.0	3
668.93	0.0	3
668.94	0.0	3
668.95	0.0	4
668.96	0.1	4
668.97	0.1	5
668.98	0.1	5
668.99	0.1	5
669.00	0.1	6
669.01	0.1	6
669.02	0.1	6
669.03	0.1	7
669.04	0.1	7
669.05	0.1	8
669.06	0.1	8
669.07	0.1	8
669.08	0.1	9
669.09	0.1	9
669.10	0.1	9
669.11	0.1	10
669.12	0.1	10
669.13	0.1	11
669.14	0.1	11
669.15	0.1	11
669.16	0.2	12
669.17	0.2	12
669.18	0.2	12
669.19	0.2	13
669.20	0.2	13
669.21	0.2	13
669.22	0.2	14
669.23	0.2	14
669.24	0.2	14
669.25	0.2	14
669.26	0.2	15
669.27	0.2	15
669.28	0.2	15
669.29	0.2	15
669.30	0.2	15

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MSE 24-hr 4 10-Year Rainfall=4.32"

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Summary for Pond 3P: E biofilter LINED

[82] Warning: Early inflow requires earlier time span

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=13)

Inflow Area = 0.043 ac, 57.33% Impervious, Inflow Depth > 2.62" for 10-Year event
Inflow = 0.15 cfs @ 12.15 hrs, Volume= 0.009 af
Outflow = 0.03 cfs @ 12.48 hrs, Volume= 0.008 af, Atten= 78%, Lag= 19.8 min
Discarded = 0.00 cfs @ 12.48 hrs, Volume= 0.000 af
Primary = 0.03 cfs @ 12.48 hrs, Volume= 0.008 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 680.81' @ 12.48 hrs Surf.Area= 540 sf Storage= 178 cf

Plug-Flow detention time= 112.0 min calculated for 0.008 af (87% of inflow)
Center-of-Mass det. time= 71.7 min (821.8 - 750.1)

Volume	Invert	Avail.Storage	Storage Description
#1	678.00'	54 cf	10.50'W x 15.50'L x 1.00'H sand invert 163 cf Overall x 33.0% Voids
#2	679.00'	66 cf	10.50'W x 15.50'L x 1.50'H media 244 cf Overall x 27.0% Voids
#3	680.50'	128 cf	10.50'W x 15.50'L x 0.60'H top media Z=3.0
#4	681.10'	192 cf	39.25'W x 19.25'L x 0.24'H NDS drain Z=3.0
#5	681.34'	82 cf	40.00'W x 20.00'L x 0.10'H weir overflow Z=3.0
		521 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Secondary	681.34'	6.0' long x 3.0' 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 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	681.10'	0.5" x 2.0" Horiz. NDS drain X 50.00 C= 0.600 in 12.0" x 12.0" Grate (35% open area) Limited to weir flow at low heads
#3	Primary	678.00'	3.600 in/hr underdrain over Horizontal area above 678.00' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 163 sf Phase-In= 0.50'
#4	Discarded	678.00'	0.001 in/hr Exfiltration over Horizontal area above 678.00' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 163 sf Phase-In= 0.50'

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MSE 24-hr 4 10-Year Rainfall=4.32"

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Discarded OutFlow Max=0.00 cfs @ 12.48 hrs HW=680.81' (Free Discharge)

↑ **4=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.03 cfs @ 12.48 hrs HW=680.81' (Free Discharge)

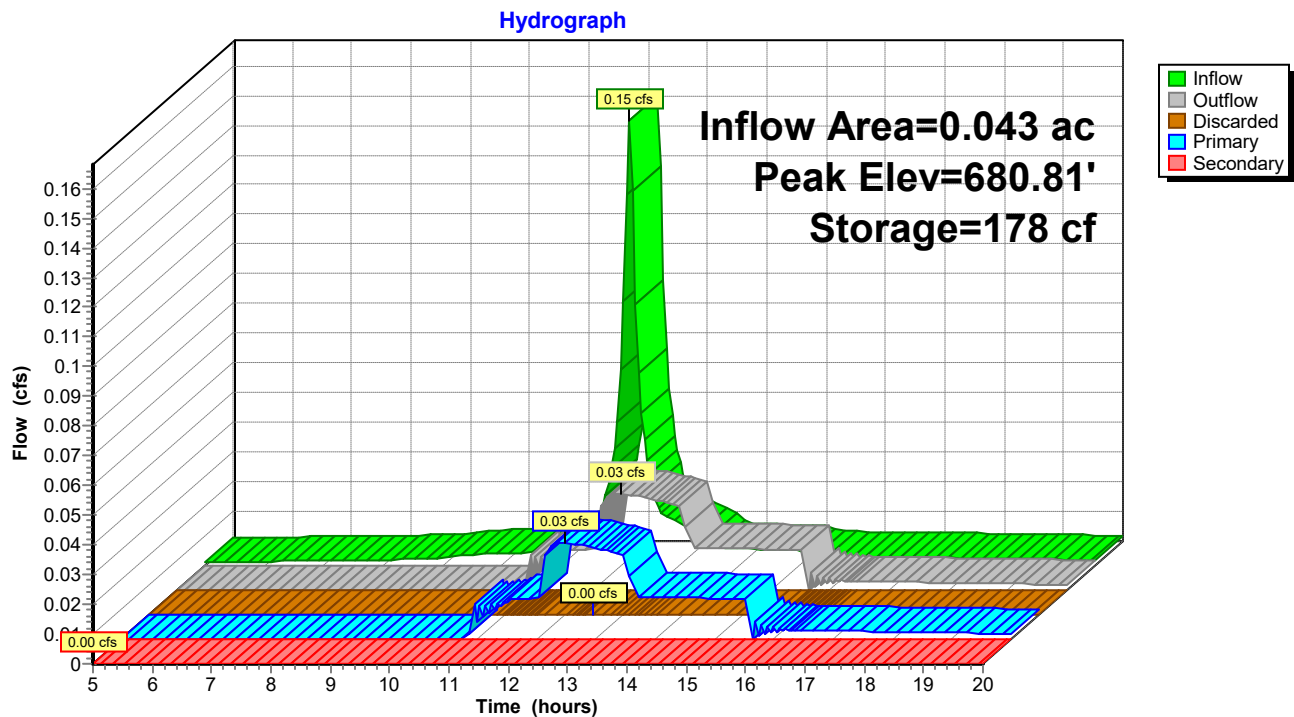
↑ **2=NDS drain** (Controls 0.00 cfs)

↑ **3=underdrain** (Controls 0.03 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=678.00' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: E biofilter LINED



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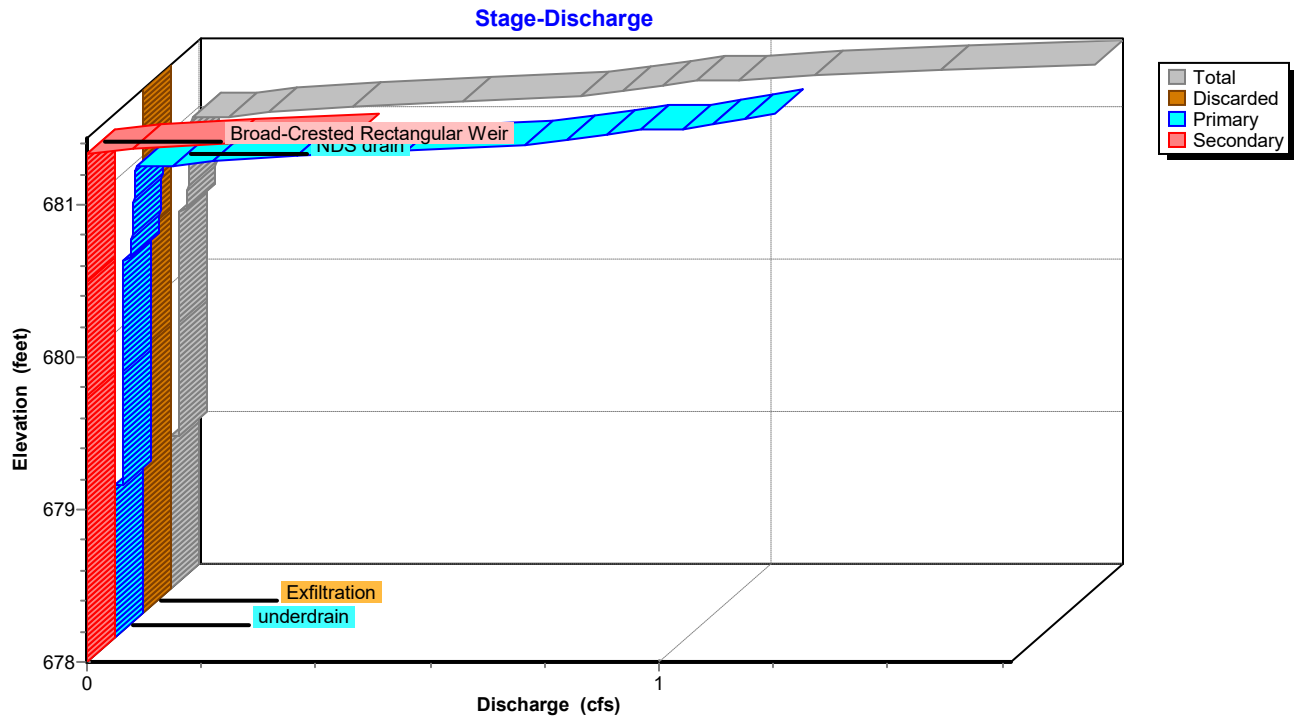
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MSE 24-hr 4 10-Year Rainfall=4.32"

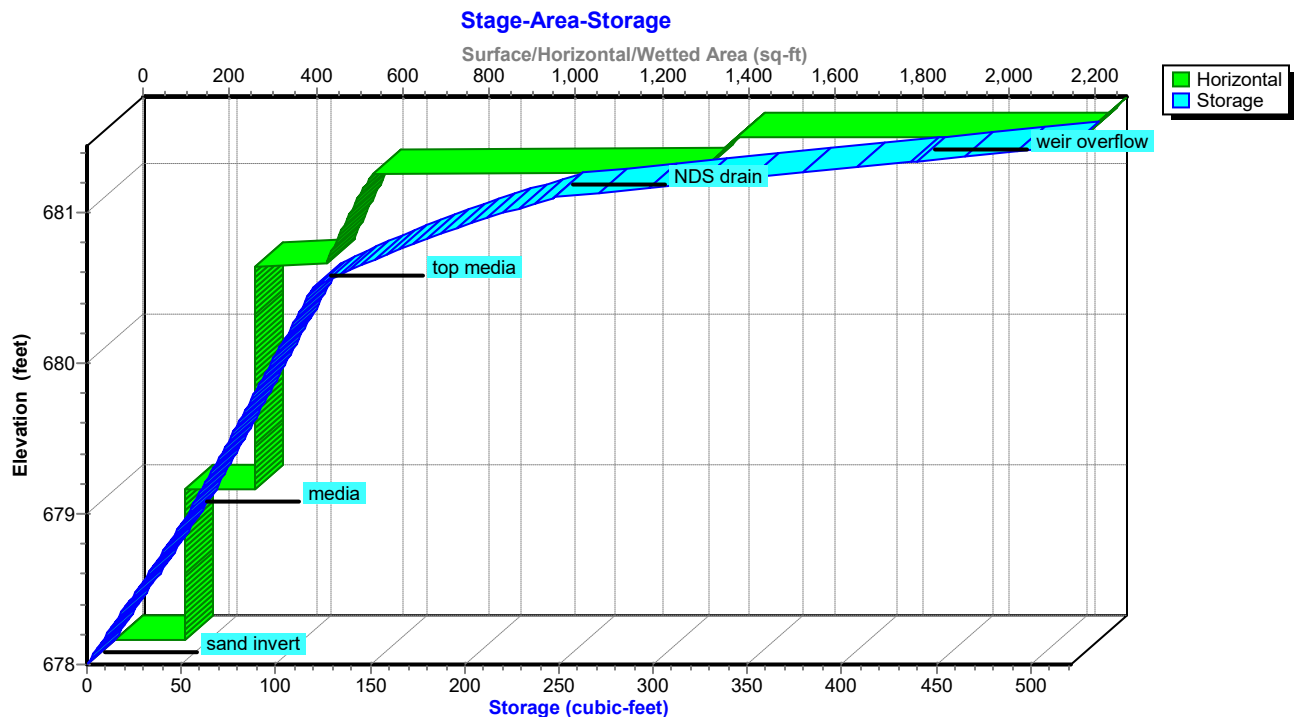
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Pond 3P: E biofilter LINED



Pond 3P: E biofilter LINED



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Hydrograph for Pond 3P: E biofilter LINED

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	0	678.00	0.00	0.00	0.00	0.00
5.50	0.00	2	678.04	0.00	0.00	0.00	0.00
6.00	0.00	5	678.09	0.00	0.00	0.00	0.00
6.50	0.00	7	678.14	0.00	0.00	0.00	0.00
7.00	0.00	10	678.19	0.00	0.00	0.00	0.00
7.50	0.00	14	678.25	0.00	0.00	0.00	0.00
8.00	0.00	17	678.32	0.00	0.00	0.00	0.00
8.50	0.00	21	678.39	0.00	0.00	0.00	0.00
9.00	0.00	25	678.46	0.00	0.00	0.00	0.00
9.50	0.00	31	678.57	0.00	0.00	0.00	0.00
10.00	0.00	38	678.70	0.00	0.00	0.00	0.00
10.50	0.00	45	678.84	0.00	0.00	0.00	0.00
11.00	0.01	54	679.00	0.01	0.00	0.01	0.00
11.50	0.01	54	679.00	0.01	0.00	0.01	0.00
12.00	0.07	79	679.58	0.01	0.00	0.01	0.00
12.50	0.03	178	680.81	0.03	0.00	0.03	0.00
13.00	0.01	155	680.70	0.03	0.00	0.03	0.00
13.50	0.01	123	680.52	0.03	0.00	0.03	0.00
14.00	0.01	106	680.19	0.01	0.00	0.01	0.00
14.50	0.01	91	679.85	0.01	0.00	0.01	0.00
15.00	0.01	76	679.50	0.01	0.00	0.01	0.00
15.50	0.00	58	679.09	0.01	0.00	0.01	0.00
16.00	0.00	54	679.00	0.00	0.00	0.00	0.00
16.50	0.00	54	679.00	0.00	0.00	0.00	0.00
17.00	0.00	54	679.00	0.00	0.00	0.00	0.00
17.50	0.00	54	679.00	0.00	0.00	0.00	0.00
18.00	0.00	54	679.00	0.00	0.00	0.00	0.00
18.50	0.00	54	679.00	0.00	0.00	0.00	0.00
19.00	0.00	54	679.00	0.00	0.00	0.00	0.00
19.50	0.00	54	679.00	0.00	0.00	0.00	0.00
20.00	0.00	54	679.00	0.00	0.00	0.00	0.00

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Stage-Discharge for Pond 3P: E biofilter LINED

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
678.00	0.00	0.00	0.00	0.00
678.10	0.00	0.00	0.00	0.00
678.20	0.00	0.00	0.00	0.00
678.30	0.00	0.00	0.00	0.00
678.40	0.00	0.00	0.00	0.00
678.50	0.00	0.00	0.00	0.00
678.60	0.00	0.00	0.00	0.00
678.70	0.00	0.00	0.00	0.00
678.80	0.00	0.00	0.00	0.00
678.90	0.00	0.00	0.00	0.00
679.00	0.01	0.00	0.01	0.00
679.10	0.01	0.00	0.01	0.00
679.20	0.01	0.00	0.01	0.00
679.30	0.01	0.00	0.01	0.00
679.40	0.01	0.00	0.01	0.00
679.50	0.01	0.00	0.01	0.00
679.60	0.01	0.00	0.01	0.00
679.70	0.01	0.00	0.01	0.00
679.80	0.01	0.00	0.01	0.00
679.90	0.01	0.00	0.01	0.00
680.00	0.01	0.00	0.01	0.00
680.10	0.01	0.00	0.01	0.00
680.20	0.01	0.00	0.01	0.00
680.30	0.01	0.00	0.01	0.00
680.40	0.01	0.00	0.01	0.00
680.50	0.03	0.00	0.03	0.00
680.60	0.03	0.00	0.03	0.00
680.70	0.03	0.00	0.03	0.00
680.80	0.03	0.00	0.03	0.00
680.90	0.03	0.00	0.03	0.00
681.00	0.04	0.00	0.04	0.00
681.10	0.10	0.00	0.10	0.00
681.20	0.52	0.00	0.52	0.00
681.30	0.85	0.00	0.85	0.00
681.40	1.31	0.00	1.09	0.22

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MSE 24-hr 4 10-Year Rainfall=4.32"

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Stage-Area-Storage for Pond 3P: E biofilter LINED

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
678.00	163	0	680.55	496	128
678.05	163	3	680.60	504	137
678.10	163	5	680.65	512	146
678.15	163	8	680.70	521	155
678.20	163	11	680.75	530	165
678.25	163	13	680.80	538	176
678.30	163	16	680.85	547	187
678.35	163	19	680.90	556	198
678.40	163	21	680.95	566	210
678.45	163	24	681.00	575	222
678.50	163	27	681.05	585	235
678.55	163	30	681.10	1,350	248
678.60	163	32	681.15	1,368	286
678.65	163	35	681.20	1,386	325
678.70	163	38	681.25	1,404	365
678.75	163	40	681.30	1,422	406
678.80	163	43	681.35	2,240	448
678.85	163	46	681.40	2,258	488
678.90	163	48			
678.95	163	51			
679.00	326	54			
679.05	326	56			
679.10	326	58			
679.15	326	60			
679.20	326	62			
679.25	326	65			
679.30	326	67			
679.35	326	69			
679.40	326	71			
679.45	326	73			
679.50	326	76			
679.55	326	78			
679.60	326	80			
679.65	326	82			
679.70	326	84			
679.75	326	87			
679.80	326	89			
679.85	326	91			
679.90	326	93			
679.95	326	95			
680.00	326	98			
680.05	326	100			
680.10	326	102			
680.15	326	104			
680.20	326	106			
680.25	326	109			
680.30	326	111			
680.35	326	113			
680.40	326	115			
680.45	326	117			
680.50	488	120			

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Summary for Pond 5P: W biofillter UNLINED

[82] Warning: Early inflow requires earlier time span

[93] Warning: Storage range exceeded by 0.07'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=4)

Inflow Area = 0.673 ac, 43.54% Impervious, Inflow Depth > 2.19" for 10-Year event
Inflow = 0.98 cfs @ 12.41 hrs, Volume= 0.123 af
Outflow = 1.31 cfs @ 12.40 hrs, Volume= 0.108 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 12.40 hrs, Volume= 0.001 af
Primary = 0.74 cfs @ 12.40 hrs, Volume= 0.093 af
Secondary = 0.57 cfs @ 12.40 hrs, Volume= 0.014 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 676.23' @ 12.40 hrs Surf.Area= 2,824 sf Storage= 1,047 cf

Plug-Flow detention time= 92.0 min calculated for 0.108 af (88% of inflow)
Center-of-Mass det. time= 54.3 min (825.6 - 771.3)

Volume	Invert	Avail.Storage	Storage Description
#1	671.75'	107 cf	8.30'W x 39.20'L x 1.00'H sand invert 325 cf Overall x 33.0% Voids
#2	672.75'	176 cf	8.30'W x 39.20'L x 2.00'H media 651 cf Overall x 27.0% Voids
#3	674.75'	728 cf	8.30'W x 39.20'L x 1.35'H top media Z=3.0
#4	676.10'	27 cf	12.30'W x 43.20'L x 0.05'H NDS drain Z=3.0
#5	676.15'	8 cf	18.00'W x 47.00'L x 0.01'H weir overflow Z=3.0
		1,047 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Secondary	676.15'	10.0' long x 3.0' 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 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	676.10'	0.5" x 2.0" Horiz. NDS drain X 50.00 C= 0.600 in 12.0" x 12.0" Grate (35% open area) Limited to weir flow at low heads
#3	Primary	672.75'	3.600 in/hr underdrain over Horizontal area above 672.75' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 651 sf Phase-In= 0.50'
#4	Discarded	671.75'	0.030 in/hr Exfiltration over Horizontal area above 671.75' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 325 sf Phase-In= 0.50'

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Discarded OutFlow Max=0.00 cfs @ 12.40 hrs HW=676.23' (Free Discharge)

↑ **4=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.79 cfs @ 12.40 hrs HW=676.23' (Free Discharge)

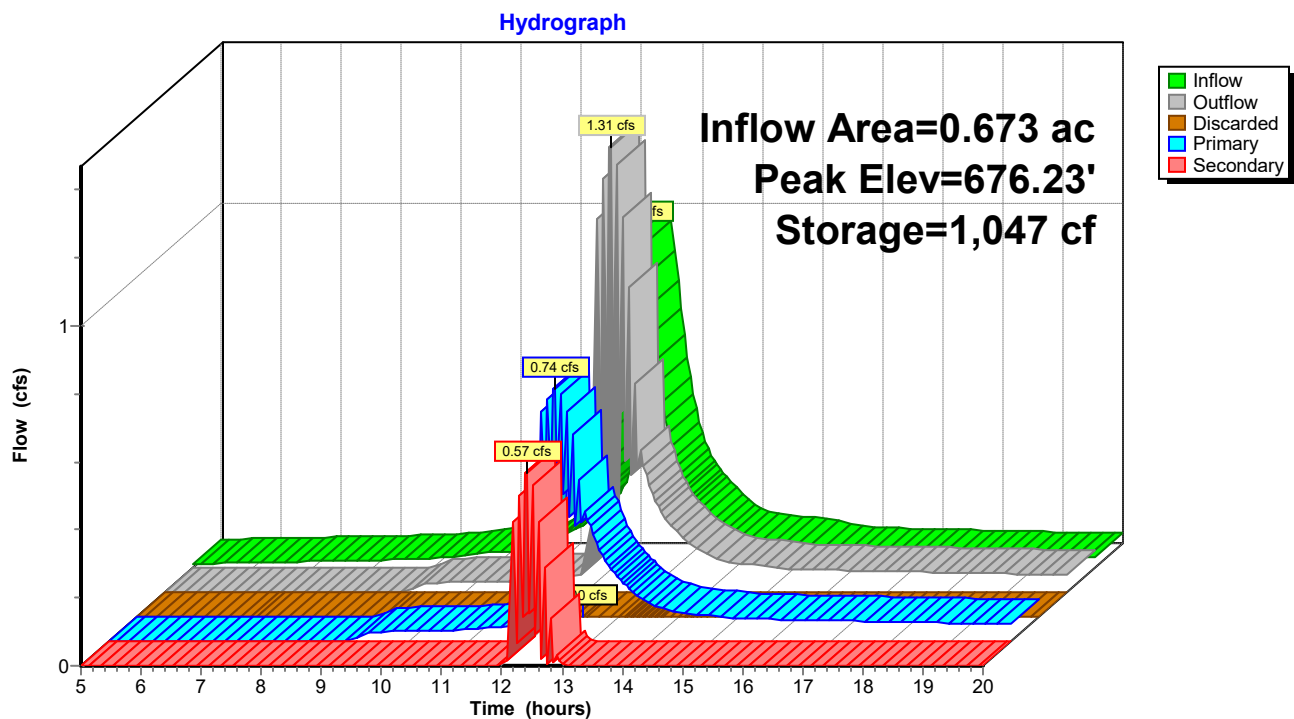
↑ **2=NDS drain** (Orifice Controls 0.60 cfs @ 1.73 fps)

↑ **3=underdrain** (Controls 0.18 cfs)

Secondary OutFlow Max=0.55 cfs @ 12.40 hrs HW=676.23' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 0.55 cfs @ 0.69 fps)

Pond 5P: W biofilter UNLINED



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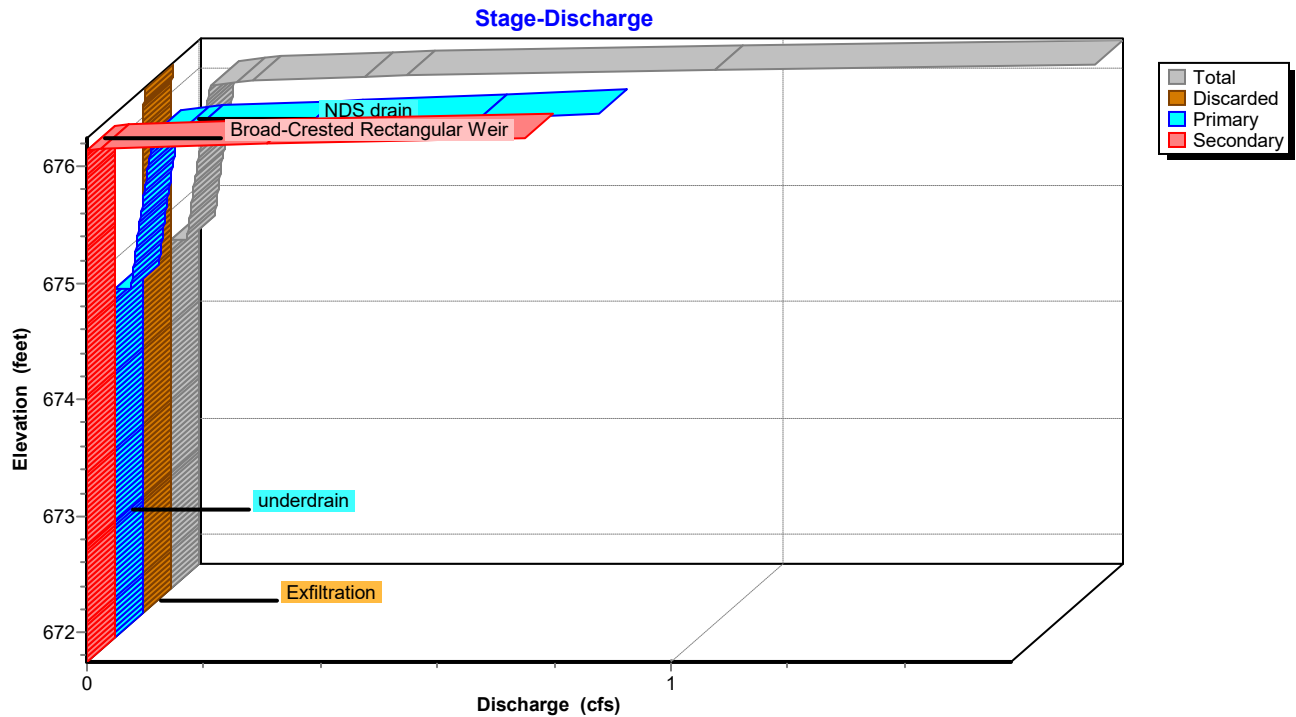
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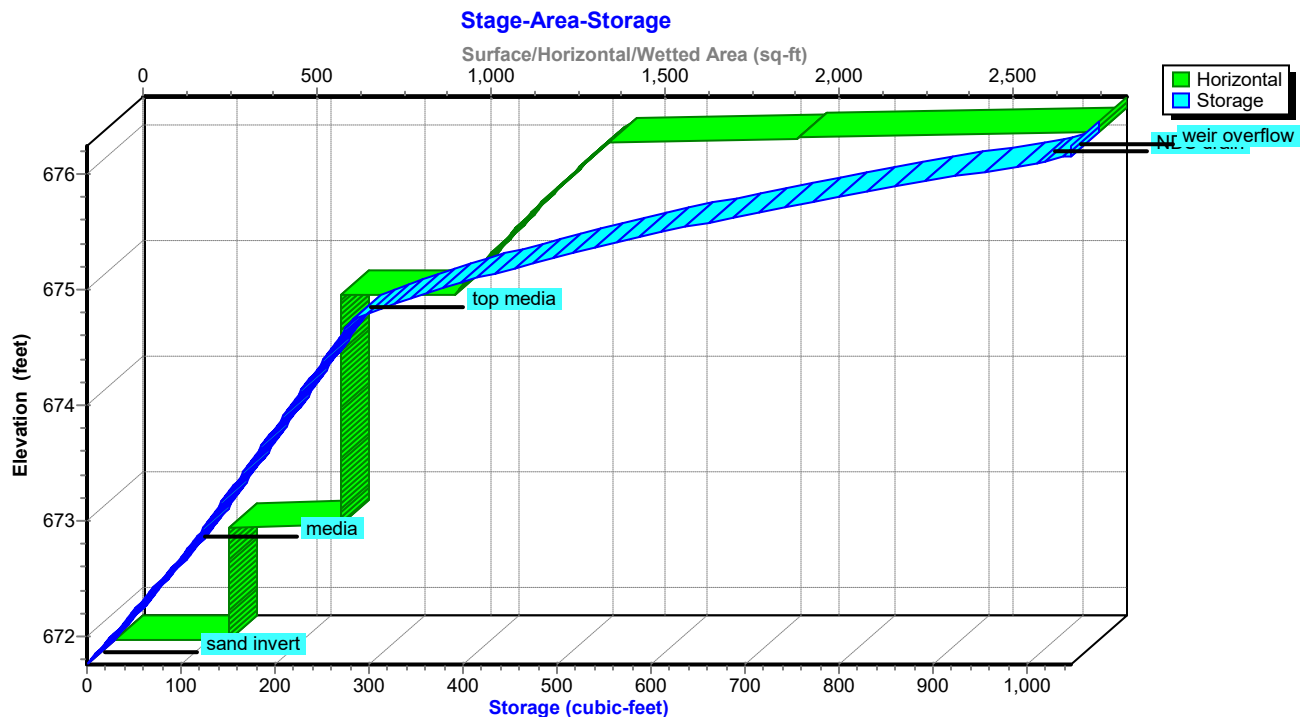
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Pond 5P: W biofillter UNLINED



Pond 5P: W biofillter UNLINED



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Hydrograph for Pond 5P: W biofilter UNLINED

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.01	1	671.76	0.00	0.00	0.00	0.00
5.50	0.01	23	671.97	0.00	0.00	0.00	0.00
6.00	0.02	49	672.20	0.00	0.00	0.00	0.00
6.50	0.02	78	672.47	0.00	0.00	0.00	0.00
7.00	0.02	110	672.78	0.00	0.00	0.00	0.00
7.50	0.02	145	673.18	0.00	0.00	0.00	0.00
8.00	0.02	183	673.61	0.00	0.00	0.00	0.00
8.50	0.02	225	674.08	0.00	0.00	0.00	0.00
9.00	0.03	269	674.59	0.00	0.00	0.00	0.00
9.50	0.04	292	674.78	0.03	0.00	0.03	0.00
10.00	0.04	315	674.84	0.03	0.00	0.03	0.00
10.50	0.05	344	674.92	0.03	0.00	0.03	0.00
11.00	0.08	394	675.05	0.04	0.00	0.03	0.00
11.50	0.12	508	675.30	0.04	0.00	0.04	0.00
12.00	0.41	792	675.79	0.06	0.00	0.06	0.00
12.50	0.93	1,047	676.23	1.26	0.00	0.73	0.53
13.00	0.33	1,040	676.15	0.35	0.00	0.34	0.01
13.50	0.18	1,024	676.12	0.18	0.00	0.18	0.00
14.00	0.10	1,011	676.10	0.11	0.00	0.11	0.00
14.50	0.08	998	676.08	0.08	0.00	0.08	0.00
15.00	0.08	995	676.08	0.08	0.00	0.08	0.00
15.50	0.05	986	676.07	0.07	0.00	0.07	0.00
16.00	0.05	955	676.03	0.07	0.00	0.06	0.00
16.50	0.04	920	675.98	0.06	0.00	0.06	0.00
17.00	0.04	883	675.93	0.06	0.00	0.06	0.00
17.50	0.04	845	675.87	0.06	0.00	0.06	0.00
18.00	0.04	807	675.82	0.06	0.00	0.06	0.00
18.50	0.03	769	675.76	0.06	0.00	0.06	0.00
19.00	0.03	730	675.70	0.05	0.00	0.05	0.00
19.50	0.03	691	675.63	0.05	0.00	0.05	0.00
20.00	0.03	651	675.57	0.05	0.00	0.05	0.00

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Stage-Discharge for Pond 5P: W biofilter UNLINED

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
671.75	0.00	0.00	0.00	0.00
671.85	0.00	0.00	0.00	0.00
671.95	0.00	0.00	0.00	0.00
672.05	0.00	0.00	0.00	0.00
672.15	0.00	0.00	0.00	0.00
672.25	0.00	0.00	0.00	0.00
672.35	0.00	0.00	0.00	0.00
672.45	0.00	0.00	0.00	0.00
672.55	0.00	0.00	0.00	0.00
672.65	0.00	0.00	0.00	0.00
672.75	0.00	0.00	0.00	0.00
672.85	0.00	0.00	0.00	0.00
672.95	0.00	0.00	0.00	0.00
673.05	0.00	0.00	0.00	0.00
673.15	0.00	0.00	0.00	0.00
673.25	0.00	0.00	0.00	0.00
673.35	0.00	0.00	0.00	0.00
673.45	0.00	0.00	0.00	0.00
673.55	0.00	0.00	0.00	0.00
673.65	0.00	0.00	0.00	0.00
673.75	0.00	0.00	0.00	0.00
673.85	0.00	0.00	0.00	0.00
673.95	0.00	0.00	0.00	0.00
674.05	0.00	0.00	0.00	0.00
674.15	0.00	0.00	0.00	0.00
674.25	0.00	0.00	0.00	0.00
674.35	0.00	0.00	0.00	0.00
674.45	0.00	0.00	0.00	0.00
674.55	0.00	0.00	0.00	0.00
674.65	0.00	0.00	0.00	0.00
674.75	0.03	0.00	0.03	0.00
674.85	0.03	0.00	0.03	0.00
674.95	0.03	0.00	0.03	0.00
675.05	0.04	0.00	0.03	0.00
675.15	0.04	0.00	0.04	0.00
675.25	0.04	0.00	0.04	0.00
675.35	0.04	0.00	0.04	0.00
675.45	0.05	0.00	0.05	0.00
675.55	0.05	0.00	0.05	0.00
675.65	0.05	0.00	0.05	0.00
675.75	0.06	0.00	0.06	0.00
675.85	0.06	0.00	0.06	0.00
675.95	0.06	0.00	0.06	0.00
676.05	0.07	0.00	0.07	0.00
676.15	0.33	0.00	0.33	0.00
676.25	1.61	0.00	0.83	0.77

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Stage-Area-Storage for Pond 5P: W biofillter UNLINED

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
671.75	325	0	674.30	651	244
671.80	325	5	674.35	651	248
671.85	325	11	674.40	651	252
671.90	325	16	674.45	651	257
671.95	325	21	674.50	651	261
672.00	325	27	674.55	651	265
672.05	325	32	674.60	651	270
672.10	325	38	674.65	651	274
672.15	325	43	674.70	651	279
672.20	325	48	674.75	976	283
672.25	325	54	674.80	990	300
672.30	325	59	674.85	1,005	317
672.35	325	64	674.90	1,020	335
672.40	325	70	674.95	1,035	354
672.45	325	75	675.00	1,050	373
672.50	325	81	675.05	1,065	394
672.55	325	86	675.10	1,080	415
672.60	325	91	675.15	1,096	437
672.65	325	97	675.20	1,112	459
672.70	325	102	675.25	1,128	483
672.75	651	107	675.30	1,144	507
672.80	651	112	675.35	1,160	532
672.85	651	116	675.40	1,177	558
672.90	651	121	675.45	1,193	585
672.95	651	125	675.50	1,210	612
673.00	651	129	675.55	1,227	641
673.05	651	134	675.60	1,244	670
673.10	651	138	675.65	1,262	700
673.15	651	143	675.70	1,279	731
673.20	651	147	675.75	1,297	763
673.25	651	151	675.80	1,315	796
673.30	651	156	675.85	1,333	829
673.35	651	160	675.90	1,351	864
673.40	651	164	675.95	1,370	899
673.45	651	169	676.00	1,389	936
673.50	651	173	676.05	1,407	973
673.55	651	178	676.10	1,958	1,012
673.60	651	182	676.15	2,821	1,039
673.65	651	186	676.20	2,824	1,047
673.70	651	191	676.25	2,824	1,047
673.75	651	195			
673.80	651	200			
673.85	651	204			
673.90	651	208			
673.95	651	213			
674.00	651	217			
674.05	651	222			
674.10	651	226			
674.15	651	230			
674.20	651	235			
674.25	651	239			

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MSE 24-hr 4 10-Year Rainfall=4.32"

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Summary for Pond 7P: 48" UG storage

Inflow Area = 0.730 ac, 45.41% Impervious, Inflow Depth > 1.74" for 10-Year event
Inflow = 0.79 cfs @ 12.40 hrs, Volume= 0.106 af
Outflow = 0.60 cfs @ 12.57 hrs, Volume= 0.105 af, Atten= 24%, Lag= 10.1 min
Primary = 0.60 cfs @ 12.57 hrs, Volume= 0.105 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 671.38' @ 12.57 hrs Surf.Area= 193 sf Storage= 214 cf

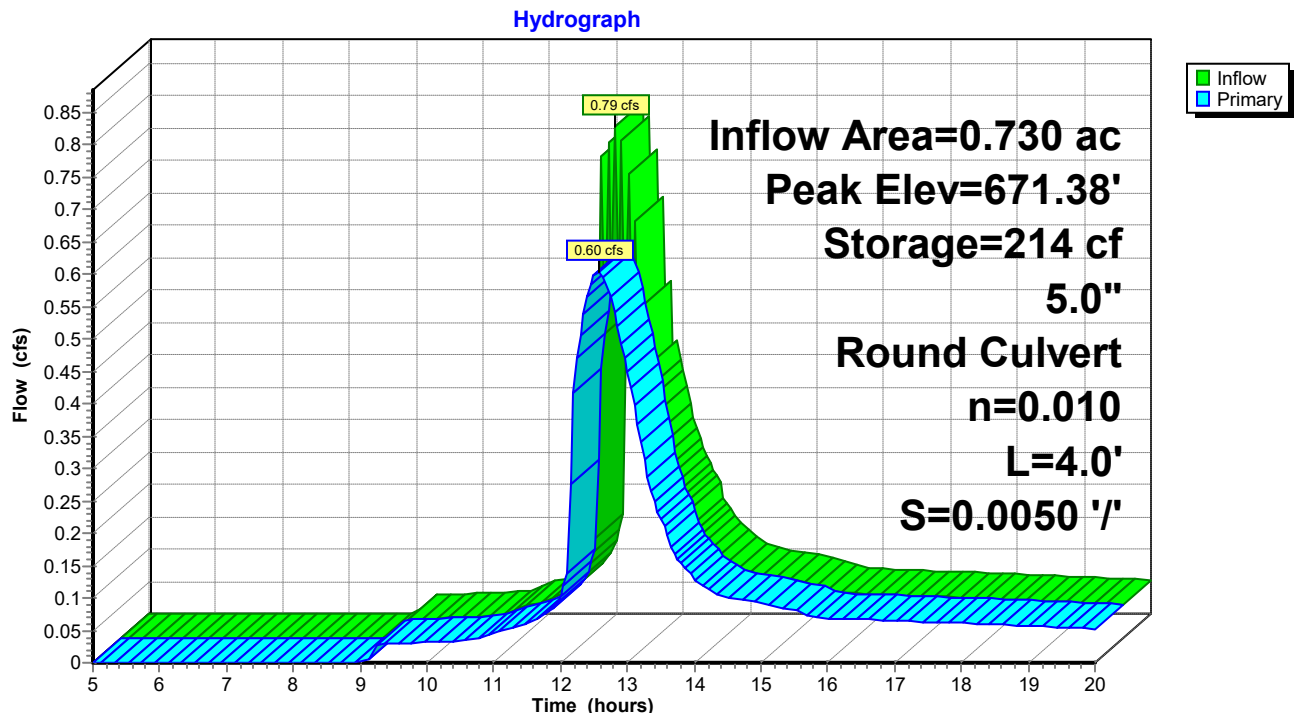
Plug-Flow detention time= 3.1 min calculated for 0.105 af (100% of inflow)
Center-of-Mass det. time= 2.7 min (834.7 - 832.0)

Volume	Invert	Avail.Storage	Storage Description
#1	669.82'	628 cf	48.0" Round Pipe Storage L= 50.0' S= 0.0026 '/

Device	Routing	Invert	Outlet Devices
#1	Primary	669.82'	5.0" Round Culvert L= 4.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 669.82' / 669.80' S= 0.0050 '/ Cc= 0.900 n= 0.010, Flow Area= 0.14 sf

Primary OutFlow Max=0.60 cfs @ 12.57 hrs HW=671.38' (Free Discharge)
←1=Culvert (Inlet Controls 0.60 cfs @ 4.41 fps)

Pond 7P: 48" UG storage



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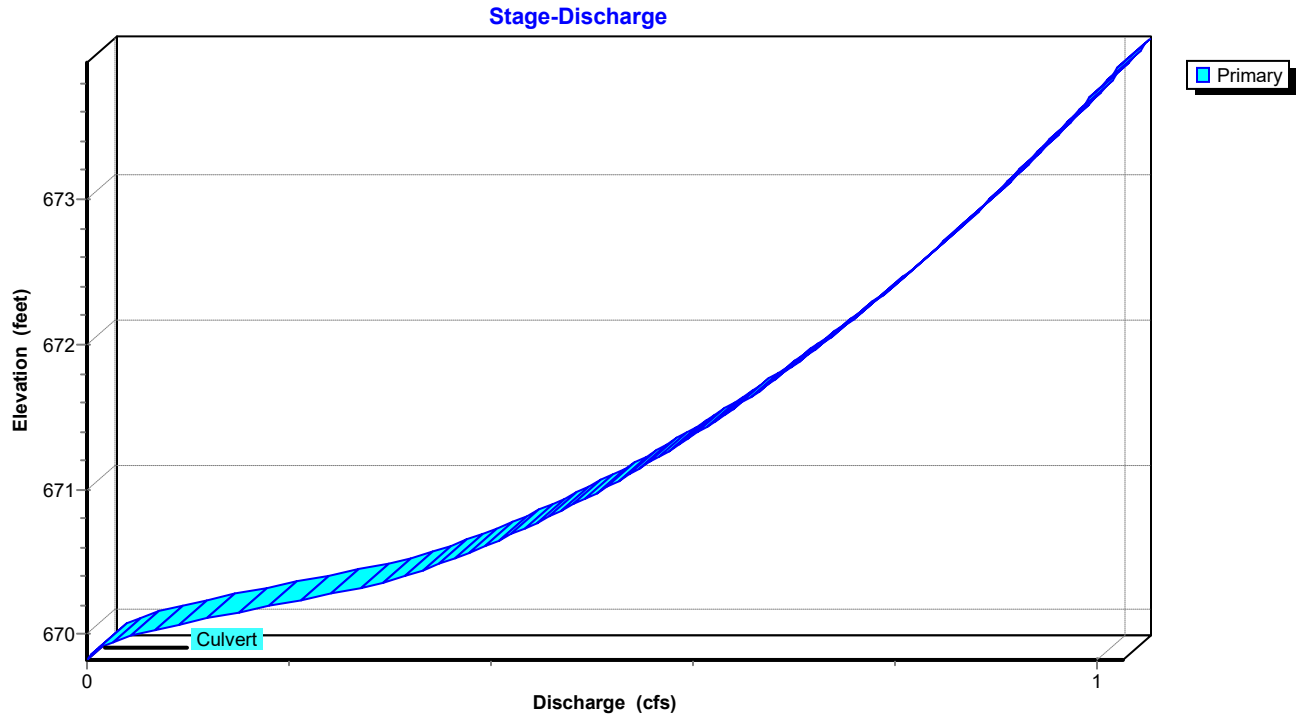
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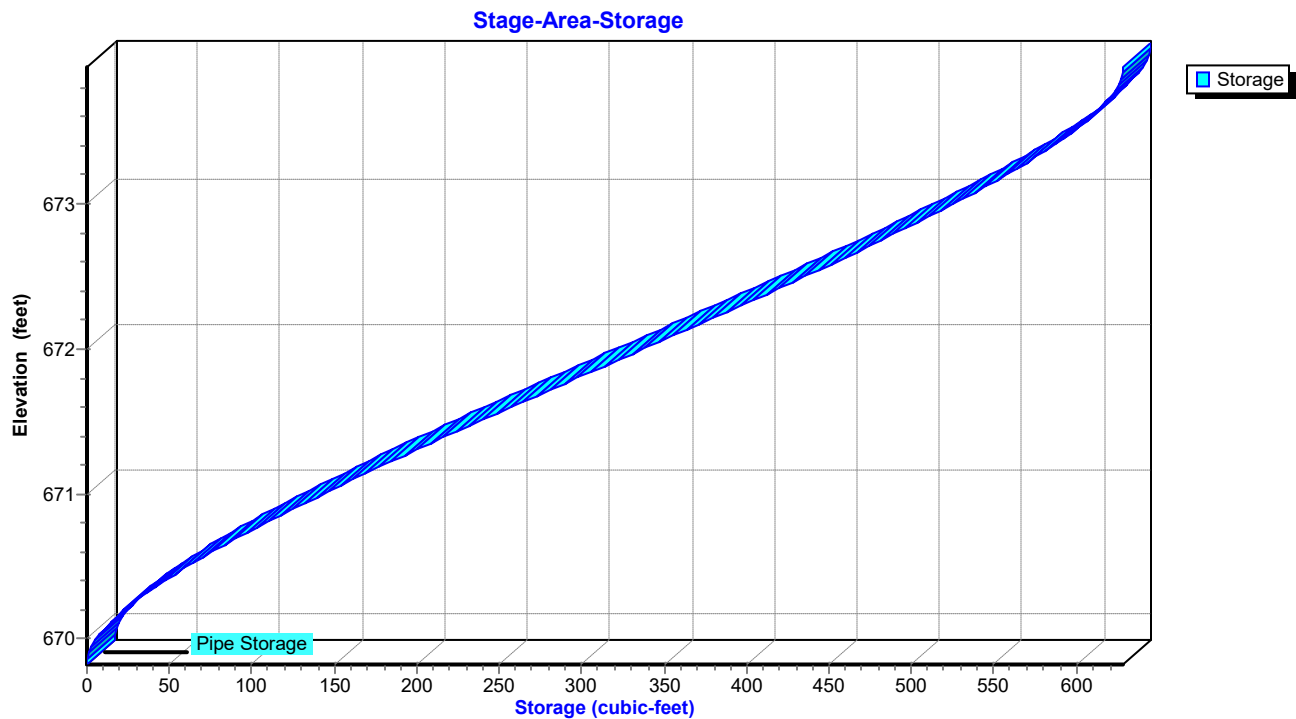
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Pond 7P: 48" UG storage



Pond 7P: 48" UG storage



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Hydrograph for Pond 7P: 48" UG storage

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
5.00	0.00	0	669.82	0.00
5.50	0.00	0	669.83	0.00
6.00	0.00	0	669.83	0.00
6.50	0.00	0	669.83	0.00
7.00	0.00	0	669.83	0.00
7.50	0.00	0	669.83	0.00
8.00	0.00	0	669.83	0.00
8.50	0.00	0	669.84	0.00
9.00	0.00	0	669.84	0.00
9.50	0.03	3	669.95	0.03
10.00	0.03	3	669.96	0.03
10.50	0.03	3	669.96	0.03
11.00	0.05	5	669.99	0.05
11.50	0.06	6	670.02	0.06
12.00	0.11	12	670.09	0.10
12.50	0.77	210	671.36	0.60
13.00	0.38	105	670.78	0.45
13.50	0.21	28	670.25	0.22
14.00	0.13	16	670.12	0.13
14.50	0.10	12	670.08	0.10
15.00	0.09	11	670.07	0.09
15.50	0.08	9	670.05	0.08
16.00	0.07	8	670.03	0.07
16.50	0.07	7	670.03	0.07
17.00	0.07	7	670.02	0.07
17.50	0.06	7	670.02	0.06
18.00	0.06	7	670.02	0.06
18.50	0.06	6	670.01	0.06
19.00	0.06	6	670.01	0.06
19.50	0.05	6	670.00	0.05
20.00	0.05	5	670.00	0.05

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Stage-Discharge for Pond 7P: 48" UG storage

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
669.82	0.00	672.37	0.79
669.87	0.00	672.42	0.80
669.92	0.02	672.47	0.81
669.97	0.04	672.52	0.82
670.02	0.06	672.57	0.83
670.07	0.09	672.62	0.83
670.12	0.13	672.67	0.84
670.17	0.16	672.72	0.85
670.22	0.20	672.77	0.86
670.27	0.24	672.82	0.87
670.32	0.27	672.87	0.87
670.37	0.30	672.92	0.88
670.42	0.32	672.97	0.89
670.47	0.34	673.02	0.90
670.52	0.36	673.07	0.90
670.57	0.38	673.12	0.91
670.62	0.40	673.17	0.92
670.67	0.42	673.22	0.93
670.72	0.43	673.27	0.93
670.77	0.45	673.32	0.94
670.82	0.46	673.37	0.95
670.87	0.48	673.42	0.95
670.92	0.49	673.47	0.96
670.97	0.50	673.52	0.97
671.02	0.52	673.57	0.98
671.07	0.53	673.62	0.98
671.12	0.54	673.67	0.99
671.17	0.55	673.72	1.00
671.22	0.57	673.77	1.00
671.27	0.58	673.82	1.01
671.32	0.59	673.87	1.02
671.37	0.60	673.92	1.02
671.42	0.61		
671.47	0.62		
671.52	0.63		
671.57	0.64		
671.62	0.65		
671.67	0.66		
671.72	0.67		
671.77	0.68		
671.82	0.69		
671.87	0.70		
671.92	0.71		
671.97	0.72		
672.02	0.73		
672.07	0.74		
672.12	0.75		
672.17	0.76		
672.22	0.77		
672.27	0.78		
672.32	0.78		

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MSE 24-hr 4 10-Year Rainfall=4.32"

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Stage-Area-Storage for Pond 7P: 48" UG storage

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
669.82	0	672.37	410
669.87	0	672.42	420
669.92	1	672.47	429
669.97	4	672.52	439
670.02	7	672.57	448
670.07	11	672.62	458
670.12	15	672.67	467
670.17	20	672.72	476
670.22	25	672.77	485
670.27	31	672.82	494
670.32	37	672.87	503
670.37	43	672.92	511
670.42	50	672.97	520
670.47	57	673.02	528
670.52	64	673.07	536
670.57	72	673.12	544
670.62	79	673.17	552
670.67	87	673.22	560
670.72	95	673.27	567
670.77	103	673.32	574
670.82	112	673.37	581
670.87	120	673.42	587
670.92	129	673.47	594
670.97	138	673.52	600
671.02	147	673.57	605
671.07	156	673.62	610
671.12	165	673.67	615
671.17	174	673.72	619
671.22	184	673.77	623
671.27	193	673.82	626
671.32	203	673.87	628
671.37	212	673.92	628
671.42	222		
671.47	232		
671.52	242		
671.57	251		
671.62	261		
671.67	271		
671.72	281		
671.77	291		
671.82	301		
671.87	311		
671.92	321		
671.97	331		
672.02	341		
672.07	351		
672.12	361		
672.17	371		
672.22	381		
672.27	391		
672.32	400		

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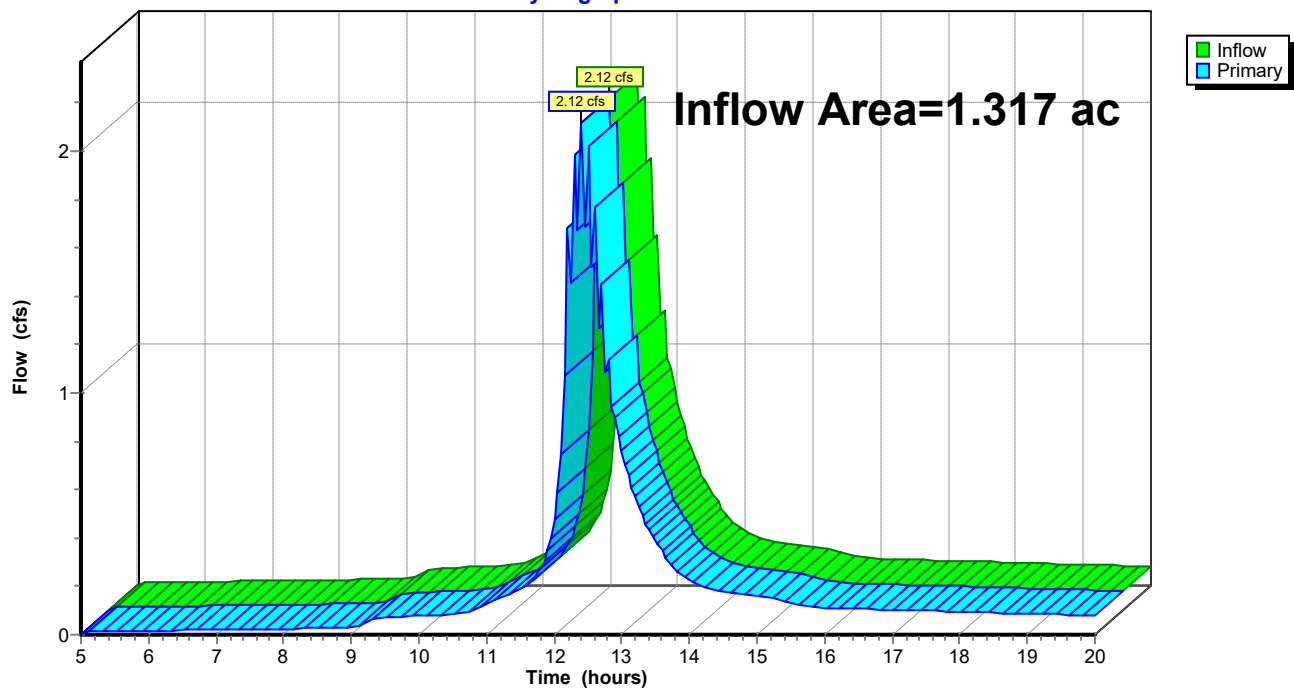
Summary for Link 2L: (new Link)

Inflow Area = 1.317 ac, 48.47% Impervious, Inflow Depth > 2.18" for 10-Year event
Inflow = 2.12 cfs @ 12.40 hrs, Volume= 0.239 af
Primary = 2.12 cfs @ 12.40 hrs, Volume= 0.239 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: (new Link)

Hydrograph



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MSE 24-hr 4 10-Year Rainfall=4.32"

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Hydrograph for Link 2L: (new Link)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00	0.00	0.00	17.75	0.10	0.00	0.10
5.25	0.01	0.00	0.01	18.00	0.10	0.00	0.10
5.50	0.01	0.00	0.01	18.25	0.09	0.00	0.09
5.75	0.02	0.00	0.02	18.50	0.09	0.00	0.09
6.00	0.02	0.00	0.02	18.75	0.09	0.00	0.09
6.25	0.02	0.00	0.02	19.00	0.09	0.00	0.09
6.50	0.02	0.00	0.02	19.25	0.09	0.00	0.09
6.75	0.02	0.00	0.02	19.50	0.08	0.00	0.08
7.00	0.02	0.00	0.02	19.75	0.08	0.00	0.08
7.25	0.02	0.00	0.02	20.00	0.08	0.00	0.08
7.50	0.02	0.00	0.02				
7.75	0.02	0.00	0.02				
8.00	0.02	0.00	0.02				
8.25	0.03	0.00	0.03				
8.50	0.03	0.00	0.03				
8.75	0.03	0.00	0.03				
9.00	0.03	0.00	0.03				
9.25	0.06	0.00	0.06				
9.50	0.07	0.00	0.07				
9.75	0.07	0.00	0.07				
10.00	0.08	0.00	0.08				
10.25	0.08	0.00	0.08				
10.50	0.08	0.00	0.08				
10.75	0.10	0.00	0.10				
11.00	0.13	0.00	0.13				
11.25	0.16	0.00	0.16				
11.50	0.19	0.00	0.19				
11.75	0.25	0.00	0.25				
12.00	0.48	0.00	0.48				
12.25	1.46	0.00	1.46				
12.50	2.02	0.00	2.02				
12.75	1.08	0.00	1.08				
13.00	0.76	0.00	0.76				
13.25	0.53	0.00	0.53				
13.50	0.39	0.00	0.39				
13.75	0.28	0.00	0.28				
14.00	0.22	0.00	0.22				
14.25	0.19	0.00	0.19				
14.50	0.18	0.00	0.18				
14.75	0.17	0.00	0.17				
15.00	0.16	0.00	0.16				
15.25	0.15	0.00	0.15				
15.50	0.13	0.00	0.13				
15.75	0.12	0.00	0.12				
16.00	0.11	0.00	0.11				
16.25	0.11	0.00	0.11				
16.50	0.11	0.00	0.11				
16.75	0.11	0.00	0.11				
17.00	0.10	0.00	0.10				
17.25	0.10	0.00	0.10				
17.50	0.10	0.00	0.10				

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MSE 24-hr 4 100-Year Rainfall=7.31"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: To E Biofilter Runoff Area=1,875 sf 57.33% Impervious Runoff Depth>5.00"
Flow Length=25' Tc=8.0 min CN=WQ Runoff=0.29 cfs 0.018 af

Subcatchment 3S: to curb inlet Runoff Area=24,840 sf 40.58% Impervious Runoff Depth>4.32"
Flow Length=300' Tc=30.0 min CN=WQ Runoff=1.93 cfs 0.205 af

Subcatchment 4S: to W biofilter Runoff Area=4,490 sf 59.91% Impervious Runoff Depth>5.10"
Flow Length=140' Tc=6.0 min CN=WQ Runoff=0.76 cfs 0.044 af

Subcatchment 5S: to NDS 13-14-15 Runoff Area=17,550 sf 54.13% Impervious Runoff Depth>4.85"
Flow Length=275' Tc=30.0 min CN=WQ Runoff=1.51 cfs 0.163 af

Subcatchment 6S: untreated Runoff Area=6,820 sf 39.15% Impervious Runoff Depth>4.28"
Flow Length=100' Tc=15.0 min CN=WQ Runoff=0.74 cfs 0.056 af

Subcatchment 7S: NW 1/4 roof Runoff Area=595 sf 100.00% Impervious Runoff Depth>6.66"
Flow Length=25' Tc=5.0 min CN=98 Runoff=0.13 cfs 0.008 af

Subcatchment 8S: S 1/2 roof Runoff Area=1,190 sf 100.00% Impervious Runoff Depth>6.66"
Flow Length=25' Tc=5.0 min CN=98 Runoff=0.26 cfs 0.015 af

Reach 3R: S. 8" PVC Avg. Flow Depth=0.67' Max Vel=3.67 fps Inflow=1.56 cfs 0.178 af
8.0" Round Pipe n=0.010 L=87.0' S=0.0052 '/' Capacity=1.13 cfs Outflow=1.17 cfs 0.178 af

Reach 4R: 6" PVC Avg. Flow Depth=0.33' Max Vel=14.97 fps Inflow=2.05 cfs 0.366 af
6.0" Round Pipe n=0.010 L=77.0' S=0.1335 '/' Capacity=2.67 cfs Outflow=2.05 cfs 0.366 af

Pond 3P: E biofilter LINED Peak Elev=681.13' Storage=272 cf Inflow=0.29 cfs 0.018 af
Discarded=0.00 cfs 0.000 af Primary=0.18 cfs 0.017 af Secondary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.017 af

Pond 5P: W biofilter UNLINED Peak Elev=676.28' Storage=1,047 cf Inflow=2.09 cfs 0.249 af
Discarded=0.00 cfs 0.001 af Primary=0.90 cfs 0.164 af Secondary=1.19 cfs 0.062 af Outflow=2.09 cfs 0.227 af

Pond 7P: 48" UG storage Peak Elev=673.19' Storage=555 cf Inflow=1.07 cfs 0.188 af
5.0" Round Culvert n=0.010 L=4.0' S=0.0050 '/' Outflow=0.92 cfs 0.188 af

Link 2L: (new Link) Inflow=3.68 cfs 0.484 af
Primary=3.68 cfs 0.484 af

Total Runoff Area = 1.317 ac Runoff Volume = 0.509 af Average Runoff Depth = 4.63"
51.53% Pervious = 0.679 ac 48.47% Impervious = 0.638 ac

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MSE 24-hr 4 100-Year Rainfall=7.31"

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Summary for Subcatchment 1S: To E Biofilter

Runoff = 0.29 cfs @ 12.15 hrs, Volume= 0.018 af, Depth> 5.00"

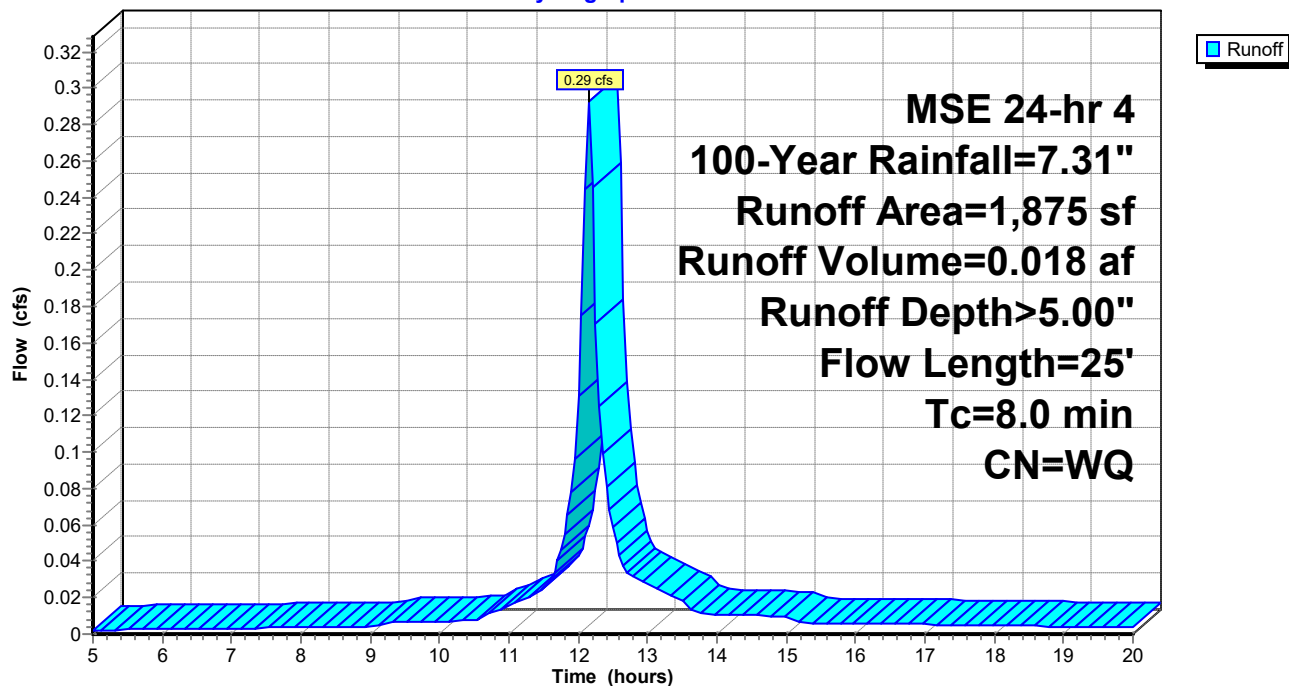
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.31"

	Area (sf)	CN	Description
*	800	61	lawn, HSG B, good
*	645	98	NE 1/4 roof
*	210	100	bio media
*	220	98	retain wall
	1,875		Weighted Average
	800		42.67% Pervious Area
	1,075		57.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	25		0.05		Direct Entry, lawn above wall to E bio

Subcatchment 1S: To E Biofilter

Hydrograph



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MSE 24-hr 4 100-Year Rainfall=7.31"

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Hydrograph for Subcatchment 1S: To E Biofilter

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.00	0.00	17.75	6.83	4.76	0.00
5.25	0.36	0.00	0.00	18.00	6.86	4.79	0.00
5.50	0.39	0.00	0.00	18.25	6.89	4.81	0.00
5.75	0.42	0.00	0.00	18.50	6.92	4.84	0.00
6.00	0.45	0.00	0.00	18.75	6.95	4.87	0.00
6.25	0.48	0.00	0.00	19.00	6.97	4.89	0.00
6.50	0.51	0.00	0.00	19.25	7.00	4.92	0.00
6.75	0.55	0.00	0.00	19.50	7.03	4.94	0.00
7.00	0.58	0.01	0.00	19.75	7.05	4.96	0.00
7.25	0.61	0.01	0.00	20.00	7.07	4.98	0.00
7.50	0.65	0.02	0.00				
7.75	0.69	0.03	0.00				
8.00	0.72	0.03	0.00				
8.25	0.76	0.04	0.00				
8.50	0.80	0.05	0.00				
8.75	0.84	0.06	0.00				
9.00	0.88	0.08	0.00				
9.25	0.95	0.10	0.01				
9.50	1.02	0.12	0.01				
9.75	1.09	0.15	0.01				
10.00	1.16	0.18	0.01				
10.25	1.23	0.21	0.01				
10.50	1.31	0.25	0.01				
10.75	1.43	0.31	0.01				
11.00	1.58	0.39	0.02				
11.25	1.77	0.50	0.02				
11.50	1.98	0.64	0.02				
11.75	2.40	0.92	0.05				
12.00	3.43	1.72	0.13				
12.25	4.91	3.00	0.17				
12.50	5.33	3.37	0.06				
12.75	5.54	3.57	0.03				
13.00	5.73	3.74	0.03				
13.25	5.88	3.88	0.02				
13.50	6.00	3.99	0.02				
13.75	6.08	4.06	0.01				
14.00	6.15	4.13	0.01				
14.25	6.22	4.19	0.01				
14.50	6.29	4.26	0.01				
14.75	6.36	4.32	0.01				
15.00	6.43	4.38	0.01				
15.25	6.47	4.42	0.01				
15.50	6.51	4.46	0.01				
15.75	6.55	4.49	0.01				
16.00	6.59	4.53	0.01				
16.25	6.62	4.56	0.01				
16.50	6.66	4.60	0.01				
16.75	6.70	4.63	0.01				
17.00	6.73	4.66	0.01				
17.25	6.76	4.70	0.01				
17.50	6.80	4.73	0.01				

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MSE 24-hr 4 100-Year Rainfall=7.31"

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Summary for Subcatchment 3S: to curb inlet

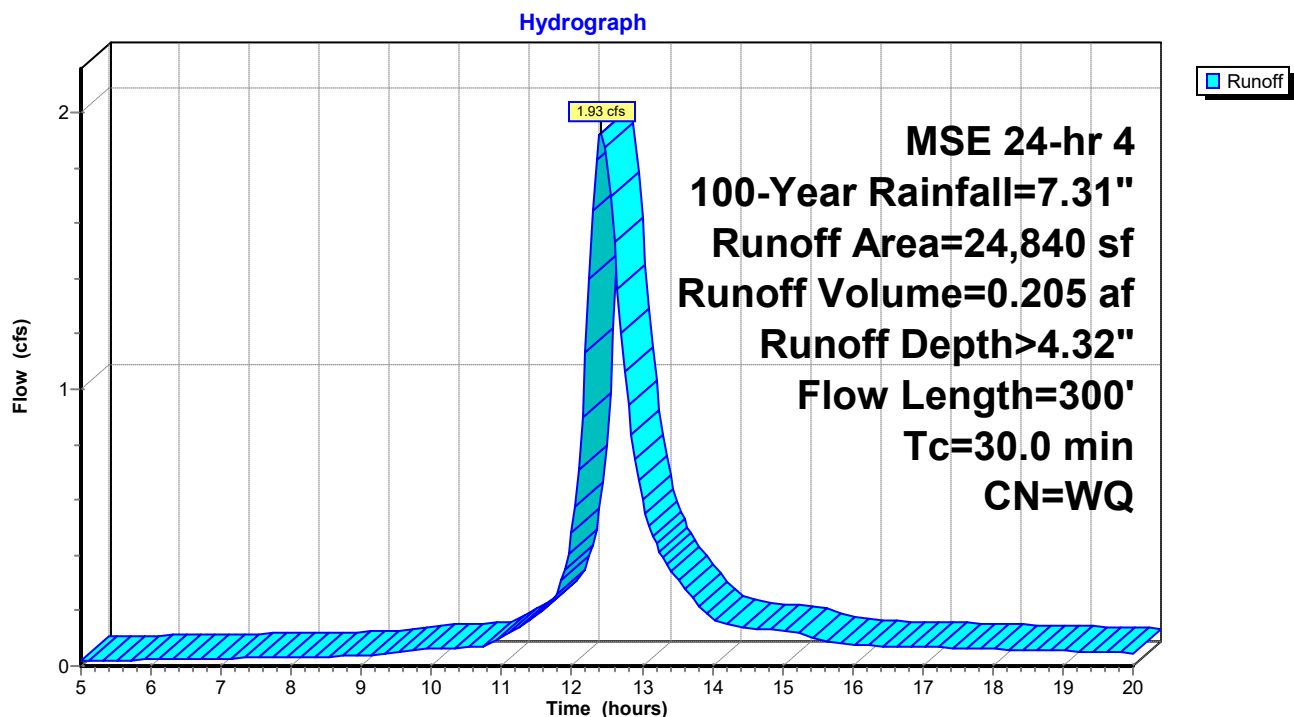
Runoff = 1.93 cfs @ 12.42 hrs, Volume= 0.205 af, Depth> 4.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.31"

	Area (sf)	CN	Description
*	3,200	98	S part parking lot
*	160	98	SW
*	780	61	lawn, HSG B, good
*	780	61	lawn above wall
*	100	98	retain wall
*	2,000	61	lawn run on 1845
*	6,200	61	lawn run on 1835
*	2,120	98	roof+drive run on 1835
*	4,500	98	roof+drive run on 1825
*	5,000	61	lawn run on 1825
	24,840		Weighted Average
	14,760		59.42% Pervious Area
	10,080		40.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.0	300		0.17		Direct Entry, 1845 lawn run on

Subcatchment 3S: to curb inlet



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MSE 24-hr 4 100-Year Rainfall=7.31"

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Hydrograph for Subcatchment 3S: to curb inlet

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.00	0.02	17.75	6.83	4.11	0.06
5.25	0.36	0.00	0.02	18.00	6.86	4.13	0.06
5.50	0.39	0.00	0.02	18.25	6.89	4.16	0.06
5.75	0.42	0.00	0.02	18.50	6.92	4.19	0.06
6.00	0.45	0.00	0.02	18.75	6.95	4.21	0.06
6.25	0.48	0.00	0.02	19.00	6.97	4.23	0.05
6.50	0.51	0.00	0.03	19.25	7.00	4.26	0.05
6.75	0.55	0.00	0.03	19.50	7.03	4.28	0.05
7.00	0.58	0.00	0.03	19.75	7.05	4.30	0.05
7.25	0.61	0.00	0.03	20.00	7.07	4.32	0.05
7.50	0.65	0.00	0.03				
7.75	0.69	0.00	0.03				
8.00	0.72	0.00	0.03				
8.25	0.76	0.01	0.03				
8.50	0.80	0.01	0.03				
8.75	0.84	0.01	0.03				
9.00	0.88	0.02	0.04				
9.25	0.95	0.03	0.04				
9.50	1.02	0.04	0.05				
9.75	1.09	0.06	0.06				
10.00	1.16	0.08	0.06				
10.25	1.23	0.10	0.06				
10.50	1.31	0.12	0.07				
10.75	1.43	0.16	0.07				
11.00	1.58	0.22	0.10				
11.25	1.77	0.30	0.14				
11.50	1.98	0.41	0.18				
11.75	2.40	0.63	0.25				
12.00	3.43	1.31	0.48				
12.25	4.91	2.47	1.40				
12.50	5.33	2.81	1.83				
12.75	5.54	2.99	1.06				
13.00	5.73	3.15	0.60				
13.25	5.88	3.28	0.41				
13.50	6.00	3.38	0.32				
13.75	6.08	3.45	0.24				
14.00	6.15	3.51	0.18				
14.25	6.22	3.57	0.15				
14.50	6.29	3.63	0.14				
14.75	6.36	3.69	0.13				
15.00	6.43	3.75	0.13				
15.25	6.47	3.79	0.12				
15.50	6.51	3.82	0.09				
15.75	6.55	3.86	0.08				
16.00	6.59	3.89	0.08				
16.25	6.62	3.92	0.07				
16.50	6.66	3.96	0.07				
16.75	6.70	3.99	0.07				
17.00	6.73	4.02	0.07				
17.25	6.76	4.05	0.07				
17.50	6.80	4.08	0.07				

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MSE 24-hr 4 100-Year Rainfall=7.31"

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Summary for Subcatchment 4S: to W biofilter

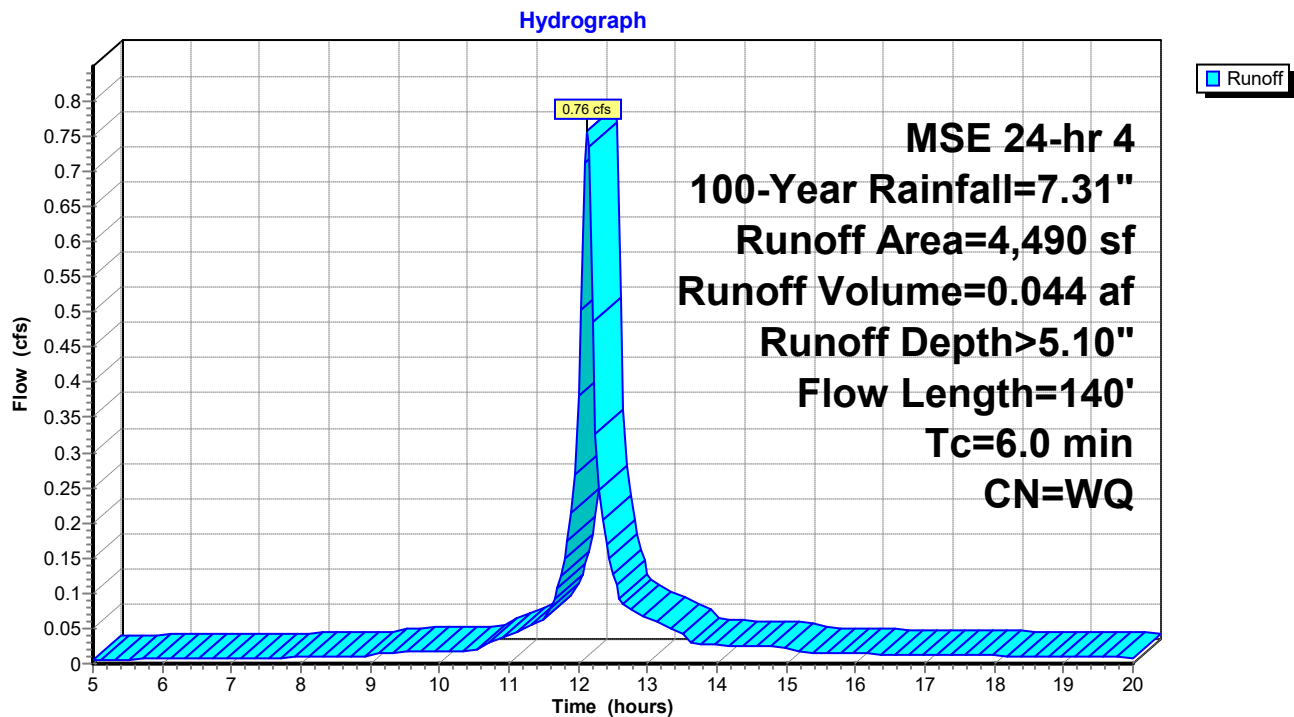
Runoff = 0.76 cfs @ 12.13 hrs, Volume= 0.044 af, Depth> 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.31"

	Area (sf)	CN	Description
*	2,000	98	N part driveway
*	230	98	N part parking lot
*	1,600	61	lawn, HSG B, good
*	460	100	bio media
*	200	61	bark mulch landscape
	4,490		Weighted Average
	1,800		40.09% Pervious Area
	2,690		59.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	140		0.39		Direct Entry, lawn via parking

Subcatchment 4S: to W biofilter



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MSE 24-hr 4 100-Year Rainfall=7.31"

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Hydrograph for Subcatchment 4S: to W biofilter

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.00	0.01	17.75	6.83	4.87	0.01
5.25	0.36	0.00	0.01	18.00	6.86	4.90	0.01
5.50	0.39	0.00	0.01	18.25	6.89	4.92	0.01
5.75	0.42	0.00	0.01	18.50	6.92	4.95	0.01
6.00	0.45	0.00	0.01	18.75	6.95	4.98	0.01
6.25	0.48	0.00	0.01	19.00	6.97	5.00	0.01
6.50	0.51	0.00	0.01	19.25	7.00	5.03	0.01
6.75	0.55	0.01	0.01	19.50	7.03	5.05	0.01
7.00	0.58	0.01	0.01	19.75	7.05	5.07	0.01
7.25	0.61	0.02	0.01	20.00	7.07	5.10	0.01
7.50	0.65	0.03	0.01				
7.75	0.69	0.03	0.01				
8.00	0.72	0.04	0.01				
8.25	0.76	0.05	0.01				
8.50	0.80	0.06	0.01				
8.75	0.84	0.08	0.01				
9.00	0.88	0.09	0.01				
9.25	0.95	0.11	0.02				
9.50	1.02	0.14	0.02				
9.75	1.09	0.17	0.02				
10.00	1.16	0.20	0.02				
10.25	1.23	0.24	0.02				
10.50	1.31	0.27	0.02				
10.75	1.43	0.34	0.03				
11.00	1.58	0.43	0.04				
11.25	1.77	0.54	0.05				
11.50	1.98	0.68	0.06				
11.75	2.40	0.98	0.12				
12.00	3.43	1.80	0.38				
12.25	4.91	3.10	0.33				
12.50	5.33	3.47	0.13				
12.75	5.54	3.67	0.08				
13.00	5.73	3.84	0.06				
13.25	5.88	3.98	0.05				
13.50	6.00	4.09	0.04				
13.75	6.08	4.16	0.03				
14.00	6.15	4.23	0.03				
14.25	6.22	4.30	0.03				
14.50	6.29	4.36	0.03				
14.75	6.36	4.43	0.02				
15.00	6.43	4.49	0.02				
15.25	6.47	4.53	0.02				
15.50	6.51	4.56	0.01				
15.75	6.55	4.60	0.01				
16.00	6.59	4.64	0.01				
16.25	6.62	4.67	0.01				
16.50	6.66	4.71	0.01				
16.75	6.70	4.74	0.01				
17.00	6.73	4.77	0.01				
17.25	6.76	4.81	0.01				
17.50	6.80	4.84	0.01				

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MSE 24-hr 4 100-Year Rainfall=7.31"

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Summary for Subcatchment 5S: to NDS 13-14-15

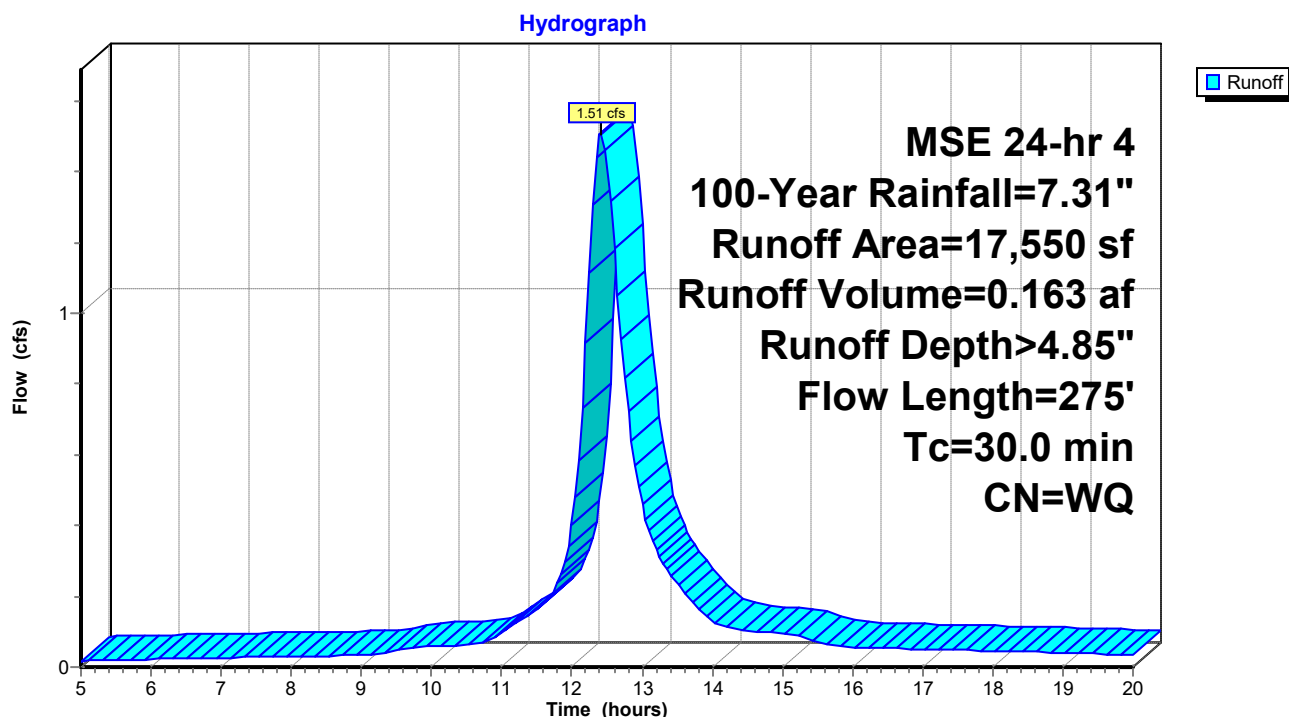
Runoff = 1.51 cfs @ 12.42 hrs, Volume= 0.163 af, Depth> 4.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.31"

	Area (sf)	CN	Description
*	550	61	NDS 14-15 lawn berm, HSG B, good
*	500	61	NDS 13 lawn
*	9,500	98	roof+drive run on 1825
*	7,000	61	lawn run on 1825
			Weighted Average
			8,050
			45.87% Pervious Area
			9,500
			54.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.0	275		0.15		Direct Entry, lawn run on 1825

Subcatchment 5S: to NDS 13-14-15



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MSE 24-hr 4 100-Year Rainfall=7.31"

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Hydrograph for Subcatchment 5S: to NDS 13-14-15

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.00	0.02	17.75	6.83	4.65	0.05
5.25	0.36	0.00	0.02	18.00	6.86	4.68	0.05
5.50	0.39	0.00	0.02	18.25	6.89	4.70	0.04
5.75	0.42	0.00	0.02	18.50	6.92	4.73	0.04
6.00	0.45	0.00	0.02	18.75	6.95	4.76	0.04
6.25	0.48	0.00	0.02	19.00	6.97	4.78	0.04
6.50	0.51	0.00	0.02	19.25	7.00	4.81	0.04
6.75	0.55	0.00	0.02	19.50	7.03	4.83	0.04
7.00	0.58	0.00	0.03	19.75	7.05	4.85	0.04
7.25	0.61	0.01	0.03	20.00	7.07	4.87	0.03
7.50	0.65	0.01	0.03				
7.75	0.69	0.02	0.03				
8.00	0.72	0.02	0.03				
8.25	0.76	0.03	0.03				
8.50	0.80	0.04	0.03				
8.75	0.84	0.05	0.03				
9.00	0.88	0.06	0.03				
9.25	0.95	0.08	0.04				
9.50	1.02	0.10	0.05				
9.75	1.09	0.13	0.05				
10.00	1.16	0.16	0.06				
10.25	1.23	0.19	0.06				
10.50	1.31	0.22	0.06				
10.75	1.43	0.28	0.07				
11.00	1.58	0.36	0.10				
11.25	1.77	0.46	0.13				
11.50	1.98	0.59	0.16				
11.75	2.40	0.87	0.22				
12.00	3.43	1.65	0.40				
12.25	4.91	2.91	1.12				
12.50	5.33	3.27	1.43				
12.75	5.54	3.47	0.82				
13.00	5.73	3.64	0.46				
13.25	5.88	3.78	0.31				
13.50	6.00	3.89	0.24				
13.75	6.08	3.96	0.18				
14.00	6.15	4.02	0.13				
14.25	6.22	4.09	0.11				
14.50	6.29	4.15	0.10				
14.75	6.36	4.21	0.10				
15.00	6.43	4.27	0.09				
15.25	6.47	4.31	0.09				
15.50	6.51	4.35	0.07				
15.75	6.55	4.39	0.06				
16.00	6.59	4.42	0.06				
16.25	6.62	4.46	0.05				
16.50	6.66	4.49	0.05				
16.75	6.70	4.52	0.05				
17.00	6.73	4.56	0.05				
17.25	6.76	4.59	0.05				
17.50	6.80	4.62	0.05				

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MSE 24-hr 4 100-Year Rainfall=7.31"

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Summary for Subcatchment 6S: untreated

Runoff = 0.74 cfs @ 12.23 hrs, Volume= 0.056 af, Depth> 4.28"

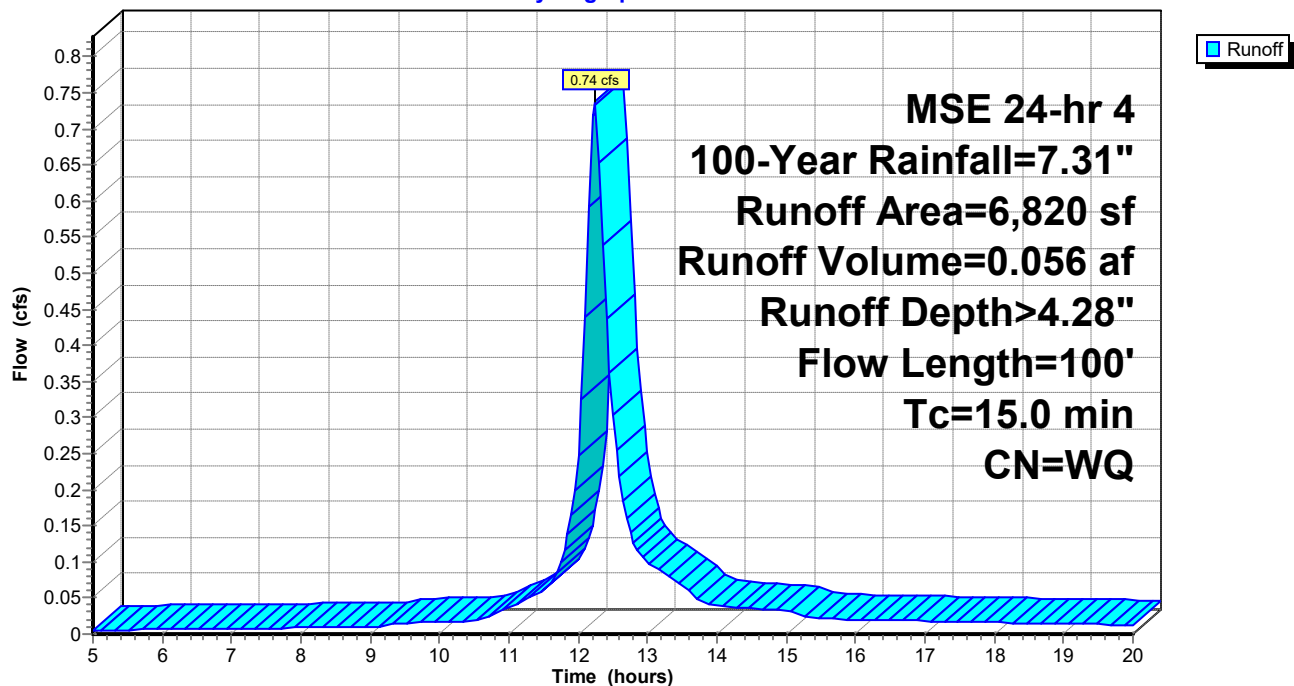
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.31"

	Area (sf)	CN	Description
*	2,400	98	S driveway
*	3,400	61	lawn, HSG B, good
*	750	61	bark mulch landscape
*	270	98	retain wall
			Weighted Average
			60.85% Pervious Area
			39.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100		0.11		Direct Entry, landscape to street

Subcatchment 6S: untreated

Hydrograph



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MSE 24-hr 4 100-Year Rainfall=7.31"

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Hydrograph for Subcatchment 6S: untreated

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.00	0.01	17.75	6.83	4.00	0.02
5.25	0.36	0.00	0.01	18.00	6.86	4.03	0.02
5.50	0.39	0.00	0.01	18.25	6.89	4.05	0.02
5.75	0.42	0.00	0.01	18.50	6.92	4.08	0.02
6.00	0.45	0.00	0.01	18.75	6.95	4.10	0.01
6.25	0.48	0.00	0.01	19.00	6.97	4.13	0.01
6.50	0.51	0.00	0.01	19.25	7.00	4.15	0.01
6.75	0.55	0.00	0.01	19.50	7.03	4.17	0.01
7.00	0.58	0.00	0.01	19.75	7.05	4.19	0.01
7.25	0.61	0.00	0.01	20.00	7.07	4.21	0.01
7.50	0.65	0.00	0.01				
7.75	0.69	0.00	0.01				
8.00	0.72	0.00	0.01				
8.25	0.76	0.00	0.01				
8.50	0.80	0.01	0.01				
8.75	0.84	0.01	0.01				
9.00	0.88	0.01	0.01				
9.25	0.95	0.02	0.01				
9.50	1.02	0.03	0.02				
9.75	1.09	0.05	0.02				
10.00	1.16	0.06	0.02				
10.25	1.23	0.08	0.02				
10.50	1.31	0.10	0.02				
10.75	1.43	0.14	0.03				
11.00	1.58	0.20	0.04				
11.25	1.77	0.27	0.05				
11.50	1.98	0.37	0.06				
11.75	2.40	0.59	0.10				
12.00	3.43	1.25	0.25				
12.25	4.91	2.38	0.73				
12.50	5.33	2.72	0.30				
12.75	5.54	2.90	0.14				
13.00	5.73	3.05	0.10				
13.25	5.88	3.18	0.08				
13.50	6.00	3.28	0.07				
13.75	6.08	3.35	0.05				
14.00	6.15	3.41	0.04				
14.25	6.22	3.47	0.04				
14.50	6.29	3.53	0.04				
14.75	6.36	3.59	0.03				
15.00	6.43	3.65	0.03				
15.25	6.47	3.68	0.03				
15.50	6.51	3.72	0.02				
15.75	6.55	3.75	0.02				
16.00	6.59	3.79	0.02				
16.25	6.62	3.82	0.02				
16.50	6.66	3.85	0.02				
16.75	6.70	3.88	0.02				
17.00	6.73	3.91	0.02				
17.25	6.76	3.94	0.02				
17.50	6.80	3.97	0.02				

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MSE 24-hr 4 100-Year Rainfall=7.31"

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Summary for Subcatchment 7S: NW 1/4 roof

[49] Hint: $T_c < 2dt$ may require smaller dt

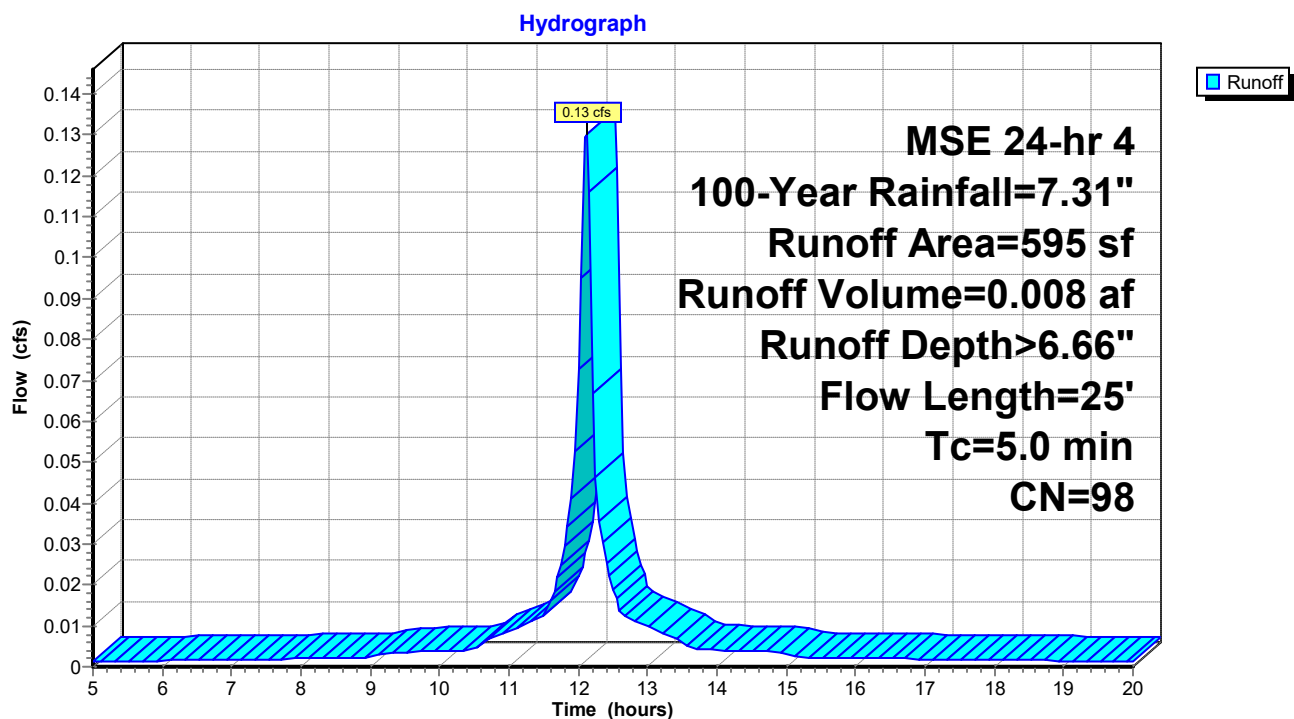
Runoff = 0.13 cfs @ 12.11 hrs, Volume= 0.008 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, $dt=0.05$ hrs
MSE 24-hr 4 100-Year Rainfall=7.31"

	Area (sf)	CN	Description
*	595	98	NW 1/4 roof
	595		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	25		0.08		Direct Entry, NW 1/4 roof

Subcatchment 7S: NW 1/4 roof



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MSE 24-hr 4 100-Year Rainfall=7.31"

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Hydrograph for Subcatchment 7S: NW 1/4 roof

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.17	0.00	17.75	6.83	6.59	0.00
5.25	0.36	0.20	0.00	18.00	6.86	6.62	0.00
5.50	0.39	0.22	0.00	18.25	6.89	6.65	0.00
5.75	0.42	0.25	0.00	18.50	6.92	6.68	0.00
6.00	0.45	0.27	0.00	18.75	6.95	6.71	0.00
6.25	0.48	0.30	0.00	19.00	6.97	6.74	0.00
6.50	0.51	0.33	0.00	19.25	7.00	6.76	0.00
6.75	0.55	0.36	0.00	19.50	7.03	6.79	0.00
7.00	0.58	0.39	0.00	19.75	7.05	6.81	0.00
7.25	0.61	0.42	0.00	20.00	7.07	6.83	0.00
7.50	0.65	0.46	0.00				
7.75	0.69	0.49	0.00				
8.00	0.72	0.53	0.00				
8.25	0.76	0.56	0.00				
8.50	0.80	0.60	0.00				
8.75	0.84	0.64	0.00				
9.00	0.88	0.68	0.00				
9.25	0.95	0.74	0.00				
9.50	1.02	0.81	0.00				
9.75	1.09	0.87	0.00				
10.00	1.16	0.94	0.00				
10.25	1.23	1.02	0.00				
10.50	1.31	1.09	0.00				
10.75	1.43	1.21	0.01				
11.00	1.58	1.36	0.01				
11.25	1.77	1.54	0.01				
11.50	1.98	1.76	0.01				
11.75	2.40	2.17	0.02				
12.00	3.43	3.19	0.07				
12.25	4.91	4.68	0.05				
12.50	5.33	5.09	0.02				
12.75	5.54	5.31	0.01				
13.00	5.73	5.49	0.01				
13.25	5.88	5.64	0.01				
13.50	6.00	5.76	0.01				
13.75	6.08	5.84	0.00				
14.00	6.15	5.91	0.00				
14.25	6.22	5.99	0.00				
14.50	6.29	6.05	0.00				
14.75	6.36	6.12	0.00				
15.00	6.43	6.19	0.00				
15.25	6.47	6.23	0.00				
15.50	6.51	6.27	0.00				
15.75	6.55	6.31	0.00				
16.00	6.59	6.35	0.00				
16.25	6.62	6.38	0.00				
16.50	6.66	6.42	0.00				
16.75	6.70	6.46	0.00				
17.00	6.73	6.49	0.00				
17.25	6.76	6.53	0.00				
17.50	6.80	6.56	0.00				

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MSE 24-hr 4 100-Year Rainfall=7.31"

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Summary for Subcatchment 8S: S 1/2 roof

[49] Hint: $T_c < 2dt$ may require smaller dt

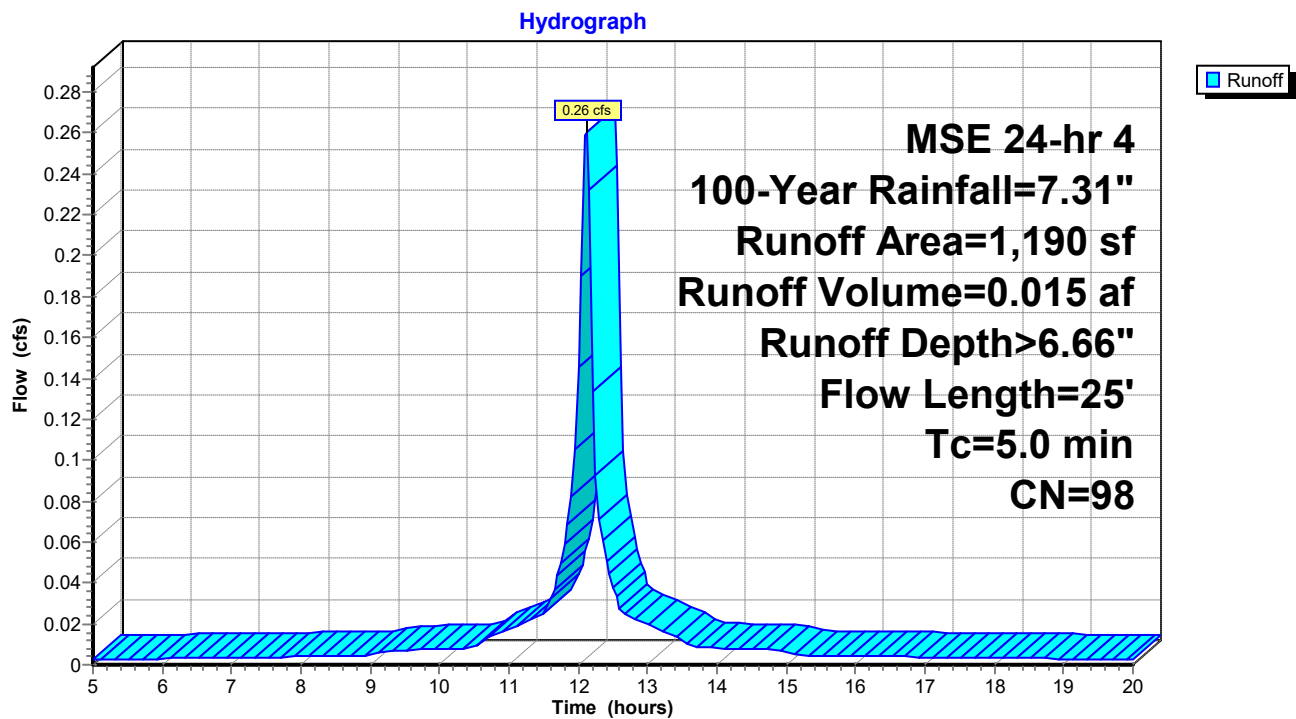
Runoff = 0.26 cfs @ 12.11 hrs, Volume= 0.015 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, $dt=0.05$ hrs
MSE 24-hr 4 100-Year Rainfall=7.31"

	Area (sf)	CN	Description
*	1,190	98	S 1/2 roof
	1,190		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	25		0.08		Direct Entry, S 1/2 roof

Subcatchment 8S: S 1/2 roof



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MSE 24-hr 4 100-Year Rainfall=7.31"

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Hydrograph for Subcatchment 8S: S 1/2 roof

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.17	0.00	17.75	6.83	6.59	0.00
5.25	0.36	0.20	0.00	18.00	6.86	6.62	0.00
5.50	0.39	0.22	0.00	18.25	6.89	6.65	0.00
5.75	0.42	0.25	0.00	18.50	6.92	6.68	0.00
6.00	0.45	0.27	0.00	18.75	6.95	6.71	0.00
6.25	0.48	0.30	0.00	19.00	6.97	6.74	0.00
6.50	0.51	0.33	0.00	19.25	7.00	6.76	0.00
6.75	0.55	0.36	0.00	19.50	7.03	6.79	0.00
7.00	0.58	0.39	0.00	19.75	7.05	6.81	0.00
7.25	0.61	0.42	0.00	20.00	7.07	6.83	0.00
7.50	0.65	0.46	0.00				
7.75	0.69	0.49	0.00				
8.00	0.72	0.53	0.00				
8.25	0.76	0.56	0.00				
8.50	0.80	0.60	0.00				
8.75	0.84	0.64	0.00				
9.00	0.88	0.68	0.00				
9.25	0.95	0.74	0.01				
9.50	1.02	0.81	0.01				
9.75	1.09	0.87	0.01				
10.00	1.16	0.94	0.01				
10.25	1.23	1.02	0.01				
10.50	1.31	1.09	0.01				
10.75	1.43	1.21	0.01				
11.00	1.58	1.36	0.02				
11.25	1.77	1.54	0.02				
11.50	1.98	1.76	0.02				
11.75	2.40	2.17	0.05				
12.00	3.43	3.19	0.15				
12.25	4.91	4.68	0.09				
12.50	5.33	5.09	0.04				
12.75	5.54	5.31	0.02				
13.00	5.73	5.49	0.02				
13.25	5.88	5.64	0.02				
13.50	6.00	5.76	0.01				
13.75	6.08	5.84	0.01				
14.00	6.15	5.91	0.01				
14.25	6.22	5.99	0.01				
14.50	6.29	6.05	0.01				
14.75	6.36	6.12	0.01				
15.00	6.43	6.19	0.01				
15.25	6.47	6.23	0.00				
15.50	6.51	6.27	0.00				
15.75	6.55	6.31	0.00				
16.00	6.59	6.35	0.00				
16.25	6.62	6.38	0.00				
16.50	6.66	6.42	0.00				
16.75	6.70	6.46	0.00				
17.00	6.73	6.49	0.00				
17.25	6.76	6.53	0.00				
17.50	6.80	6.56	0.00				

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MSE 24-hr 4 100-Year Rainfall=7.31"

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Summary for Reach 3R: S. 8" PVC

[52] Hint: Inlet/Outlet conditions not evaluated

[82] Warning: Early inflow requires earlier time span

[55] Hint: Peak inflow is 138% of Manning's capacity

[76] Warning: Detained 0.009 af (Pond w/culvert advised)

Inflow Area = 0.430 ac, 57.04% Impervious, Inflow Depth > 4.97" for 100-Year event
Inflow = 1.56 cfs @ 12.41 hrs, Volume= 0.178 af
Outflow = 1.17 cfs @ 12.27 hrs, Volume= 0.178 af, Atten= 25%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 3.67 fps, Min. Travel Time= 0.4 min

Avg. Velocity= 1.85 fps, Avg. Travel Time= 0.8 min

Peak Storage= 30 cf @ 12.30 hrs

Average Depth at Peak Storage= 0.67'

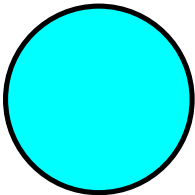
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.13 cfs

8.0" Round Pipe

n= 0.010 PVC, smooth interior

Length= 87.0' Slope= 0.0052 '/'

Inlet Invert= 676.38', Outlet Invert= 675.93'



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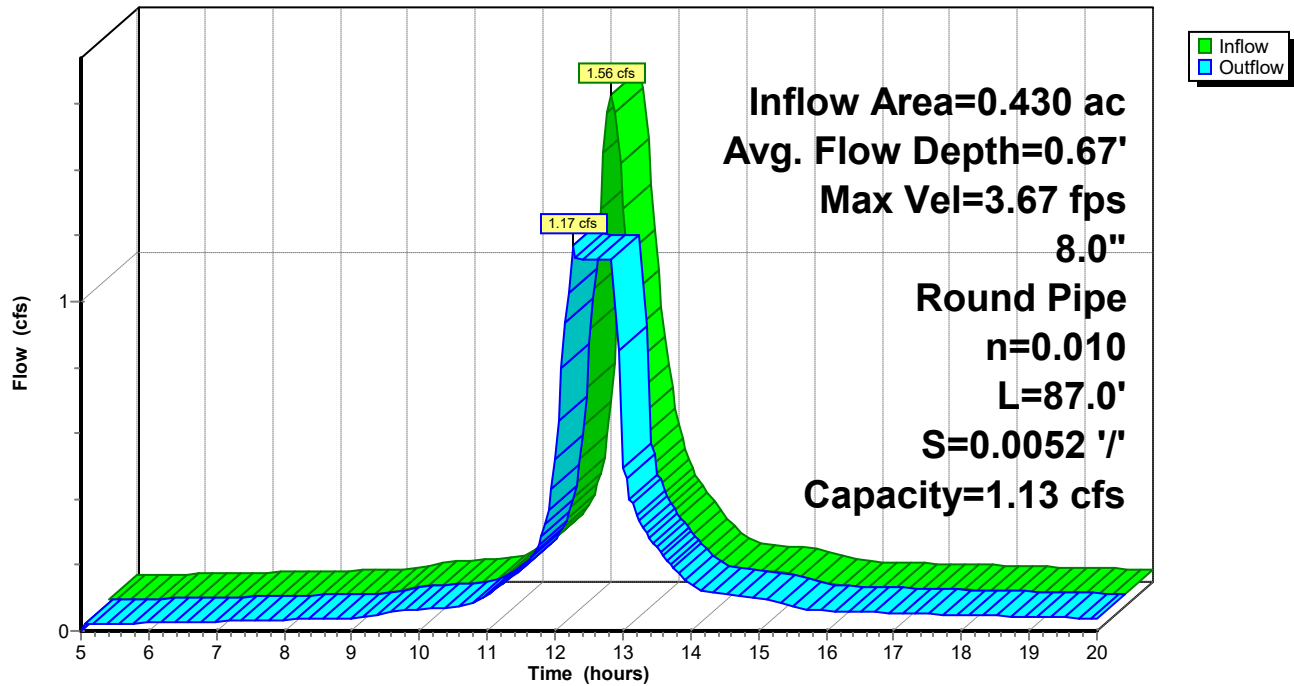
MSE 24-hr 4 100-Year Rainfall=7.31"

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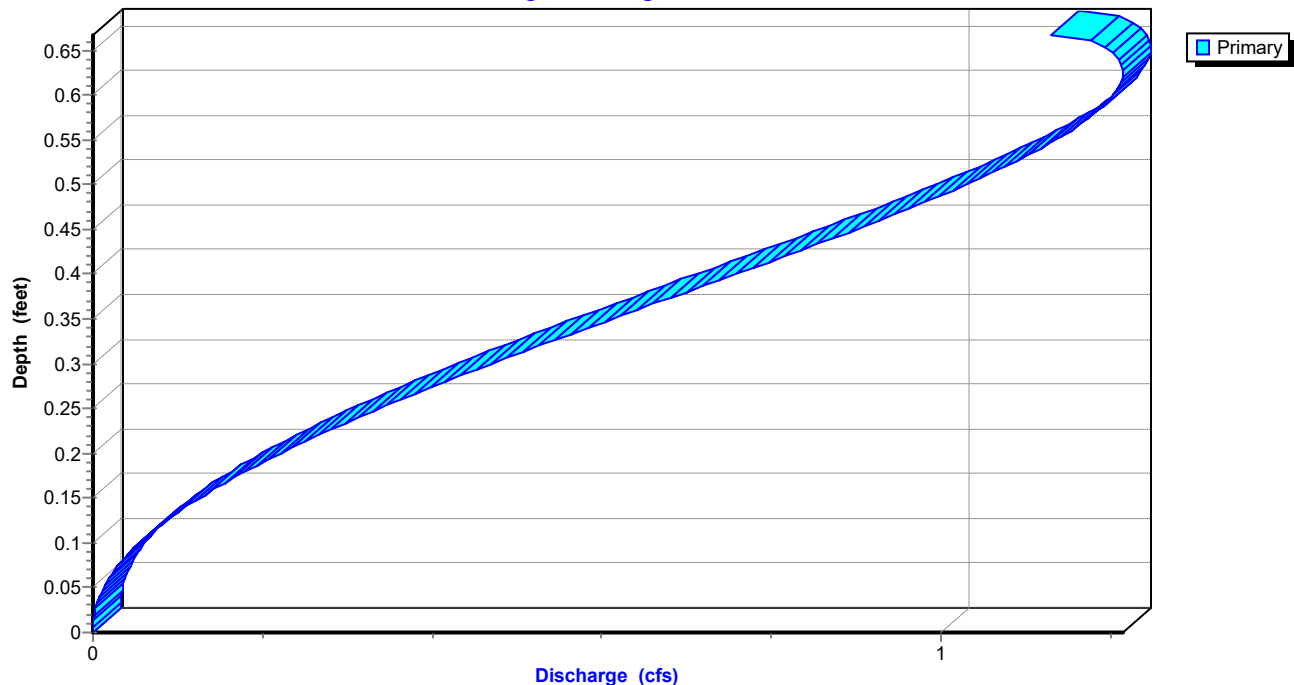
Reach 3R: S. 8" PVC

Hydrograph



Reach 3R: S. 8" PVC

Stage-Discharge



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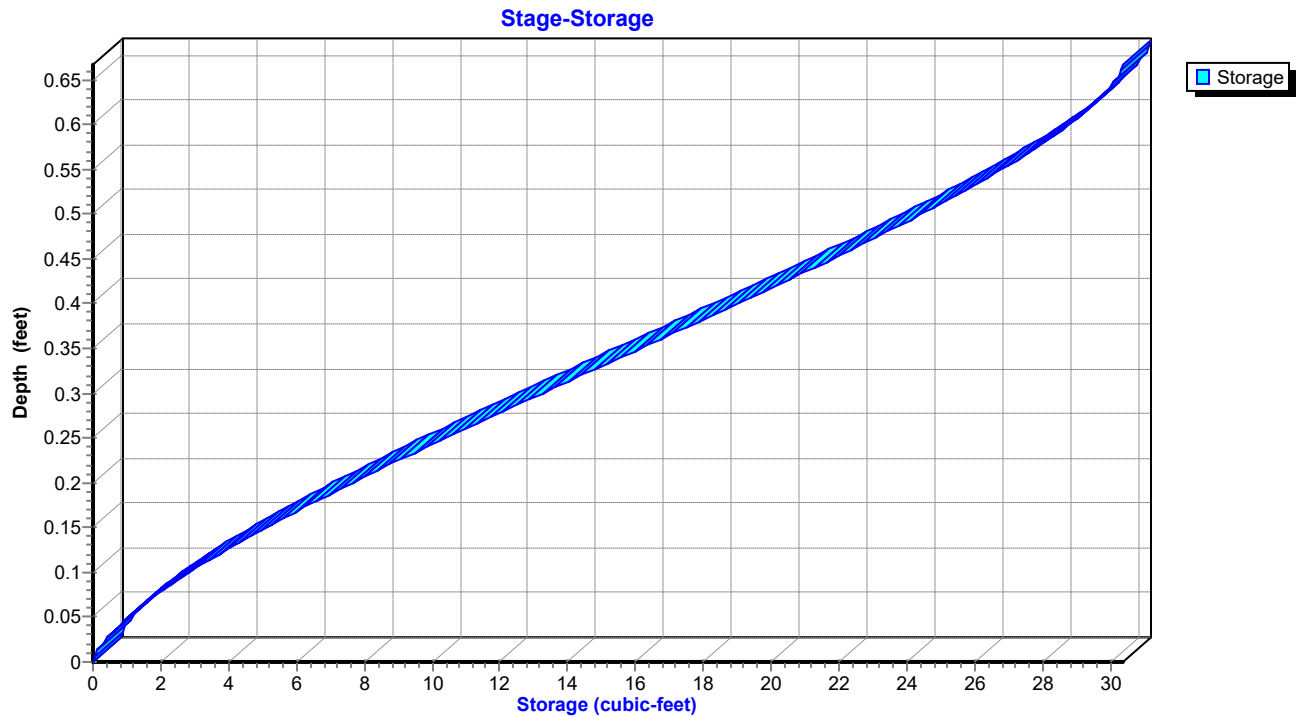
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Reach 3R: S. 8" PVC



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Hydrograph for Reach 3R: S. 8" PVC

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.02	0	676.38	0.00
5.50	0.02	2	676.44	0.02
6.00	0.02	2	676.45	0.02
6.50	0.03	2	676.45	0.03
7.00	0.03	2	676.45	0.03
7.50	0.03	2	676.46	0.03
8.00	0.03	2	676.46	0.03
8.50	0.04	2	676.46	0.04
9.00	0.04	2	676.46	0.04
9.50	0.06	3	676.48	0.05
10.00	0.07	3	676.49	0.07
10.50	0.07	3	676.49	0.07
11.00	0.11	5	676.52	0.11
11.50	0.19	7	676.56	0.19
12.00	0.55	15	676.70	0.52
12.50	1.46	30	677.05	1.13
13.00	0.48	13	676.67	0.49
13.50	0.25	8	676.59	0.25
14.00	0.14	6	676.54	0.14
14.50	0.11	5	676.52	0.11
15.00	0.10	4	676.52	0.10
15.50	0.07	4	676.50	0.08
16.00	0.06	3	676.49	0.06
16.50	0.06	3	676.48	0.06
17.00	0.05	3	676.48	0.05
17.50	0.05	3	676.48	0.05
18.00	0.05	3	676.47	0.05
18.50	0.05	3	676.47	0.05
19.00	0.04	2	676.47	0.04
19.50	0.04	2	676.47	0.04
20.00	0.04	2	676.46	0.04

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Stage-Discharge for Reach 3R: S. 8" PVC

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)	Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
676.38	0.00	0.00	676.89	3.68	1.05
676.39	0.37	0.00	676.90	3.68	1.08
676.40	0.60	0.00	676.91	3.69	1.10
676.41	0.78	0.00	676.92	3.69	1.12
676.42	0.94	0.01	676.93	3.69	1.14
676.43	1.08	0.01	676.94	3.69	1.15
676.44	1.21	0.02	676.95	3.68	1.17
676.45	1.34	0.03	676.96	3.67	1.18
676.46	1.46	0.03	676.97	3.66	1.19
676.47	1.57	0.04	676.98	3.64	1.20
676.48	1.67	0.05	676.99	3.62	1.21
676.49	1.77	0.07	677.00	3.59	1.21
676.50	1.87	0.08	677.01	3.56	1.21
676.51	1.96	0.09	677.02	3.51	1.21
676.52	2.05	0.11	677.03	3.46	1.20
676.53	2.13	0.13	677.04	3.38	1.18
676.54	2.22	0.14	677.05	3.17	1.11
676.55	2.29	0.16			
676.56	2.37	0.18			
676.57	2.44	0.20			
676.58	2.51	0.22			
676.59	2.58	0.24			
676.60	2.65	0.27			
676.61	2.71	0.29			
676.62	2.77	0.31			
676.63	2.83	0.34			
676.64	2.88	0.36			
676.65	2.94	0.39			
676.66	2.99	0.42			
676.67	3.04	0.44			
676.68	3.09	0.47			
676.69	3.14	0.50			
676.70	3.18	0.53			
676.71	3.22	0.56			
676.72	3.26	0.58			
676.73	3.30	0.61			
676.74	3.34	0.64			
676.75	3.38	0.67			
676.76	3.41	0.70			
676.77	3.44	0.73			
676.78	3.47	0.76			
676.79	3.50	0.79			
676.80	3.53	0.82			
676.81	3.55	0.85			
676.82	3.57	0.87			
676.83	3.59	0.90			
676.84	3.61	0.93			
676.85	3.63	0.95			
676.86	3.64	0.98			
676.87	3.66	1.01			
676.88	3.67	1.03			

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MSE 24-hr 4 100-Year Rainfall=7.31"

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Stage-Area-Storage for Reach 3R: S. 8" PVC

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
676.38	0.0	0	676.89	0.3	25
676.39	0.0	0	676.90	0.3	25
676.40	0.0	0	676.91	0.3	26
676.41	0.0	0	676.92	0.3	26
676.42	0.0	1	676.93	0.3	27
676.43	0.0	1	676.94	0.3	27
676.44	0.0	1	676.95	0.3	28
676.45	0.0	2	676.96	0.3	28
676.46	0.0	2	676.97	0.3	28
676.47	0.0	2	676.98	0.3	29
676.48	0.0	3	676.99	0.3	29
676.49	0.0	3	677.00	0.3	29
676.50	0.0	4	677.01	0.3	30
676.51	0.0	4	677.02	0.3	30
676.52	0.1	5	677.03	0.3	30
676.53	0.1	5	677.04	0.3	30
676.54	0.1	6	677.05	0.3	30
676.55	0.1	6			
676.56	0.1	7			
676.57	0.1	7			
676.58	0.1	8			
676.59	0.1	8			
676.60	0.1	9			
676.61	0.1	9			
676.62	0.1	10			
676.63	0.1	10			
676.64	0.1	11			
676.65	0.1	12			
676.66	0.1	12			
676.67	0.1	13			
676.68	0.2	13			
676.69	0.2	14			
676.70	0.2	14			
676.71	0.2	15			
676.72	0.2	16			
676.73	0.2	16			
676.74	0.2	17			
676.75	0.2	17			
676.76	0.2	18			
676.77	0.2	18			
676.78	0.2	19			
676.79	0.2	20			
676.80	0.2	20			
676.81	0.2	21			
676.82	0.2	21			
676.83	0.3	22			
676.84	0.3	22			
676.85	0.3	23			
676.86	0.3	23			
676.87	0.3	24			
676.88	0.3	24			

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MSE 24-hr 4 100-Year Rainfall=7.31"

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Summary for Reach 4R: 6" PVC

[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.160 ac, 49.72% Impervious, Inflow Depth > 3.79" for 100-Year event
Inflow = 2.05 cfs @ 12.56 hrs, Volume= 0.366 af
Outflow = 2.05 cfs @ 12.59 hrs, Volume= 0.366 af, Atten= 0%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 14.97 fps, Min. Travel Time= 0.1 min

Avg. Velocity= 7.60 fps, Avg. Travel Time= 0.2 min

Peak Storage= 11 cf @ 12.59 hrs

Average Depth at Peak Storage= 0.33'

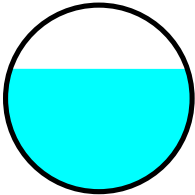
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 2.67 cfs

6.0" Round Pipe

n= 0.010

Length= 77.0' Slope= 0.1335 '/'

Inlet Invert= 668.80', Outlet Invert= 658.52'



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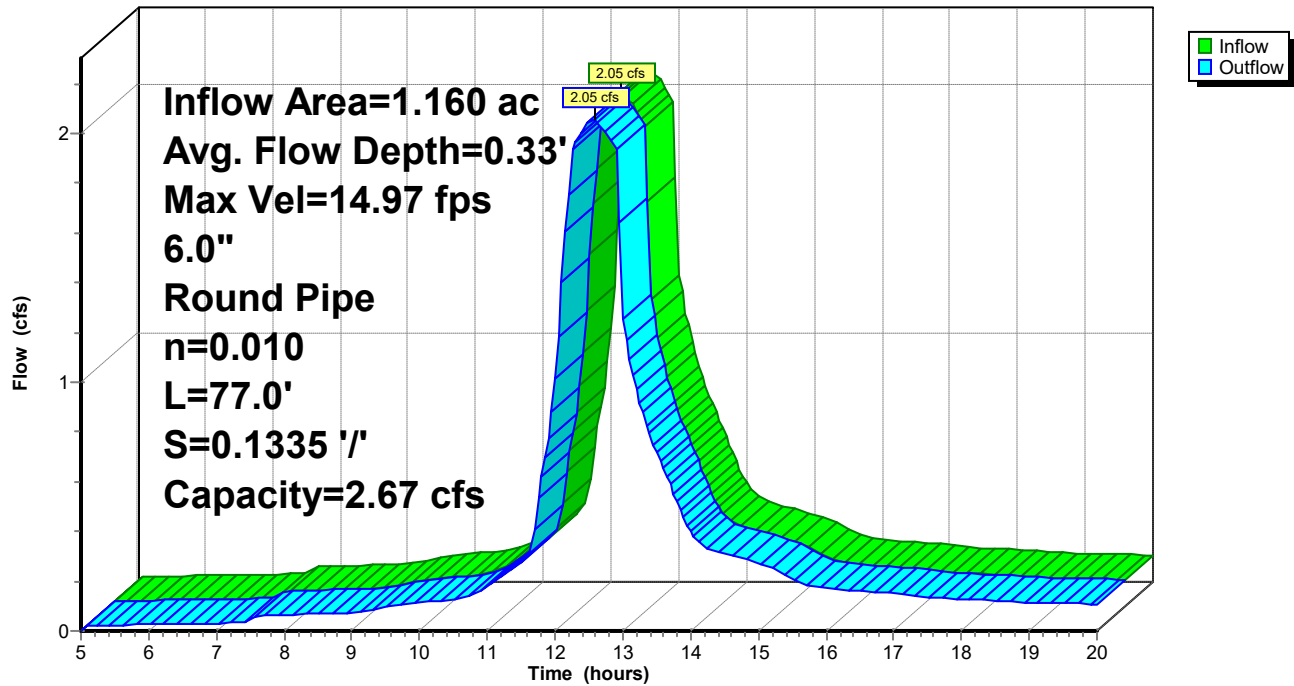
MSE 24-hr 4 100-Year Rainfall=7.31"

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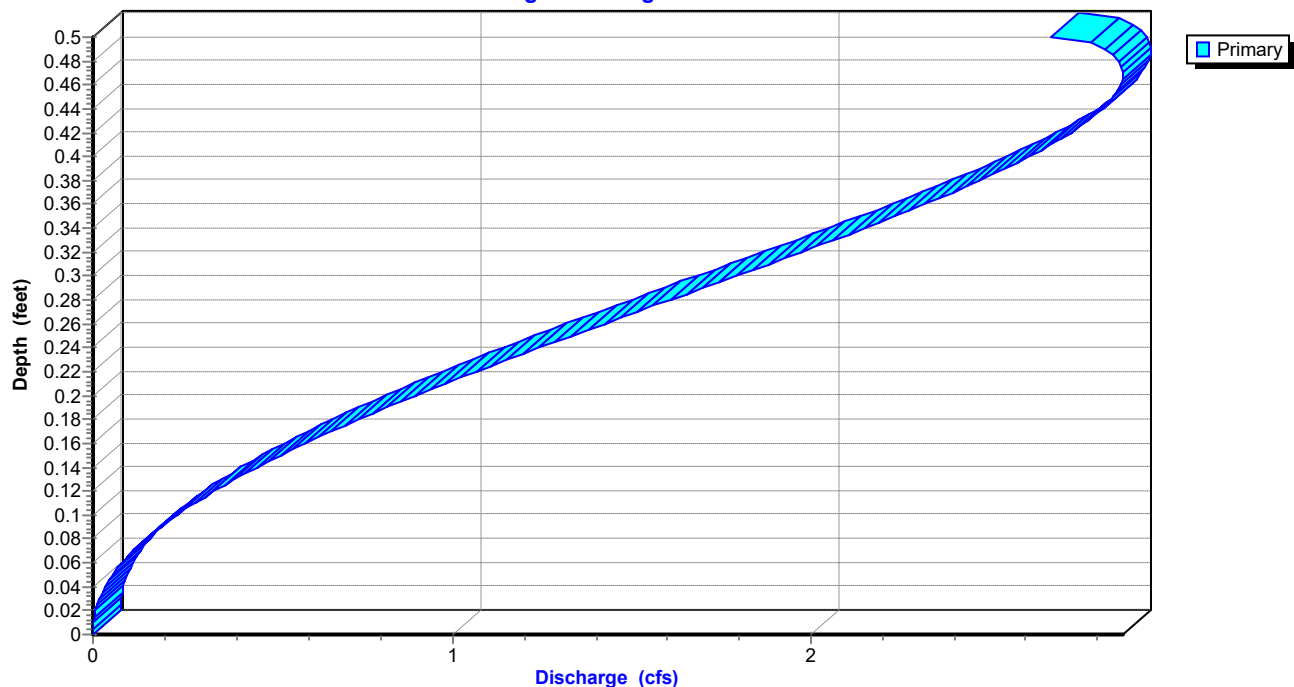
Reach 4R: 6" PVC

Hydrograph



Reach 4R: 6" PVC

Stage-Discharge



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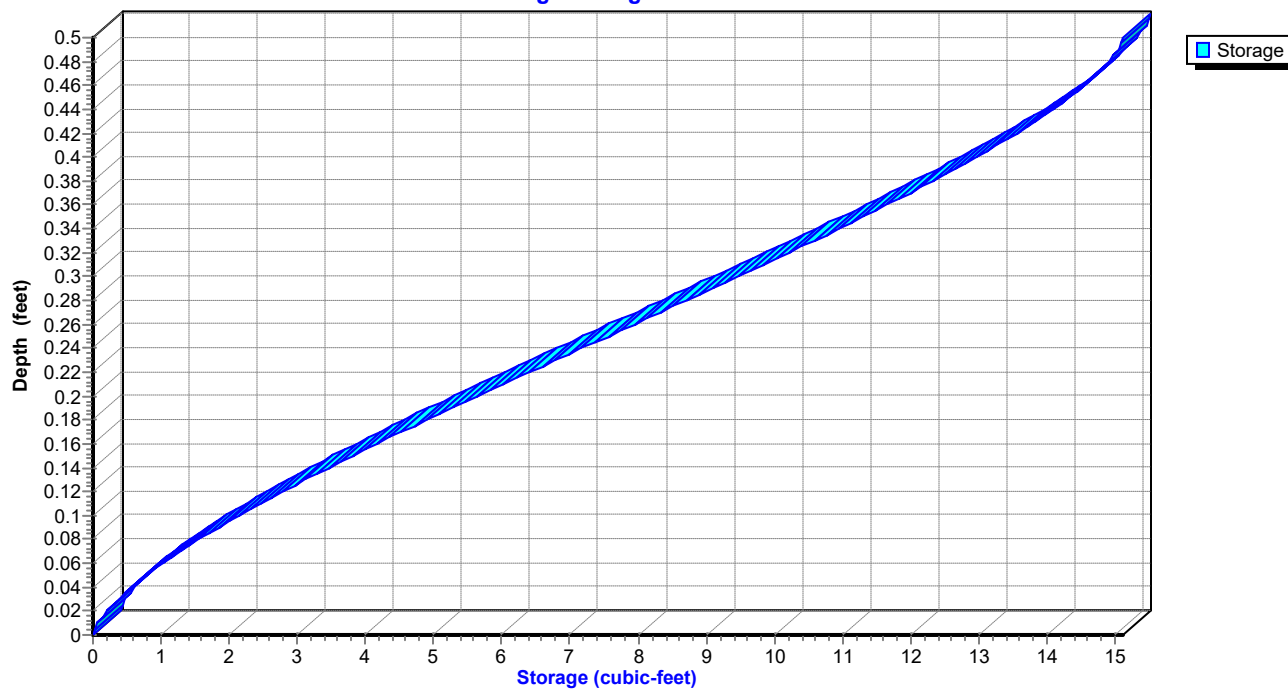
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Reach 4R: 6" PVC

Stage-Storage



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Hydrograph for Reach 4R: 6" PVC

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	668.80	0.00
5.50	0.02	0	668.83	0.02
6.00	0.03	0	668.83	0.03
6.50	0.03	0	668.84	0.03
7.00	0.03	1	668.84	0.03
7.50	0.03	1	668.84	0.03
8.00	0.06	1	668.85	0.06
8.50	0.07	1	668.86	0.07
9.00	0.07	1	668.86	0.07
9.50	0.10	1	668.87	0.10
10.00	0.11	1	668.87	0.11
10.50	0.13	1	668.87	0.13
11.00	0.18	2	668.89	0.18
11.50	0.27	2	668.91	0.27
12.00	1.02	6	669.01	1.01
12.50	2.05	11	669.13	2.05
13.00	1.23	7	669.04	1.25
13.50	0.71	5	668.98	0.72
14.00	0.40	3	668.93	0.40
14.50	0.31	3	668.91	0.31
15.00	0.27	2	668.91	0.27
15.50	0.21	2	668.90	0.21
16.00	0.17	2	668.89	0.17
16.50	0.16	2	668.88	0.16
17.00	0.15	2	668.88	0.15
17.50	0.14	1	668.88	0.14
18.00	0.13	1	668.87	0.13
18.50	0.12	1	668.87	0.12
19.00	0.11	1	668.87	0.11
19.50	0.11	1	668.87	0.11
20.00	0.11	1	668.87	0.11

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Stage-Discharge for Reach 4R: 6" PVC

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
668.80	0.00	0.00
668.81	1.91	0.00
668.82	3.01	0.01
668.83	3.93	0.02
668.84	4.72	0.03
668.85	5.45	0.06
668.86	6.11	0.08
668.87	6.72	0.11
668.88	7.30	0.15
668.89	7.84	0.19
668.90	8.35	0.23
668.91	8.83	0.28
668.92	9.29	0.34
668.93	9.73	0.39
668.94	10.14	0.46
668.95	10.54	0.52
668.96	10.91	0.59
668.97	11.27	0.66
668.98	11.61	0.74
668.99	11.94	0.82
669.00	12.25	0.90
669.01	12.54	0.98
669.02	12.82	1.07
669.03	13.09	1.15
669.04	13.34	1.24
669.05	13.57	1.33
669.06	13.80	1.42
669.07	14.01	1.52
669.08	14.20	1.61
669.09	14.39	1.70
669.10	14.56	1.79
669.11	14.71	1.88
669.12	14.86	1.97
669.13	14.98	2.06
669.14	15.10	2.15
669.15	15.20	2.23
669.16	15.29	2.31
669.17	15.36	2.39
669.18	15.41	2.47
669.19	15.45	2.54
669.20	15.47	2.61
669.21	15.47	2.67
669.22	15.46	2.72
669.23	15.42	2.77
669.24	15.35	2.81
669.25	15.26	2.84
669.26	15.14	2.86
669.27	14.97	2.87
669.28	14.74	2.86
669.29	14.41	2.82
669.30	13.57	2.67

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Stage-Area-Storage for Reach 4R: 6" PVC

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
668.80	0.0	0
668.81	0.0	0
668.82	0.0	0
668.83	0.0	0
668.84	0.0	1
668.85	0.0	1
668.86	0.0	1
668.87	0.0	1
668.88	0.0	2
668.89	0.0	2
668.90	0.0	2
668.91	0.0	2
668.92	0.0	3
668.93	0.0	3
668.94	0.0	3
668.95	0.0	4
668.96	0.1	4
668.97	0.1	5
668.98	0.1	5
668.99	0.1	5
669.00	0.1	6
669.01	0.1	6
669.02	0.1	6
669.03	0.1	7
669.04	0.1	7
669.05	0.1	8
669.06	0.1	8
669.07	0.1	8
669.08	0.1	9
669.09	0.1	9
669.10	0.1	9
669.11	0.1	10
669.12	0.1	10
669.13	0.1	11
669.14	0.1	11
669.15	0.1	11
669.16	0.2	12
669.17	0.2	12
669.18	0.2	12
669.19	0.2	13
669.20	0.2	13
669.21	0.2	13
669.22	0.2	14
669.23	0.2	14
669.24	0.2	14
669.25	0.2	14
669.26	0.2	15
669.27	0.2	15
669.28	0.2	15
669.29	0.2	15
669.30	0.2	15

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MSE 24-hr 4 100-Year Rainfall=7.31"

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Summary for Pond 3P: E biofilter LINED

[82] Warning: Early inflow requires earlier time span

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=12)

Inflow Area = 0.043 ac, 57.33% Impervious, Inflow Depth > 5.00" for 100-Year event
Inflow = 0.29 cfs @ 12.15 hrs, Volume= 0.018 af
Outflow = 0.18 cfs @ 12.26 hrs, Volume= 0.017 af, Atten= 40%, Lag= 6.5 min
Discarded = 0.00 cfs @ 12.25 hrs, Volume= 0.000 af
Primary = 0.18 cfs @ 12.26 hrs, Volume= 0.017 af
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 681.13' @ 12.26 hrs Surf.Area= 1,362 sf Storage= 272 cf

Plug-Flow detention time= 90.9 min calculated for 0.017 af (93% of inflow)
Center-of-Mass det. time= 65.5 min (816.1 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1	678.00'	54 cf	10.50'W x 15.50'L x 1.00'H sand invert 163 cf Overall x 33.0% Voids
#2	679.00'	66 cf	10.50'W x 15.50'L x 1.50'H media 244 cf Overall x 27.0% Voids
#3	680.50'	128 cf	10.50'W x 15.50'L x 0.60'H top media Z=3.0
#4	681.10'	192 cf	39.25'W x 19.25'L x 0.24'H NDS drain Z=3.0
#5	681.34'	82 cf	40.00'W x 20.00'L x 0.10'H weir overflow Z=3.0
		521 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Secondary	681.34'	6.0' long x 3.0' 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 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	681.10'	0.5" x 2.0" Horiz. NDS drain X 50.00 C= 0.600 in 12.0" x 12.0" Grate (35% open area) Limited to weir flow at low heads
#3	Primary	678.00'	3.600 in/hr underdrain over Horizontal area above 678.00' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 163 sf Phase-In= 0.50'
#4	Discarded	678.00'	0.001 in/hr Exfiltration over Horizontal area above 678.00' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 163 sf Phase-In= 0.50'

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Discarded OutFlow Max=0.00 cfs @ 12.25 hrs HW=681.13' (Free Discharge)

↑ **4=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.17 cfs @ 12.26 hrs HW=681.13' (Free Discharge)

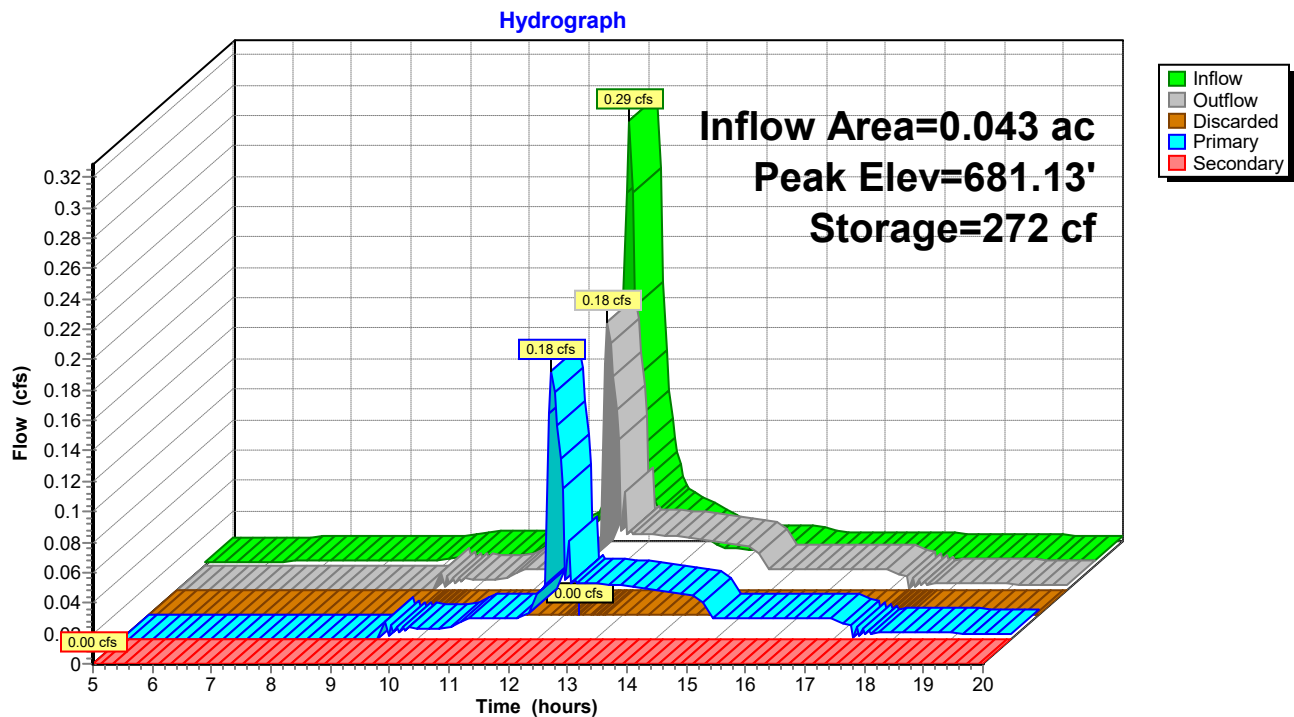
↑ **2=NDS drain** (Weir Controls 0.07 cfs @ 0.57 fps)

↑ **3=underdrain** (Controls 0.10 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=678.00' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: E biofilter LINED



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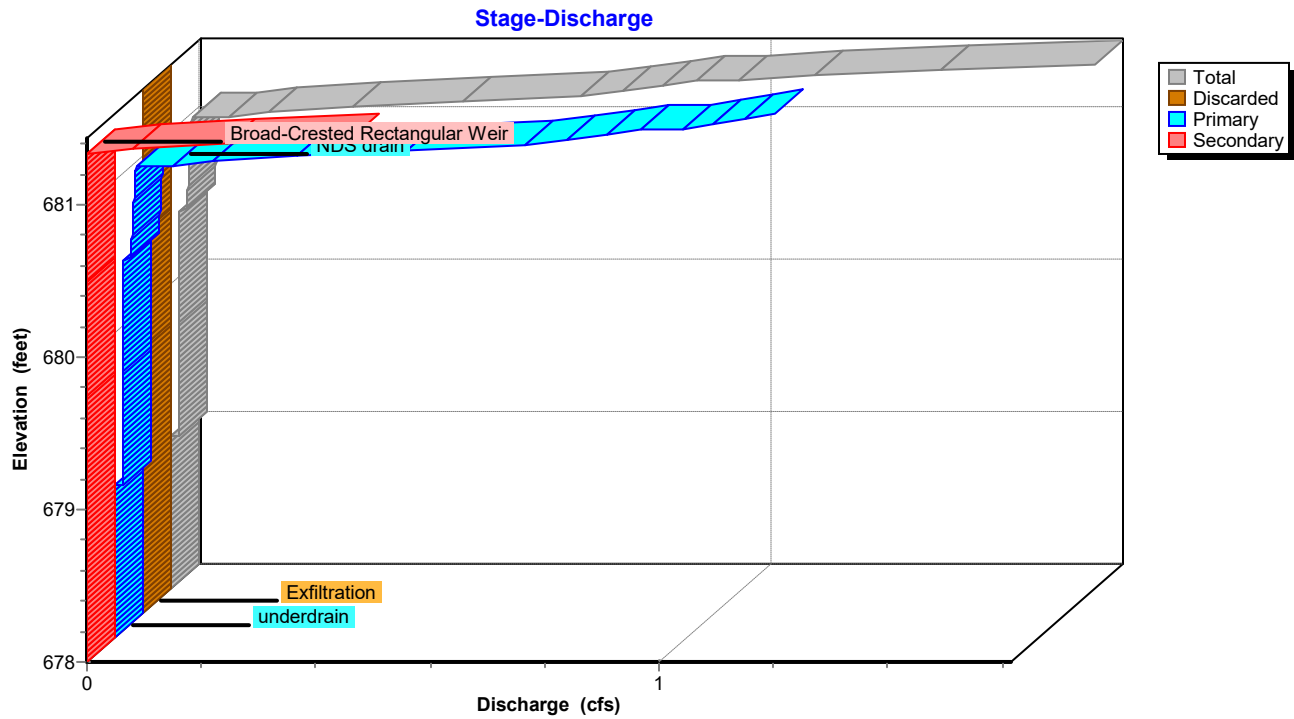
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MSE 24-hr 4 100-Year Rainfall=7.31"

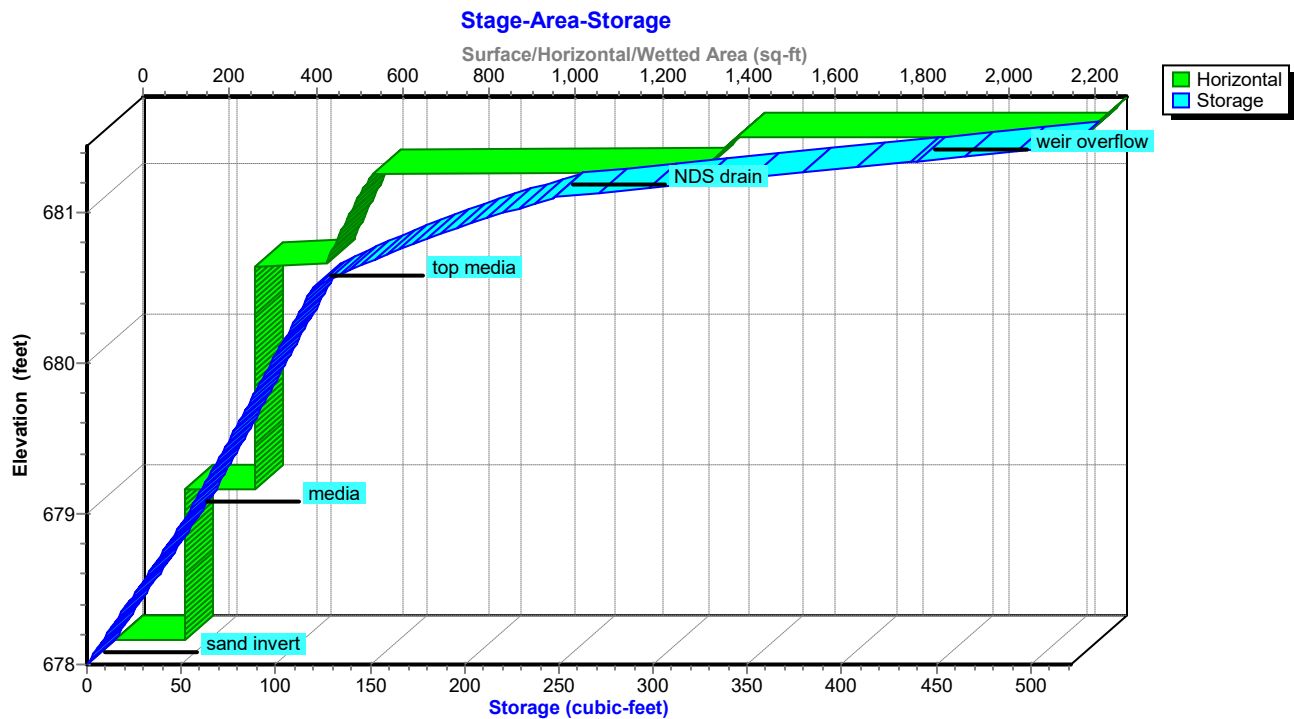
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Pond 3P: E biofilter LINED



Pond 3P: E biofilter LINED



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Hydrograph for Pond 3P: E biofilter LINED

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	0	678.00	0.00	0.00	0.00	0.00
5.50	0.00	4	678.08	0.00	0.00	0.00	0.00
6.00	0.00	9	678.17	0.00	0.00	0.00	0.00
6.50	0.00	14	678.26	0.00	0.00	0.00	0.00
7.00	0.00	20	678.37	0.00	0.00	0.00	0.00
7.50	0.00	25	678.47	0.00	0.00	0.00	0.00
8.00	0.00	32	678.59	0.00	0.00	0.00	0.00
8.50	0.00	38	678.72	0.00	0.00	0.00	0.00
9.00	0.00	45	678.85	0.00	0.00	0.00	0.00
9.50	0.01	54	679.00	0.00	0.00	0.00	0.00
10.00	0.01	54	679.00	0.01	0.00	0.01	0.00
10.50	0.01	54	679.00	0.01	0.00	0.01	0.00
11.00	0.02	54	679.01	0.01	0.00	0.01	0.00
11.50	0.02	66	679.27	0.01	0.00	0.01	0.00
12.00	0.13	136	680.59	0.03	0.00	0.03	0.00
12.50	0.06	247	681.10	0.04	0.00	0.04	0.00
13.00	0.03	239	681.07	0.04	0.00	0.04	0.00
13.50	0.02	215	680.97	0.04	0.00	0.04	0.00
14.00	0.01	177	680.81	0.03	0.00	0.03	0.00
14.50	0.01	141	680.62	0.03	0.00	0.03	0.00
15.00	0.01	116	680.42	0.01	0.00	0.01	0.00
15.50	0.01	104	680.13	0.01	0.00	0.01	0.00
16.00	0.01	89	679.81	0.01	0.00	0.01	0.00
16.50	0.01	75	679.47	0.01	0.00	0.01	0.00
17.00	0.01	60	679.13	0.01	0.00	0.01	0.00
17.50	0.01	54	679.00	0.01	0.00	0.01	0.00
18.00	0.00	54	679.00	0.00	0.00	0.00	0.00
18.50	0.00	54	679.00	0.00	0.00	0.00	0.00
19.00	0.00	54	679.00	0.00	0.00	0.00	0.00
19.50	0.00	54	679.00	0.00	0.00	0.00	0.00
20.00	0.00	54	679.00	0.00	0.00	0.00	0.00

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MSE 24-hr 4 100-Year Rainfall=7.31"

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Stage-Discharge for Pond 3P: E biofilter LINED

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
678.00	0.00	0.00	0.00	0.00
678.10	0.00	0.00	0.00	0.00
678.20	0.00	0.00	0.00	0.00
678.30	0.00	0.00	0.00	0.00
678.40	0.00	0.00	0.00	0.00
678.50	0.00	0.00	0.00	0.00
678.60	0.00	0.00	0.00	0.00
678.70	0.00	0.00	0.00	0.00
678.80	0.00	0.00	0.00	0.00
678.90	0.00	0.00	0.00	0.00
679.00	0.01	0.00	0.01	0.00
679.10	0.01	0.00	0.01	0.00
679.20	0.01	0.00	0.01	0.00
679.30	0.01	0.00	0.01	0.00
679.40	0.01	0.00	0.01	0.00
679.50	0.01	0.00	0.01	0.00
679.60	0.01	0.00	0.01	0.00
679.70	0.01	0.00	0.01	0.00
679.80	0.01	0.00	0.01	0.00
679.90	0.01	0.00	0.01	0.00
680.00	0.01	0.00	0.01	0.00
680.10	0.01	0.00	0.01	0.00
680.20	0.01	0.00	0.01	0.00
680.30	0.01	0.00	0.01	0.00
680.40	0.01	0.00	0.01	0.00
680.50	0.03	0.00	0.03	0.00
680.60	0.03	0.00	0.03	0.00
680.70	0.03	0.00	0.03	0.00
680.80	0.03	0.00	0.03	0.00
680.90	0.03	0.00	0.03	0.00
681.00	0.04	0.00	0.04	0.00
681.10	0.10	0.00	0.10	0.00
681.20	0.52	0.00	0.52	0.00
681.30	0.85	0.00	0.85	0.00
681.40	1.31	0.00	1.09	0.22

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Stage-Area-Storage for Pond 3P: E biofilter LINED

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
678.00	163	0	680.55	496	128
678.05	163	3	680.60	504	137
678.10	163	5	680.65	512	146
678.15	163	8	680.70	521	155
678.20	163	11	680.75	530	165
678.25	163	13	680.80	538	176
678.30	163	16	680.85	547	187
678.35	163	19	680.90	556	198
678.40	163	21	680.95	566	210
678.45	163	24	681.00	575	222
678.50	163	27	681.05	585	235
678.55	163	30	681.10	1,350	248
678.60	163	32	681.15	1,368	286
678.65	163	35	681.20	1,386	325
678.70	163	38	681.25	1,404	365
678.75	163	40	681.30	1,422	406
678.80	163	43	681.35	2,240	448
678.85	163	46	681.40	2,258	488
678.90	163	48			
678.95	163	51			
679.00	326	54			
679.05	326	56			
679.10	326	58			
679.15	326	60			
679.20	326	62			
679.25	326	65			
679.30	326	67			
679.35	326	69			
679.40	326	71			
679.45	326	73			
679.50	326	76			
679.55	326	78			
679.60	326	80			
679.65	326	82			
679.70	326	84			
679.75	326	87			
679.80	326	89			
679.85	326	91			
679.90	326	93			
679.95	326	95			
680.00	326	98			
680.05	326	100			
680.10	326	102			
680.15	326	104			
680.20	326	106			
680.25	326	109			
680.30	326	111			
680.35	326	113			
680.40	326	115			
680.45	326	117			
680.50	488	120			

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Summary for Pond 5P: W biofillter UNLINED

[82] Warning: Early inflow requires earlier time span

[93] Warning: Storage range exceeded by 0.12'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.673 ac, 43.54% Impervious, Inflow Depth > 4.44" for 100-Year event
Inflow = 2.09 cfs @ 12.41 hrs, Volume= 0.249 af
Outflow = 2.09 cfs @ 12.43 hrs, Volume= 0.227 af, Atten= 0%, Lag= 1.3 min
Discarded = 0.00 cfs @ 12.43 hrs, Volume= 0.001 af
Primary = 0.90 cfs @ 12.43 hrs, Volume= 0.164 af
Secondary = 1.19 cfs @ 12.43 hrs, Volume= 0.062 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 676.28' @ 12.43 hrs Surf.Area= 2,824 sf Storage= 1,047 cf

Plug-Flow detention time= 53.4 min calculated for 0.227 af (91% of inflow)
Center-of-Mass det. time= 23.2 min (795.3 - 772.0)

Volume	Invert	Avail.Storage	Storage Description
#1	671.75'	107 cf	8.30'W x 39.20'L x 1.00'H sand invert 325 cf Overall x 33.0% Voids
#2	672.75'	176 cf	8.30'W x 39.20'L x 2.00'H media 651 cf Overall x 27.0% Voids
#3	674.75'	728 cf	8.30'W x 39.20'L x 1.35'H top media Z=3.0
#4	676.10'	27 cf	12.30'W x 43.20'L x 0.05'H NDS drain Z=3.0
#5	676.15'	8 cf	18.00'W x 47.00'L x 0.01'H weir overflow Z=3.0
		1,047 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Secondary	676.15'	10.0' long x 3.0' 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 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	676.10'	0.5" x 2.0" Horiz. NDS drain X 50.00 C= 0.600 in 12.0" x 12.0" Grate (35% open area) Limited to weir flow at low heads
#3	Primary	672.75'	3.600 in/hr underdrain over Horizontal area above 672.75' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 651 sf Phase-In= 0.50'
#4	Discarded	671.75'	0.030 in/hr Exfiltration over Horizontal area above 671.75' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 325 sf Phase-In= 0.50'

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Discarded OutFlow Max=0.00 cfs @ 12.43 hrs HW=676.28' (Free Discharge)

↑ **4=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.90 cfs @ 12.43 hrs HW=676.28' (Free Discharge)

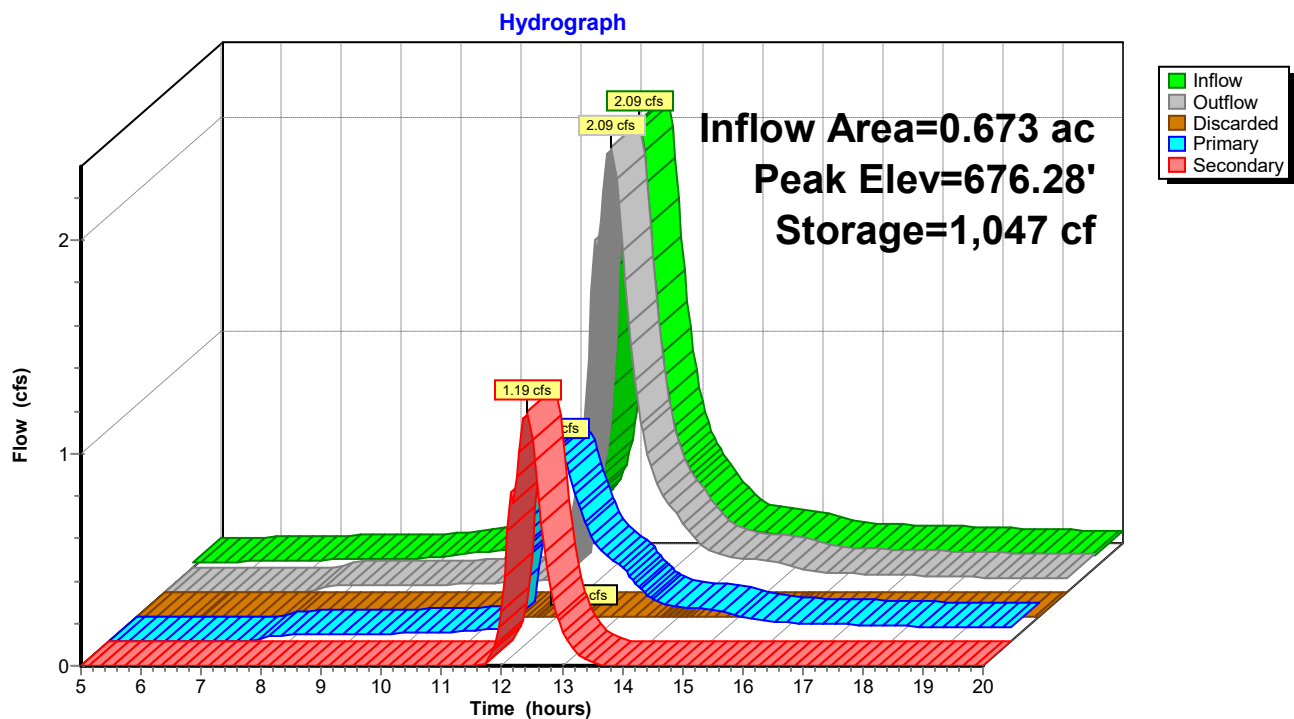
↑ **2=NDS drain** (Orifice Controls 0.71 cfs @ 2.05 fps)

↑ **3=underdrain** (Controls 0.18 cfs)

Secondary OutFlow Max=1.17 cfs @ 12.43 hrs HW=676.28' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 1.17 cfs @ 0.89 fps)

Pond 5P: W biofillter UNLINED



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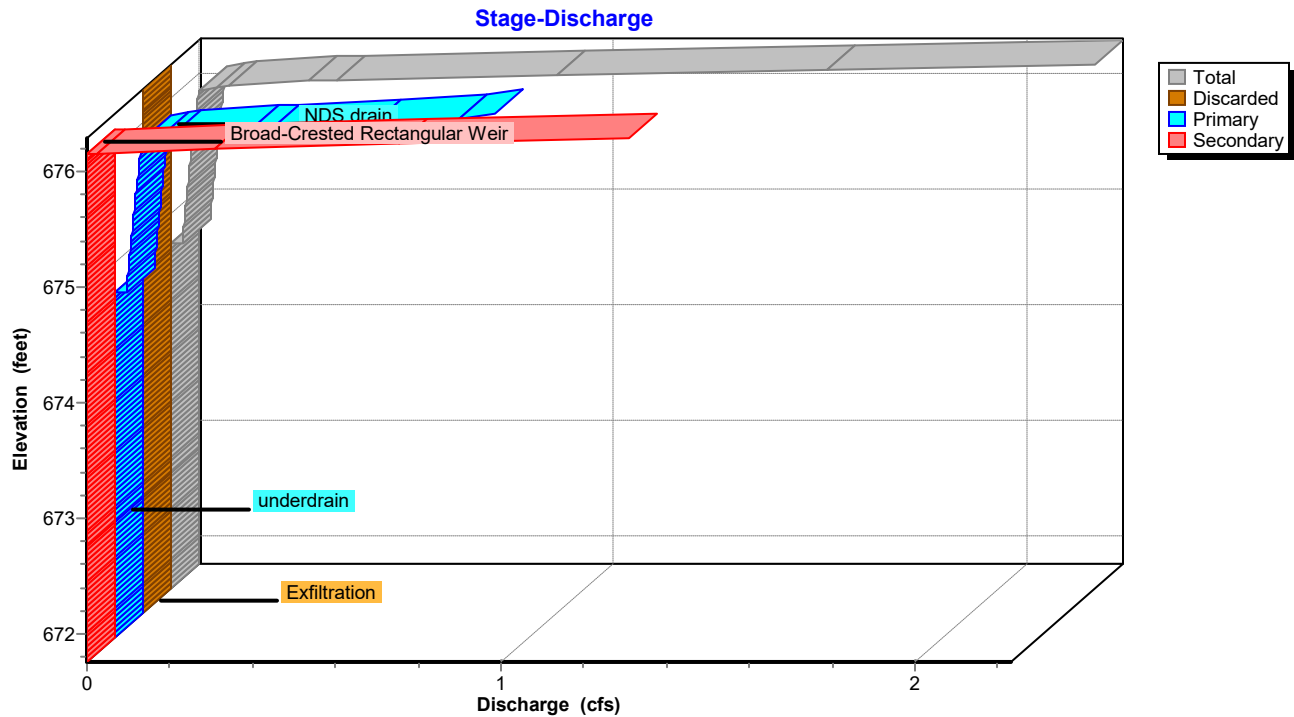
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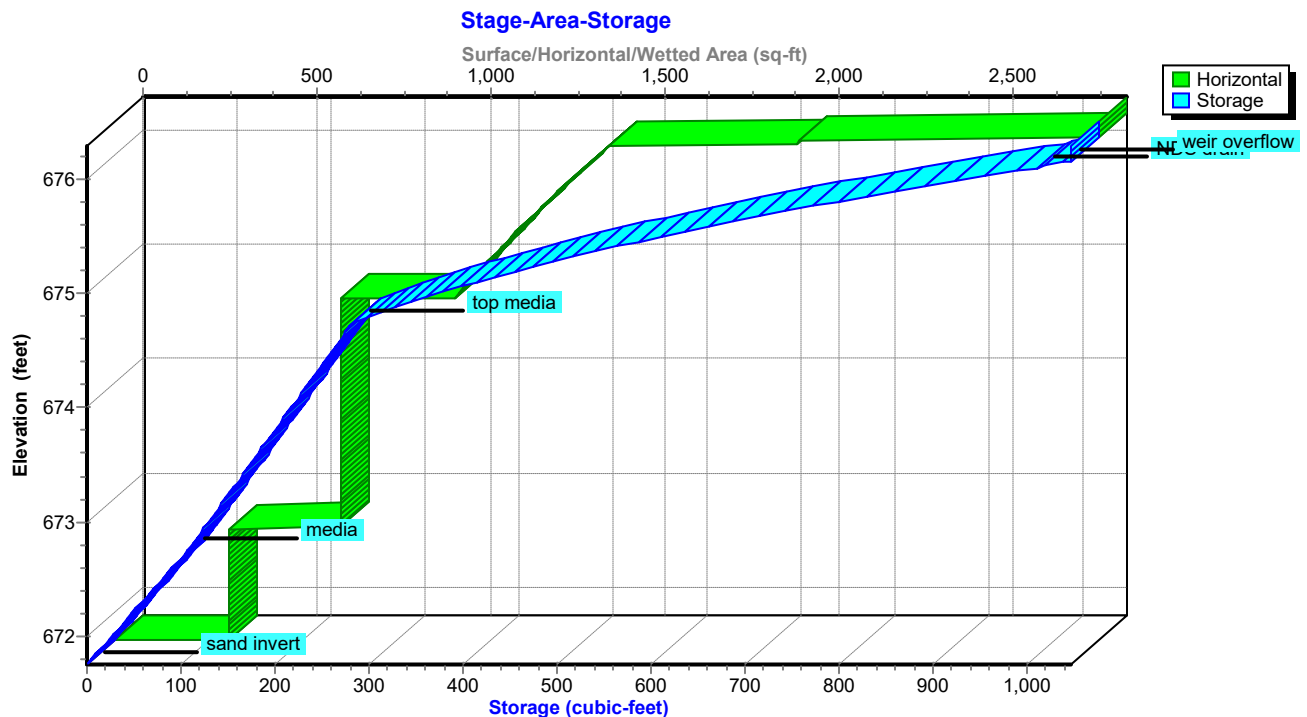
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Pond 5P: W biofillter UNLINED



Pond 5P: W biofillter UNLINED



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Hydrograph for Pond 5P: W biofilter UNLINED

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.02	2	671.77	0.00	0.00	0.00	0.00
5.50	0.03	48	672.20	0.00	0.00	0.00	0.00
6.00	0.03	99	672.67	0.00	0.00	0.00	0.00
6.50	0.03	155	673.29	0.00	0.00	0.00	0.00
7.00	0.04	216	673.99	0.00	0.00	0.00	0.00
7.50	0.04	282	674.74	0.00	0.00	0.00	0.00
8.00	0.04	305	674.81	0.03	0.00	0.03	0.00
8.50	0.04	327	674.88	0.03	0.00	0.03	0.00
9.00	0.05	350	674.94	0.03	0.00	0.03	0.00
9.50	0.07	391	675.04	0.04	0.00	0.03	0.00
10.00	0.08	458	675.20	0.04	0.00	0.04	0.00
10.50	0.09	531	675.35	0.04	0.00	0.04	0.00
11.00	0.14	642	675.55	0.05	0.00	0.05	0.00
11.50	0.25	889	675.94	0.06	0.00	0.06	0.00
12.00	0.86	1,047	676.20	0.84	0.00	0.58	0.26
12.50	1.96	1,047	676.27	1.94	0.00	0.88	1.06
13.00	0.67	1,047	676.18	0.65	0.00	0.49	0.16
13.50	0.36	1,043	676.16	0.37	0.00	0.36	0.01
14.00	0.20	1,027	676.13	0.21	0.00	0.21	0.00
14.50	0.16	1,022	676.12	0.16	0.00	0.16	0.00
15.00	0.15	1,021	676.12	0.15	0.00	0.15	0.00
15.50	0.11	1,013	676.10	0.12	0.00	0.12	0.00
16.00	0.09	1,003	676.09	0.09	0.00	0.09	0.00
16.50	0.09	999	676.08	0.09	0.00	0.09	0.00
17.00	0.08	997	676.08	0.08	0.00	0.08	0.00
17.50	0.08	995	676.08	0.08	0.00	0.08	0.00
18.00	0.07	993	676.08	0.07	0.00	0.07	0.00
18.50	0.07	991	676.07	0.07	0.00	0.07	0.00
19.00	0.06	989	676.07	0.07	0.00	0.07	0.00
19.50	0.06	980	676.06	0.07	0.00	0.07	0.00
20.00	0.06	965	676.04	0.07	0.00	0.06	0.00

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Stage-Discharge for Pond 5P: W biofilter UNLINED

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
671.75	0.00	0.00	0.00	0.00
671.85	0.00	0.00	0.00	0.00
671.95	0.00	0.00	0.00	0.00
672.05	0.00	0.00	0.00	0.00
672.15	0.00	0.00	0.00	0.00
672.25	0.00	0.00	0.00	0.00
672.35	0.00	0.00	0.00	0.00
672.45	0.00	0.00	0.00	0.00
672.55	0.00	0.00	0.00	0.00
672.65	0.00	0.00	0.00	0.00
672.75	0.00	0.00	0.00	0.00
672.85	0.00	0.00	0.00	0.00
672.95	0.00	0.00	0.00	0.00
673.05	0.00	0.00	0.00	0.00
673.15	0.00	0.00	0.00	0.00
673.25	0.00	0.00	0.00	0.00
673.35	0.00	0.00	0.00	0.00
673.45	0.00	0.00	0.00	0.00
673.55	0.00	0.00	0.00	0.00
673.65	0.00	0.00	0.00	0.00
673.75	0.00	0.00	0.00	0.00
673.85	0.00	0.00	0.00	0.00
673.95	0.00	0.00	0.00	0.00
674.05	0.00	0.00	0.00	0.00
674.15	0.00	0.00	0.00	0.00
674.25	0.00	0.00	0.00	0.00
674.35	0.00	0.00	0.00	0.00
674.45	0.00	0.00	0.00	0.00
674.55	0.00	0.00	0.00	0.00
674.65	0.00	0.00	0.00	0.00
674.75	0.03	0.00	0.03	0.00
674.85	0.03	0.00	0.03	0.00
674.95	0.03	0.00	0.03	0.00
675.05	0.04	0.00	0.03	0.00
675.15	0.04	0.00	0.04	0.00
675.25	0.04	0.00	0.04	0.00
675.35	0.04	0.00	0.04	0.00
675.45	0.05	0.00	0.05	0.00
675.55	0.05	0.00	0.05	0.00
675.65	0.05	0.00	0.05	0.00
675.75	0.06	0.00	0.06	0.00
675.85	0.06	0.00	0.06	0.00
675.95	0.06	0.00	0.06	0.00
676.05	0.07	0.00	0.07	0.00
676.15	0.33	0.00	0.33	0.00
676.25	1.61	0.00	0.83	0.77

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Stage-Area-Storage for Pond 5P: W biofillter UNLINED

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
671.75	325	0	674.30	651	244
671.80	325	5	674.35	651	248
671.85	325	11	674.40	651	252
671.90	325	16	674.45	651	257
671.95	325	21	674.50	651	261
672.00	325	27	674.55	651	265
672.05	325	32	674.60	651	270
672.10	325	38	674.65	651	274
672.15	325	43	674.70	651	279
672.20	325	48	674.75	976	283
672.25	325	54	674.80	990	300
672.30	325	59	674.85	1,005	317
672.35	325	64	674.90	1,020	335
672.40	325	70	674.95	1,035	354
672.45	325	75	675.00	1,050	373
672.50	325	81	675.05	1,065	394
672.55	325	86	675.10	1,080	415
672.60	325	91	675.15	1,096	437
672.65	325	97	675.20	1,112	459
672.70	325	102	675.25	1,128	483
672.75	651	107	675.30	1,144	507
672.80	651	112	675.35	1,160	532
672.85	651	116	675.40	1,177	558
672.90	651	121	675.45	1,193	585
672.95	651	125	675.50	1,210	612
673.00	651	129	675.55	1,227	641
673.05	651	134	675.60	1,244	670
673.10	651	138	675.65	1,262	700
673.15	651	143	675.70	1,279	731
673.20	651	147	675.75	1,297	763
673.25	651	151	675.80	1,315	796
673.30	651	156	675.85	1,333	829
673.35	651	160	675.90	1,351	864
673.40	651	164	675.95	1,370	899
673.45	651	169	676.00	1,389	936
673.50	651	173	676.05	1,407	973
673.55	651	178	676.10	1,958	1,012
673.60	651	182	676.15	2,821	1,039
673.65	651	186	676.20	2,824	1,047
673.70	651	191	676.25	2,824	1,047
673.75	651	195			
673.80	651	200			
673.85	651	204			
673.90	651	208			
673.95	651	213			
674.00	651	217			
674.05	651	222			
674.10	651	226			
674.15	651	230			
674.20	651	235			
674.25	651	239			

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Summary for Pond 7P: 48" UG storage

[82] Warning: Early inflow requires earlier time span

[78] Warning: Submerged Pond 5P Primary device # 3 by 0.44'

Inflow Area = 0.730 ac, 45.41% Impervious, Inflow Depth > 3.09" for 100-Year event
Inflow = 1.07 cfs @ 12.27 hrs, Volume= 0.188 af
Outflow = 0.92 cfs @ 12.56 hrs, Volume= 0.188 af, Atten= 14%, Lag= 17.7 min
Primary = 0.92 cfs @ 12.56 hrs, Volume= 0.188 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 673.19' @ 12.56 hrs Surf.Area= 151 sf Storage= 555 cf

Plug-Flow detention time= 5.1 min calculated for 0.188 af (100% of inflow)
Center-of-Mass det. time= 4.7 min (815.0 - 810.3)

Volume	Invert	Avail.Storage	Storage Description
#1	669.82'	628 cf	48.0" Round Pipe Storage L= 50.0' S= 0.0026 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	669.82'	5.0" Round Culvert L= 4.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 669.82' / 669.80' S= 0.0050 '/ Cc= 0.900 n= 0.010, Flow Area= 0.14 sf

Primary OutFlow Max=0.92 cfs @ 12.56 hrs HW=673.19' (Free Discharge)

↑**1=Culvert** (Inlet Controls 0.92 cfs @ 6.76 fps)

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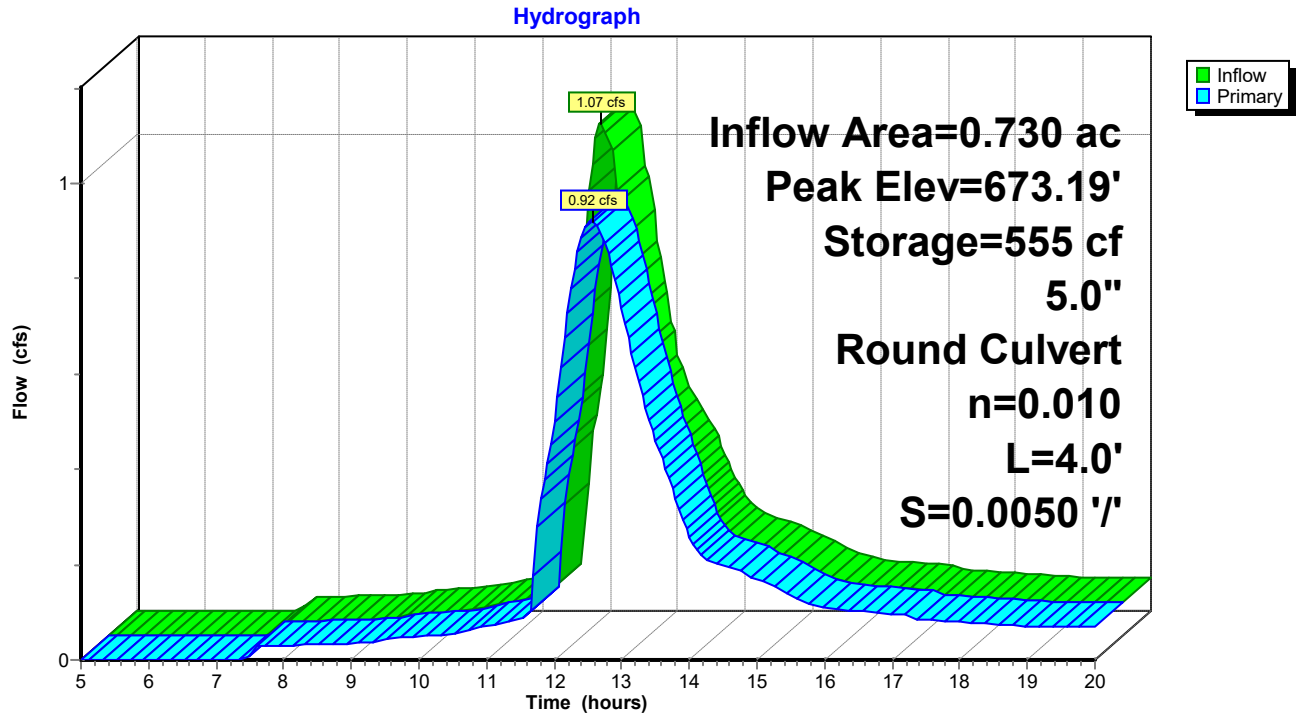
Chiro HCAD Propose + Run On AMENDED Mar. '26

MSE 24-hr 4 100-Year Rainfall=7.31"

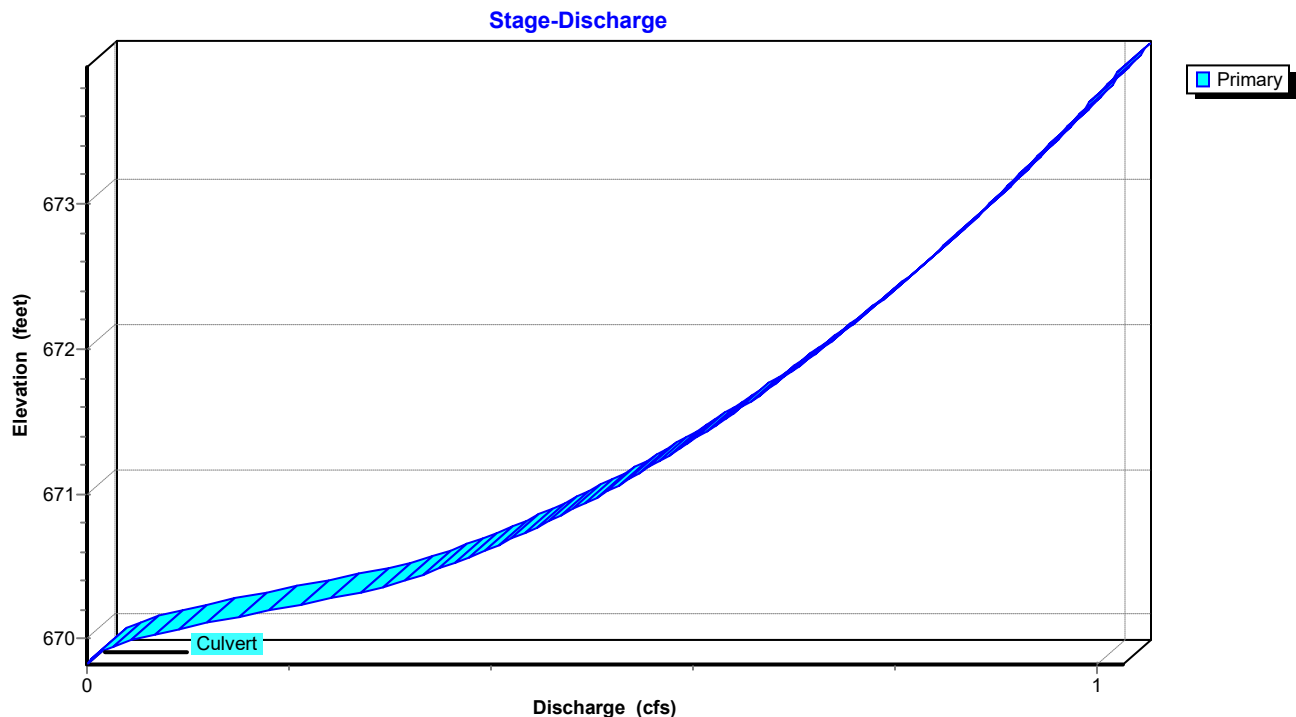
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Pond 7P: 48" UG storage



Pond 7P: 48" UG storage



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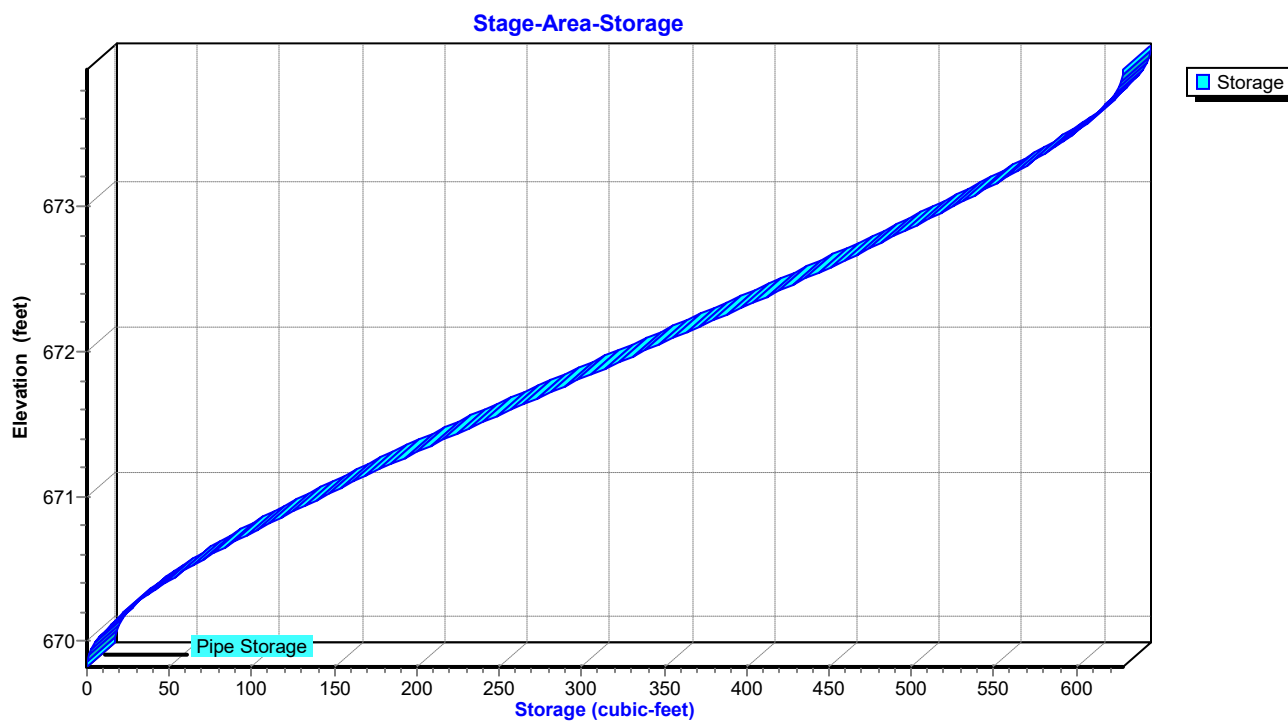
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Pond 7P: 48" UG storage



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MSE 24-hr 4 100-Year Rainfall=7.31"

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Hydrograph for Pond 7P: 48" UG storage

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
5.00	0.00	0	669.83	0.00
5.50	0.00	0	669.84	0.00
6.00	0.00	0	669.84	0.00
6.50	0.00	0	669.84	0.00
7.00	0.00	0	669.84	0.00
7.50	0.00	0	669.84	0.00
8.00	0.03	3	669.95	0.03
8.50	0.03	3	669.96	0.03
9.00	0.03	3	669.96	0.03
9.50	0.04	4	669.99	0.04
10.00	0.05	5	669.99	0.05
10.50	0.05	6	670.00	0.05
11.00	0.07	8	670.03	0.07
11.50	0.09	10	670.06	0.09
12.00	0.68	136	670.96	0.50
12.50	0.94	551	673.17	0.92
13.00	0.54	350	672.06	0.74
13.50	0.40	112	670.82	0.46
14.00	0.24	34	670.30	0.26
14.50	0.20	25	670.21	0.20
15.00	0.17	21	670.18	0.17
15.50	0.13	16	670.13	0.14
16.00	0.11	13	670.09	0.11
16.50	0.10	12	670.08	0.10
17.00	0.10	11	670.08	0.10
17.50	0.09	9	670.06	0.08
18.00	0.08	9	670.05	0.08
18.50	0.07	8	670.04	0.08
19.00	0.07	8	670.03	0.07
19.50	0.07	8	670.03	0.07
20.00	0.07	8	670.03	0.07

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MSE 24-hr 4 100-Year Rainfall=7.31"

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Stage-Discharge for Pond 7P: 48" UG storage

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
669.82	0.00	672.37	0.79
669.87	0.00	672.42	0.80
669.92	0.02	672.47	0.81
669.97	0.04	672.52	0.82
670.02	0.06	672.57	0.83
670.07	0.09	672.62	0.83
670.12	0.13	672.67	0.84
670.17	0.16	672.72	0.85
670.22	0.20	672.77	0.86
670.27	0.24	672.82	0.87
670.32	0.27	672.87	0.87
670.37	0.30	672.92	0.88
670.42	0.32	672.97	0.89
670.47	0.34	673.02	0.90
670.52	0.36	673.07	0.90
670.57	0.38	673.12	0.91
670.62	0.40	673.17	0.92
670.67	0.42	673.22	0.93
670.72	0.43	673.27	0.93
670.77	0.45	673.32	0.94
670.82	0.46	673.37	0.95
670.87	0.48	673.42	0.95
670.92	0.49	673.47	0.96
670.97	0.50	673.52	0.97
671.02	0.52	673.57	0.98
671.07	0.53	673.62	0.98
671.12	0.54	673.67	0.99
671.17	0.55	673.72	1.00
671.22	0.57	673.77	1.00
671.27	0.58	673.82	1.01
671.32	0.59	673.87	1.02
671.37	0.60	673.92	1.02
671.42	0.61		
671.47	0.62		
671.52	0.63		
671.57	0.64		
671.62	0.65		
671.67	0.66		
671.72	0.67		
671.77	0.68		
671.82	0.69		
671.87	0.70		
671.92	0.71		
671.97	0.72		
672.02	0.73		
672.07	0.74		
672.12	0.75		
672.17	0.76		
672.22	0.77		
672.27	0.78		
672.32	0.78		

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MSE 24-hr 4 100-Year Rainfall=7.31"

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Stage-Area-Storage for Pond 7P: 48" UG storage

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
669.82	0	672.37	410
669.87	0	672.42	420
669.92	1	672.47	429
669.97	4	672.52	439
670.02	7	672.57	448
670.07	11	672.62	458
670.12	15	672.67	467
670.17	20	672.72	476
670.22	25	672.77	485
670.27	31	672.82	494
670.32	37	672.87	503
670.37	43	672.92	511
670.42	50	672.97	520
670.47	57	673.02	528
670.52	64	673.07	536
670.57	72	673.12	544
670.62	79	673.17	552
670.67	87	673.22	560
670.72	95	673.27	567
670.77	103	673.32	574
670.82	112	673.37	581
670.87	120	673.42	587
670.92	129	673.47	594
670.97	138	673.52	600
671.02	147	673.57	605
671.07	156	673.62	610
671.12	165	673.67	615
671.17	174	673.72	619
671.22	184	673.77	623
671.27	193	673.82	626
671.32	203	673.87	628
671.37	212	673.92	628
671.42	222		
671.47	232		
671.52	242		
671.57	251		
671.62	261		
671.67	271		
671.72	281		
671.77	291		
671.82	301		
671.87	311		
671.92	321		
671.97	331		
672.02	341		
672.07	351		
672.12	361		
672.17	371		
672.22	381		
672.27	391		
672.32	400		

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MSE 24-hr 4 100-Year Rainfall=7.31"

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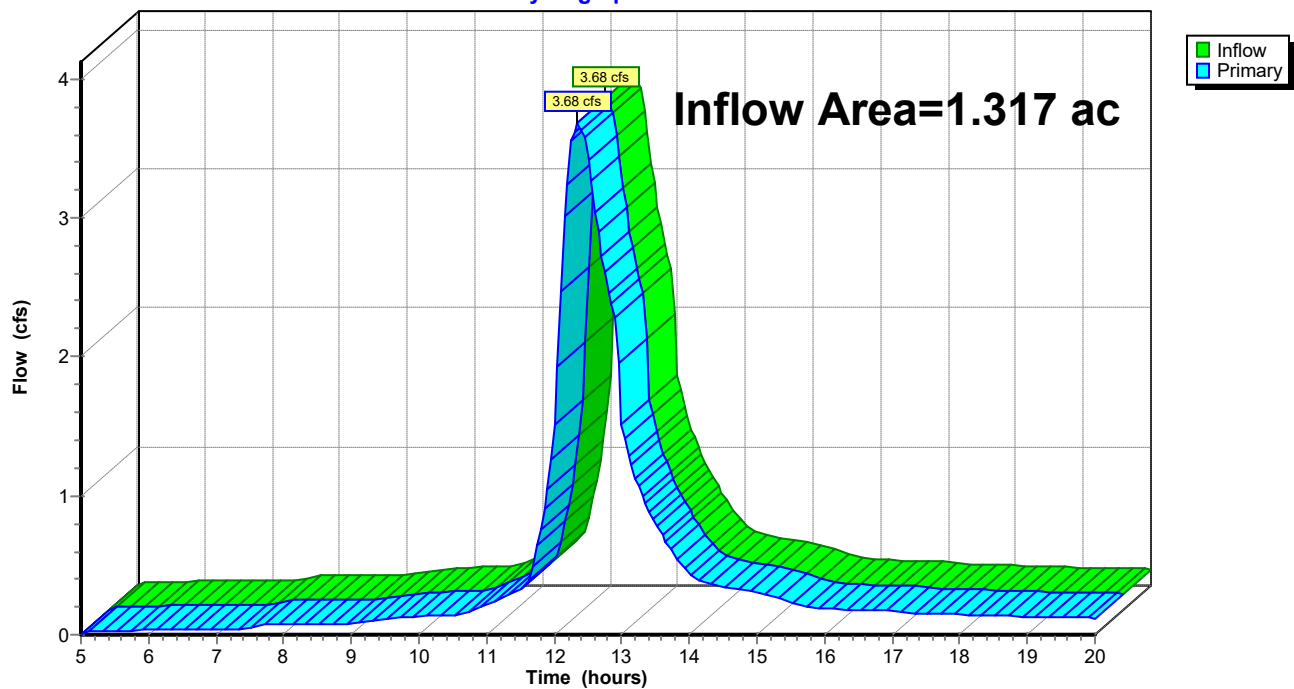
Summary for Link 2L: (new Link)

Inflow Area = 1.317 ac, 48.47% Impervious, Inflow Depth > 4.41" for 100-Year event
Inflow = 3.68 cfs @ 12.35 hrs, Volume= 0.484 af
Primary = 3.68 cfs @ 12.35 hrs, Volume= 0.484 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: (new Link)

Hydrograph



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MSE 24-hr 4 100-Year Rainfall=7.31"

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Hydrograph for Link 2L: (new Link)

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.01	0.00	0.01	17.75	0.15	0.00	0.15
5.25	0.03	0.00	0.03	18.00	0.15	0.00	0.15
5.50	0.03	0.00	0.03	18.25	0.14	0.00	0.14
5.75	0.03	0.00	0.03	18.50	0.14	0.00	0.14
6.00	0.03	0.00	0.03	18.75	0.13	0.00	0.13
6.25	0.03	0.00	0.03	19.00	0.13	0.00	0.13
6.50	0.04	0.00	0.04	19.25	0.13	0.00	0.13
6.75	0.04	0.00	0.04	19.50	0.12	0.00	0.12
7.00	0.04	0.00	0.04	19.75	0.12	0.00	0.12
7.25	0.04	0.00	0.04	20.00	0.12	0.00	0.12
7.50	0.04	0.00	0.04				
7.75	0.07	0.00	0.07				
8.00	0.07	0.00	0.07				
8.25	0.08	0.00	0.08				
8.50	0.08	0.00	0.08				
8.75	0.08	0.00	0.08				
9.00	0.08	0.00	0.08				
9.25	0.09	0.00	0.09				
9.50	0.11	0.00	0.11				
9.75	0.12	0.00	0.12				
10.00	0.13	0.00	0.13				
10.25	0.14	0.00	0.14				
10.50	0.14	0.00	0.14				
10.75	0.17	0.00	0.17				
11.00	0.22	0.00	0.22				
11.25	0.27	0.00	0.27				
11.50	0.33	0.00	0.33				
11.75	0.64	0.00	0.64				
12.00	1.52	0.00	1.52				
12.25	3.56	0.00	3.56				
12.50	3.41	0.00	3.41				
12.75	2.61	0.00	2.61				
13.00	1.51	0.00	1.51				
13.25	1.07	0.00	1.07				
13.50	0.80	0.00	0.80				
13.75	0.60	0.00	0.60				
14.00	0.44	0.00	0.44				
14.25	0.37	0.00	0.37				
14.50	0.34	0.00	0.34				
14.75	0.33	0.00	0.33				
15.00	0.30	0.00	0.30				
15.25	0.27	0.00	0.27				
15.50	0.23	0.00	0.23				
15.75	0.20	0.00	0.20				
16.00	0.19	0.00	0.19				
16.25	0.18	0.00	0.18				
16.50	0.18	0.00	0.18				
16.75	0.17	0.00	0.17				
17.00	0.17	0.00	0.17				
17.25	0.16	0.00	0.16				
17.50	0.15	0.00	0.15				

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.027	98	1/2 roof (7S)
0.046	98	N part driveway (4S)
0.005	98	N part parking lot (4S)
0.011	61	NDS 13 lawn (5S)
0.013	61	NDS 14-15 lawn berm, HSG B, good (5S)
0.015	98	NE 1/4 roof (1S)
0.014	98	NW 1/4 roof (8S)
0.055	98	S driveway (6S)
0.073	98	S part parking lot (3S)
0.004	98	SW (3S)
0.017	61	bark mulch landscape (6S)
0.015	100	bio media (1S, 4S)
0.005	61	landscape (4S)
0.018	61	lawn above wall (3S)
0.151	61	lawn, HSG B, good (1S, 3S, 4S, 6S)
0.014	98	retain wall (1S, 3S, 6S)
0.483	82	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.164	HSG B	1S, 3S, 4S, 5S, 6S
0.000	HSG C	
0.000	HSG D	
0.319	Other	1S, 3S, 4S, 5S, 6S, 7S, 8S
0.483		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	0.027	0.027	1/2 roof	7S
0.000	0.000	0.000	0.000	0.046	0.046	N part driveway	4S
0.000	0.000	0.000	0.000	0.005	0.005	N part parking lot	4S
0.000	0.000	0.000	0.000	0.011	0.011	NDS 13 lawn	5S
0.000	0.013	0.000	0.000	0.000	0.013	NDS 14-15 lawn berm	5S
0.000	0.000	0.000	0.000	0.015	0.015	NE 1/4 roof	1S
0.000	0.000	0.000	0.000	0.014	0.014	NW 1/4 roof	8S
0.000	0.000	0.000	0.000	0.055	0.055	S driveway	6S
0.000	0.000	0.000	0.000	0.073	0.073	S part parking lot	3S
0.000	0.000	0.000	0.000	0.004	0.004	SW	3S
0.000	0.000	0.000	0.000	0.017	0.017	bark mulch landscape	6S
0.000	0.000	0.000	0.000	0.015	0.015	bio media	1S, 4S
0.000	0.000	0.000	0.000	0.005	0.005	landscape	4S
0.000	0.151	0.000	0.000	0.000	0.151	lawn	1S, 3S, 4S, 6S
0.000	0.000	0.000	0.000	0.018	0.018	lawn above wall	3S
0.000	0.000	0.000	0.000	0.014	0.014	retain wall	1S, 3S, 6S
0.000	0.164	0.000	0.000	0.319	0.483	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	3R	676.38	675.93	87.0	0.0052	0.010	8.0	0.0	0.0
2	4R	668.80	658.52	77.0	0.1335	0.010	6.0	0.0	0.0
3	7P	668.82	668.80	4.0	0.0050	0.010	5.0	0.0	0.0

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Notes Listing (all nodes)

Line#	Node Number	Notes
1	Project	Rainfall events imported from "NRCS-Rain.txt" for 9170 WI La Crosse
2		Rainfall events imported from "NRCS-Rain.txt" for 9170 WI La Crosse

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: To E Biofilter	Runoff Area=1,875 sf 57.33% Impervious Runoff Depth>1.63" Flow Length=25' Tc=8.0 min CN=WQ Runoff=0.09 cfs 0.006 af
Subcatchment 3S: to curb inlet	Runoff Area=5,020 sf 68.92% Impervious Runoff Depth>1.88" Flow Length=150' Tc=10.0 min CN=WQ Runoff=0.26 cfs 0.018 af
Subcatchment 4S: to W biofilter	Runoff Area=4,490 sf 59.91% Impervious Runoff Depth>1.68" Flow Length=140' Tc=6.0 min CN=WQ Runoff=0.24 cfs 0.014 af
Subcatchment 5S: to NDS 13-14-15	Runoff Area=1,050 sf 0.00% Impervious Runoff Depth>0.31" Flow Length=175' Tc=8.0 min CN=WQ Runoff=0.01 cfs 0.001 af
Subcatchment 6S: untreated	Runoff Area=6,820 sf 39.15% Impervious Runoff Depth>1.20" Flow Length=100' Tc=15.0 min CN=WQ Runoff=0.19 cfs 0.016 af
Subcatchment 7S: S 1/2 roof to 8" PVC	Runoff Area=1,190 sf 100.00% Impervious Runoff Depth>2.58" Flow Length=25' Tc=5.0 min CN=98 Runoff=0.10 cfs 0.006 af
Subcatchment 8S: NW 1/4 roof	Runoff Area=595 sf 100.00% Impervious Runoff Depth>2.58" Flow Length=25' Tc=5.0 min CN=98 Runoff=0.05 cfs 0.003 af
Reach 3R: S. 8" PVC	Avg. Flow Depth=0.14' Max Vel=2.02 fps Inflow=0.11 cfs 0.006 af 8.0" Round Pipe n=0.010 L=87.0' S=0.0052 '/' Capacity=1.13 cfs Outflow=0.10 cfs 0.006 af
Reach 4R: W. 6" PVC	Avg. Flow Depth=0.09' Max Vel=7.94 fps Inflow=0.20 cfs 0.040 af 6.0" Round Pipe n=0.010 L=77.0' S=0.1335 '/' Capacity=2.67 cfs Outflow=0.20 cfs 0.040 af
Pond 3P: E biofilter LINED	Peak Elev=680.51' Storage=121 cf Inflow=0.09 cfs 0.006 af Primary=0.03 cfs 0.005 af Secondary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.005 af
Pond 5P: W biofillter UNLINED	Peak Elev=675.85' Storage=832 cf Inflow=0.49 cfs 0.032 af Discarded=0.00 cfs 0.000 af Primary=0.06 cfs 0.026 af Secondary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.026 af
Pond 7P: 48" UG storage	Peak Elev=669.22' Storage=25 cf Inflow=0.21 cfs 0.040 af 5.0" Round Culvert n=0.010 L=4.0' S=0.0050 '/' Outflow=0.20 cfs 0.040 af
Link 2L: frontage rd	Inflow=0.37 cfs 0.055 af Primary=0.37 cfs 0.055 af
Total Runoff Area = 0.483 ac Runoff Volume = 0.063 af Average Runoff Depth = 1.57"	
44.49% Pervious = 0.215 ac 55.51% Impervious = 0.268 ac	

Summary for Subcatchment 1S: To E Biofilter

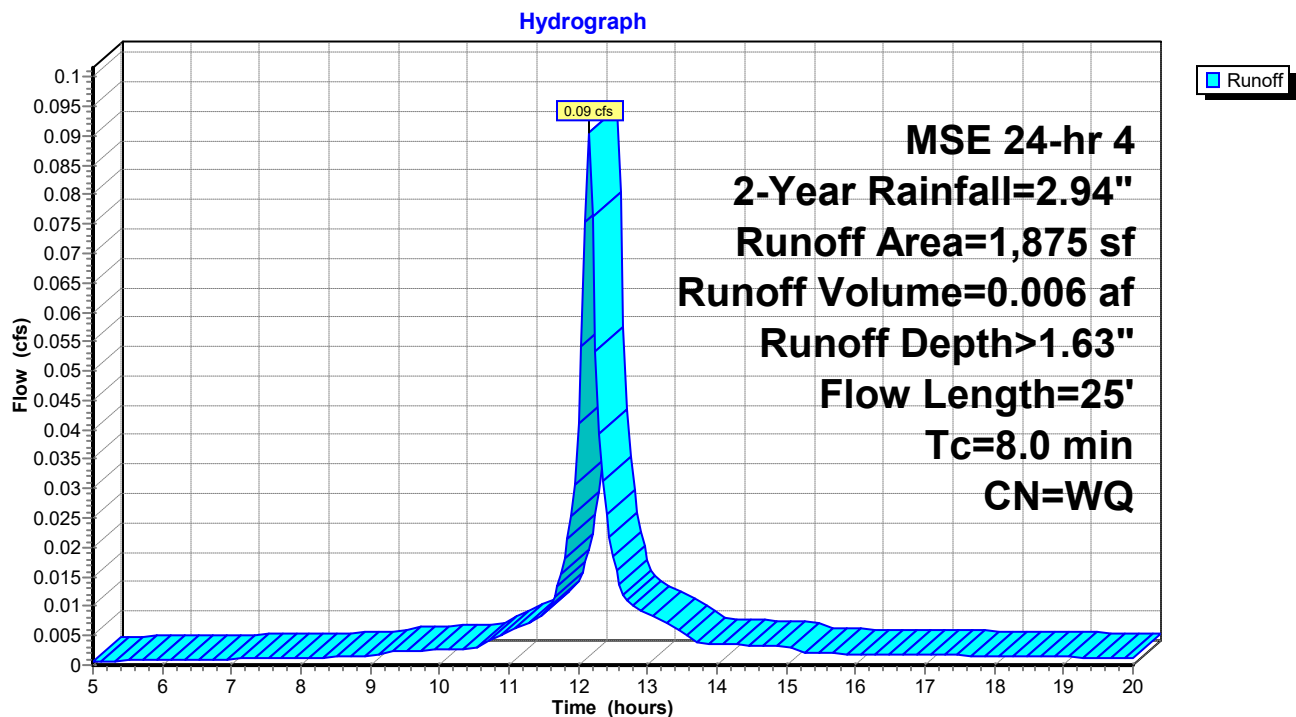
Runoff = 0.09 cfs @ 12.15 hrs, Volume= 0.006 af, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
*	800	61	lawn, HSG B, good
*	645	98	NE 1/4 roof
*	210	100	bio media
*	220	98	retain wall
	1,875		Weighted Average
	800		42.67% Pervious Area
	1,075		57.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	25		0.05		Direct Entry, lawn above wall to E bio

Subcatchment 1S: To E Biofilter



Hydrograph for Subcatchment 1S: To E Biofilter

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.13	0.00	0.00	17.75	2.75	1.18	0.00
5.25	0.15	0.00	0.00	18.00	2.76	1.19	0.00
5.50	0.16	0.00	0.00	18.25	2.77	1.20	0.00
5.75	0.17	0.00	0.00	18.50	2.78	1.21	0.00
6.00	0.18	0.00	0.00	18.75	2.79	1.22	0.00
6.25	0.19	0.00	0.00	19.00	2.81	1.23	0.00
6.50	0.21	0.00	0.00	19.25	2.82	1.24	0.00
6.75	0.22	0.00	0.00	19.50	2.83	1.24	0.00
7.00	0.23	0.00	0.00	19.75	2.84	1.25	0.00
7.25	0.25	0.00	0.00	20.00	2.84	1.26	0.00
7.50	0.26	0.00	0.00				
7.75	0.28	0.00	0.00				
8.00	0.29	0.00	0.00				
8.25	0.31	0.00	0.00				
8.50	0.32	0.00	0.00				
8.75	0.34	0.00	0.00				
9.00	0.36	0.00	0.00				
9.25	0.38	0.00	0.00				
9.50	0.41	0.00	0.00				
9.75	0.44	0.00	0.00				
10.00	0.47	0.00	0.00				
10.25	0.50	0.00	0.00				
10.50	0.53	0.00	0.00				
10.75	0.57	0.01	0.00				
11.00	0.64	0.02	0.01				
11.25	0.71	0.03	0.01				
11.50	0.80	0.05	0.01				
11.75	0.96	0.10	0.02				
12.00	1.38	0.28	0.04				
12.25	1.98	0.63	0.05				
12.50	2.14	0.74	0.02				
12.75	2.23	0.80	0.01				
13.00	2.30	0.86	0.01				
13.25	2.37	0.90	0.01				
13.50	2.41	0.94	0.01				
13.75	2.44	0.96	0.00				
14.00	2.47	0.98	0.00				
14.25	2.50	1.00	0.00				
14.50	2.53	1.02	0.00				
14.75	2.56	1.04	0.00				
15.00	2.58	1.06	0.00				
15.25	2.60	1.07	0.00				
15.50	2.62	1.08	0.00				
15.75	2.63	1.10	0.00				
16.00	2.65	1.11	0.00				
16.25	2.66	1.12	0.00				
16.50	2.68	1.13	0.00				
16.75	2.69	1.14	0.00				
17.00	2.71	1.15	0.00				
17.25	2.72	1.16	0.00				
17.50	2.73	1.17	0.00				

Summary for Subcatchment 3S: to curb inlet

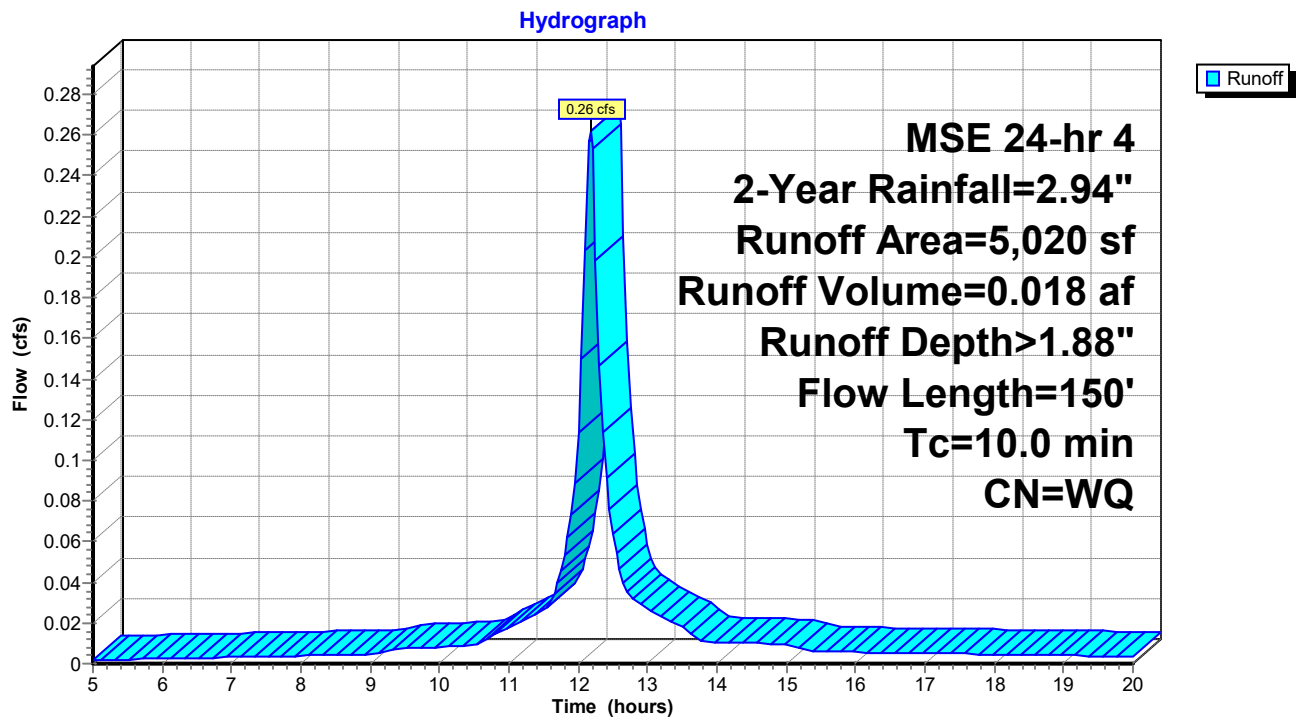
Runoff = 0.26 cfs @ 12.17 hrs, Volume= 0.018 af, Depth> 1.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
*	3,200	98	S part parking lot
*	160	98	SW
*	780	61	lawn, HSG B, good
*	780	61	lawn above wall
*	100	98	retain wall
	5,020		Weighted Average
	1,560		31.08% Pervious Area
	3,460		68.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	150		0.25		Direct Entry, LAXVC lawn via AC pavement

Subcatchment 3S: to curb inlet



Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Hydrograph for Subcatchment 3S: to curb inlet

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.13	0.00	0.00	17.75	2.75	1.52	0.00
5.25	0.15	0.00	0.00	18.00	2.76	1.53	0.00
5.50	0.16	0.00	0.00	18.25	2.77	1.54	0.00
5.75	0.17	0.00	0.00	18.50	2.78	1.55	0.00
6.00	0.18	0.00	0.00	18.75	2.79	1.56	0.00
6.25	0.19	0.00	0.00	19.00	2.81	1.57	0.00
6.50	0.21	0.00	0.00	19.25	2.82	1.58	0.00
6.75	0.22	0.00	0.00	19.50	2.83	1.59	0.00
7.00	0.23	0.00	0.00	19.75	2.84	1.60	0.00
7.25	0.25	0.00	0.00	20.00	2.84	1.60	0.00
7.50	0.26	0.00	0.00				
7.75	0.28	0.00	0.00				
8.00	0.29	0.00	0.00				
8.25	0.31	0.00	0.00				
8.50	0.32	0.00	0.00				
8.75	0.34	0.00	0.00				
9.00	0.36	0.00	0.00				
9.25	0.38	0.00	0.01				
9.50	0.41	0.01	0.01				
9.75	0.44	0.01	0.01				
10.00	0.47	0.02	0.01				
10.25	0.50	0.02	0.01				
10.50	0.53	0.03	0.01				
10.75	0.57	0.04	0.01				
11.00	0.64	0.06	0.02				
11.25	0.71	0.09	0.02				
11.50	0.80	0.13	0.03				
11.75	0.96	0.20	0.05				
12.00	1.38	0.45	0.11				
12.25	1.98	0.89	0.20				
12.50	2.14	1.02	0.06				
12.75	2.23	1.09	0.03				
13.00	2.30	1.15	0.03				
13.25	2.37	1.20	0.02				
13.50	2.41	1.24	0.02				
13.75	2.44	1.26	0.01				
14.00	2.47	1.29	0.01				
14.25	2.50	1.31	0.01				
14.50	2.53	1.34	0.01				
14.75	2.56	1.36	0.01				
15.00	2.58	1.38	0.01				
15.25	2.60	1.40	0.01				
15.50	2.62	1.41	0.01				
15.75	2.63	1.42	0.01				
16.00	2.65	1.44	0.01				
16.25	2.66	1.45	0.01				
16.50	2.68	1.46	0.01				
16.75	2.69	1.47	0.01				
17.00	2.71	1.49	0.01				
17.25	2.72	1.50	0.01				
17.50	2.73	1.51	0.00				

Summary for Subcatchment 4S: to W biofilter

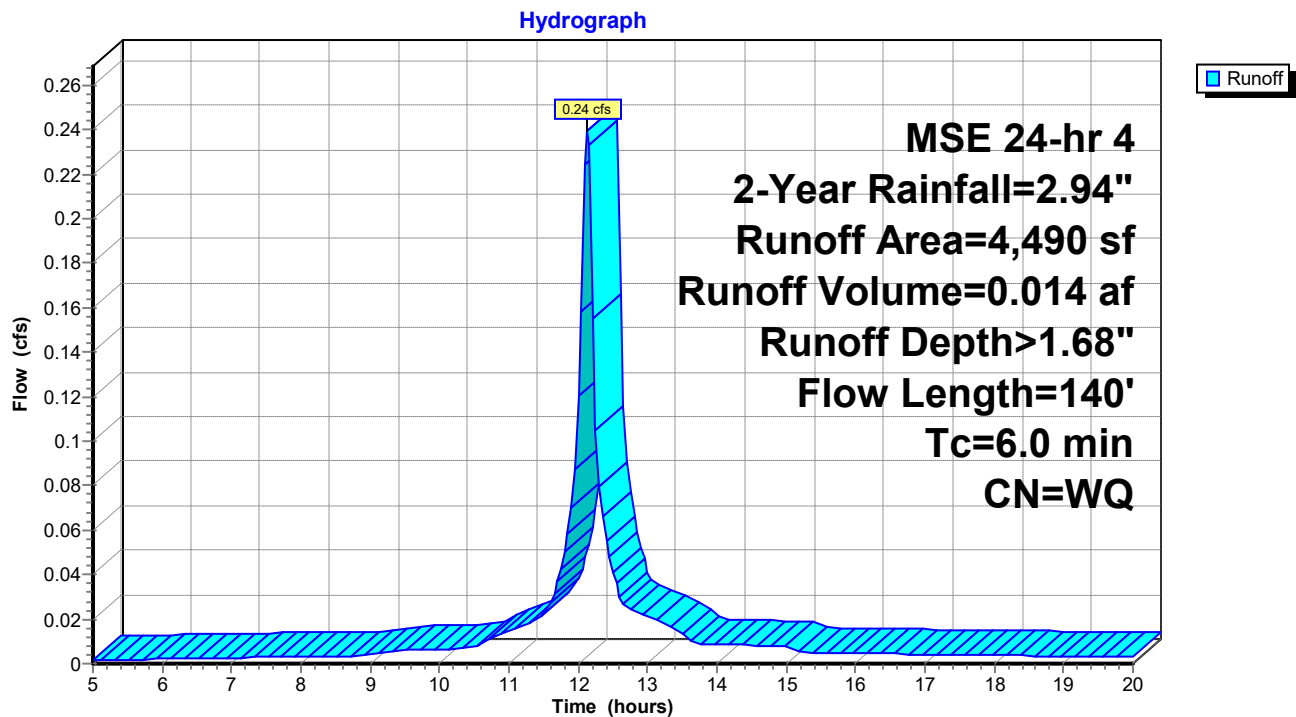
Runoff = 0.24 cfs @ 12.13 hrs, Volume= 0.014 af, Depth> 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
*	2,000	98	N part driveway
*	230	98	N part parking lot
*	1,600	61	lawn, HSG B, good
*	460	100	bio media
*	200	61	landscape
	4,490		Weighted Average
	1,800		40.09% Pervious Area
	2,690		59.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	140		0.39		Direct Entry, lawn via parking

Subcatchment 4S: to W biofilter



Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Hydrograph for Subcatchment 4S: to W biofilter

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.13	0.00	0.00	17.75	2.75	1.25	0.00
5.25	0.15	0.00	0.00	18.00	2.76	1.26	0.00
5.50	0.16	0.00	0.00	18.25	2.77	1.26	0.00
5.75	0.17	0.00	0.00	18.50	2.78	1.27	0.00
6.00	0.18	0.00	0.00	18.75	2.79	1.28	0.00
6.25	0.19	0.00	0.00	19.00	2.81	1.29	0.00
6.50	0.21	0.00	0.00	19.25	2.82	1.30	0.00
6.75	0.22	0.00	0.00	19.50	2.83	1.31	0.00
7.00	0.23	0.00	0.00	19.75	2.84	1.32	0.00
7.25	0.25	0.00	0.00	20.00	2.84	1.32	0.00
7.50	0.26	0.00	0.00				
7.75	0.28	0.00	0.00				
8.00	0.29	0.00	0.00				
8.25	0.31	0.00	0.00				
8.50	0.32	0.00	0.00				
8.75	0.34	0.00	0.00				
9.00	0.36	0.00	0.00				
9.25	0.38	0.00	0.01				
9.50	0.41	0.00	0.01				
9.75	0.44	0.00	0.01				
10.00	0.47	0.00	0.01				
10.25	0.50	0.00	0.01				
10.50	0.53	0.01	0.01				
10.75	0.57	0.01	0.01				
11.00	0.64	0.02	0.01				
11.25	0.71	0.04	0.02				
11.50	0.80	0.06	0.02				
11.75	0.96	0.12	0.04				
12.00	1.38	0.31	0.12				
12.25	1.98	0.68	0.10				
12.50	2.14	0.79	0.04				
12.75	2.23	0.86	0.02				
13.00	2.30	0.91	0.02				
13.25	2.37	0.96	0.02				
13.50	2.41	0.99	0.01				
13.75	2.44	1.01	0.01				
14.00	2.47	1.04	0.01				
14.25	2.50	1.06	0.01				
14.50	2.53	1.08	0.01				
14.75	2.56	1.10	0.01				
15.00	2.58	1.12	0.01				
15.25	2.60	1.13	0.01				
15.50	2.62	1.15	0.00				
15.75	2.63	1.16	0.00				
16.00	2.65	1.17	0.00				
16.25	2.66	1.18	0.00				
16.50	2.68	1.19	0.00				
16.75	2.69	1.20	0.00				
17.00	2.71	1.21	0.00				
17.25	2.72	1.23	0.00				
17.50	2.73	1.24	0.00				

Summary for Subcatchment 5S: to NDS 13-14-15

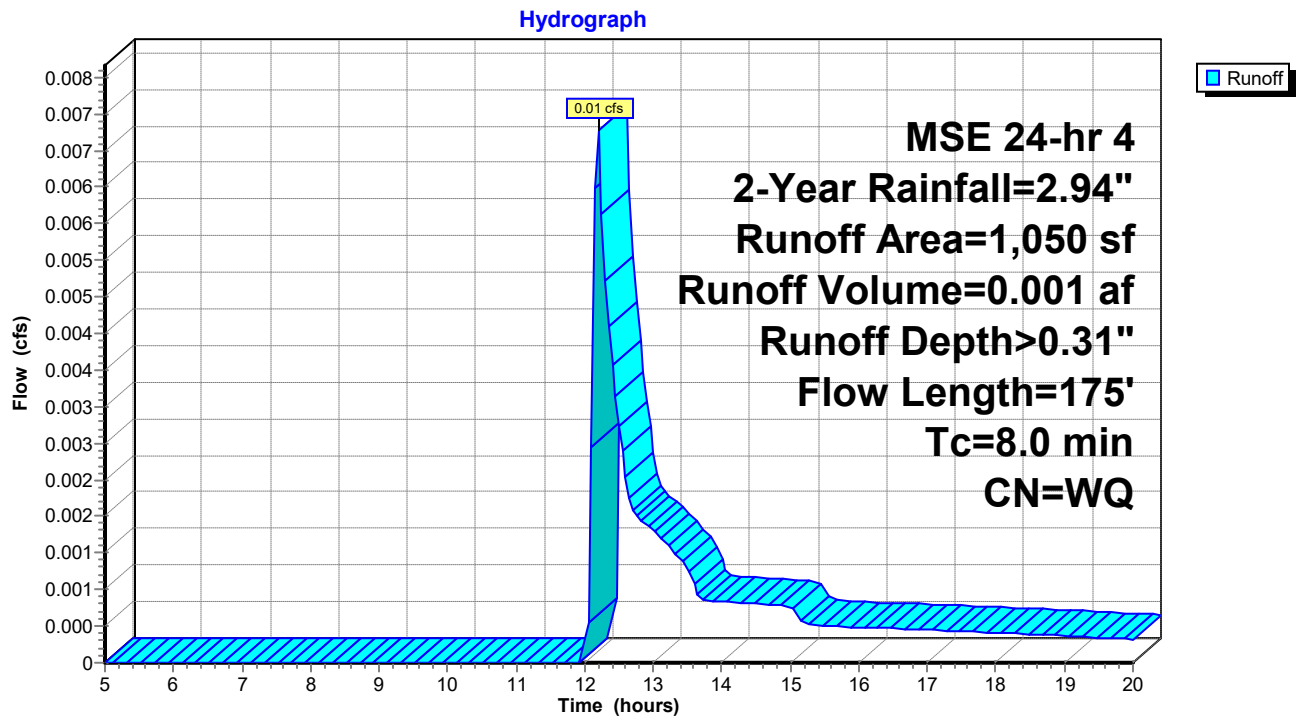
Runoff = 0.01 cfs @ 12.20 hrs, Volume= 0.001 af, Depth> 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
*	550	61	NDS 14-15 lawn berm, HSG B, good
*	500	61	NDS 13 lawn
	1,050		Weighted Average
	1,050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	175		0.36		Direct Entry, lawn berm

Subcatchment 5S: to NDS 13-14-15



Hydrograph for Subcatchment 5S: to NDS 13-14-15

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.13	0.00	0.00	17.75	2.75	0.27	0.00
5.25	0.15	0.00	0.00	18.00	2.76	0.28	0.00
5.50	0.16	0.00	0.00	18.25	2.77	0.28	0.00
5.75	0.17	0.00	0.00	18.50	2.78	0.29	0.00
6.00	0.18	0.00	0.00	18.75	2.79	0.29	0.00
6.25	0.19	0.00	0.00	19.00	2.81	0.29	0.00
6.50	0.21	0.00	0.00	19.25	2.82	0.30	0.00
6.75	0.22	0.00	0.00	19.50	2.83	0.30	0.00
7.00	0.23	0.00	0.00	19.75	2.84	0.30	0.00
7.25	0.25	0.00	0.00	20.00	2.84	0.31	0.00
7.50	0.26	0.00	0.00				
7.75	0.28	0.00	0.00				
8.00	0.29	0.00	0.00				
8.25	0.31	0.00	0.00				
8.50	0.32	0.00	0.00				
8.75	0.34	0.00	0.00				
9.00	0.36	0.00	0.00				
9.25	0.38	0.00	0.00				
9.50	0.41	0.00	0.00				
9.75	0.44	0.00	0.00				
10.00	0.47	0.00	0.00				
10.25	0.50	0.00	0.00				
10.50	0.53	0.00	0.00				
10.75	0.57	0.00	0.00				
11.00	0.64	0.00	0.00				
11.25	0.71	0.00	0.00				
11.50	0.80	0.00	0.00				
11.75	0.96	0.00	0.00				
12.00	1.38	0.00	0.00				
12.25	1.98	0.07	0.01				
12.50	2.14	0.10	0.00				
12.75	2.23	0.12	0.00				
13.00	2.30	0.14	0.00				
13.25	2.37	0.16	0.00				
13.50	2.41	0.17	0.00				
13.75	2.44	0.18	0.00				
14.00	2.47	0.19	0.00				
14.25	2.50	0.20	0.00				
14.50	2.53	0.21	0.00				
14.75	2.56	0.21	0.00				
15.00	2.58	0.22	0.00				
15.25	2.60	0.23	0.00				
15.50	2.62	0.23	0.00				
15.75	2.63	0.24	0.00				
16.00	2.65	0.24	0.00				
16.25	2.66	0.25	0.00				
16.50	2.68	0.25	0.00				
16.75	2.69	0.26	0.00				
17.00	2.71	0.26	0.00				
17.25	2.72	0.27	0.00				
17.50	2.73	0.27	0.00				

Summary for Subcatchment 6S: untreated

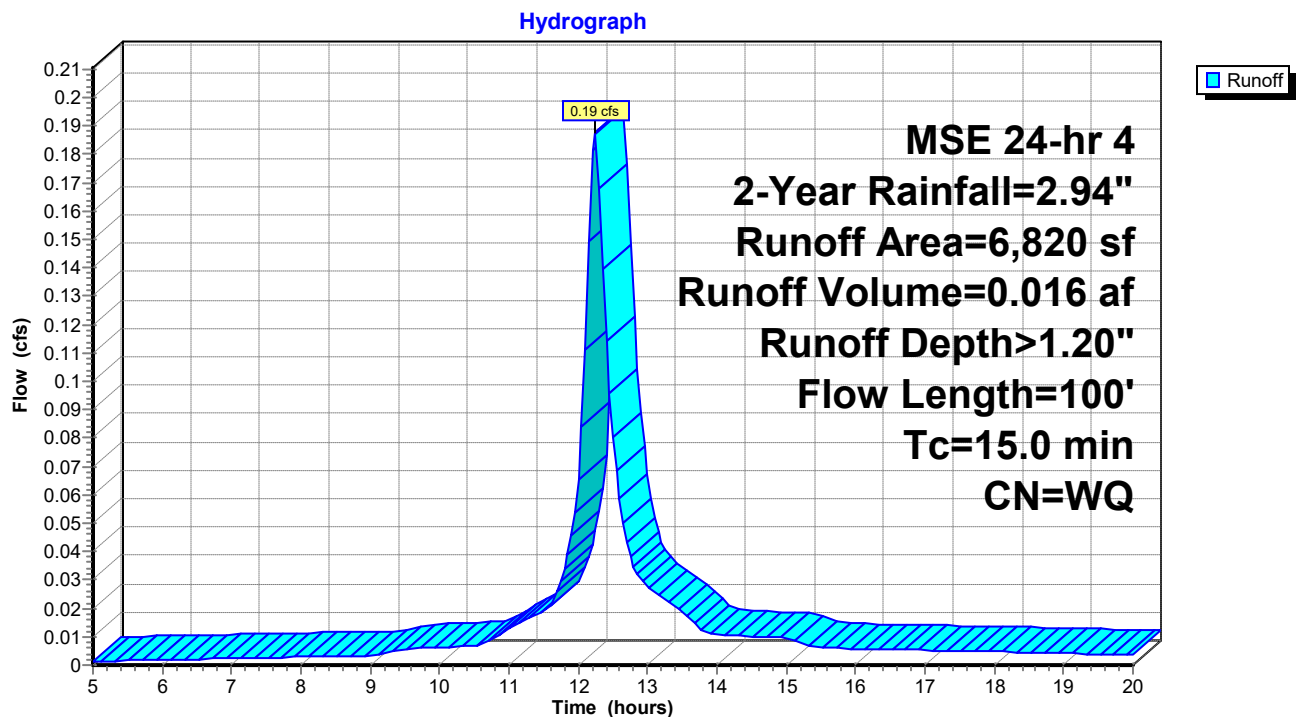
Runoff = 0.19 cfs @ 12.24 hrs, Volume= 0.016 af, Depth> 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
*	2,400	98	S driveway
*	3,400	61	lawn, HSG B, good
*	750	61	bark mulch landscape
*	270	98	retain wall
	6,820		Weighted Average
	4,150		60.85% Pervious Area
	2,670		39.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100		0.11		Direct Entry, landscape to street

Subcatchment 6S: untreated



Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Hydrograph for Subcatchment 6S: untreated

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.13	0.00	0.00	17.75	2.75	0.80	0.00
5.25	0.15	0.00	0.00	18.00	2.76	0.81	0.00
5.50	0.16	0.00	0.00	18.25	2.77	0.81	0.00
5.75	0.17	0.00	0.00	18.50	2.78	0.82	0.00
6.00	0.18	0.00	0.00	18.75	2.79	0.83	0.00
6.25	0.19	0.00	0.00	19.00	2.81	0.84	0.00
6.50	0.21	0.00	0.00	19.25	2.82	0.84	0.00
6.75	0.22	0.00	0.00	19.50	2.83	0.85	0.00
7.00	0.23	0.00	0.00	19.75	2.84	0.85	0.00
7.25	0.25	0.00	0.00	20.00	2.84	0.86	0.00
7.50	0.26	0.00	0.00				
7.75	0.28	0.00	0.00				
8.00	0.29	0.00	0.00				
8.25	0.31	0.00	0.00				
8.50	0.32	0.00	0.00				
8.75	0.34	0.00	0.00				
9.00	0.36	0.00	0.00				
9.25	0.38	0.00	0.00				
9.50	0.41	0.00	0.01				
9.75	0.44	0.00	0.01				
10.00	0.47	0.00	0.01				
10.25	0.50	0.00	0.01				
10.50	0.53	0.00	0.01				
10.75	0.57	0.00	0.01				
11.00	0.64	0.00	0.01				
11.25	0.71	0.00	0.02				
11.50	0.80	0.00	0.02				
11.75	0.96	0.02	0.03				
12.00	1.38	0.12	0.07				
12.25	1.98	0.37	0.19				
12.50	2.14	0.45	0.08				
12.75	2.23	0.50	0.04				
13.00	2.30	0.54	0.03				
13.25	2.37	0.57	0.02				
13.50	2.41	0.60	0.02				
13.75	2.44	0.62	0.01				
14.00	2.47	0.64	0.01				
14.25	2.50	0.65	0.01				
14.50	2.53	0.67	0.01				
14.75	2.56	0.68	0.01				
15.00	2.58	0.70	0.01				
15.25	2.60	0.71	0.01				
15.50	2.62	0.72	0.01				
15.75	2.63	0.73	0.01				
16.00	2.65	0.74	0.01				
16.25	2.66	0.75	0.01				
16.50	2.68	0.76	0.01				
16.75	2.69	0.77	0.01				
17.00	2.71	0.77	0.01				
17.25	2.72	0.78	0.01				
17.50	2.73	0.79	0.01				

Summary for Subcatchment 7S: S 1/2 roof to 8" PVC

[49] Hint: Tc<2dt may require smaller dt

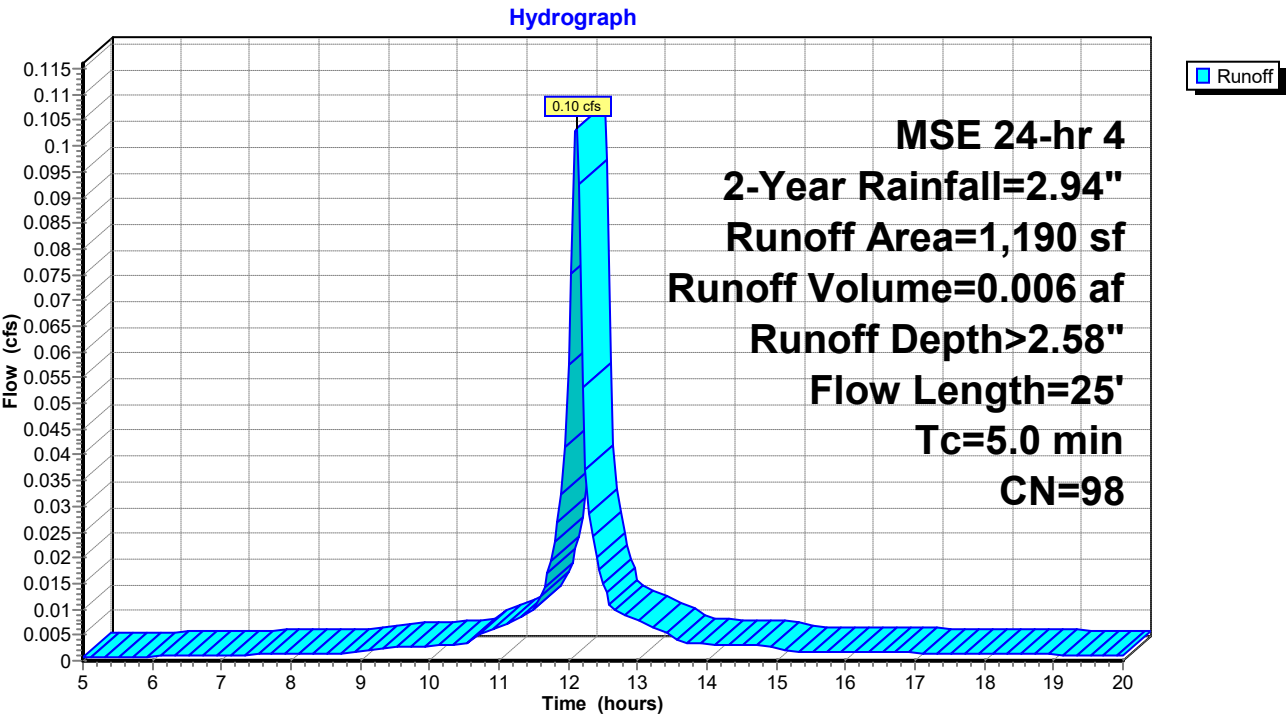
Runoff = 0.10 cfs @ 12.11 hrs, Volume= 0.006 af, Depth> 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
*	1,190	98	1/2 roof
	1,190		100.00% Impervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
5.0	25		0.08		Direct Entry, S 1/2 roof

Subcatchment 7S: S 1/2 roof to 8" PVC



Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Hydrograph for Subcatchment 7S: S 1/2 roof to 8" PVC

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.13	0.03	0.00	17.75	2.75	2.52	0.00
5.25	0.15	0.04	0.00	18.00	2.76	2.53	0.00
5.50	0.16	0.04	0.00	18.25	2.77	2.54	0.00
5.75	0.17	0.05	0.00	18.50	2.78	2.55	0.00
6.00	0.18	0.06	0.00	18.75	2.79	2.56	0.00
6.25	0.19	0.07	0.00	19.00	2.81	2.57	0.00
6.50	0.21	0.07	0.00	19.25	2.82	2.58	0.00
6.75	0.22	0.08	0.00	19.50	2.83	2.59	0.00
7.00	0.23	0.09	0.00	19.75	2.84	2.60	0.00
7.25	0.25	0.10	0.00	20.00	2.84	2.61	0.00
7.50	0.26	0.11	0.00				
7.75	0.28	0.13	0.00				
8.00	0.29	0.14	0.00				
8.25	0.31	0.15	0.00				
8.50	0.32	0.16	0.00				
8.75	0.34	0.18	0.00				
9.00	0.36	0.19	0.00				
9.25	0.38	0.21	0.00				
9.50	0.41	0.24	0.00				
9.75	0.44	0.26	0.00				
10.00	0.47	0.29	0.00				
10.25	0.50	0.31	0.00				
10.50	0.53	0.34	0.00				
10.75	0.57	0.39	0.01				
11.00	0.64	0.44	0.01				
11.25	0.71	0.51	0.01				
11.50	0.80	0.60	0.01				
11.75	0.96	0.76	0.02				
12.00	1.38	1.16	0.06				
12.25	1.98	1.75	0.04				
12.50	2.14	1.91	0.02				
12.75	2.23	2.00	0.01				
13.00	2.30	2.08	0.01				
13.25	2.37	2.14	0.01				
13.50	2.41	2.19	0.01				
13.75	2.44	2.22	0.00				
14.00	2.47	2.25	0.00				
14.25	2.50	2.27	0.00				
14.50	2.53	2.30	0.00				
14.75	2.56	2.33	0.00				
15.00	2.58	2.35	0.00				
15.25	2.60	2.37	0.00				
15.50	2.62	2.39	0.00				
15.75	2.63	2.40	0.00				
16.00	2.65	2.42	0.00				
16.25	2.66	2.43	0.00				
16.50	2.68	2.45	0.00				
16.75	2.69	2.46	0.00				
17.00	2.71	2.48	0.00				
17.25	2.72	2.49	0.00				
17.50	2.73	2.50	0.00				

Summary for Subcatchment 8S: NW 1/4 roof

[49] Hint: $T_c < 2dt$ may require smaller dt

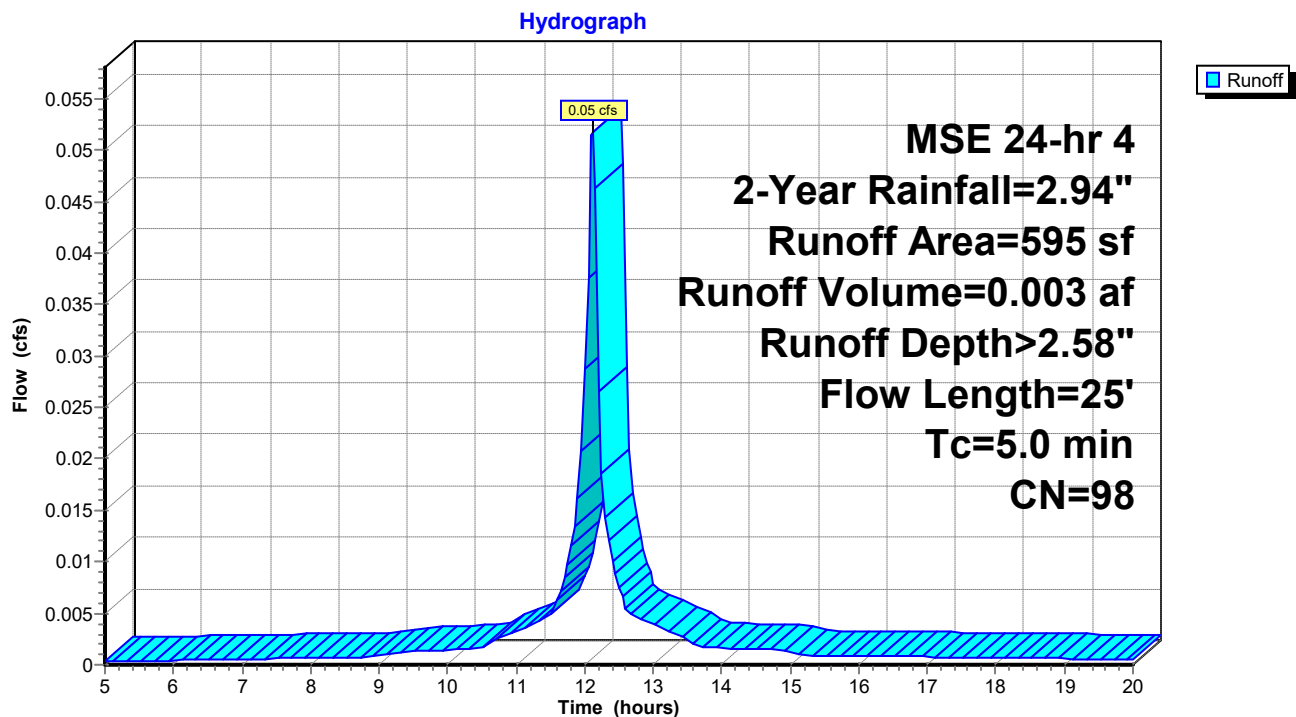
Runoff = 0.05 cfs @ 12.11 hrs, Volume= 0.003 af, Depth> 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, $dt= 0.05$ hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
*	595	98	NW 1/4 roof
	595		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	25		0.08		Direct Entry, NW 1/4 roof

Subcatchment 8S: NW 1/4 roof



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Hydrograph for Subcatchment 8S: NW 1/4 roof

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.13	0.03	0.00	17.75	2.75	2.52	0.00
5.25	0.15	0.04	0.00	18.00	2.76	2.53	0.00
5.50	0.16	0.04	0.00	18.25	2.77	2.54	0.00
5.75	0.17	0.05	0.00	18.50	2.78	2.55	0.00
6.00	0.18	0.06	0.00	18.75	2.79	2.56	0.00
6.25	0.19	0.07	0.00	19.00	2.81	2.57	0.00
6.50	0.21	0.07	0.00	19.25	2.82	2.58	0.00
6.75	0.22	0.08	0.00	19.50	2.83	2.59	0.00
7.00	0.23	0.09	0.00	19.75	2.84	2.60	0.00
7.25	0.25	0.10	0.00	20.00	2.84	2.61	0.00
7.50	0.26	0.11	0.00				
7.75	0.28	0.13	0.00				
8.00	0.29	0.14	0.00				
8.25	0.31	0.15	0.00				
8.50	0.32	0.16	0.00				
8.75	0.34	0.18	0.00				
9.00	0.36	0.19	0.00				
9.25	0.38	0.21	0.00				
9.50	0.41	0.24	0.00				
9.75	0.44	0.26	0.00				
10.00	0.47	0.29	0.00				
10.25	0.50	0.31	0.00				
10.50	0.53	0.34	0.00				
10.75	0.57	0.39	0.00				
11.00	0.64	0.44	0.00				
11.25	0.71	0.51	0.00				
11.50	0.80	0.60	0.00				
11.75	0.96	0.76	0.01				
12.00	1.38	1.16	0.03				
12.25	1.98	1.75	0.02				
12.50	2.14	1.91	0.01				
12.75	2.23	2.00	0.00				
13.00	2.30	2.08	0.00				
13.25	2.37	2.14	0.00				
13.50	2.41	2.19	0.00				
13.75	2.44	2.22	0.00				
14.00	2.47	2.25	0.00				
14.25	2.50	2.27	0.00				
14.50	2.53	2.30	0.00				
14.75	2.56	2.33	0.00				
15.00	2.58	2.35	0.00				
15.25	2.60	2.37	0.00				
15.50	2.62	2.39	0.00				
15.75	2.63	2.40	0.00				
16.00	2.65	2.42	0.00				
16.25	2.66	2.43	0.00				
16.50	2.68	2.45	0.00				
16.75	2.69	2.46	0.00				
17.00	2.71	2.48	0.00				
17.25	2.72	2.49	0.00				
17.50	2.73	2.50	0.00				

Summary for Reach 3R: S. 8" PVC

[52] Hint: Inlet/Outlet conditions not evaluated

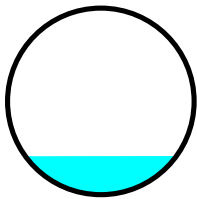
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.051 ac, 53.13% Impervious, Inflow Depth > 1.52" for 2-Year event
Inflow = 0.11 cfs @ 12.12 hrs, Volume= 0.006 af
Outflow = 0.10 cfs @ 12.14 hrs, Volume= 0.006 af, Atten= 4%, Lag= 1.4 min

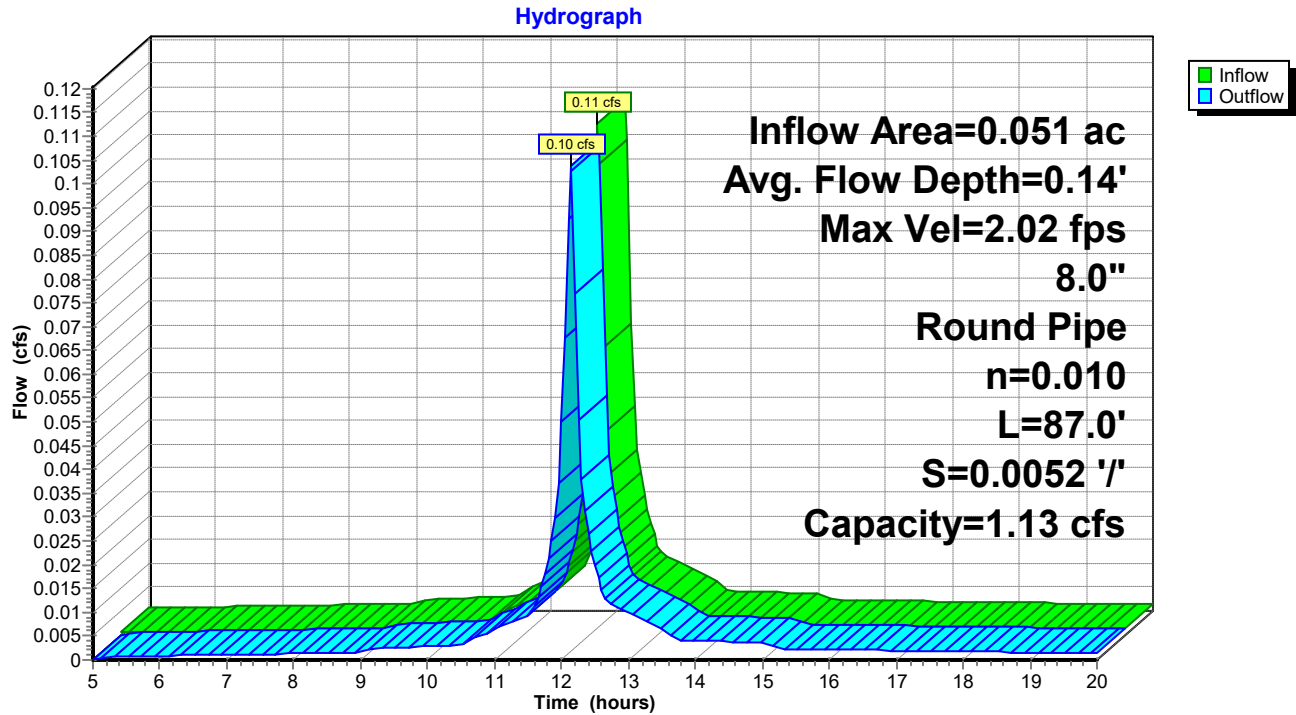
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.02 fps, Min. Travel Time= 0.7 min
Avg. Velocity= 0.70 fps, Avg. Travel Time= 2.1 min

Peak Storage= 5 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.13 cfs

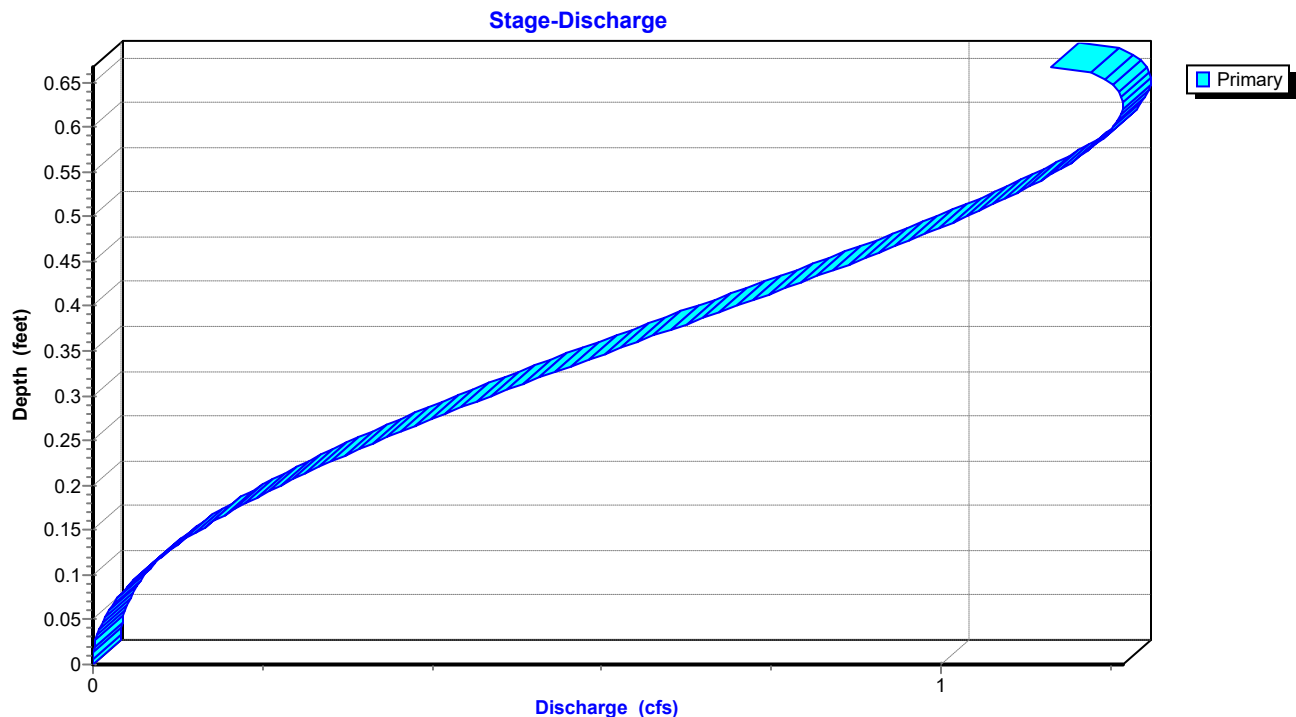
8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 87.0' Slope= 0.0052 '/'
Inlet Invert= 676.38', Outlet Invert= 675.93'



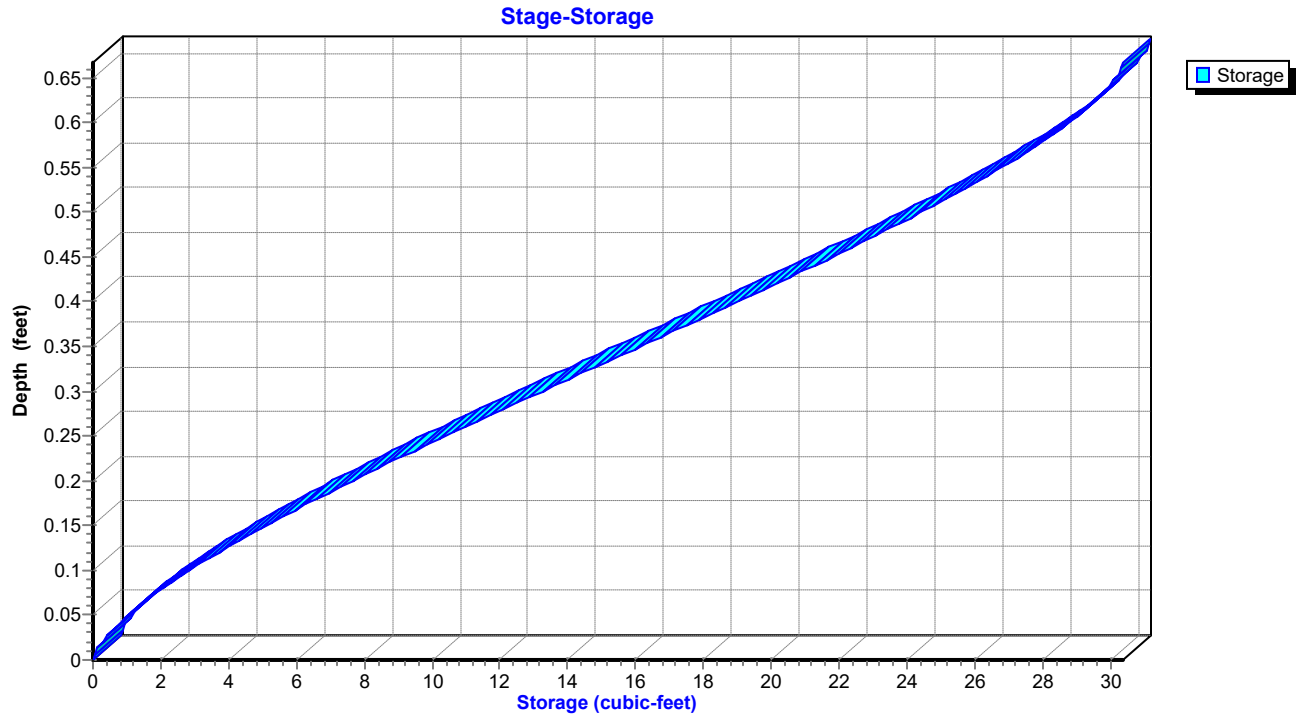
Reach 3R: S. 8" PVC



Reach 3R: S. 8" PVC



Reach 3R: S. 8" PVC



Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Hydrograph for Reach 3R: S. 8" PVC

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	676.38	0.00
5.50	0.00	0	676.39	0.00
6.00	0.00	0	676.39	0.00
6.50	0.00	0	676.39	0.00
7.00	0.00	0	676.40	0.00
7.50	0.00	0	676.40	0.00
8.00	0.00	0	676.40	0.00
8.50	0.00	0	676.40	0.00
9.00	0.00	0	676.40	0.00
9.50	0.00	0	676.40	0.00
10.00	0.00	0	676.40	0.00
10.50	0.00	0	676.41	0.00
11.00	0.01	1	676.42	0.01
11.50	0.01	1	676.42	0.01
12.00	0.06	3	676.48	0.05
12.50	0.02	1	676.44	0.02
13.00	0.01	1	676.42	0.01
13.50	0.01	1	676.42	0.01
14.00	0.00	0	676.41	0.00
14.50	0.00	0	676.41	0.00
15.00	0.00	0	676.41	0.00
15.50	0.00	0	676.40	0.00
16.00	0.00	0	676.40	0.00
16.50	0.00	0	676.40	0.00
17.00	0.00	0	676.40	0.00
17.50	0.00	0	676.40	0.00
18.00	0.00	0	676.40	0.00
18.50	0.00	0	676.40	0.00
19.00	0.00	0	676.40	0.00
19.50	0.00	0	676.40	0.00
20.00	0.00	0	676.40	0.00

Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Stage-Discharge for Reach 3R: S. 8" PVC

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)	Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
676.38	0.00	0.00	676.89	3.68	1.05
676.39	0.37	0.00	676.90	3.68	1.08
676.40	0.60	0.00	676.91	3.69	1.10
676.41	0.78	0.00	676.92	3.69	1.12
676.42	0.94	0.01	676.93	3.69	1.14
676.43	1.08	0.01	676.94	3.69	1.15
676.44	1.21	0.02	676.95	3.68	1.17
676.45	1.34	0.03	676.96	3.67	1.18
676.46	1.46	0.03	676.97	3.66	1.19
676.47	1.57	0.04	676.98	3.64	1.20
676.48	1.67	0.05	676.99	3.62	1.21
676.49	1.77	0.07	677.00	3.59	1.21
676.50	1.87	0.08	677.01	3.56	1.21
676.51	1.96	0.09	677.02	3.51	1.21
676.52	2.05	0.11	677.03	3.46	1.20
676.53	2.13	0.13	677.04	3.38	1.18
676.54	2.22	0.14	677.05	3.17	1.11
676.55	2.29	0.16			
676.56	2.37	0.18			
676.57	2.44	0.20			
676.58	2.51	0.22			
676.59	2.58	0.24			
676.60	2.65	0.27			
676.61	2.71	0.29			
676.62	2.77	0.31			
676.63	2.83	0.34			
676.64	2.88	0.36			
676.65	2.94	0.39			
676.66	2.99	0.42			
676.67	3.04	0.44			
676.68	3.09	0.47			
676.69	3.14	0.50			
676.70	3.18	0.53			
676.71	3.22	0.56			
676.72	3.26	0.58			
676.73	3.30	0.61			
676.74	3.34	0.64			
676.75	3.38	0.67			
676.76	3.41	0.70			
676.77	3.44	0.73			
676.78	3.47	0.76			
676.79	3.50	0.79			
676.80	3.53	0.82			
676.81	3.55	0.85			
676.82	3.57	0.87			
676.83	3.59	0.90			
676.84	3.61	0.93			
676.85	3.63	0.95			
676.86	3.64	0.98			
676.87	3.66	1.01			
676.88	3.67	1.03			

Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Stage-Area-Storage for Reach 3R: S. 8" PVC

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
676.38	0.0	0	676.89	0.3	25
676.39	0.0	0	676.90	0.3	25
676.40	0.0	0	676.91	0.3	26
676.41	0.0	0	676.92	0.3	26
676.42	0.0	1	676.93	0.3	27
676.43	0.0	1	676.94	0.3	27
676.44	0.0	1	676.95	0.3	28
676.45	0.0	2	676.96	0.3	28
676.46	0.0	2	676.97	0.3	28
676.47	0.0	2	676.98	0.3	29
676.48	0.0	3	676.99	0.3	29
676.49	0.0	3	677.00	0.3	29
676.50	0.0	4	677.01	0.3	30
676.51	0.0	4	677.02	0.3	30
676.52	0.1	5	677.03	0.3	30
676.53	0.1	5	677.04	0.3	30
676.54	0.1	6	677.05	0.3	30
676.55	0.1	6			
676.56	0.1	7			
676.57	0.1	7			
676.58	0.1	8			
676.59	0.1	8			
676.60	0.1	9			
676.61	0.1	9			
676.62	0.1	10			
676.63	0.1	10			
676.64	0.1	11			
676.65	0.1	12			
676.66	0.1	12			
676.67	0.1	13			
676.68	0.2	13			
676.69	0.2	14			
676.70	0.2	14			
676.71	0.2	15			
676.72	0.2	16			
676.73	0.2	16			
676.74	0.2	17			
676.75	0.2	17			
676.76	0.2	18			
676.77	0.2	18			
676.78	0.2	19			
676.79	0.2	20			
676.80	0.2	20			
676.81	0.2	21			
676.82	0.2	21			
676.83	0.3	22			
676.84	0.3	22			
676.85	0.3	23			
676.86	0.3	23			
676.87	0.3	24			
676.88	0.3	24			

Summary for Reach 4R: W. 6" PVC

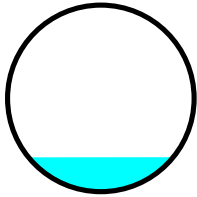
[52] Hint: Inlet/Outlet conditions not evaluated
[82] Warning: Early inflow requires earlier time span
[79] Warning: Submerged Pond 7P Primary device # 1 INLET by 0.07'

Inflow Area = 0.326 ac, 63.36% Impervious, Inflow Depth > 1.46" for 2-Year event
Inflow = 0.20 cfs @ 12.16 hrs, Volume= 0.040 af
Outflow = 0.20 cfs @ 12.17 hrs, Volume= 0.040 af, Atten= 1%, Lag= 0.3 min

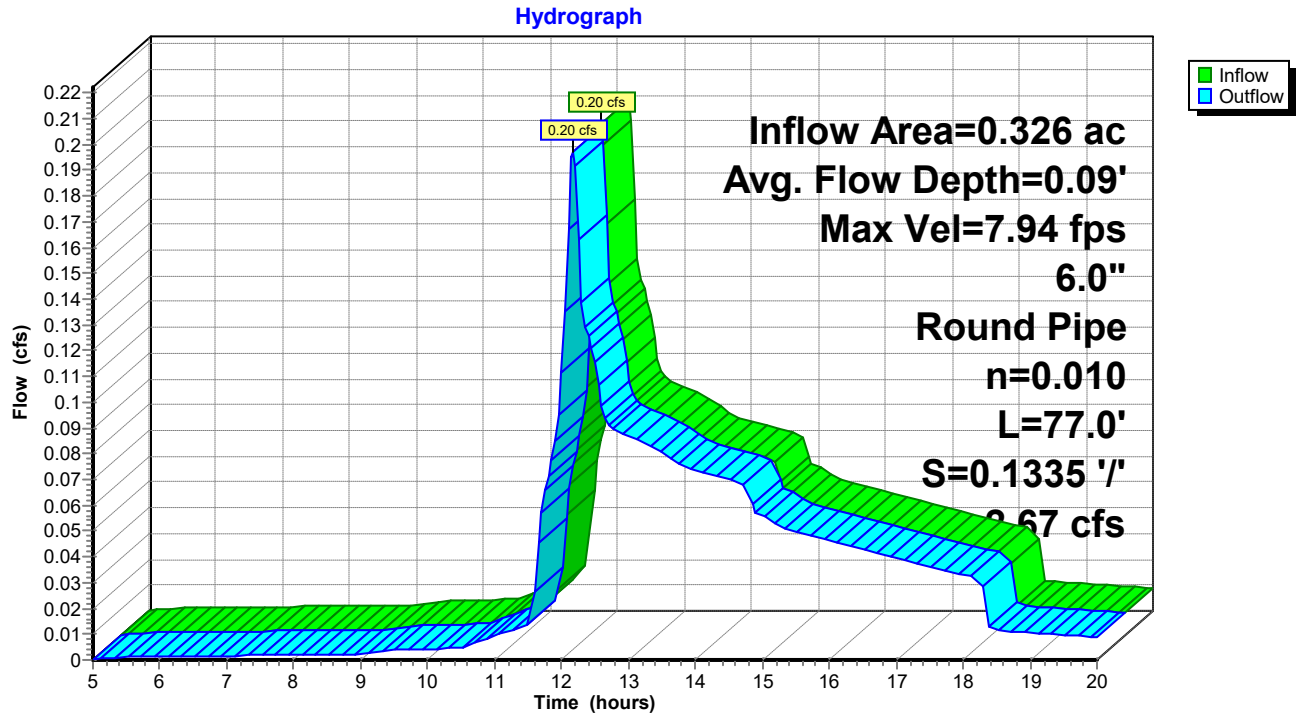
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.94 fps, Min. Travel Time= 0.2 min
Avg. Velocity= 3.86 fps, Avg. Travel Time= 0.3 min

Peak Storage= 2 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 2.67 cfs

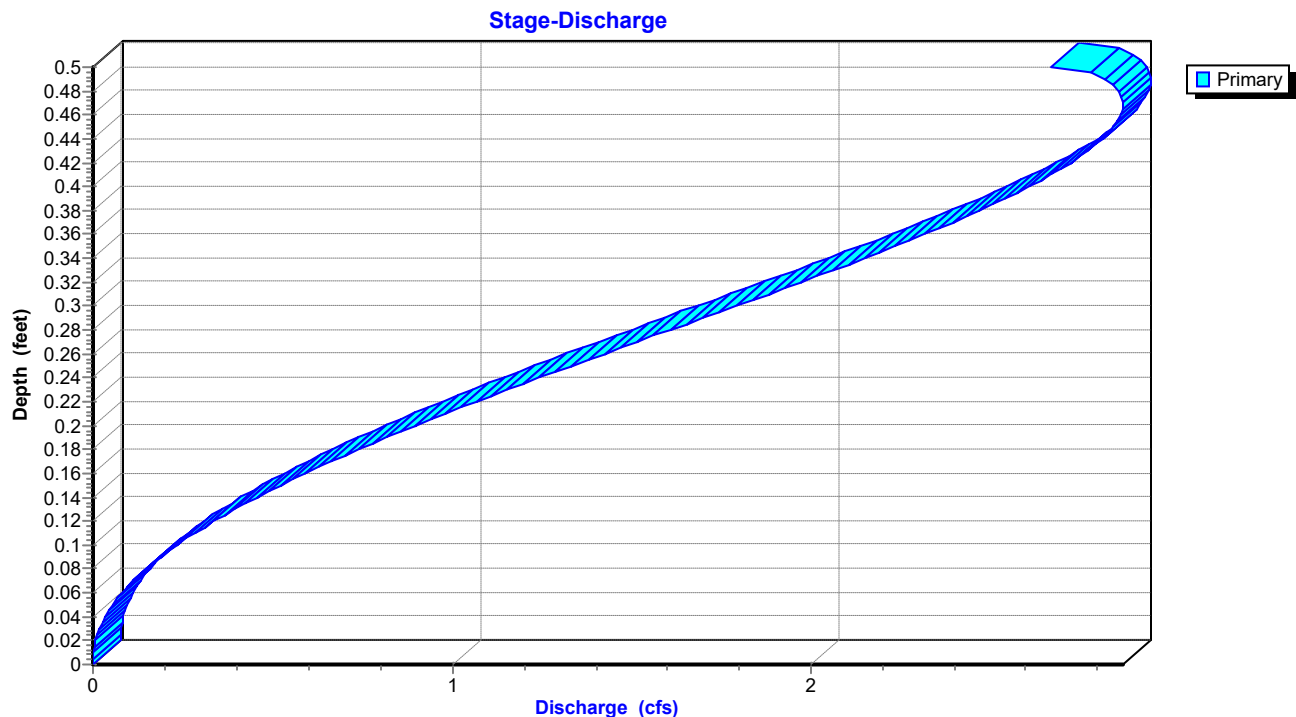
6.0" Round Pipe
n= 0.010
Length= 77.0' Slope= 0.1335 '/'
Inlet Invert= 668.80', Outlet Invert= 658.52'



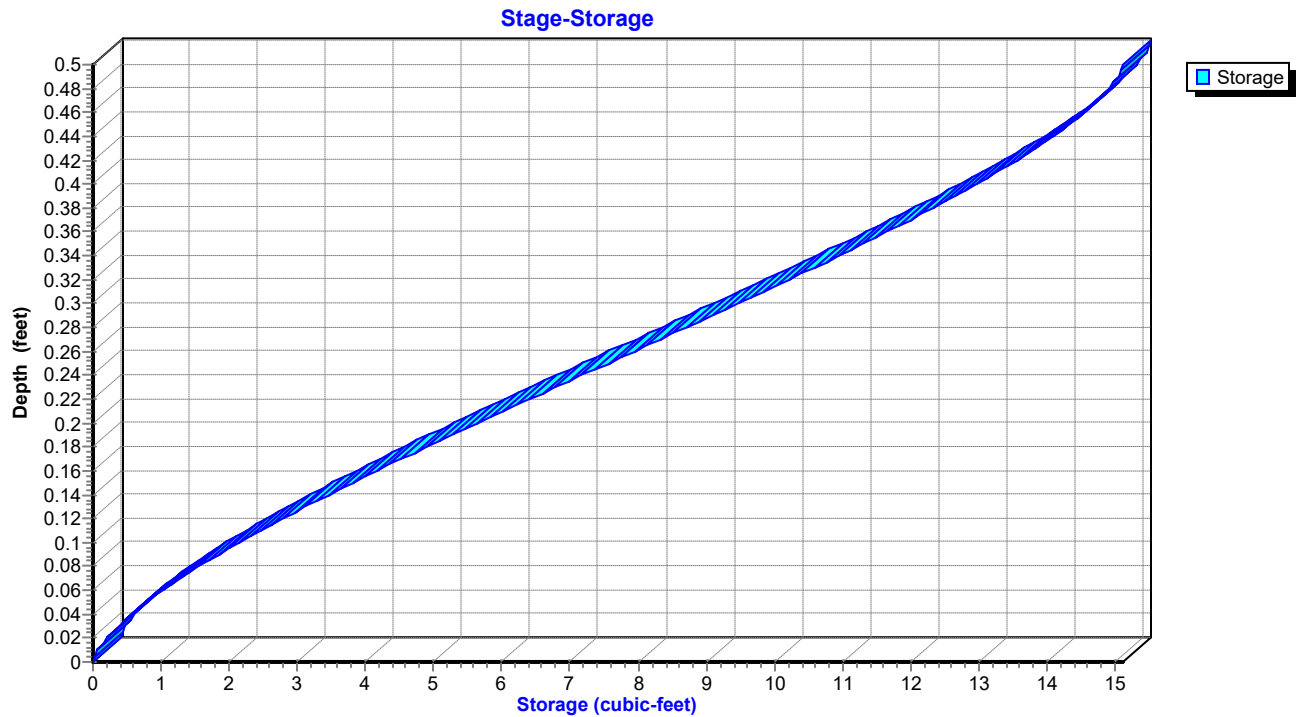
Reach 4R: W. 6" PVC



Reach 4R: W. 6" PVC



Reach 4R: W. 6" PVC



Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Hydrograph for Reach 4R: W. 6" PVC

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	668.80	0.00
5.50	0.00	0	668.81	0.00
6.00	0.00	0	668.81	0.00
6.50	0.00	0	668.81	0.00
7.00	0.00	0	668.81	0.00
7.50	0.00	0	668.81	0.00
8.00	0.00	0	668.81	0.00
8.50	0.00	0	668.81	0.00
9.00	0.00	0	668.81	0.00
9.50	0.00	0	668.81	0.00
10.00	0.00	0	668.81	0.00
10.50	0.00	0	668.82	0.00
11.00	0.01	0	668.82	0.01
11.50	0.01	0	668.83	0.01
12.00	0.11	1	668.87	0.11
12.50	0.11	1	668.87	0.12
13.00	0.09	1	668.86	0.09
13.50	0.08	1	668.86	0.08
14.00	0.07	1	668.86	0.07
14.50	0.07	1	668.86	0.07
15.00	0.06	1	668.85	0.06
15.50	0.05	1	668.85	0.05
16.00	0.05	1	668.85	0.05
16.50	0.04	1	668.84	0.04
17.00	0.04	1	668.84	0.04
17.50	0.04	1	668.84	0.04
18.00	0.03	1	668.84	0.03
18.50	0.01	0	668.82	0.01
19.00	0.01	0	668.82	0.01
19.50	0.01	0	668.82	0.01
20.00	0.01	0	668.82	0.01

Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Stage-Discharge for Reach 4R: W. 6" PVC

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
668.80	0.00	0.00
668.81	1.91	0.00
668.82	3.01	0.01
668.83	3.93	0.02
668.84	4.72	0.03
668.85	5.45	0.06
668.86	6.11	0.08
668.87	6.72	0.11
668.88	7.30	0.15
668.89	7.84	0.19
668.90	8.35	0.23
668.91	8.83	0.28
668.92	9.29	0.34
668.93	9.73	0.39
668.94	10.14	0.46
668.95	10.54	0.52
668.96	10.91	0.59
668.97	11.27	0.66
668.98	11.61	0.74
668.99	11.94	0.82
669.00	12.25	0.90
669.01	12.54	0.98
669.02	12.82	1.07
669.03	13.09	1.15
669.04	13.34	1.24
669.05	13.57	1.33
669.06	13.80	1.42
669.07	14.01	1.52
669.08	14.20	1.61
669.09	14.39	1.70
669.10	14.56	1.79
669.11	14.71	1.88
669.12	14.86	1.97
669.13	14.98	2.06
669.14	15.10	2.15
669.15	15.20	2.23
669.16	15.29	2.31
669.17	15.36	2.39
669.18	15.41	2.47
669.19	15.45	2.54
669.20	15.47	2.61
669.21	15.47	2.67
669.22	15.46	2.72
669.23	15.42	2.77
669.24	15.35	2.81
669.25	15.26	2.84
669.26	15.14	2.86
669.27	14.97	2.87
669.28	14.74	2.86
669.29	14.41	2.82
669.30	13.57	2.67

Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Stage-Area-Storage for Reach 4R: W. 6" PVC

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
668.80	0.0	0
668.81	0.0	0
668.82	0.0	0
668.83	0.0	0
668.84	0.0	1
668.85	0.0	1
668.86	0.0	1
668.87	0.0	1
668.88	0.0	2
668.89	0.0	2
668.90	0.0	2
668.91	0.0	2
668.92	0.0	3
668.93	0.0	3
668.94	0.0	3
668.95	0.0	4
668.96	0.1	4
668.97	0.1	5
668.98	0.1	5
668.99	0.1	5
669.00	0.1	6
669.01	0.1	6
669.02	0.1	6
669.03	0.1	7
669.04	0.1	7
669.05	0.1	8
669.06	0.1	8
669.07	0.1	8
669.08	0.1	9
669.09	0.1	9
669.10	0.1	9
669.11	0.1	10
669.12	0.1	10
669.13	0.1	11
669.14	0.1	11
669.15	0.1	11
669.16	0.2	12
669.17	0.2	12
669.18	0.2	12
669.19	0.2	13
669.20	0.2	13
669.21	0.2	13
669.22	0.2	14
669.23	0.2	14
669.24	0.2	14
669.25	0.2	14
669.26	0.2	15
669.27	0.2	15
669.28	0.2	15
669.29	0.2	15
669.30	0.2	15

Summary for Pond 3P: E biofilter LINED

[82] Warning: Early inflow requires earlier time span
 [42] Hint: Gap in defined storage above volume #4 at 681.34'
 [85] Warning: Oscillations may require smaller dt or Finer Routing (severity=7)

Inflow Area = 0.043 ac, 57.33% Impervious, Inflow Depth > 1.63" for 2-Year event
 Inflow = 0.09 cfs @ 12.15 hrs, Volume= 0.006 af
 Outflow = 0.03 cfs @ 12.38 hrs, Volume= 0.005 af, Atten= 69%, Lag= 13.8 min
 Primary = 0.03 cfs @ 12.38 hrs, Volume= 0.005 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 680.51' @ 12.38 hrs Surf.Area= 490 sf Storage= 121 cf

Plug-Flow detention time= 132.7 min calculated for 0.005 af (79% of inflow)
 Center-of-Mass det. time= 78.8 min (827.9 - 749.1)

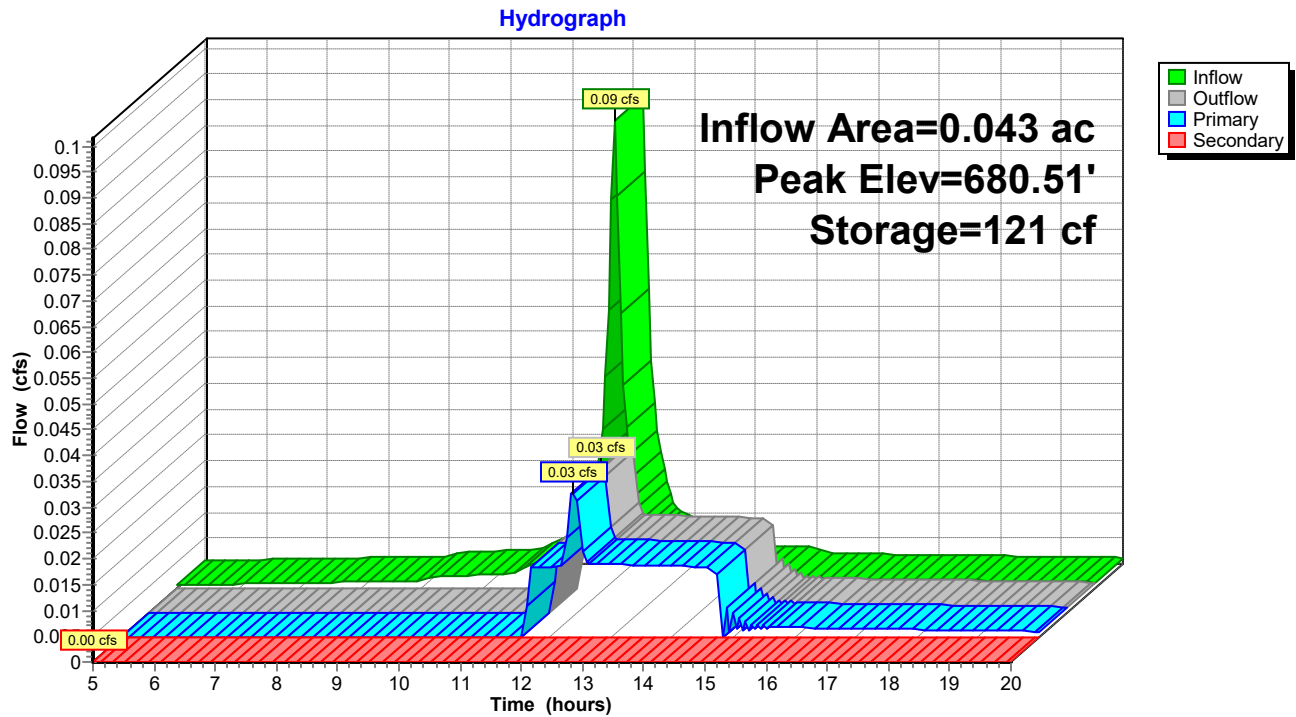
Volume	Invert	Avail.Storage	Storage Description
#1	678.00'	54 cf	10.50'W x 15.50'L x 1.00'H sand invert 163 cf Overall x 33.0% Voids
#2	679.00'	66 cf	10.50'W x 15.50'L x 1.50'H media 244 cf Overall x 27.0% Voids
#3	680.50'	128 cf	10.50'W x 15.50'L x 0.60'H top media Z=3.0
#4	681.10'	195 cf	39.50'W x 19.50'L x 0.24'H NDS drain Z=3.0
#5	681.43'	8 cf	40.00'W x 20.00'L x 0.01'H weir overflow Z=3.0
		451 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Secondary	681.34'	6.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	681.10'	0.5" x 2.0" Horiz. NDS drain X 50.00 C= 0.600 in 12.0" x 12.0" Grate (35% open area) Limited to weir flow at low heads
#3	Primary	678.00'	3.600 in/hr underdrain over Horizontal area above 678.00' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 163 sf Phase-In= 0.50'

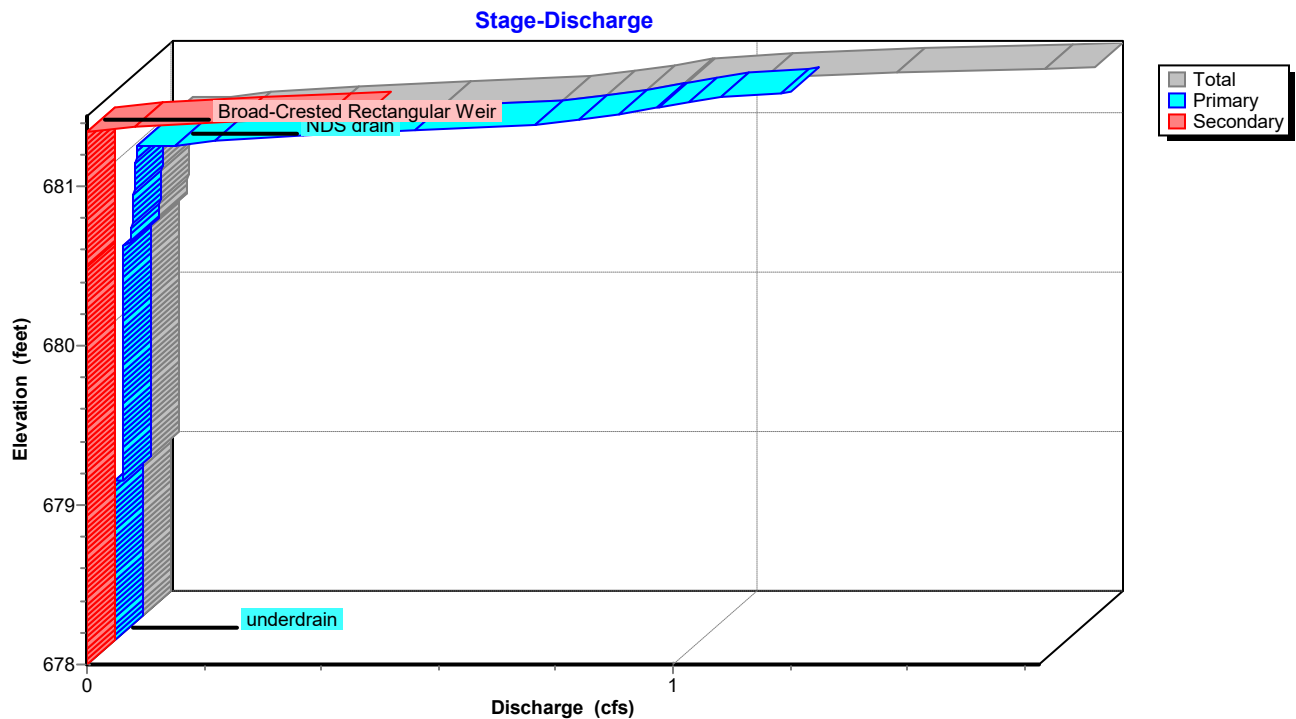
Primary OutFlow Max=0.03 cfs @ 12.38 hrs HW=680.51' (Free Discharge)
 ↑ 2=NDS drain (Controls 0.00 cfs)
 ↑ 3=underdrain (Controls 0.03 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=678.00' (Free Discharge)
 ↑ 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

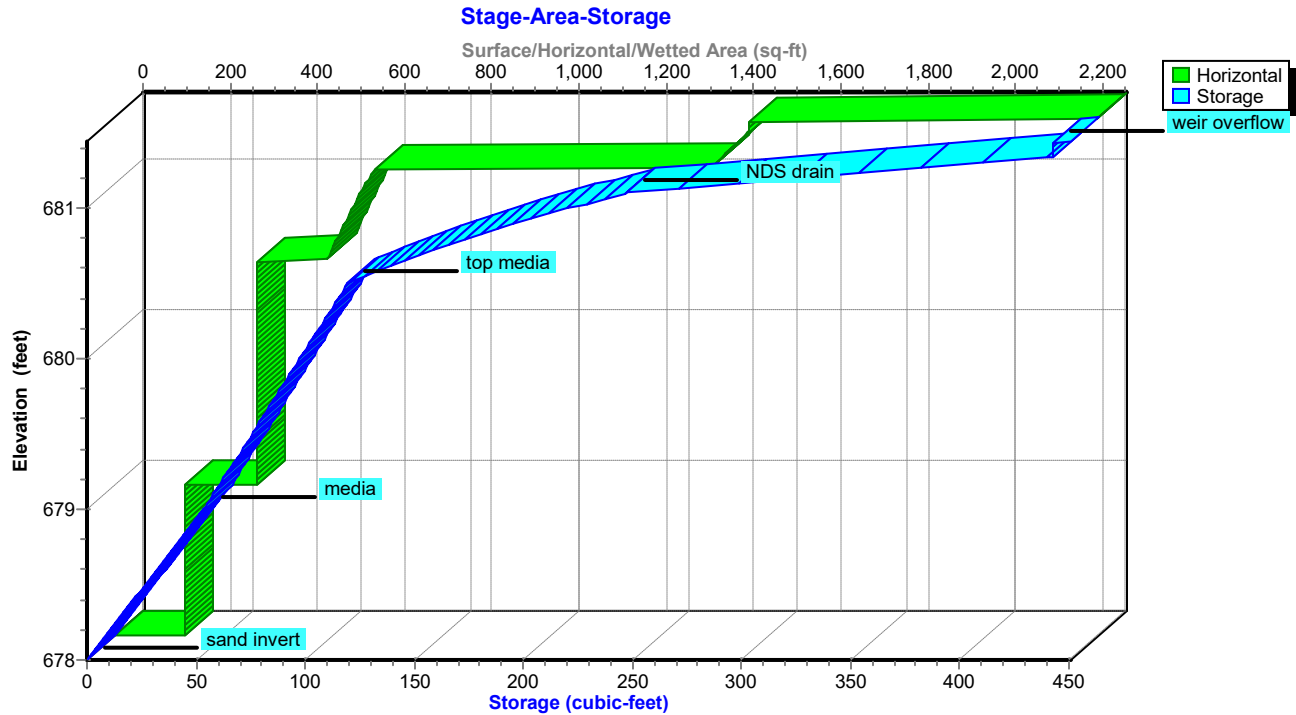
Pond 3P: E biofilter LINED



Pond 3P: E biofilter LINED



Pond 3P: E biofilter LINED



Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Hydrograph for Pond 3P: E biofilter LINED

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	0	678.00	0.00	0.00	0.00
5.50	0.00	1	678.02	0.00	0.00	0.00
6.00	0.00	3	678.05	0.00	0.00	0.00
6.50	0.00	4	678.08	0.00	0.00	0.00
7.00	0.00	6	678.11	0.00	0.00	0.00
7.50	0.00	8	678.15	0.00	0.00	0.00
8.00	0.00	10	678.19	0.00	0.00	0.00
8.50	0.00	13	678.24	0.00	0.00	0.00
9.00	0.00	15	678.28	0.00	0.00	0.00
9.50	0.00	19	678.35	0.00	0.00	0.00
10.00	0.00	24	678.44	0.00	0.00	0.00
10.50	0.00	28	678.53	0.00	0.00	0.00
11.00	0.01	36	678.67	0.00	0.00	0.00
11.50	0.01	49	678.91	0.00	0.00	0.00
12.00	0.04	64	679.24	0.01	0.01	0.00
12.50	0.02	119	680.49	0.02	0.02	0.00
13.00	0.01	113	680.35	0.01	0.01	0.00
13.50	0.01	101	680.07	0.01	0.01	0.00
14.00	0.00	83	679.66	0.01	0.01	0.00
14.50	0.00	64	679.24	0.01	0.01	0.00
15.00	0.00	54	679.00	0.00	0.00	0.00
15.50	0.00	54	679.00	0.00	0.00	0.00
16.00	0.00	54	679.00	0.00	0.00	0.00
16.50	0.00	54	679.00	0.00	0.00	0.00
17.00	0.00	54	679.00	0.00	0.00	0.00
17.50	0.00	54	679.00	0.00	0.00	0.00
18.00	0.00	54	679.00	0.00	0.00	0.00
18.50	0.00	54	679.00	0.00	0.00	0.00
19.00	0.00	54	679.00	0.00	0.00	0.00
19.50	0.00	54	679.00	0.00	0.00	0.00
20.00	0.00	54	679.00	0.00	0.00	0.00

Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Stage-Discharge for Pond 3P: E biofilter LINED

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
678.00	0.00	0.00	0.00	680.55	0.03	0.03	0.00
678.05	0.00	0.00	0.00	680.60	0.03	0.03	0.00
678.10	0.00	0.00	0.00	680.65	0.03	0.03	0.00
678.15	0.00	0.00	0.00	680.70	0.03	0.03	0.00
678.20	0.00	0.00	0.00	680.75	0.03	0.03	0.00
678.25	0.00	0.00	0.00	680.80	0.03	0.03	0.00
678.30	0.00	0.00	0.00	680.85	0.03	0.03	0.00
678.35	0.00	0.00	0.00	680.90	0.03	0.03	0.00
678.40	0.00	0.00	0.00	680.95	0.03	0.03	0.00
678.45	0.00	0.00	0.00	681.00	0.04	0.04	0.00
678.50	0.00	0.00	0.00	681.05	0.04	0.04	0.00
678.55	0.00	0.00	0.00	681.10	0.10	0.10	0.00
678.60	0.00	0.00	0.00	681.15	0.25	0.25	0.00
678.65	0.00	0.00	0.00	681.20	0.52	0.52	0.00
678.70	0.00	0.00	0.00	681.25	0.75	0.75	0.00
678.75	0.00	0.00	0.00	681.30	0.86	0.86	0.00
678.80	0.00	0.00	0.00	681.35	0.96	0.95	0.01
678.85	0.00	0.00	0.00	681.40	1.24	1.03	0.22
678.90	0.00	0.00	0.00				
678.95	0.00	0.00	0.00				
679.00	0.01	0.01	0.00				
679.05	0.01	0.01	0.00				
679.10	0.01	0.01	0.00				
679.15	0.01	0.01	0.00				
679.20	0.01	0.01	0.00				
679.25	0.01	0.01	0.00				
679.30	0.01	0.01	0.00				
679.35	0.01	0.01	0.00				
679.40	0.01	0.01	0.00				
679.45	0.01	0.01	0.00				
679.50	0.01	0.01	0.00				
679.55	0.01	0.01	0.00				
679.60	0.01	0.01	0.00				
679.65	0.01	0.01	0.00				
679.70	0.01	0.01	0.00				
679.75	0.01	0.01	0.00				
679.80	0.01	0.01	0.00				
679.85	0.01	0.01	0.00				
679.90	0.01	0.01	0.00				
679.95	0.01	0.01	0.00				
680.00	0.01	0.01	0.00				
680.05	0.01	0.01	0.00				
680.10	0.01	0.01	0.00				
680.15	0.01	0.01	0.00				
680.20	0.01	0.01	0.00				
680.25	0.01	0.01	0.00				
680.30	0.01	0.01	0.00				
680.35	0.01	0.01	0.00				
680.40	0.01	0.01	0.00				
680.45	0.01	0.01	0.00				
680.50	0.03	0.03	0.00				

Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Stage-Area-Storage for Pond 3P: E biofilter LINED

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
678.00	163	0	680.55	496	128
678.05	163	3	680.60	504	137
678.10	163	5	680.65	512	146
678.15	163	8	680.70	521	155
678.20	163	11	680.75	530	165
678.25	163	13	680.80	538	176
678.30	163	16	680.85	547	187
678.35	163	19	680.90	556	198
678.40	163	21	680.95	566	210
678.45	163	24	681.00	575	222
678.50	163	27	681.05	585	235
678.55	163	30	681.10	1,365	248
678.60	163	32	681.15	1,383	287
678.65	163	35	681.20	1,401	327
678.70	163	38	681.25	1,419	368
678.75	163	40	681.30	1,437	409
678.80	163	43	681.35	1,452	443
678.85	163	46	681.40	1,452	443
678.90	163	48			
678.95	163	51			
679.00	326	54			
679.05	326	56			
679.10	326	58			
679.15	326	60			
679.20	326	62			
679.25	326	65			
679.30	326	67			
679.35	326	69			
679.40	326	71			
679.45	326	73			
679.50	326	76			
679.55	326	78			
679.60	326	80			
679.65	326	82			
679.70	326	84			
679.75	326	87			
679.80	326	89			
679.85	326	91			
679.90	326	93			
679.95	326	95			
680.00	326	98			
680.05	326	100			
680.10	326	102			
680.15	326	104			
680.20	326	106			
680.25	326	109			
680.30	326	111			
680.35	326	113			
680.40	326	115			
680.45	326	117			
680.50	488	120			

Summary for Pond 5P: W biofillter UNLINED

[82] Warning: Early inflow requires earlier time span

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=14)

Inflow Area = 0.218 ac, 64.67% Impervious, Inflow Depth > 1.79" for 2-Year event
 Inflow = 0.49 cfs @ 12.15 hrs, Volume= 0.032 af
 Outflow = 0.06 cfs @ 12.72 hrs, Volume= 0.026 af, Atten= 88%, Lag= 34.5 min
 Discarded = 0.00 cfs @ 12.72 hrs, Volume= 0.000 af
 Primary = 0.06 cfs @ 12.72 hrs, Volume= 0.026 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 675.85' @ 12.72 hrs Surf.Area= 1,335 sf Storage= 832 cf

Plug-Flow detention time= 192.4 min calculated for 0.026 af (80% of inflow)
 Center-of-Mass det. time= 141.5 min (889.5 - 748.1)

Volume	Invert	Avail.Storage	Storage Description
#1	671.75'	107 cf	8.30'W x 39.20'L x 1.00'H sand invert 325 cf Overall x 33.0% Voids
#2	672.75'	176 cf	8.30'W x 39.20'L x 2.00'H media 651 cf Overall x 27.0% Voids
#3	674.75'	728 cf	8.30'W x 39.20'L x 1.35'H top media Z=3.0
#4	676.10'	43 cf	18.00'W x 47.00'L x 0.05'H NDS drain Z=3.0
#5	676.15'	8 cf	18.00'W x 47.00'L x 0.01'H weir overflow Z=3.0
		1,063 cf	Total Available Storage

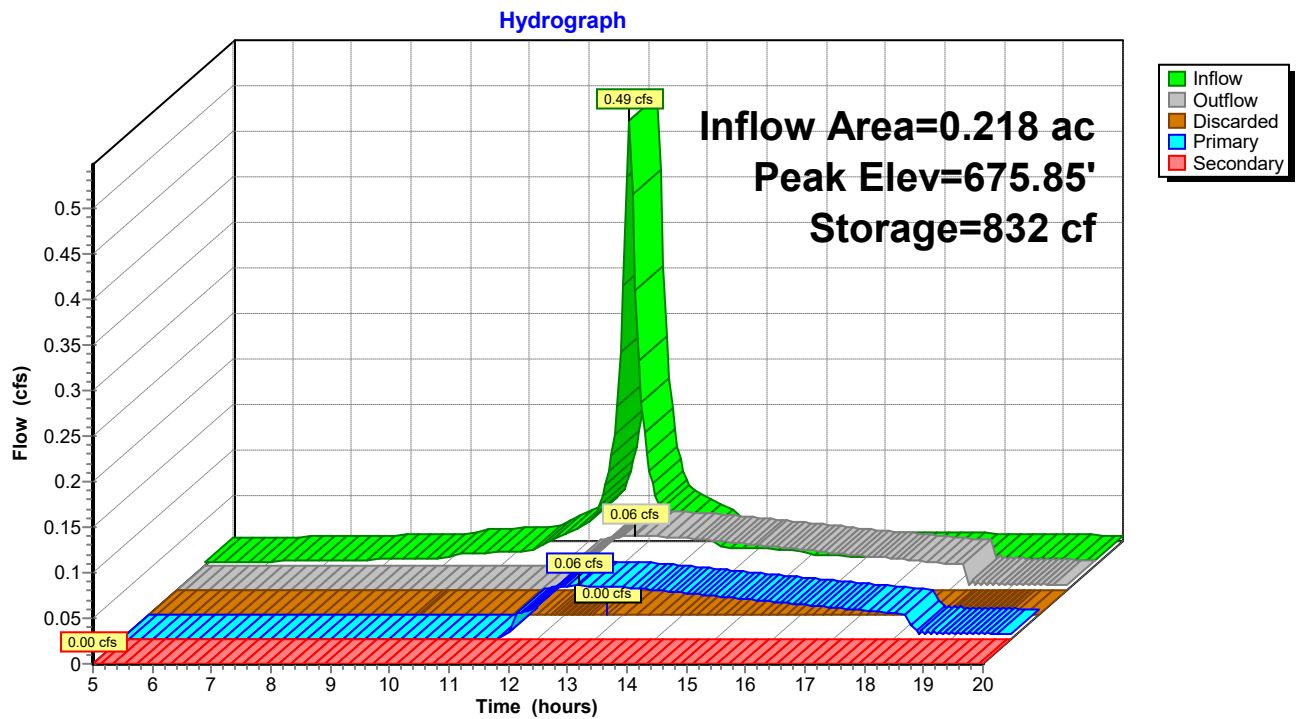
Device	Routing	Invert	Outlet Devices
#1	Secondary	676.15'	10.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	676.10'	0.5" x 2.0" Horiz. NDS drain X 50.00 C= 0.600 in 12.0" x 12.0" Grate (35% open area) Limited to weir flow at low heads
#3	Primary	672.75'	3.600 in/hr underdrain over Horizontal area above 672.75' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 651 sf Phase-In= 0.50'
#4	Discarded	671.75'	0.030 in/hr Exfiltration over Horizontal area above 671.75' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 325 sf Phase-In= 0.50'

Discarded OutFlow Max=0.00 cfs @ 12.72 hrs HW=675.85' (Free Discharge)
↳ **4=Exfiltration** (Controls 0.00 cfs)

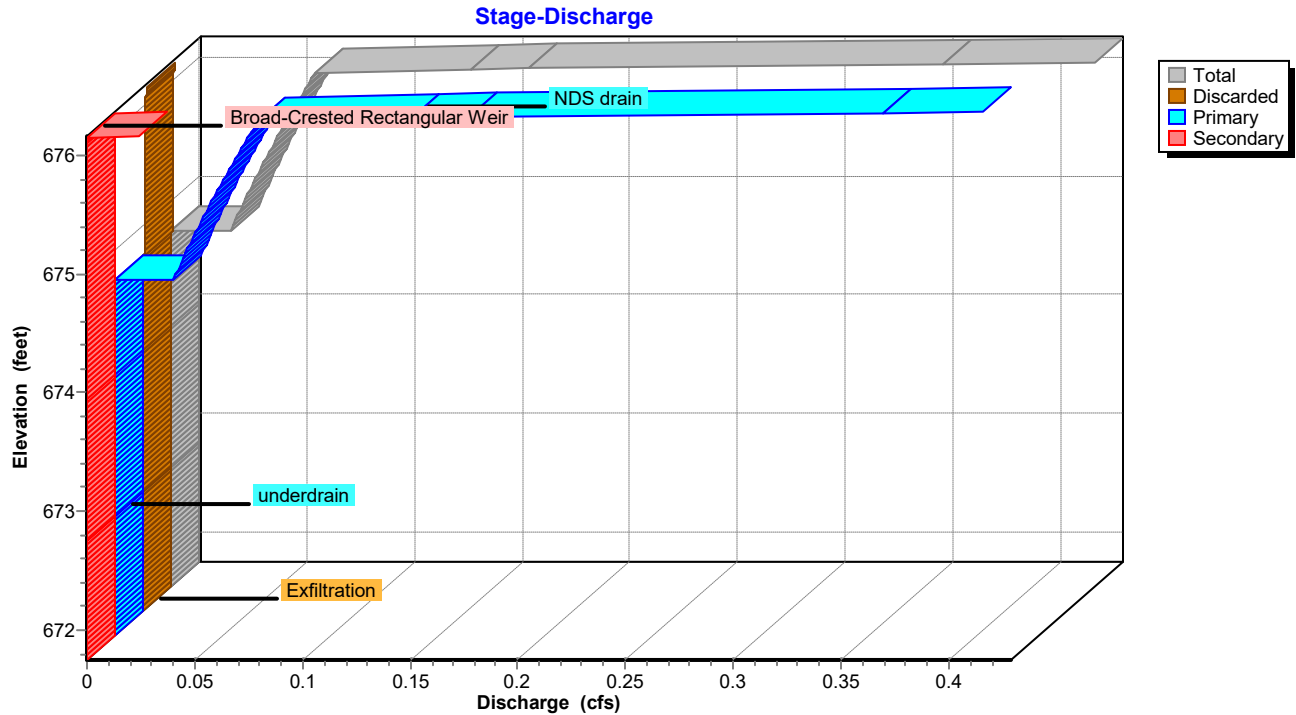
Primary OutFlow Max=0.06 cfs @ 12.72 hrs HW=675.85' (Free Discharge)
↳ **2=NDS drain** (Controls 0.00 cfs)
↳ **3=underdrain** (Controls 0.06 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=671.75' (Free Discharge)
↳ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

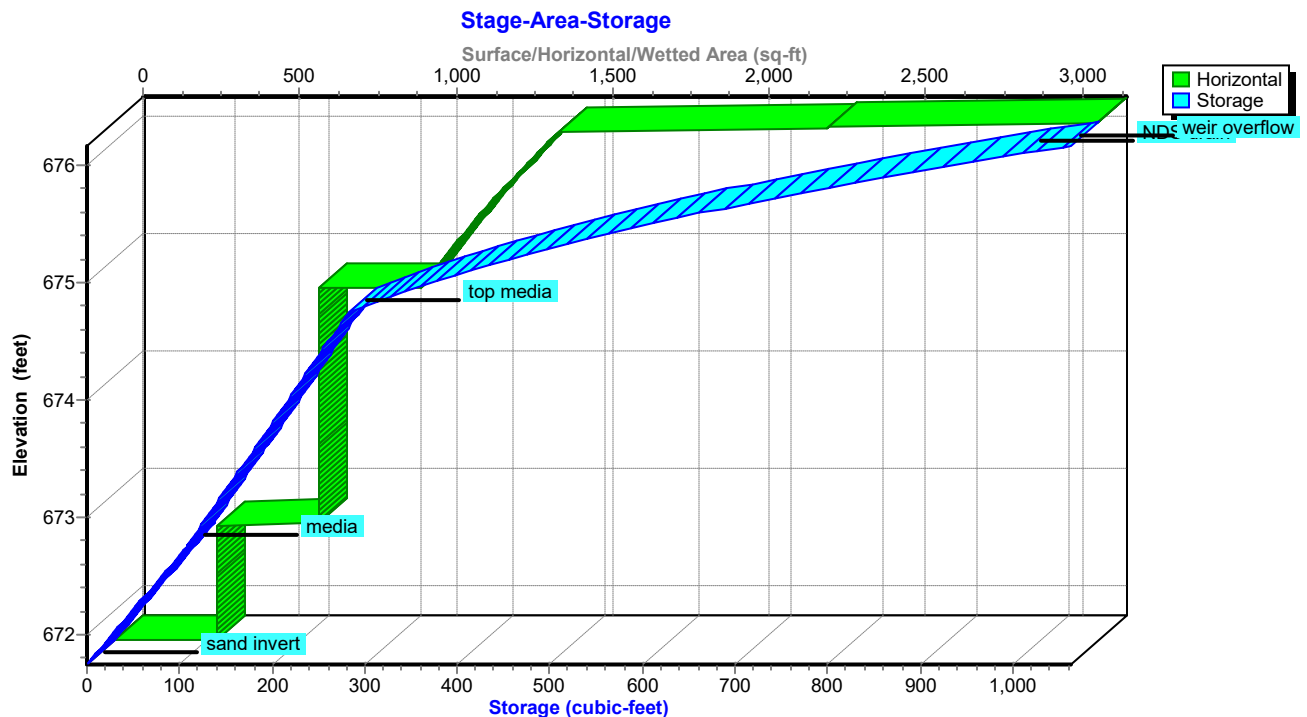
Pond 5P: W biofilter UNLINED



Pond 5P: W biofillter UNLINED



Pond 5P: W biofillter UNLINED



Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Hydrograph for Pond 5P: W biofilter UNLINED

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	0	671.75	0.00	0.00	0.00	0.00
5.50	0.00	7	671.81	0.00	0.00	0.00	0.00
6.00	0.00	14	671.88	0.00	0.00	0.00	0.00
6.50	0.01	23	671.97	0.00	0.00	0.00	0.00
7.00	0.01	33	672.06	0.00	0.00	0.00	0.00
7.50	0.01	44	672.16	0.00	0.00	0.00	0.00
8.00	0.01	56	672.27	0.00	0.00	0.00	0.00
8.50	0.01	69	672.39	0.00	0.00	0.00	0.00
9.00	0.01	83	672.52	0.00	0.00	0.00	0.00
9.50	0.01	104	672.72	0.00	0.00	0.00	0.00
10.00	0.01	129	673.00	0.00	0.00	0.00	0.00
10.50	0.02	156	673.31	0.00	0.00	0.00	0.00
11.00	0.03	200	673.81	0.00	0.00	0.00	0.00
11.50	0.05	272	674.63	0.00	0.00	0.00	0.00
12.00	0.23	409	675.09	0.04	0.00	0.04	0.00
12.50	0.10	818	675.83	0.06	0.00	0.06	0.00
13.00	0.05	826	675.85	0.06	0.00	0.06	0.00
13.50	0.03	793	675.80	0.06	0.00	0.06	0.00
14.00	0.02	732	675.70	0.05	0.00	0.05	0.00
14.50	0.02	671	675.60	0.05	0.00	0.05	0.00
15.00	0.02	613	675.50	0.05	0.00	0.05	0.00
15.50	0.01	552	675.39	0.04	0.00	0.04	0.00
16.00	0.01	493	675.27	0.04	0.00	0.04	0.00
16.50	0.01	439	675.16	0.04	0.00	0.04	0.00
17.00	0.01	390	675.04	0.04	0.00	0.03	0.00
17.50	0.01	346	674.93	0.03	0.00	0.03	0.00
18.00	0.01	306	674.82	0.03	0.00	0.03	0.00
18.50	0.01	283	674.75	0.01	0.00	0.01	0.00
19.00	0.01	283	674.75	0.01	0.00	0.01	0.00
19.50	0.01	283	674.75	0.01	0.00	0.01	0.00
20.00	0.01	283	674.75	0.01	0.00	0.01	0.00

Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Stage-Discharge for Pond 5P: W biofilter UNLINED

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
671.75	0.00	0.00	0.00	0.00
671.85	0.00	0.00	0.00	0.00
671.95	0.00	0.00	0.00	0.00
672.05	0.00	0.00	0.00	0.00
672.15	0.00	0.00	0.00	0.00
672.25	0.00	0.00	0.00	0.00
672.35	0.00	0.00	0.00	0.00
672.45	0.00	0.00	0.00	0.00
672.55	0.00	0.00	0.00	0.00
672.65	0.00	0.00	0.00	0.00
672.75	0.00	0.00	0.00	0.00
672.85	0.00	0.00	0.00	0.00
672.95	0.00	0.00	0.00	0.00
673.05	0.00	0.00	0.00	0.00
673.15	0.00	0.00	0.00	0.00
673.25	0.00	0.00	0.00	0.00
673.35	0.00	0.00	0.00	0.00
673.45	0.00	0.00	0.00	0.00
673.55	0.00	0.00	0.00	0.00
673.65	0.00	0.00	0.00	0.00
673.75	0.00	0.00	0.00	0.00
673.85	0.00	0.00	0.00	0.00
673.95	0.00	0.00	0.00	0.00
674.05	0.00	0.00	0.00	0.00
674.15	0.00	0.00	0.00	0.00
674.25	0.00	0.00	0.00	0.00
674.35	0.00	0.00	0.00	0.00
674.45	0.00	0.00	0.00	0.00
674.55	0.00	0.00	0.00	0.00
674.65	0.00	0.00	0.00	0.00
674.75	0.03	0.00	0.03	0.00
674.85	0.03	0.00	0.03	0.00
674.95	0.03	0.00	0.03	0.00
675.05	0.04	0.00	0.03	0.00
675.15	0.04	0.00	0.04	0.00
675.25	0.04	0.00	0.04	0.00
675.35	0.04	0.00	0.04	0.00
675.45	0.05	0.00	0.05	0.00
675.55	0.05	0.00	0.05	0.00
675.65	0.05	0.00	0.05	0.00
675.75	0.06	0.00	0.06	0.00
675.85	0.06	0.00	0.06	0.00
675.95	0.06	0.00	0.06	0.00
676.05	0.07	0.00	0.07	0.00
676.15	0.36	0.00	0.36	0.00

Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

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Stage-Area-Storage for Pond 5P: W biofillter UNLINED

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
671.75	325	0	674.30	651	244
671.80	325	5	674.35	651	248
671.85	325	11	674.40	651	252
671.90	325	16	674.45	651	257
671.95	325	21	674.50	651	261
672.00	325	27	674.55	651	265
672.05	325	32	674.60	651	270
672.10	325	38	674.65	651	274
672.15	325	43	674.70	651	279
672.20	325	48	674.75	976	283
672.25	325	54	674.80	990	300
672.30	325	59	674.85	1,005	317
672.35	325	64	674.90	1,020	335
672.40	325	70	674.95	1,035	354
672.45	325	75	675.00	1,050	373
672.50	325	81	675.05	1,065	394
672.55	325	86	675.10	1,080	415
672.60	325	91	675.15	1,096	437
672.65	325	97	675.20	1,112	459
672.70	325	102	675.25	1,128	483
672.75	651	107	675.30	1,144	507
672.80	651	112	675.35	1,160	532
672.85	651	116	675.40	1,177	558
672.90	651	121	675.45	1,193	585
672.95	651	125	675.50	1,210	612
673.00	651	129	675.55	1,227	641
673.05	651	134	675.60	1,244	670
673.10	651	138	675.65	1,262	700
673.15	651	143	675.70	1,279	731
673.20	651	147	675.75	1,297	763
673.25	651	151	675.80	1,315	796
673.30	651	156	675.85	1,333	829
673.35	651	160	675.90	1,351	864
673.40	651	164	675.95	1,370	899
673.45	651	169	676.00	1,389	936
673.50	651	173	676.05	1,407	973
673.55	651	178	676.10	2,272	1,012
673.60	651	182	676.15	3,138	1,054
673.65	651	186			
673.70	651	191			
673.75	651	195			
673.80	651	200			
673.85	651	204			
673.90	651	208			
673.95	651	213			
674.00	651	217			
674.05	651	222			
674.10	651	226			
674.15	651	230			
674.20	651	235			
674.25	651	239			

Summary for Pond 7P: 48" UG storage

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.326 ac, 63.36% Impervious, Inflow Depth > 1.46" for 2-Year event
Inflow = 0.21 cfs @ 12.13 hrs, Volume= 0.040 af
Outflow = 0.20 cfs @ 12.16 hrs, Volume= 0.040 af, Atten= 6%, Lag= 1.9 min
Primary = 0.20 cfs @ 12.16 hrs, Volume= 0.040 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 669.22' @ 12.16 hrs Surf.Area= 110 sf Storage= 25 cf

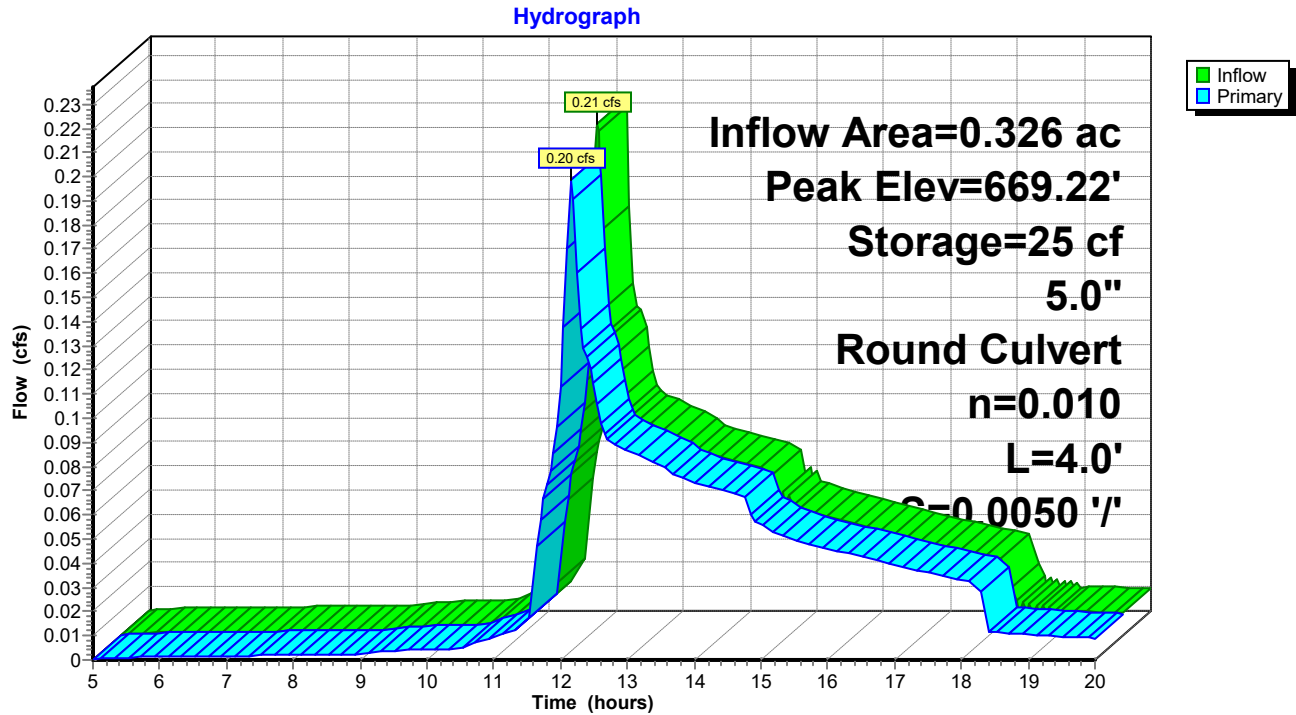
Plug-Flow detention time= 1.7 min calculated for 0.040 af (100% of inflow)
Center-of-Mass det. time= 1.6 min (850.3 - 848.7)

Volume	Invert	Avail.Storage	Storage Description
#1	668.82'	628 cf	48.0" Round Pipe Storage L= 50.0' S= 0.0026 '/'

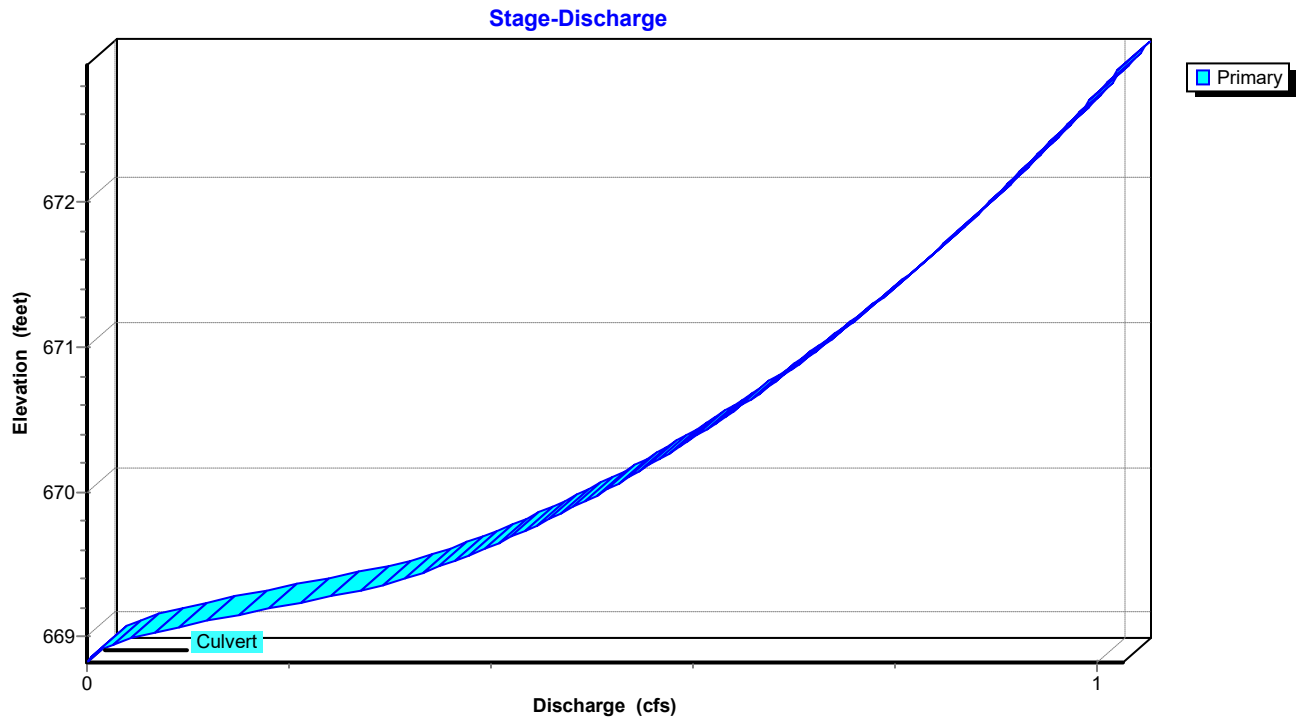
Device	Routing	Invert	Outlet Devices
#1	Primary	668.82'	5.0" Round Culvert L= 4.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 668.82' / 668.80' S= 0.0050 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.14 sf

Primary OutFlow Max=0.20 cfs @ 12.16 hrs HW=669.21' (Free Discharge)
1=Culvert (Barrel Controls 0.20 cfs @ 1.90 fps)

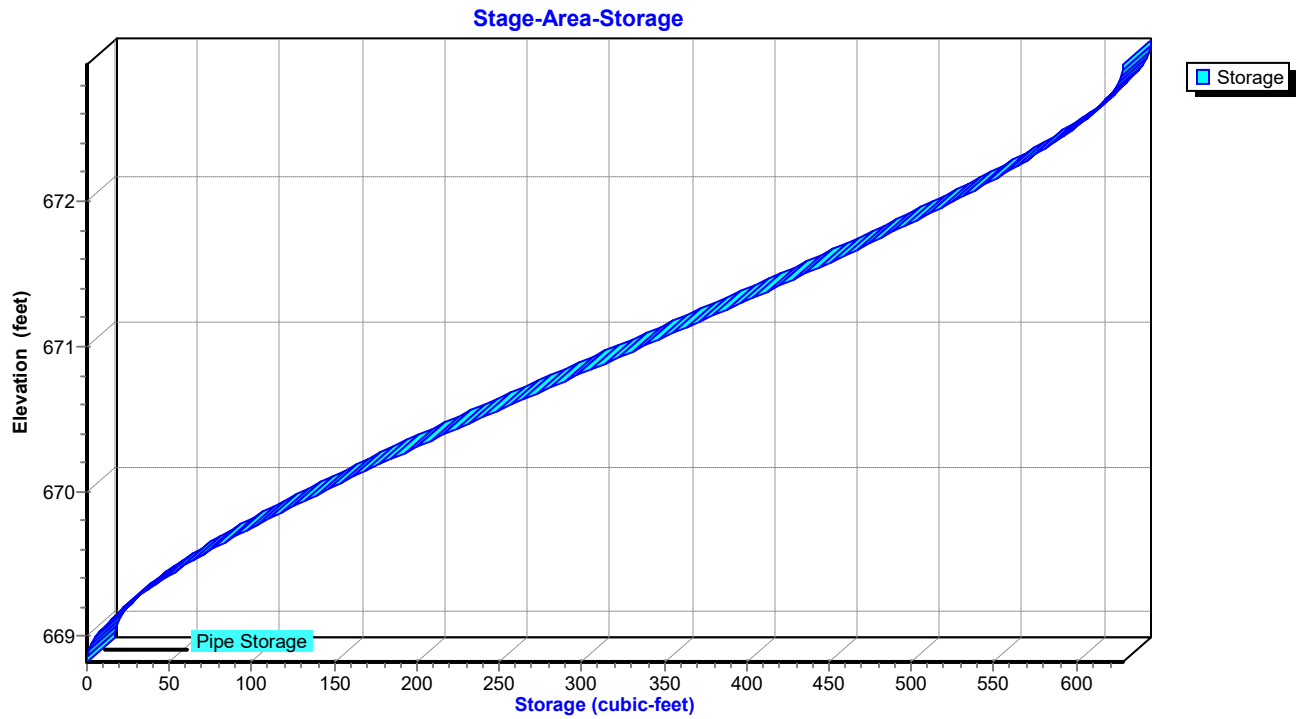
Pond 7P: 48" UG storage



Pond 7P: 48" UG storage



Pond 7P: 48" UG storage



Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

Prepared by Paragon Associates

Printed 3/11/2026

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Hydrograph for Pond 7P: 48" UG storage

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
5.00	0.00	0	668.82	0.00
5.50	0.00	0	668.83	0.00
6.00	0.00	0	668.84	0.00
6.50	0.00	0	668.84	0.00
7.00	0.00	0	668.84	0.00
7.50	0.00	0	668.84	0.00
8.00	0.00	0	668.85	0.00
8.50	0.00	0	668.85	0.00
9.00	0.00	0	668.85	0.00
9.50	0.00	0	668.86	0.00
10.00	0.00	0	668.87	0.00
10.50	0.00	0	668.87	0.00
11.00	0.01	1	668.89	0.01
11.50	0.01	1	668.91	0.01
12.00	0.13	13	669.10	0.11
12.50	0.11	13	669.10	0.11
13.00	0.09	10	669.06	0.09
13.50	0.08	9	669.05	0.08
14.00	0.07	8	669.04	0.07
14.50	0.07	8	669.03	0.07
15.00	0.06	6	669.01	0.06
15.50	0.05	5	669.00	0.05
16.00	0.05	5	668.99	0.05
16.50	0.04	4	668.98	0.04
17.00	0.04	4	668.97	0.04
17.50	0.04	3	668.97	0.04
18.00	0.03	3	668.96	0.03
18.50	0.01	1	668.90	0.01
19.00	0.01	1	668.89	0.01
19.50	0.01	1	668.89	0.01
20.00	0.01	1	668.89	0.01

Stage-Discharge for Pond 7P: 48" UG storage

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
668.82	0.00	671.37	0.79
668.87	0.00	671.42	0.80
668.92	0.02	671.47	0.81
668.97	0.04	671.52	0.82
669.02	0.06	671.57	0.83
669.07	0.09	671.62	0.83
669.12	0.13	671.67	0.84
669.17	0.16	671.72	0.85
669.22	0.20	671.77	0.86
669.27	0.24	671.82	0.87
669.32	0.27	671.87	0.87
669.37	0.30	671.92	0.88
669.42	0.32	671.97	0.89
669.47	0.34	672.02	0.90
669.52	0.36	672.07	0.90
669.57	0.38	672.12	0.91
669.62	0.40	672.17	0.92
669.67	0.42	672.22	0.93
669.72	0.43	672.27	0.93
669.77	0.45	672.32	0.94
669.82	0.46	672.37	0.95
669.87	0.48	672.42	0.95
669.92	0.49	672.47	0.96
669.97	0.50	672.52	0.97
670.02	0.52	672.57	0.98
670.07	0.53	672.62	0.98
670.12	0.54	672.67	0.99
670.17	0.55	672.72	1.00
670.22	0.57	672.77	1.00
670.27	0.58	672.82	1.01
670.32	0.59	672.87	1.02
670.37	0.60	672.92	1.02
670.42	0.61		
670.47	0.62		
670.52	0.63		
670.57	0.64		
670.62	0.65		
670.67	0.66		
670.72	0.67		
670.77	0.68		
670.82	0.69		
670.87	0.70		
670.92	0.71		
670.97	0.72		
671.02	0.73		
671.07	0.74		
671.12	0.75		
671.17	0.76		
671.22	0.77		
671.27	0.78		
671.32	0.78		

Stage-Area-Storage for Pond 7P: 48" UG storage

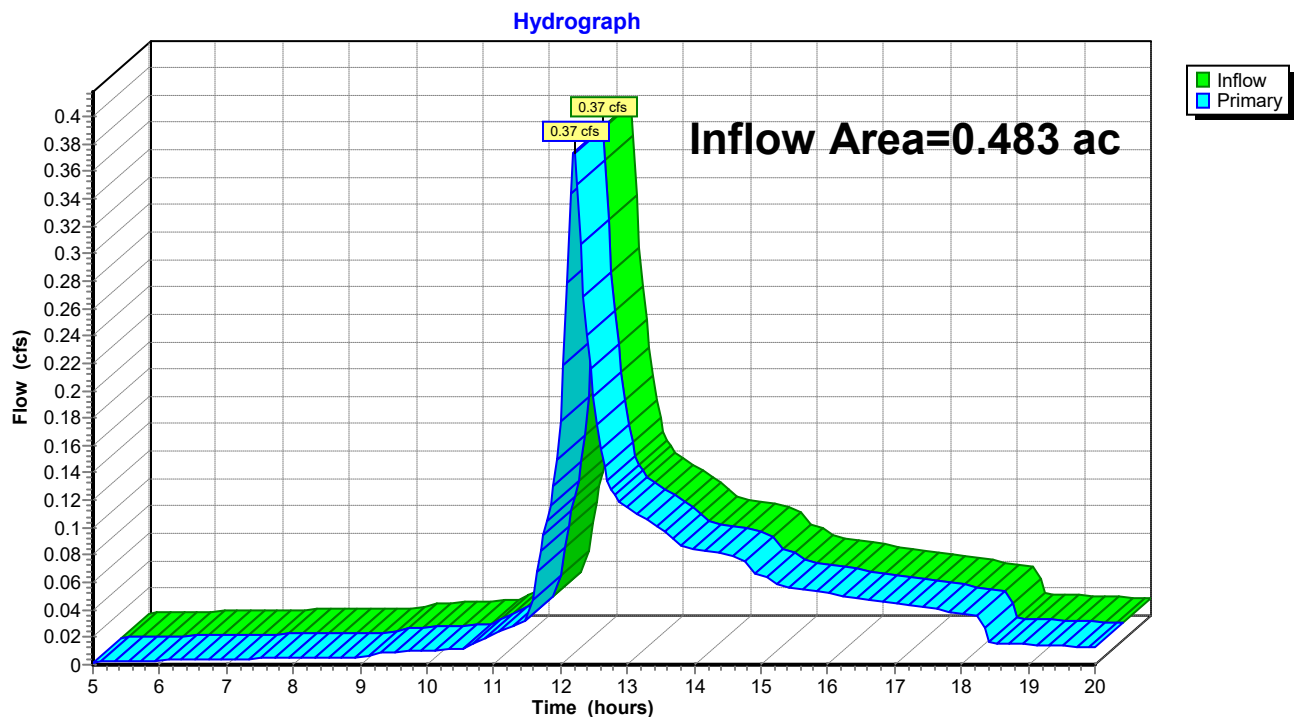
Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
668.82	0	671.37	410
668.87	0	671.42	420
668.92	1	671.47	429
668.97	4	671.52	439
669.02	7	671.57	448
669.07	11	671.62	458
669.12	15	671.67	467
669.17	20	671.72	476
669.22	25	671.77	485
669.27	31	671.82	494
669.32	37	671.87	503
669.37	43	671.92	511
669.42	50	671.97	520
669.47	57	672.02	528
669.52	64	672.07	536
669.57	72	672.12	544
669.62	79	672.17	552
669.67	87	672.22	560
669.72	95	672.27	567
669.77	103	672.32	574
669.82	112	672.37	581
669.87	120	672.42	587
669.92	129	672.47	594
669.97	138	672.52	600
670.02	147	672.57	605
670.07	156	672.62	610
670.12	165	672.67	615
670.17	174	672.72	619
670.22	184	672.77	623
670.27	193	672.82	626
670.32	203	672.87	628
670.37	212	672.92	628
670.42	222		
670.47	232		
670.52	242		
670.57	251		
670.62	261		
670.67	271		
670.72	281		
670.77	291		
670.82	301		
670.87	311		
670.92	321		
670.97	331		
671.02	341		
671.07	351		
671.12	361		
671.17	371		
671.22	381		
671.27	391		
671.32	400		

Summary for Link 2L: frontage rd

Inflow Area = 0.483 ac, 55.51% Impervious, Inflow Depth > 1.37" for 2-Year event
Inflow = 0.37 cfs @ 12.20 hrs, Volume= 0.055 af
Primary = 0.37 cfs @ 12.20 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: frontage rd



Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 2-Year Rainfall=2.94"*

Prepared by Paragon Associates

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Hydrograph for Link 2L: frontage rd

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00	0.00	0.00	17.75	0.04	0.00	0.04
5.25	0.00	0.00	0.00	18.00	0.04	0.00	0.04
5.50	0.00	0.00	0.00	18.25	0.04	0.00	0.04
5.75	0.00	0.00	0.00	18.50	0.02	0.00	0.02
6.00	0.00	0.00	0.00	18.75	0.02	0.00	0.02
6.25	0.00	0.00	0.00	19.00	0.01	0.00	0.01
6.50	0.00	0.00	0.00	19.25	0.01	0.00	0.01
6.75	0.00	0.00	0.00	19.50	0.01	0.00	0.01
7.00	0.00	0.00	0.00	19.75	0.01	0.00	0.01
7.25	0.00	0.00	0.00	20.00	0.01	0.00	0.01
7.50	0.00	0.00	0.00				
7.75	0.00	0.00	0.00				
8.00	0.00	0.00	0.00				
8.25	0.01	0.00	0.01				
8.50	0.01	0.00	0.01				
8.75	0.01	0.00	0.01				
9.00	0.01	0.00	0.01				
9.25	0.01	0.00	0.01				
9.50	0.01	0.00	0.01				
9.75	0.01	0.00	0.01				
10.00	0.01	0.00	0.01				
10.25	0.01	0.00	0.01				
10.50	0.01	0.00	0.01				
10.75	0.02	0.00	0.02				
11.00	0.02	0.00	0.02				
11.25	0.03	0.00	0.03				
11.50	0.03	0.00	0.03				
11.75	0.10	0.00	0.10				
12.00	0.18	0.00	0.18				
12.25	0.35	0.00	0.35				
12.50	0.20	0.00	0.20				
12.75	0.13	0.00	0.13				
13.00	0.11	0.00	0.11				
13.25	0.11	0.00	0.11				
13.50	0.10	0.00	0.10				
13.75	0.09	0.00	0.09				
14.00	0.08	0.00	0.08				
14.25	0.08	0.00	0.08				
14.50	0.08	0.00	0.08				
14.75	0.08	0.00	0.08				
15.00	0.07	0.00	0.07				
15.25	0.06	0.00	0.06				
15.50	0.06	0.00	0.06				
15.75	0.05	0.00	0.05				
16.00	0.05	0.00	0.05				
16.25	0.05	0.00	0.05				
16.50	0.05	0.00	0.05				
16.75	0.05	0.00	0.05				
17.00	0.04	0.00	0.04				
17.25	0.04	0.00	0.04				
17.50	0.04	0.00	0.04				

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: To E Biofilter	Runoff Area=1,875 sf 57.33% Impervious Runoff Depth>2.62" Flow Length=25' Tc=8.0 min CN=WQ Runoff=0.15 cfs 0.009 af
Subcatchment 3S: to curb inlet	Runoff Area=5,020 sf 68.92% Impervious Runoff Depth>2.95" Flow Length=150' Tc=10.0 min CN=WQ Runoff=0.42 cfs 0.028 af
Subcatchment 4S: to W biofilter	Runoff Area=4,490 sf 59.91% Impervious Runoff Depth>2.70" Flow Length=140' Tc=6.0 min CN=WQ Runoff=0.39 cfs 0.023 af
Subcatchment 5S: to NDS 13-14-15	Runoff Area=1,050 sf 0.00% Impervious Runoff Depth>0.90" Flow Length=175' Tc=8.0 min CN=WQ Runoff=0.03 cfs 0.002 af
Subcatchment 6S: untreated	Runoff Area=6,820 sf 39.15% Impervious Runoff Depth>2.06" Flow Length=100' Tc=15.0 min CN=WQ Runoff=0.34 cfs 0.027 af
Subcatchment 7S: S 1/2 roof to 8" PVC	Runoff Area=1,190 sf 100.00% Impervious Runoff Depth>3.88" Flow Length=25' Tc=5.0 min CN=98 Runoff=0.15 cfs 0.009 af
Subcatchment 8S: NW 1/4 roof	Runoff Area=595 sf 100.00% Impervious Runoff Depth>3.88" Flow Length=25' Tc=5.0 min CN=98 Runoff=0.08 cfs 0.004 af
Reach 3R: S. 8" PVC	Avg. Flow Depth=0.18' Max Vel=2.35 fps Inflow=0.18 cfs 0.011 af 8.0" Round Pipe n=0.010 L=87.0' S=0.0052 '/' Capacity=1.13 cfs Outflow=0.17 cfs 0.011 af
Reach 4R: W. 6" PVC	Avg. Flow Depth=0.13' Max Vel=9.82 fps Inflow=0.41 cfs 0.067 af 6.0" Round Pipe n=0.010 L=77.0' S=0.1335 '/' Capacity=2.67 cfs Outflow=0.41 cfs 0.067 af
Pond 3P: E biofilter LINED	Peak Elev=680.81' Storage=178 cf Inflow=0.15 cfs 0.009 af Primary=0.03 cfs 0.008 af Secondary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.008 af
Pond 5P: W biofillter UNLINED	Peak Elev=676.16' Storage=1,059 cf Inflow=0.79 cfs 0.052 af Discarded=0.00 cfs 0.001 af Primary=0.38 cfs 0.044 af Secondary=0.01 cfs 0.000 af Outflow=0.40 cfs 0.045 af
Pond 7P: 48" UG storage	Peak Elev=669.66' Storage=85 cf Inflow=0.50 cfs 0.067 af 5.0" Round Culvert n=0.010 L=4.0' S=0.0050 '/' Outflow=0.41 cfs 0.067 af
Link 2L: frontage rd	Inflow=0.69 cfs 0.094 af Primary=0.69 cfs 0.094 af
Total Runoff Area = 0.483 ac Runoff Volume = 0.103 af Average Runoff Depth = 2.56"	
44.49% Pervious = 0.215 ac 55.51% Impervious = 0.268 ac	

Summary for Subcatchment 1S: To E Biofilter

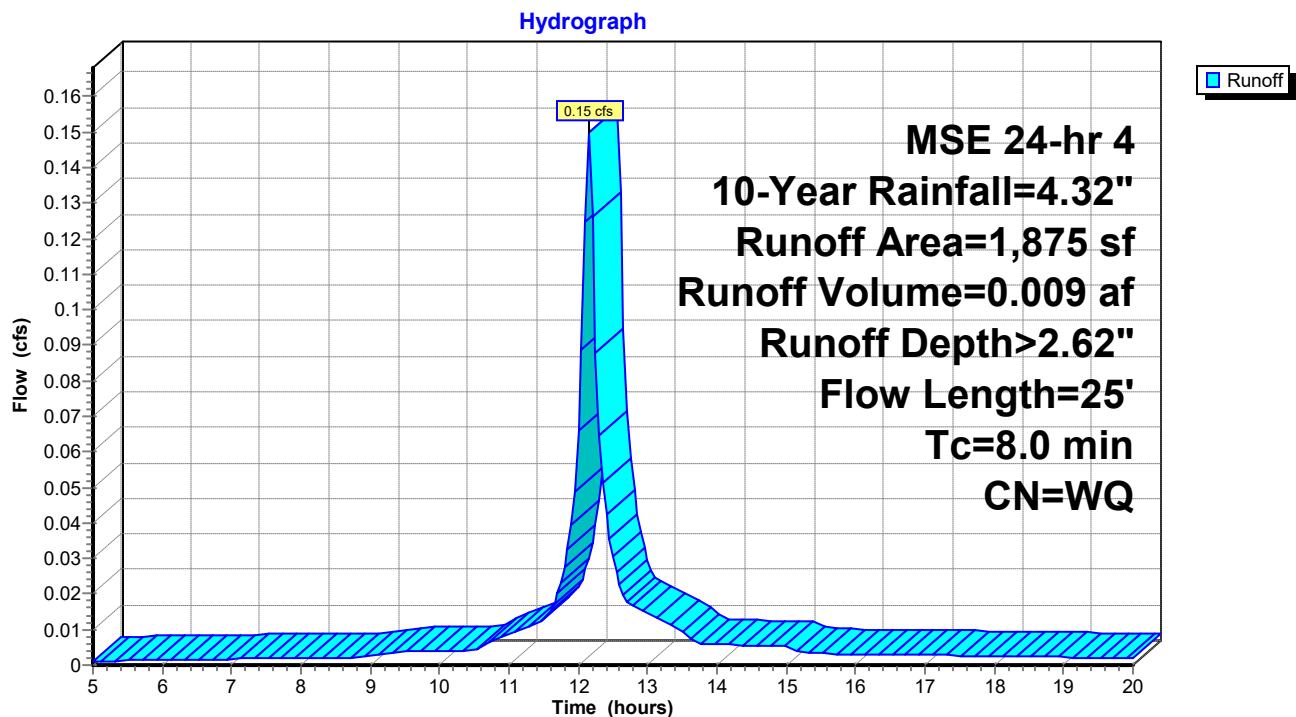
Runoff = 0.15 cfs @ 12.15 hrs, Volume= 0.009 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10-Year Rainfall=4.32"

	Area (sf)	CN	Description
*	800	61	lawn, HSG B, good
*	645	98	NE 1/4 roof
*	210	100	bio media
*	220	98	retain wall
	1,875		Weighted Average
	800		42.67% Pervious Area
	1,075		57.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	25		0.05		Direct Entry, lawn above wall to E bio

Subcatchment 1S: To E Biofilter



Hydrograph for Subcatchment 1S: To E Biofilter

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.00	0.00	17.75	4.04	2.23	0.00
5.25	0.21	0.00	0.00	18.00	4.05	2.25	0.00
5.50	0.23	0.00	0.00	18.25	4.07	2.26	0.00
5.75	0.25	0.00	0.00	18.50	4.09	2.28	0.00
6.00	0.27	0.00	0.00	18.75	4.11	2.29	0.00
6.25	0.28	0.00	0.00	19.00	4.12	2.31	0.00
6.50	0.30	0.00	0.00	19.25	4.14	2.32	0.00
6.75	0.32	0.00	0.00	19.50	4.15	2.33	0.00
7.00	0.34	0.00	0.00	19.75	4.17	2.35	0.00
7.25	0.36	0.00	0.00	20.00	4.18	2.36	0.00
7.50	0.38	0.00	0.00				
7.75	0.41	0.00	0.00				
8.00	0.43	0.00	0.00				
8.25	0.45	0.00	0.00				
8.50	0.47	0.00	0.00				
8.75	0.50	0.00	0.00				
9.00	0.52	0.00	0.00				
9.25	0.56	0.01	0.00				
9.50	0.60	0.01	0.00				
9.75	0.64	0.02	0.00				
10.00	0.68	0.02	0.00				
10.25	0.73	0.03	0.00				
10.50	0.77	0.04	0.00				
10.75	0.84	0.06	0.01				
11.00	0.93	0.09	0.01				
11.25	1.04	0.13	0.01				
11.50	1.17	0.18	0.01				
11.75	1.42	0.30	0.02				
12.00	2.02	0.66	0.07				
12.25	2.90	1.30	0.09				
12.50	3.15	1.50	0.03				
12.75	3.28	1.60	0.02				
13.00	3.39	1.69	0.01				
13.25	3.48	1.76	0.01				
13.50	3.55	1.82	0.01				
13.75	3.59	1.86	0.01				
14.00	3.64	1.90	0.01				
14.25	3.68	1.93	0.01				
14.50	3.72	1.96	0.01				
14.75	3.76	2.00	0.01				
15.00	3.80	2.03	0.01				
15.25	3.82	2.05	0.00				
15.50	3.85	2.07	0.00				
15.75	3.87	2.09	0.00				
16.00	3.89	2.11	0.00				
16.25	3.91	2.13	0.00				
16.50	3.94	2.15	0.00				
16.75	3.96	2.17	0.00				
17.00	3.98	2.18	0.00				
17.25	4.00	2.20	0.00				
17.50	4.02	2.22	0.00				

Summary for Subcatchment 3S: to curb inlet

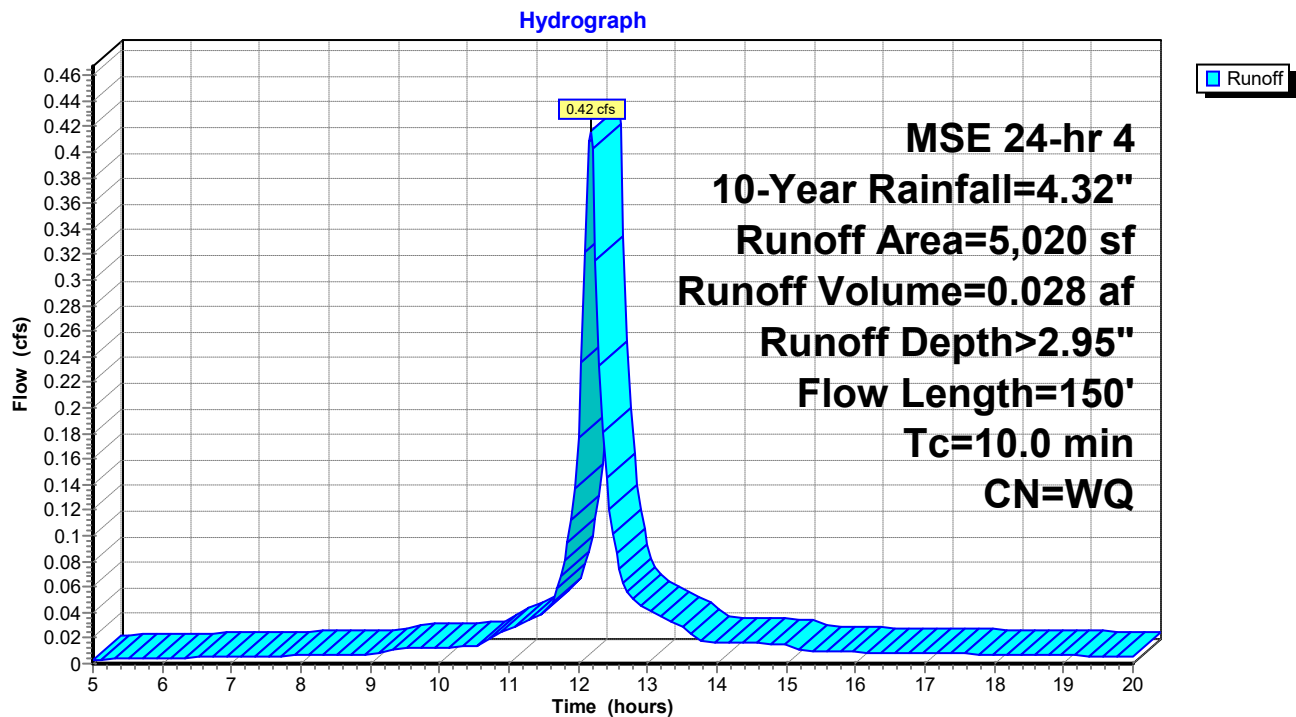
Runoff = 0.42 cfs @ 12.17 hrs, Volume= 0.028 af, Depth> 2.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10-Year Rainfall=4.32"

	Area (sf)	CN	Description
*	3,200	98	S part parking lot
*	160	98	SW
*	780	61	lawn, HSG B, good
*	780	61	lawn above wall
*	100	98	retain wall
	5,020		Weighted Average
	1,560		31.08% Pervious Area
	3,460		68.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	150		0.25		Direct Entry, LAXVC lawn via AC pavement

Subcatchment 3S: to curb inlet



Hydrograph for Subcatchment 3S: to curb inlet

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.00	0.00	17.75	4.04	2.67	0.01
5.25	0.21	0.00	0.00	18.00	4.05	2.69	0.01
5.50	0.23	0.00	0.00	18.25	4.07	2.70	0.01
5.75	0.25	0.00	0.00	18.50	4.09	2.72	0.01
6.00	0.27	0.00	0.00	18.75	4.11	2.73	0.01
6.25	0.28	0.00	0.00	19.00	4.12	2.75	0.01
6.50	0.30	0.00	0.00	19.25	4.14	2.76	0.01
6.75	0.32	0.00	0.01	19.50	4.15	2.78	0.01
7.00	0.34	0.00	0.01	19.75	4.17	2.79	0.01
7.25	0.36	0.00	0.01	20.00	4.18	2.80	0.01
7.50	0.38	0.00	0.01				
7.75	0.41	0.01	0.01				
8.00	0.43	0.01	0.01				
8.25	0.45	0.01	0.01				
8.50	0.47	0.02	0.01				
8.75	0.50	0.02	0.01				
9.00	0.52	0.03	0.01				
9.25	0.56	0.04	0.01				
9.50	0.60	0.05	0.01				
9.75	0.64	0.06	0.01				
10.00	0.68	0.08	0.01				
10.25	0.73	0.10	0.01				
10.50	0.77	0.11	0.01				
10.75	0.84	0.15	0.02				
11.00	0.93	0.19	0.03				
11.25	1.04	0.25	0.03				
11.50	1.17	0.32	0.04				
11.75	1.42	0.48	0.07				
12.00	2.02	0.92	0.18				
12.25	2.90	1.66	0.32				
12.50	3.15	1.87	0.10				
12.75	3.28	1.98	0.05				
13.00	3.39	2.08	0.04				
13.25	3.48	2.16	0.04				
13.50	3.55	2.23	0.03				
13.75	3.59	2.27	0.02				
14.00	3.64	2.30	0.02				
14.25	3.68	2.34	0.02				
14.50	3.72	2.38	0.02				
14.75	3.76	2.42	0.02				
15.00	3.80	2.45	0.02				
15.25	3.82	2.47	0.01				
15.50	3.85	2.50	0.01				
15.75	3.87	2.52	0.01				
16.00	3.89	2.54	0.01				
16.25	3.91	2.56	0.01				
16.50	3.94	2.58	0.01				
16.75	3.96	2.60	0.01				
17.00	3.98	2.62	0.01				
17.25	4.00	2.63	0.01				
17.50	4.02	2.65	0.01				

Summary for Subcatchment 4S: to W biofilter

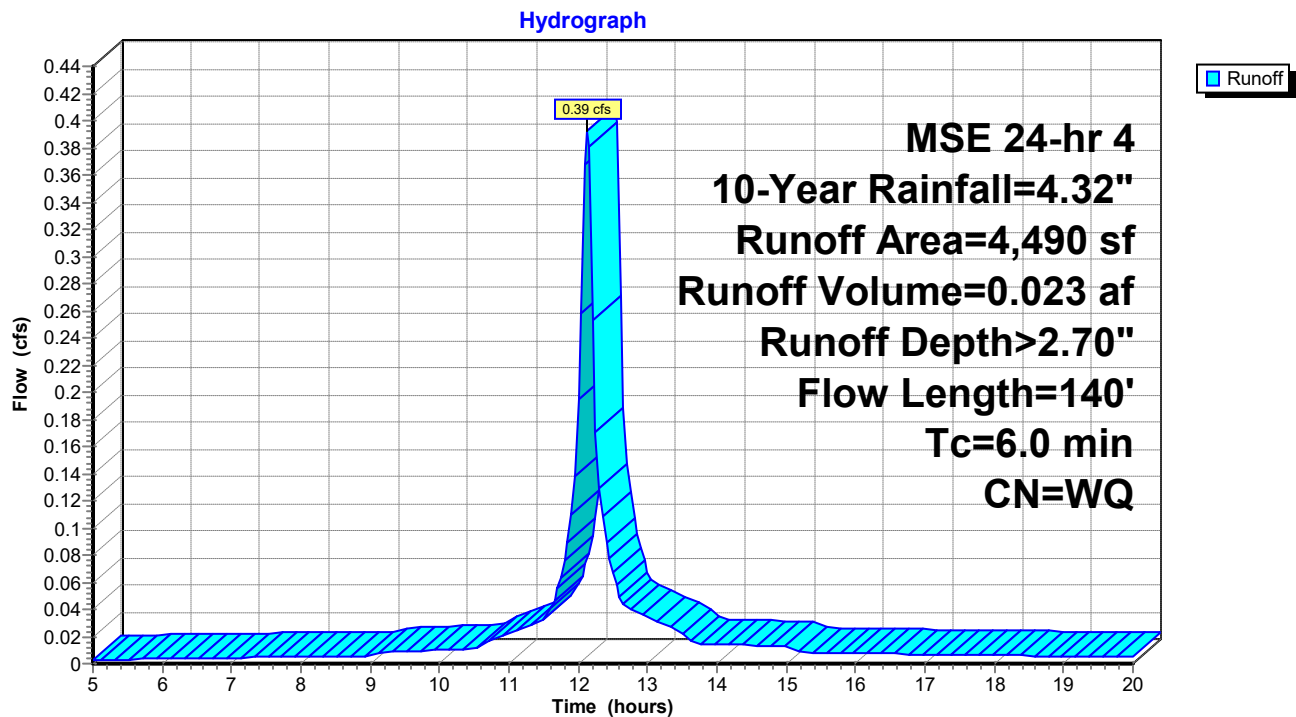
Runoff = 0.39 cfs @ 12.13 hrs, Volume= 0.023 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10-Year Rainfall=4.32"

	Area (sf)	CN	Description
*	2,000	98	N part driveway
*	230	98	N part parking lot
*	1,600	61	lawn, HSG B, good
*	460	100	bio media
*	200	61	landscape
	4,490		Weighted Average
	1,800		40.09% Pervious Area
	2,690		59.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	140		0.39		Direct Entry, lawn via parking

Subcatchment 4S: to W biofilter



Hydrograph for Subcatchment 4S: to W biofilter

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.00	0.00	17.75	4.04	2.32	0.01
5.25	0.21	0.00	0.00	18.00	4.05	2.33	0.01
5.50	0.23	0.00	0.00	18.25	4.07	2.35	0.01
5.75	0.25	0.00	0.00	18.50	4.09	2.36	0.01
6.00	0.27	0.00	0.00	18.75	4.11	2.38	0.01
6.25	0.28	0.00	0.00	19.00	4.12	2.39	0.01
6.50	0.30	0.00	0.00	19.25	4.14	2.41	0.01
6.75	0.32	0.00	0.00	19.50	4.15	2.42	0.00
7.00	0.34	0.00	0.00	19.75	4.17	2.43	0.00
7.25	0.36	0.00	0.00	20.00	4.18	2.44	0.00
7.50	0.38	0.00	0.00				
7.75	0.41	0.00	0.00				
8.00	0.43	0.00	0.01				
8.25	0.45	0.00	0.01				
8.50	0.47	0.00	0.01				
8.75	0.50	0.00	0.01				
9.00	0.52	0.01	0.01				
9.25	0.56	0.01	0.01				
9.50	0.60	0.02	0.01				
9.75	0.64	0.02	0.01				
10.00	0.68	0.03	0.01				
10.25	0.73	0.04	0.01				
10.50	0.77	0.05	0.01				
10.75	0.84	0.08	0.02				
11.00	0.93	0.11	0.02				
11.25	1.04	0.15	0.03				
11.50	1.17	0.21	0.03				
11.75	1.42	0.33	0.06				
12.00	2.02	0.71	0.19				
12.25	2.90	1.37	0.17				
12.50	3.15	1.57	0.07				
12.75	3.28	1.67	0.04				
13.00	3.39	1.76	0.03				
13.25	3.48	1.84	0.03				
13.50	3.55	1.90	0.02				
13.75	3.59	1.94	0.01				
14.00	3.64	1.97	0.01				
14.25	3.68	2.01	0.01				
14.50	3.72	2.04	0.01				
14.75	3.76	2.08	0.01				
15.00	3.80	2.11	0.01				
15.25	3.82	2.13	0.01				
15.50	3.85	2.15	0.01				
15.75	3.87	2.17	0.01				
16.00	3.89	2.19	0.01				
16.25	3.91	2.21	0.01				
16.50	3.94	2.23	0.01				
16.75	3.96	2.25	0.01				
17.00	3.98	2.27	0.01				
17.25	4.00	2.28	0.01				
17.50	4.02	2.30	0.01				

Summary for Subcatchment 5S: to NDS 13-14-15

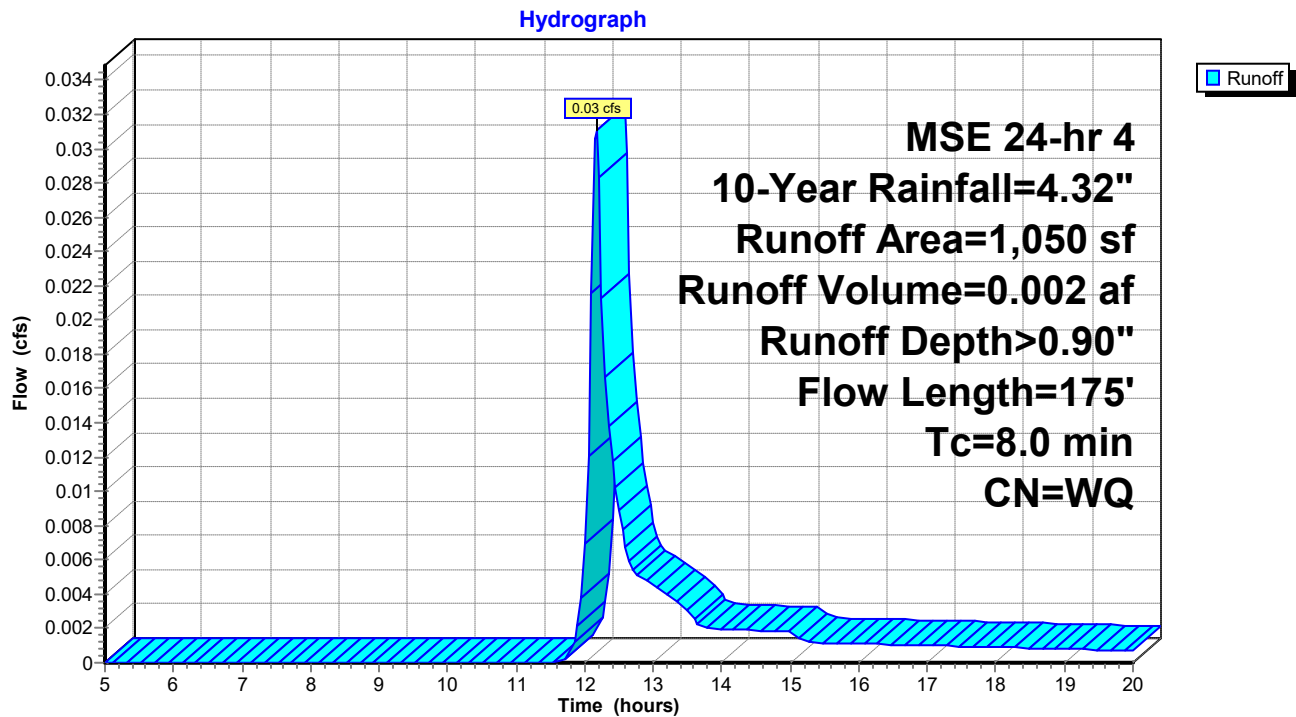
Runoff = 0.03 cfs @ 12.17 hrs, Volume= 0.002 af, Depth> 0.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10-Year Rainfall=4.32"

	Area (sf)	CN	Description
*	550	61	NDS 14-15 lawn berm, HSG B, good
*	500	61	NDS 13 lawn
	1,050		Weighted Average
	1,050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	175		0.36		Direct Entry, lawn berm

Subcatchment 5S: to NDS 13-14-15



Hydrograph for Subcatchment 5S: to NDS 13-14-15

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.00	0.00	17.75	4.04	0.83	0.00
5.25	0.21	0.00	0.00	18.00	4.05	0.84	0.00
5.50	0.23	0.00	0.00	18.25	4.07	0.85	0.00
5.75	0.25	0.00	0.00	18.50	4.09	0.86	0.00
6.00	0.27	0.00	0.00	18.75	4.11	0.87	0.00
6.25	0.28	0.00	0.00	19.00	4.12	0.88	0.00
6.50	0.30	0.00	0.00	19.25	4.14	0.88	0.00
6.75	0.32	0.00	0.00	19.50	4.15	0.89	0.00
7.00	0.34	0.00	0.00	19.75	4.17	0.90	0.00
7.25	0.36	0.00	0.00	20.00	4.18	0.91	0.00
7.50	0.38	0.00	0.00				
7.75	0.41	0.00	0.00				
8.00	0.43	0.00	0.00				
8.25	0.45	0.00	0.00				
8.50	0.47	0.00	0.00				
8.75	0.50	0.00	0.00				
9.00	0.52	0.00	0.00				
9.25	0.56	0.00	0.00				
9.50	0.60	0.00	0.00				
9.75	0.64	0.00	0.00				
10.00	0.68	0.00	0.00				
10.25	0.73	0.00	0.00				
10.50	0.77	0.00	0.00				
10.75	0.84	0.00	0.00				
11.00	0.93	0.00	0.00				
11.25	1.04	0.00	0.00				
11.50	1.17	0.00	0.00				
11.75	1.42	0.00	0.00				
12.00	2.02	0.08	0.01				
12.25	2.90	0.33	0.02				
12.50	3.15	0.42	0.01				
12.75	3.28	0.48	0.01				
13.00	3.39	0.52	0.00				
13.25	3.48	0.56	0.00				
13.50	3.55	0.59	0.00				
13.75	3.59	0.61	0.00				
14.00	3.64	0.63	0.00				
14.25	3.68	0.65	0.00				
14.50	3.72	0.67	0.00				
14.75	3.76	0.69	0.00				
15.00	3.80	0.71	0.00				
15.25	3.82	0.72	0.00				
15.50	3.85	0.74	0.00				
15.75	3.87	0.75	0.00				
16.00	3.89	0.76	0.00				
16.25	3.91	0.77	0.00				
16.50	3.94	0.78	0.00				
16.75	3.96	0.79	0.00				
17.00	3.98	0.80	0.00				
17.25	4.00	0.81	0.00				
17.50	4.02	0.82	0.00				

Summary for Subcatchment 6S: untreated

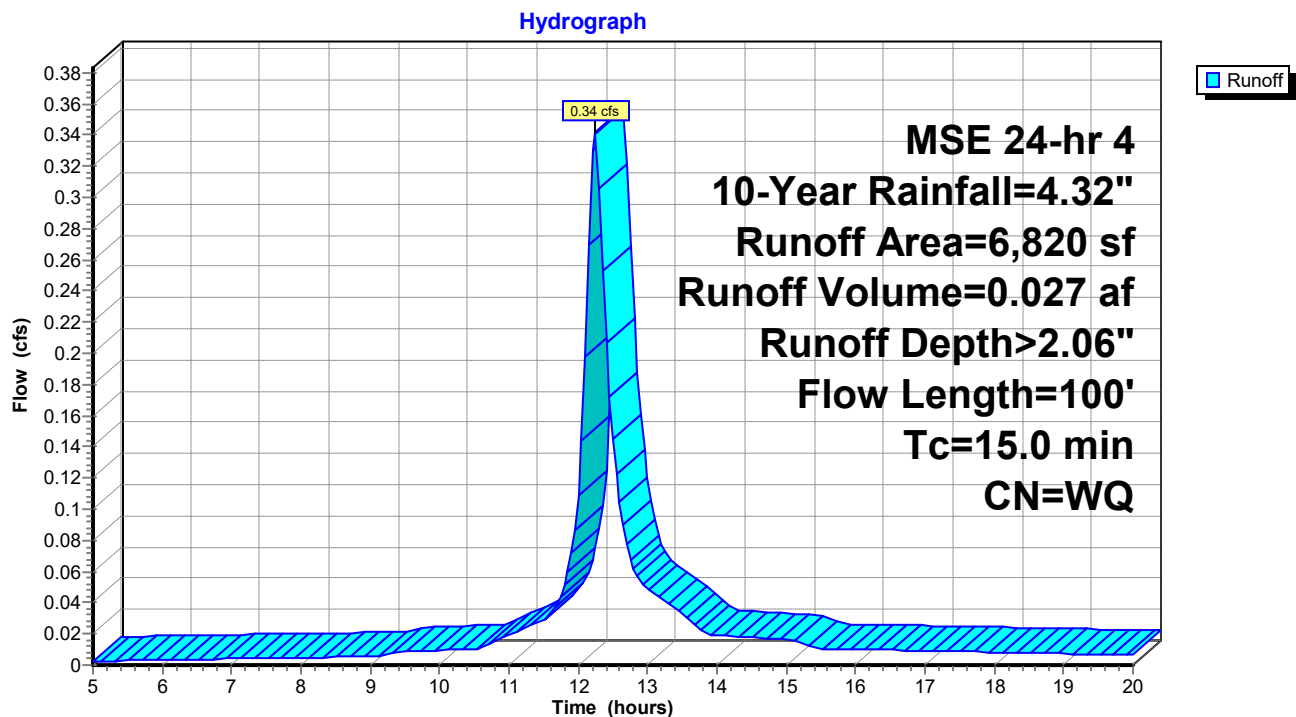
Runoff = 0.34 cfs @ 12.24 hrs, Volume= 0.027 af, Depth> 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10-Year Rainfall=4.32"

	Area (sf)	CN	Description
*	2,400	98	S driveway
*	3,400	61	lawn, HSG B, good
*	750	61	bark mulch landscape
*	270	98	retain wall
	6,820		Weighted Average
	4,150		60.85% Pervious Area
	2,670		39.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100		0.11		Direct Entry, landscape to street

Subcatchment 6S: untreated



Hydrograph for Subcatchment 6S: untreated

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.00	0.00	17.75	4.04	1.69	0.01
5.25	0.21	0.00	0.00	18.00	4.05	1.71	0.01
5.50	0.23	0.00	0.00	18.25	4.07	1.72	0.01
5.75	0.25	0.00	0.00	18.50	4.09	1.73	0.01
6.00	0.27	0.00	0.00	18.75	4.11	1.75	0.01
6.25	0.28	0.00	0.00	19.00	4.12	1.76	0.01
6.50	0.30	0.00	0.00	19.25	4.14	1.77	0.01
6.75	0.32	0.00	0.00	19.50	4.15	1.78	0.01
7.00	0.34	0.00	0.00	19.75	4.17	1.79	0.01
7.25	0.36	0.00	0.00	20.00	4.18	1.80	0.01
7.50	0.38	0.00	0.00				
7.75	0.41	0.00	0.00				
8.00	0.43	0.00	0.00				
8.25	0.45	0.00	0.00				
8.50	0.47	0.00	0.01				
8.75	0.50	0.00	0.01				
9.00	0.52	0.00	0.01				
9.25	0.56	0.00	0.01				
9.50	0.60	0.00	0.01				
9.75	0.64	0.00	0.01				
10.00	0.68	0.00	0.01				
10.25	0.73	0.00	0.01				
10.50	0.77	0.00	0.01				
10.75	0.84	0.01	0.01				
11.00	0.93	0.02	0.02				
11.25	1.04	0.04	0.02				
11.50	1.17	0.07	0.03				
11.75	1.42	0.14	0.04				
12.00	2.02	0.39	0.11				
12.25	2.90	0.90	0.34				
12.50	3.15	1.06	0.14				
12.75	3.28	1.15	0.07				
13.00	3.39	1.22	0.05				
13.25	3.48	1.28	0.04				
13.50	3.55	1.34	0.03				
13.75	3.59	1.37	0.02				
14.00	3.64	1.40	0.02				
14.25	3.68	1.43	0.02				
14.50	3.72	1.46	0.02				
14.75	3.76	1.49	0.02				
15.00	3.80	1.52	0.02				
15.25	3.82	1.53	0.01				
15.50	3.85	1.55	0.01				
15.75	3.87	1.57	0.01				
16.00	3.89	1.59	0.01				
16.25	3.91	1.60	0.01				
16.50	3.94	1.62	0.01				
16.75	3.96	1.63	0.01				
17.00	3.98	1.65	0.01				
17.25	4.00	1.67	0.01				
17.50	4.02	1.68	0.01				

Summary for Subcatchment 7S: S 1/2 roof to 8" PVC

[49] Hint: Tc<2dt may require smaller dt

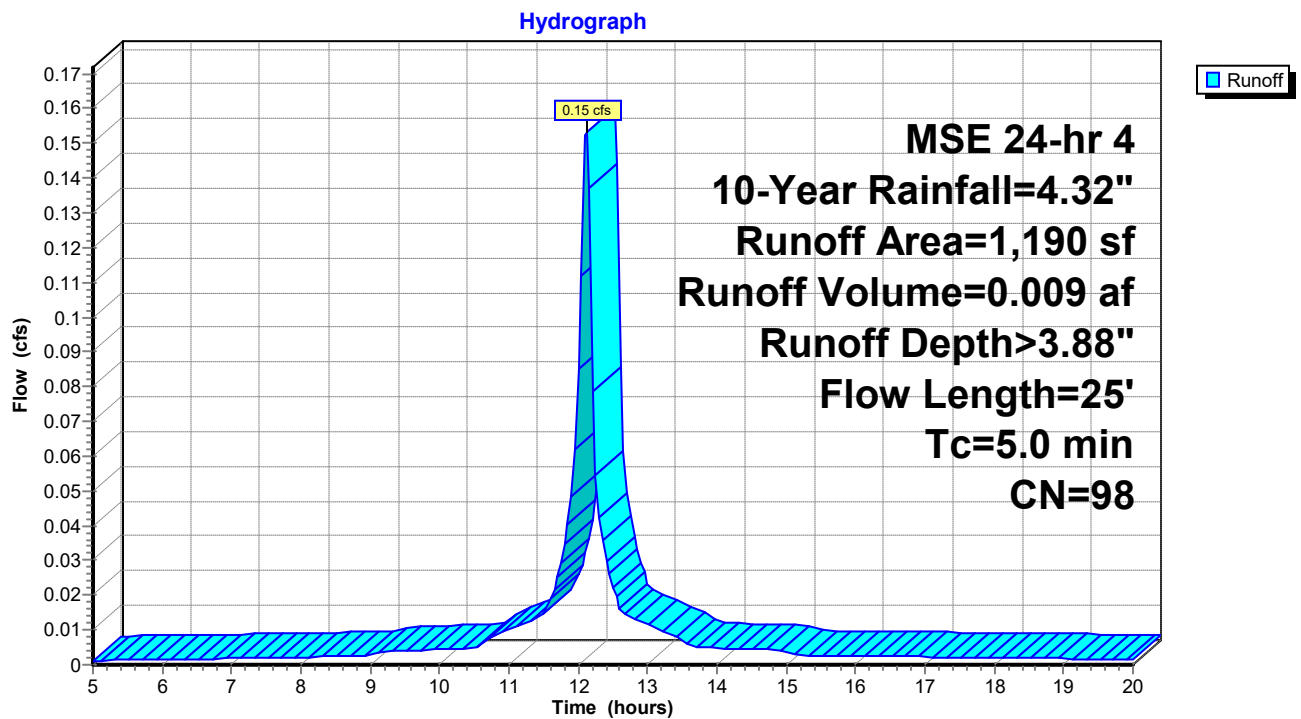
Runoff = 0.15 cfs @ 12.11 hrs, Volume= 0.009 af, Depth> 3.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10-Year Rainfall=4.32"

	Area (sf)	CN	Description
*	1,190	98	1/2 roof
	1,190		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	25		0.08		Direct Entry, S 1/2 roof

Subcatchment 7S: S 1/2 roof to 8" PVC



Hydrograph for Subcatchment 7S: S 1/2 roof to 8" PVC

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.07	0.00	17.75	4.04	3.80	0.00
5.25	0.21	0.08	0.00	18.00	4.05	3.82	0.00
5.50	0.23	0.09	0.00	18.25	4.07	3.84	0.00
5.75	0.25	0.10	0.00	18.50	4.09	3.85	0.00
6.00	0.27	0.12	0.00	18.75	4.11	3.87	0.00
6.25	0.28	0.13	0.00	19.00	4.12	3.89	0.00
6.50	0.30	0.15	0.00	19.25	4.14	3.90	0.00
6.75	0.32	0.16	0.00	19.50	4.15	3.92	0.00
7.00	0.34	0.18	0.00	19.75	4.17	3.93	0.00
7.25	0.36	0.20	0.00	20.00	4.18	3.94	0.00
7.50	0.38	0.22	0.00				
7.75	0.41	0.23	0.00				
8.00	0.43	0.25	0.00				
8.25	0.45	0.27	0.00				
8.50	0.47	0.29	0.00				
8.75	0.50	0.32	0.00				
9.00	0.52	0.34	0.00				
9.25	0.56	0.37	0.00				
9.50	0.60	0.41	0.00				
9.75	0.64	0.45	0.00				
10.00	0.68	0.49	0.00				
10.25	0.73	0.53	0.00				
10.50	0.77	0.57	0.00				
10.75	0.84	0.64	0.01				
11.00	0.93	0.73	0.01				
11.25	1.04	0.83	0.01				
11.50	1.17	0.96	0.01				
11.75	1.42	1.20	0.03				
12.00	2.02	1.80	0.09				
12.25	2.90	2.67	0.05				
12.50	3.15	2.91	0.02				
12.75	3.28	3.04	0.01				
13.00	3.39	3.15	0.01				
13.25	3.48	3.24	0.01				
13.50	3.55	3.31	0.01				
13.75	3.59	3.36	0.00				
14.00	3.64	3.40	0.00				
14.25	3.68	3.44	0.00				
14.50	3.72	3.48	0.00				
14.75	3.76	3.52	0.00				
15.00	3.80	3.56	0.00				
15.25	3.82	3.59	0.00				
15.50	3.85	3.61	0.00				
15.75	3.87	3.63	0.00				
16.00	3.89	3.66	0.00				
16.25	3.91	3.68	0.00				
16.50	3.94	3.70	0.00				
16.75	3.96	3.72	0.00				
17.00	3.98	3.74	0.00				
17.25	4.00	3.76	0.00				
17.50	4.02	3.78	0.00				

Summary for Subcatchment 8S: NW 1/4 roof

[49] Hint: Tc<2dt may require smaller dt

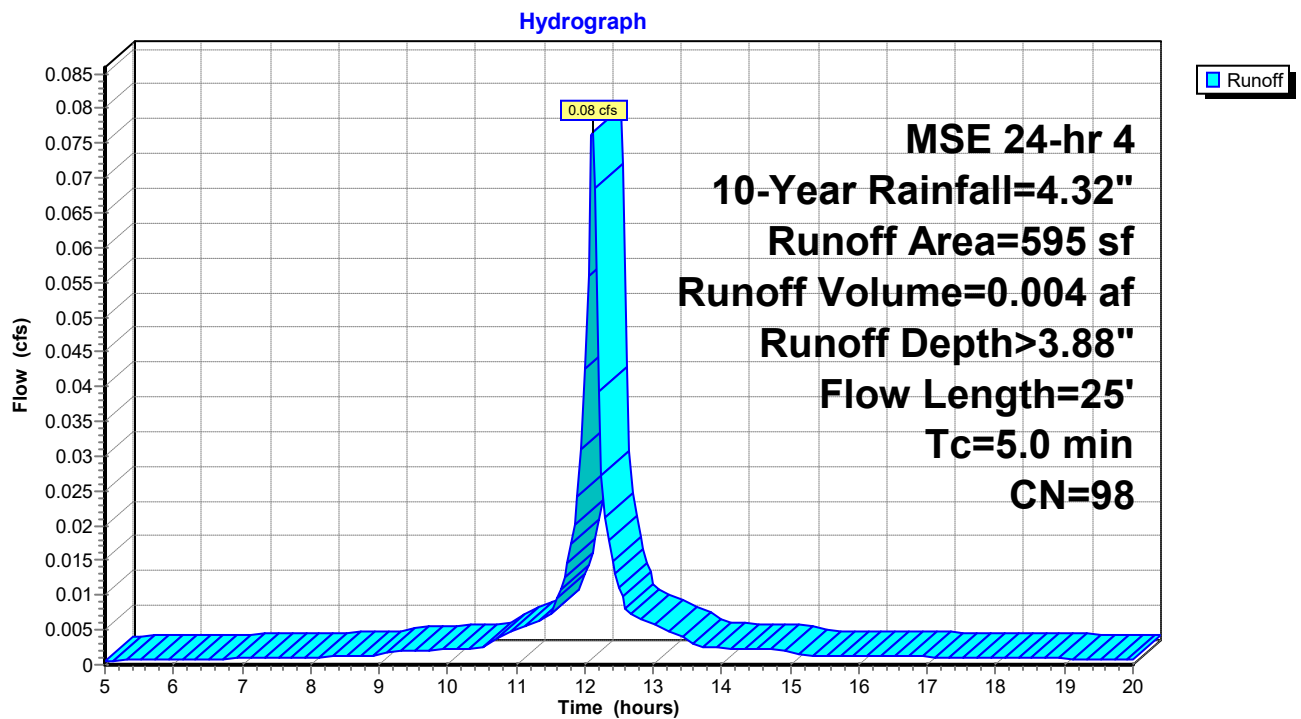
Runoff = 0.08 cfs @ 12.11 hrs, Volume= 0.004 af, Depth> 3.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 10-Year Rainfall=4.32"

Area (sf)	CN	Description
* 595	98	NW 1/4 roof
595		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	25		0.08		Direct Entry, NW 1/4 roof

Subcatchment 8S: NW 1/4 roof



Hydrograph for Subcatchment 8S: NW 1/4 roof

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.07	0.00	17.75	4.04	3.80	0.00
5.25	0.21	0.08	0.00	18.00	4.05	3.82	0.00
5.50	0.23	0.09	0.00	18.25	4.07	3.84	0.00
5.75	0.25	0.10	0.00	18.50	4.09	3.85	0.00
6.00	0.27	0.12	0.00	18.75	4.11	3.87	0.00
6.25	0.28	0.13	0.00	19.00	4.12	3.89	0.00
6.50	0.30	0.15	0.00	19.25	4.14	3.90	0.00
6.75	0.32	0.16	0.00	19.50	4.15	3.92	0.00
7.00	0.34	0.18	0.00	19.75	4.17	3.93	0.00
7.25	0.36	0.20	0.00	20.00	4.18	3.94	0.00
7.50	0.38	0.22	0.00				
7.75	0.41	0.23	0.00				
8.00	0.43	0.25	0.00				
8.25	0.45	0.27	0.00				
8.50	0.47	0.29	0.00				
8.75	0.50	0.32	0.00				
9.00	0.52	0.34	0.00				
9.25	0.56	0.37	0.00				
9.50	0.60	0.41	0.00				
9.75	0.64	0.45	0.00				
10.00	0.68	0.49	0.00				
10.25	0.73	0.53	0.00				
10.50	0.77	0.57	0.00				
10.75	0.84	0.64	0.00				
11.00	0.93	0.73	0.01				
11.25	1.04	0.83	0.01				
11.50	1.17	0.96	0.01				
11.75	1.42	1.20	0.01				
12.00	2.02	1.80	0.04				
12.25	2.90	2.67	0.03				
12.50	3.15	2.91	0.01				
12.75	3.28	3.04	0.01				
13.00	3.39	3.15	0.01				
13.25	3.48	3.24	0.00				
13.50	3.55	3.31	0.00				
13.75	3.59	3.36	0.00				
14.00	3.64	3.40	0.00				
14.25	3.68	3.44	0.00				
14.50	3.72	3.48	0.00				
14.75	3.76	3.52	0.00				
15.00	3.80	3.56	0.00				
15.25	3.82	3.59	0.00				
15.50	3.85	3.61	0.00				
15.75	3.87	3.63	0.00				
16.00	3.89	3.66	0.00				
16.25	3.91	3.68	0.00				
16.50	3.94	3.70	0.00				
16.75	3.96	3.72	0.00				
17.00	3.98	3.74	0.00				
17.25	4.00	3.76	0.00				
17.50	4.02	3.78	0.00				

Summary for Reach 3R: S. 8" PVC

[52] Hint: Inlet/Outlet conditions not evaluated

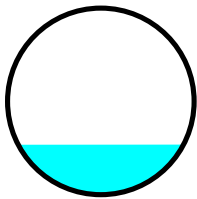
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.051 ac, 53.13% Impervious, Inflow Depth > 2.48" for 10-Year event
Inflow = 0.18 cfs @ 12.12 hrs, Volume= 0.011 af
Outflow = 0.17 cfs @ 12.14 hrs, Volume= 0.011 af, Atten= 3%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.35 fps, Min. Travel Time= 0.6 min
Avg. Velocity= 0.81 fps, Avg. Travel Time= 1.8 min

Peak Storage= 7 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.13 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 87.0' Slope= 0.0052 '/'
Inlet Invert= 676.38', Outlet Invert= 675.93'



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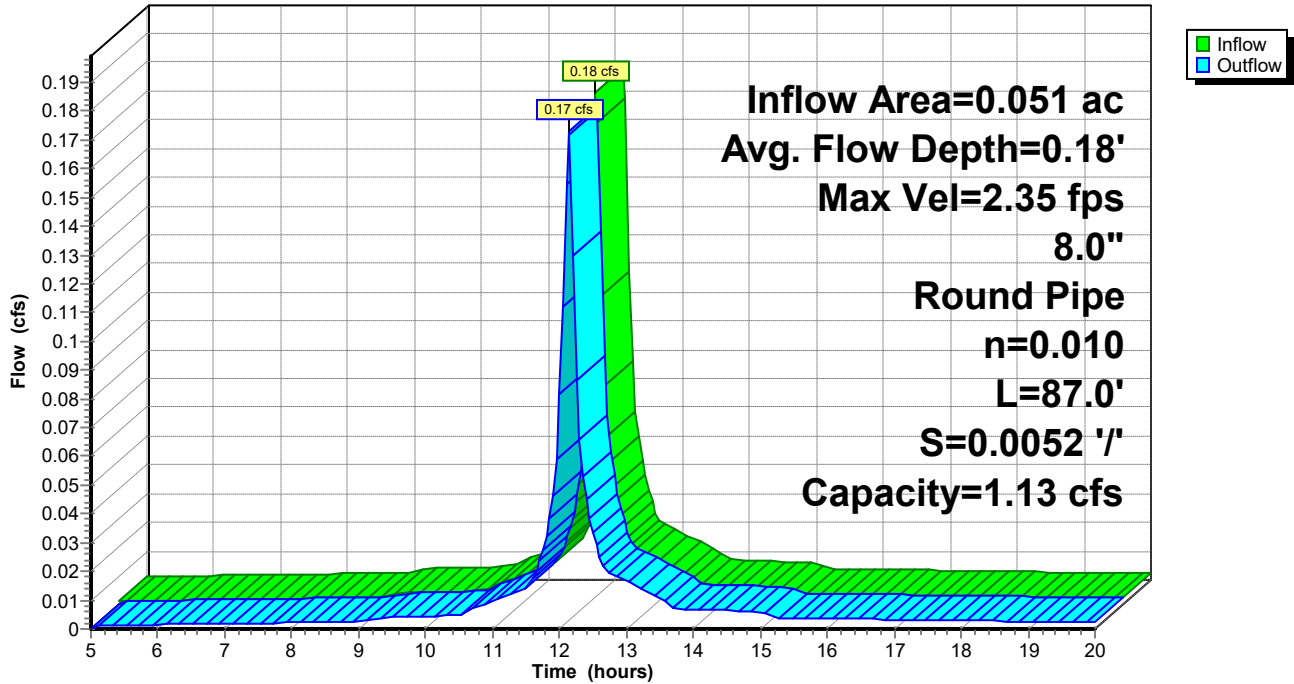
MSE 24-hr 4 10-Year Rainfall=4.32"

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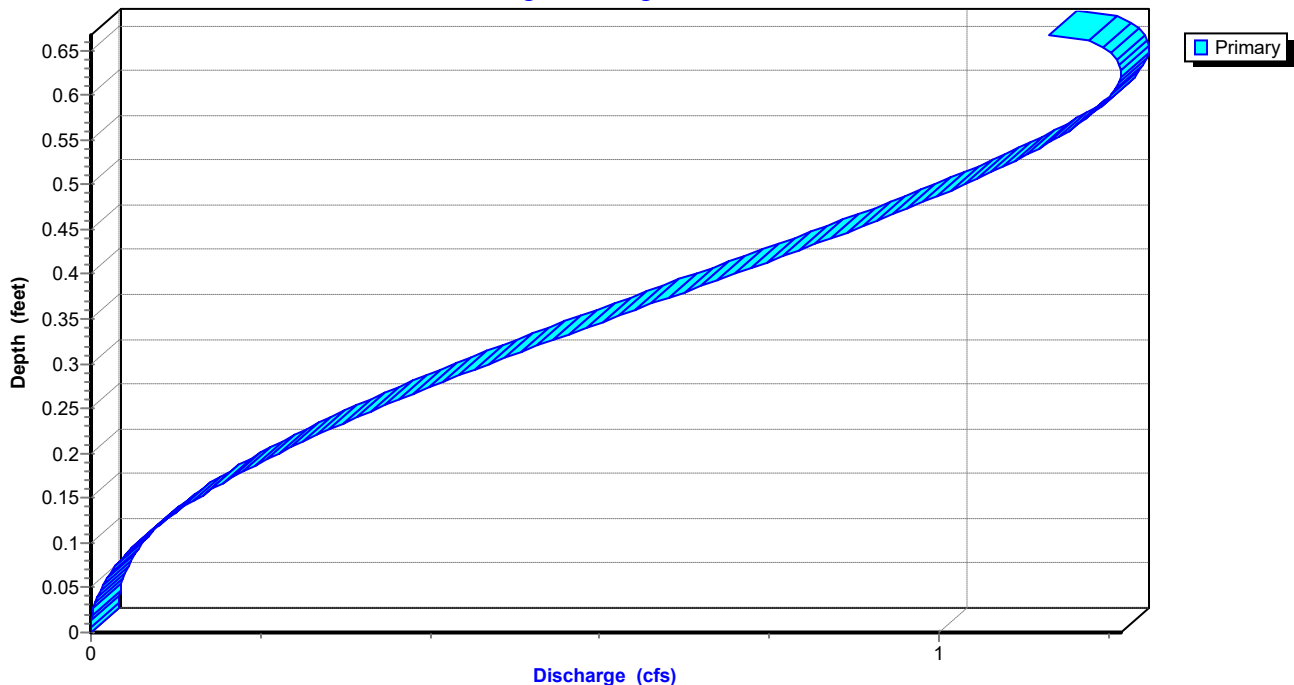
Reach 3R: S. 8" PVC

Hydrograph

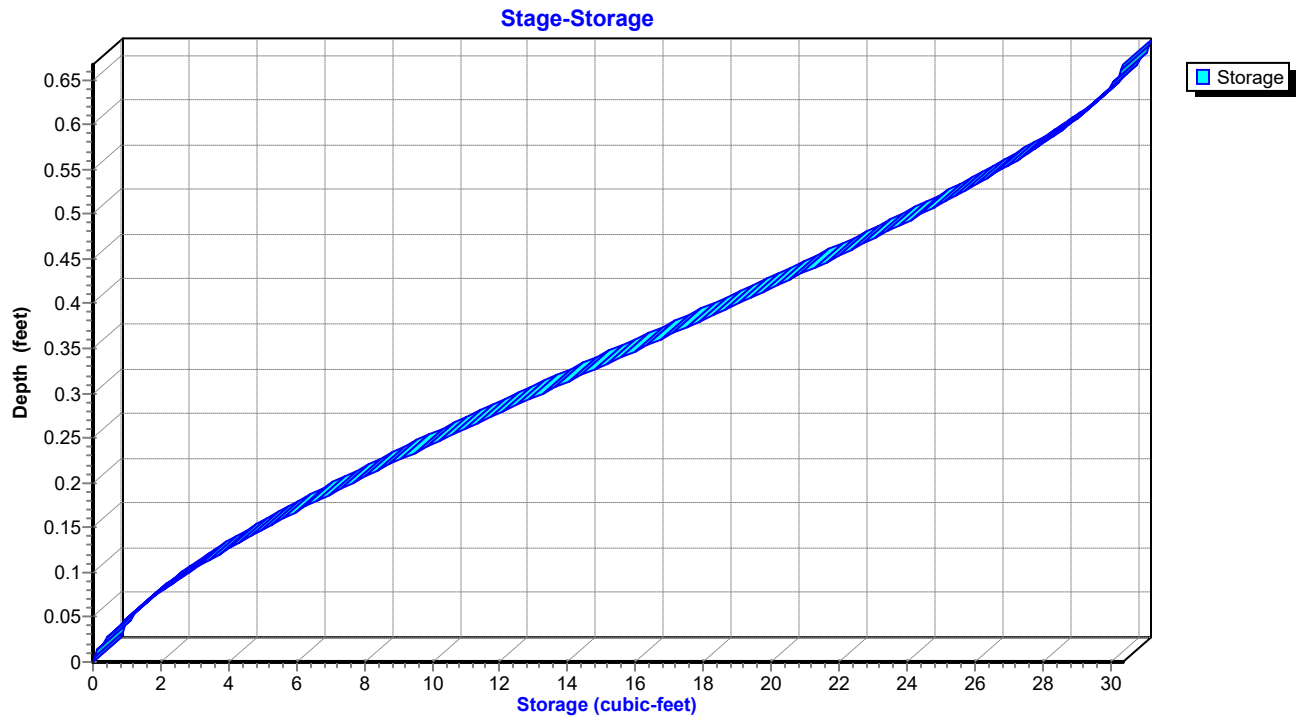


Reach 3R: S. 8" PVC

Stage-Discharge



Reach 3R: S. 8" PVC



Hydrograph for Reach 3R: S. 8" PVC

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	676.38	0.00
5.50	0.00	0	676.40	0.00
6.00	0.00	0	676.40	0.00
6.50	0.00	0	676.40	0.00
7.00	0.00	0	676.40	0.00
7.50	0.00	0	676.40	0.00
8.00	0.00	0	676.40	0.00
8.50	0.00	0	676.40	0.00
9.00	0.00	0	676.40	0.00
9.50	0.00	0	676.41	0.00
10.00	0.00	0	676.41	0.00
10.50	0.00	1	676.41	0.00
11.00	0.01	1	676.42	0.01
11.50	0.01	1	676.43	0.01
12.00	0.09	4	676.50	0.08
12.50	0.03	2	676.46	0.03
13.00	0.02	1	676.44	0.02
13.50	0.01	1	676.43	0.01
14.00	0.01	1	676.42	0.01
14.50	0.01	1	676.42	0.01
15.00	0.01	1	676.41	0.01
15.50	0.00	0	676.41	0.00
16.00	0.00	0	676.41	0.00
16.50	0.00	0	676.41	0.00
17.00	0.00	0	676.41	0.00
17.50	0.00	0	676.41	0.00
18.00	0.00	0	676.40	0.00
18.50	0.00	0	676.40	0.00
19.00	0.00	0	676.40	0.00
19.50	0.00	0	676.40	0.00
20.00	0.00	0	676.40	0.00

Stage-Discharge for Reach 3R: S. 8" PVC

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)	Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
676.38	0.00	0.00	676.89	3.68	1.05
676.39	0.37	0.00	676.90	3.68	1.08
676.40	0.60	0.00	676.91	3.69	1.10
676.41	0.78	0.00	676.92	3.69	1.12
676.42	0.94	0.01	676.93	3.69	1.14
676.43	1.08	0.01	676.94	3.69	1.15
676.44	1.21	0.02	676.95	3.68	1.17
676.45	1.34	0.03	676.96	3.67	1.18
676.46	1.46	0.03	676.97	3.66	1.19
676.47	1.57	0.04	676.98	3.64	1.20
676.48	1.67	0.05	676.99	3.62	1.21
676.49	1.77	0.07	677.00	3.59	1.21
676.50	1.87	0.08	677.01	3.56	1.21
676.51	1.96	0.09	677.02	3.51	1.21
676.52	2.05	0.11	677.03	3.46	1.20
676.53	2.13	0.13	677.04	3.38	1.18
676.54	2.22	0.14	677.05	3.17	1.11
676.55	2.29	0.16			
676.56	2.37	0.18			
676.57	2.44	0.20			
676.58	2.51	0.22			
676.59	2.58	0.24			
676.60	2.65	0.27			
676.61	2.71	0.29			
676.62	2.77	0.31			
676.63	2.83	0.34			
676.64	2.88	0.36			
676.65	2.94	0.39			
676.66	2.99	0.42			
676.67	3.04	0.44			
676.68	3.09	0.47			
676.69	3.14	0.50			
676.70	3.18	0.53			
676.71	3.22	0.56			
676.72	3.26	0.58			
676.73	3.30	0.61			
676.74	3.34	0.64			
676.75	3.38	0.67			
676.76	3.41	0.70			
676.77	3.44	0.73			
676.78	3.47	0.76			
676.79	3.50	0.79			
676.80	3.53	0.82			
676.81	3.55	0.85			
676.82	3.57	0.87			
676.83	3.59	0.90			
676.84	3.61	0.93			
676.85	3.63	0.95			
676.86	3.64	0.98			
676.87	3.66	1.01			
676.88	3.67	1.03			

Stage-Area-Storage for Reach 3R: S. 8" PVC

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
676.38	0.0	0	676.89	0.3	25
676.39	0.0	0	676.90	0.3	25
676.40	0.0	0	676.91	0.3	26
676.41	0.0	0	676.92	0.3	26
676.42	0.0	1	676.93	0.3	27
676.43	0.0	1	676.94	0.3	27
676.44	0.0	1	676.95	0.3	28
676.45	0.0	2	676.96	0.3	28
676.46	0.0	2	676.97	0.3	28
676.47	0.0	2	676.98	0.3	29
676.48	0.0	3	676.99	0.3	29
676.49	0.0	3	677.00	0.3	29
676.50	0.0	4	677.01	0.3	30
676.51	0.0	4	677.02	0.3	30
676.52	0.1	5	677.03	0.3	30
676.53	0.1	5	677.04	0.3	30
676.54	0.1	6	677.05	0.3	30
676.55	0.1	6			
676.56	0.1	7			
676.57	0.1	7			
676.58	0.1	8			
676.59	0.1	8			
676.60	0.1	9			
676.61	0.1	9			
676.62	0.1	10			
676.63	0.1	10			
676.64	0.1	11			
676.65	0.1	12			
676.66	0.1	12			
676.67	0.1	13			
676.68	0.2	13			
676.69	0.2	14			
676.70	0.2	14			
676.71	0.2	15			
676.72	0.2	16			
676.73	0.2	16			
676.74	0.2	17			
676.75	0.2	17			
676.76	0.2	18			
676.77	0.2	18			
676.78	0.2	19			
676.79	0.2	20			
676.80	0.2	20			
676.81	0.2	21			
676.82	0.2	21			
676.83	0.3	22			
676.84	0.3	22			
676.85	0.3	23			
676.86	0.3	23			
676.87	0.3	24			
676.88	0.3	24			

Summary for Reach 4R: W. 6" PVC

[52] Hint: Inlet/Outlet conditions not evaluated

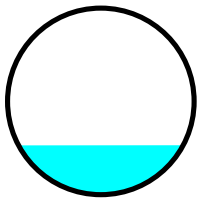
[79] Warning: Submerged Pond 7P Primary device # 1 INLET by 0.11'

Inflow Area = 0.326 ac, 63.36% Impervious, Inflow Depth > 2.47" for 10-Year event
Inflow = 0.41 cfs @ 12.37 hrs, Volume= 0.067 af
Outflow = 0.41 cfs @ 12.38 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 9.82 fps, Min. Travel Time= 0.1 min
Avg. Velocity= 4.57 fps, Avg. Travel Time= 0.3 min

Peak Storage= 3 cf @ 12.38 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 2.67 cfs

6.0" Round Pipe
n= 0.010
Length= 77.0' Slope= 0.1335 '/
Inlet Invert= 668.80', Outlet Invert= 658.52'



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Prepared by Paragon Associates

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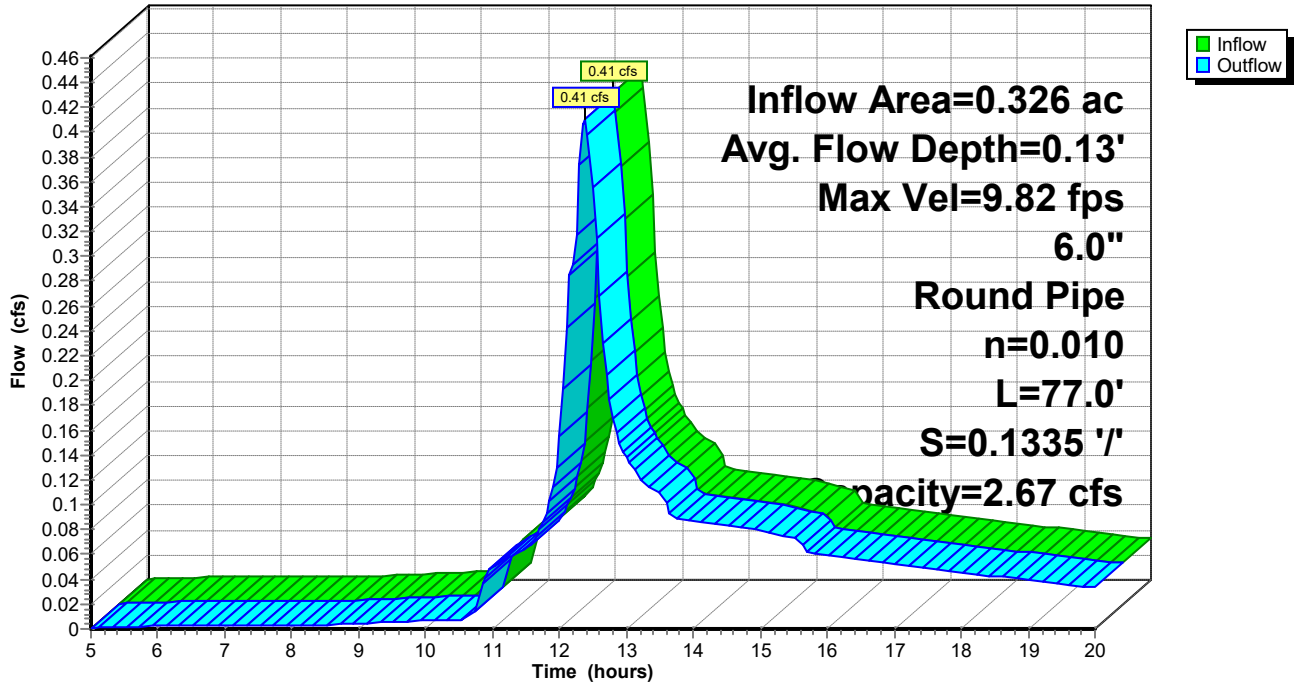
MSE 24-hr 4 10-Year Rainfall=4.32"

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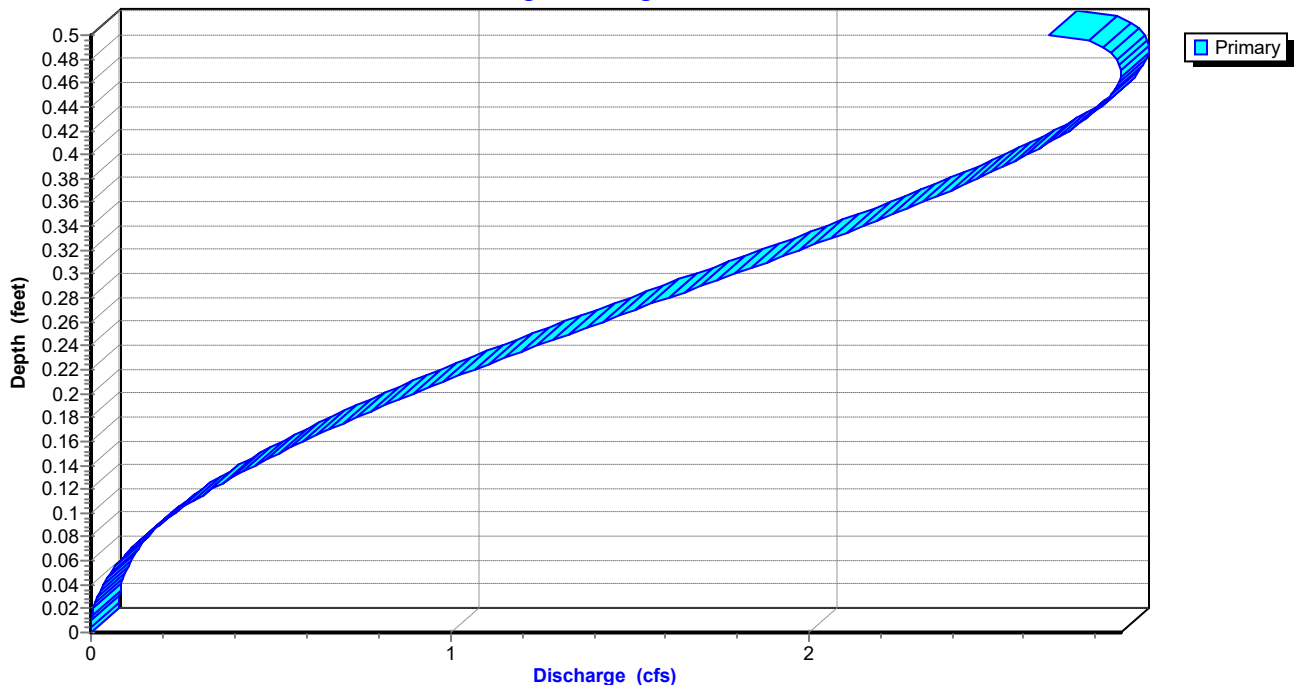
Reach 4R: W. 6" PVC

Hydrograph

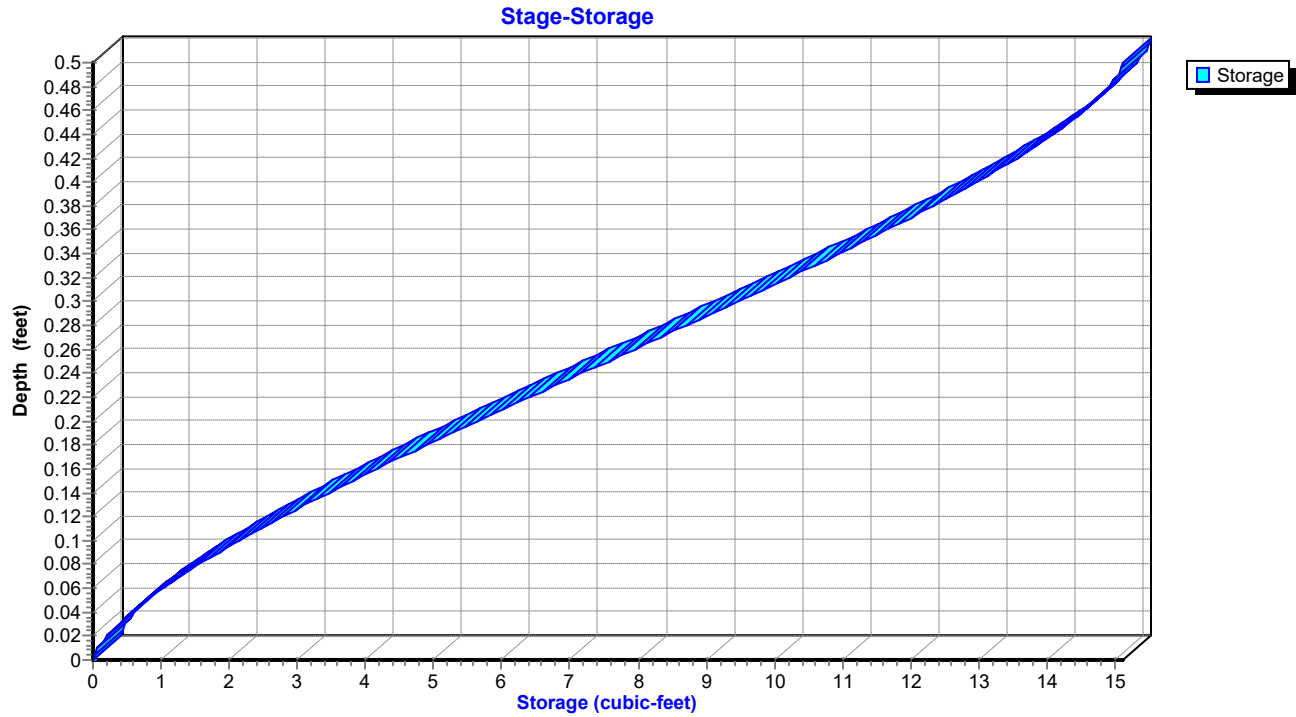


Reach 4R: W. 6" PVC

Stage-Discharge



Reach 4R: W. 6" PVC



Hydrograph for Reach 4R: W. 6" PVC

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	668.80	0.00
5.50	0.00	0	668.81	0.00
6.00	0.00	0	668.81	0.00
6.50	0.00	0	668.81	0.00
7.00	0.00	0	668.81	0.00
7.50	0.00	0	668.81	0.00
8.00	0.00	0	668.81	0.00
8.50	0.00	0	668.81	0.00
9.00	0.00	0	668.81	0.00
9.50	0.01	0	668.82	0.01
10.00	0.01	0	668.82	0.01
10.50	0.01	0	668.82	0.01
11.00	0.05	1	668.85	0.05
11.50	0.06	1	668.85	0.06
12.00	0.16	2	668.88	0.16
12.50	0.35	3	668.92	0.36
13.00	0.14	1	668.88	0.14
13.50	0.11	1	668.87	0.11
14.00	0.09	1	668.86	0.09
14.50	0.08	1	668.86	0.08
15.00	0.08	1	668.86	0.08
15.50	0.07	1	668.86	0.07
16.00	0.06	1	668.85	0.06
16.50	0.06	1	668.85	0.06
17.00	0.05	1	668.85	0.05
17.50	0.05	1	668.85	0.05
18.00	0.05	1	668.85	0.05
18.50	0.04	1	668.84	0.04
19.00	0.04	1	668.84	0.04
19.50	0.04	1	668.84	0.04
20.00	0.03	1	668.84	0.03

Stage-Discharge for Reach 4R: W. 6" PVC

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
668.80	0.00	0.00
668.81	1.91	0.00
668.82	3.01	0.01
668.83	3.93	0.02
668.84	4.72	0.03
668.85	5.45	0.06
668.86	6.11	0.08
668.87	6.72	0.11
668.88	7.30	0.15
668.89	7.84	0.19
668.90	8.35	0.23
668.91	8.83	0.28
668.92	9.29	0.34
668.93	9.73	0.39
668.94	10.14	0.46
668.95	10.54	0.52
668.96	10.91	0.59
668.97	11.27	0.66
668.98	11.61	0.74
668.99	11.94	0.82
669.00	12.25	0.90
669.01	12.54	0.98
669.02	12.82	1.07
669.03	13.09	1.15
669.04	13.34	1.24
669.05	13.57	1.33
669.06	13.80	1.42
669.07	14.01	1.52
669.08	14.20	1.61
669.09	14.39	1.70
669.10	14.56	1.79
669.11	14.71	1.88
669.12	14.86	1.97
669.13	14.98	2.06
669.14	15.10	2.15
669.15	15.20	2.23
669.16	15.29	2.31
669.17	15.36	2.39
669.18	15.41	2.47
669.19	15.45	2.54
669.20	15.47	2.61
669.21	15.47	2.67
669.22	15.46	2.72
669.23	15.42	2.77
669.24	15.35	2.81
669.25	15.26	2.84
669.26	15.14	2.86
669.27	14.97	2.87
669.28	14.74	2.86
669.29	14.41	2.82
669.30	13.57	2.67

Stage-Area-Storage for Reach 4R: W. 6" PVC

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
668.80	0.0	0
668.81	0.0	0
668.82	0.0	0
668.83	0.0	0
668.84	0.0	1
668.85	0.0	1
668.86	0.0	1
668.87	0.0	1
668.88	0.0	2
668.89	0.0	2
668.90	0.0	2
668.91	0.0	2
668.92	0.0	3
668.93	0.0	3
668.94	0.0	3
668.95	0.0	4
668.96	0.1	4
668.97	0.1	5
668.98	0.1	5
668.99	0.1	5
669.00	0.1	6
669.01	0.1	6
669.02	0.1	6
669.03	0.1	7
669.04	0.1	7
669.05	0.1	8
669.06	0.1	8
669.07	0.1	8
669.08	0.1	9
669.09	0.1	9
669.10	0.1	9
669.11	0.1	10
669.12	0.1	10
669.13	0.1	11
669.14	0.1	11
669.15	0.1	11
669.16	0.2	12
669.17	0.2	12
669.18	0.2	12
669.19	0.2	13
669.20	0.2	13
669.21	0.2	13
669.22	0.2	14
669.23	0.2	14
669.24	0.2	14
669.25	0.2	14
669.26	0.2	15
669.27	0.2	15
669.28	0.2	15
669.29	0.2	15
669.30	0.2	15

Summary for Pond 3P: E biofilter LINED

[82] Warning: Early inflow requires earlier time span
 [42] Hint: Gap in defined storage above volume #4 at 681.34'
 [85] Warning: Oscillations may require smaller dt or Finer Routing (severity=13)

Inflow Area = 0.043 ac, 57.33% Impervious, Inflow Depth > 2.62" for 10-Year event
 Inflow = 0.15 cfs @ 12.15 hrs, Volume= 0.009 af
 Outflow = 0.03 cfs @ 12.48 hrs, Volume= 0.008 af, Atten= 78%, Lag= 19.8 min
 Primary = 0.03 cfs @ 12.48 hrs, Volume= 0.008 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 680.81' @ 12.48 hrs Surf.Area= 540 sf Storage= 178 cf

Plug-Flow detention time= 112.7 min calculated for 0.008 af (87% of inflow)
 Center-of-Mass det. time= 71.7 min (821.8 - 750.1)

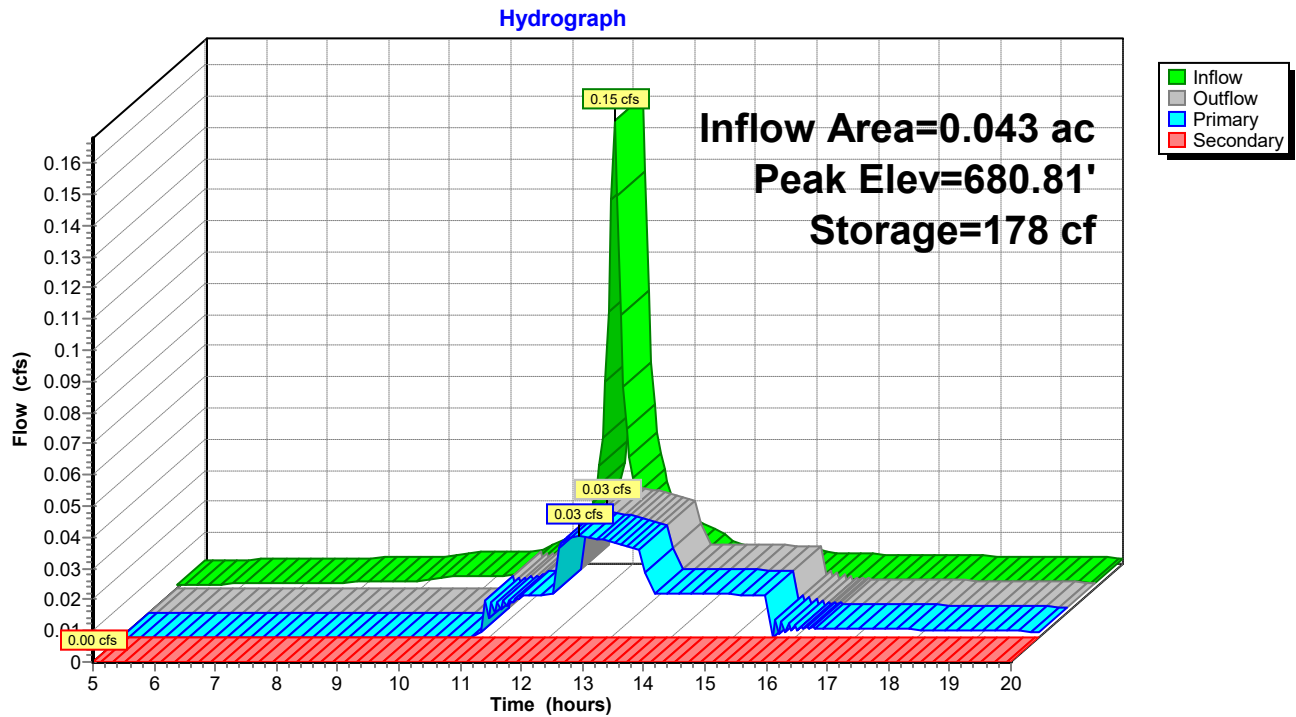
Volume	Invert	Avail.Storage	Storage Description
#1	678.00'	54 cf	10.50'W x 15.50'L x 1.00'H sand invert 163 cf Overall x 33.0% Voids
#2	679.00'	66 cf	10.50'W x 15.50'L x 1.50'H media 244 cf Overall x 27.0% Voids
#3	680.50'	128 cf	10.50'W x 15.50'L x 0.60'H top media Z=3.0
#4	681.10'	195 cf	39.50'W x 19.50'L x 0.24'H NDS drain Z=3.0
#5	681.43'	8 cf	40.00'W x 20.00'L x 0.01'H weir overflow Z=3.0
		451 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Secondary	681.34'	6.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	681.10'	0.5" x 2.0" Horiz. NDS drain X 50.00 C= 0.600 in 12.0" x 12.0" Grate (35% open area) Limited to weir flow at low heads
#3	Primary	678.00'	3.600 in/hr underdrain over Horizontal area above 678.00' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 163 sf Phase-In= 0.50'

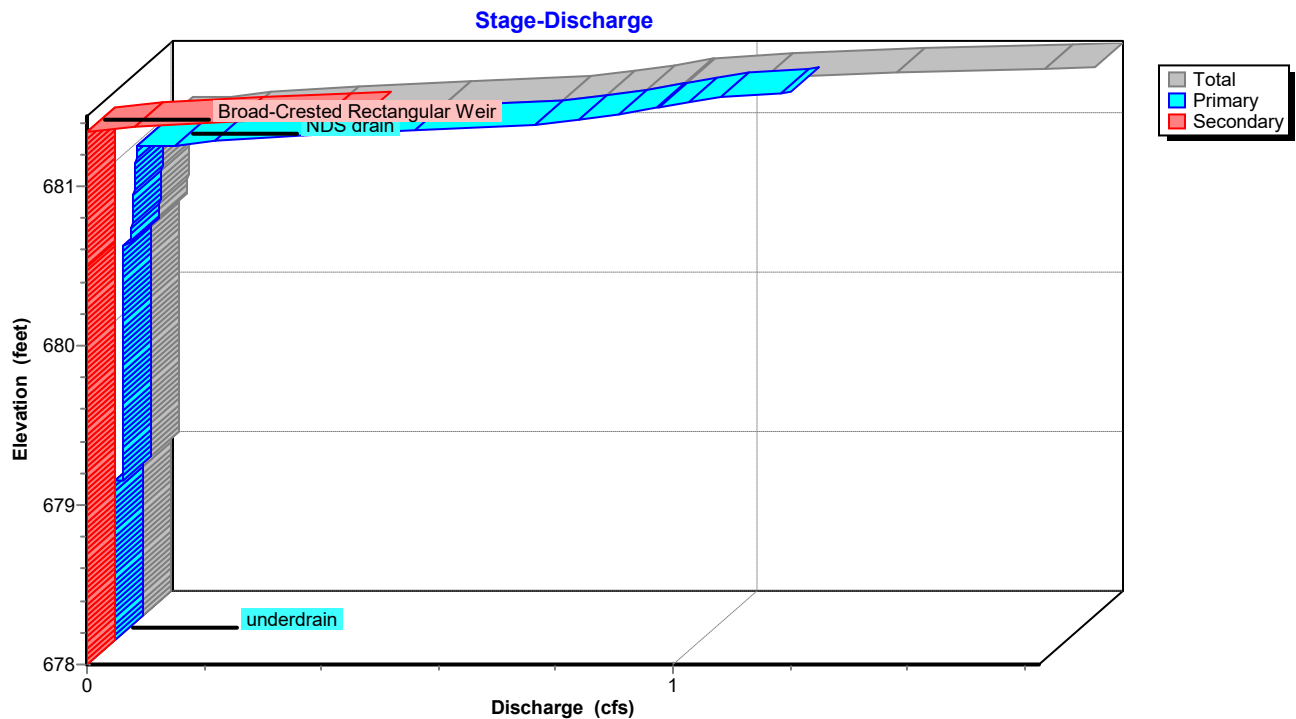
Primary OutFlow Max=0.03 cfs @ 12.48 hrs HW=680.81' (Free Discharge)
 ↑ 2=NDS drain (Controls 0.00 cfs)
 ↑ 3=underdrain (Controls 0.03 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=678.00' (Free Discharge)
 ↑ 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

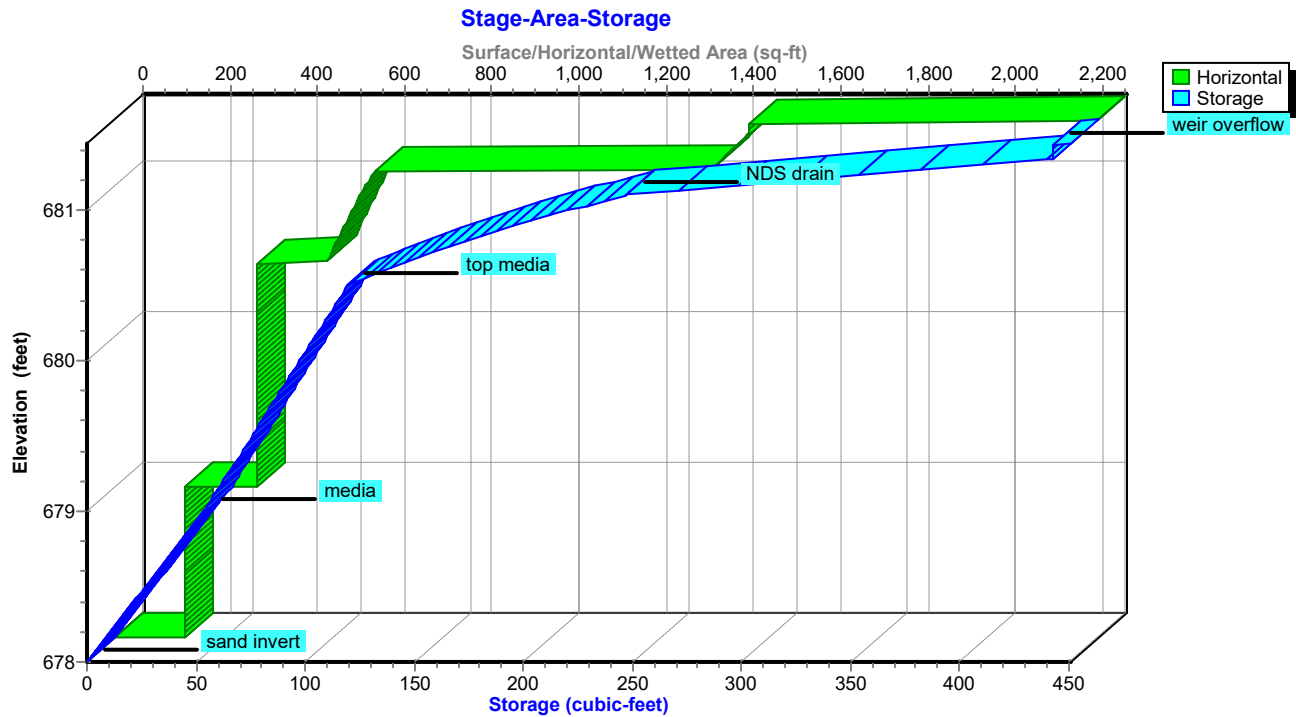
Pond 3P: E biofilter LINED



Pond 3P: E biofilter LINED



Pond 3P: E biofilter LINED



Hydrograph for Pond 3P: E biofilter LINED

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	0	678.00	0.00	0.00	0.00
5.50	0.00	2	678.04	0.00	0.00	0.00
6.00	0.00	5	678.09	0.00	0.00	0.00
6.50	0.00	7	678.14	0.00	0.00	0.00
7.00	0.00	10	678.19	0.00	0.00	0.00
7.50	0.00	14	678.25	0.00	0.00	0.00
8.00	0.00	17	678.32	0.00	0.00	0.00
8.50	0.00	21	678.39	0.00	0.00	0.00
9.00	0.00	25	678.46	0.00	0.00	0.00
9.50	0.00	31	678.57	0.00	0.00	0.00
10.00	0.00	38	678.70	0.00	0.00	0.00
10.50	0.00	45	678.84	0.00	0.00	0.00
11.00	0.01	54	679.00	0.01	0.01	0.00
11.50	0.01	54	679.00	0.01	0.01	0.00
12.00	0.07	79	679.58	0.01	0.01	0.00
12.50	0.03	178	680.81	0.03	0.03	0.00
13.00	0.01	155	680.70	0.03	0.03	0.00
13.50	0.01	123	680.52	0.03	0.03	0.00
14.00	0.01	106	680.19	0.01	0.01	0.00
14.50	0.01	91	679.85	0.01	0.01	0.00
15.00	0.01	76	679.50	0.01	0.01	0.00
15.50	0.00	58	679.10	0.01	0.01	0.00
16.00	0.00	54	679.00	0.00	0.00	0.00
16.50	0.00	54	679.00	0.00	0.00	0.00
17.00	0.00	54	679.00	0.00	0.00	0.00
17.50	0.00	54	679.00	0.00	0.00	0.00
18.00	0.00	54	679.00	0.00	0.00	0.00
18.50	0.00	54	679.00	0.00	0.00	0.00
19.00	0.00	54	679.00	0.00	0.00	0.00
19.50	0.00	54	679.00	0.00	0.00	0.00
20.00	0.00	54	679.00	0.00	0.00	0.00

Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 10-Year Rainfall=4.32"*

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Stage-Discharge for Pond 3P: E biofilter LINED

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
678.00	0.00	0.00	0.00	680.55	0.03	0.03	0.00
678.05	0.00	0.00	0.00	680.60	0.03	0.03	0.00
678.10	0.00	0.00	0.00	680.65	0.03	0.03	0.00
678.15	0.00	0.00	0.00	680.70	0.03	0.03	0.00
678.20	0.00	0.00	0.00	680.75	0.03	0.03	0.00
678.25	0.00	0.00	0.00	680.80	0.03	0.03	0.00
678.30	0.00	0.00	0.00	680.85	0.03	0.03	0.00
678.35	0.00	0.00	0.00	680.90	0.03	0.03	0.00
678.40	0.00	0.00	0.00	680.95	0.03	0.03	0.00
678.45	0.00	0.00	0.00	681.00	0.04	0.04	0.00
678.50	0.00	0.00	0.00	681.05	0.04	0.04	0.00
678.55	0.00	0.00	0.00	681.10	0.10	0.10	0.00
678.60	0.00	0.00	0.00	681.15	0.25	0.25	0.00
678.65	0.00	0.00	0.00	681.20	0.52	0.52	0.00
678.70	0.00	0.00	0.00	681.25	0.75	0.75	0.00
678.75	0.00	0.00	0.00	681.30	0.86	0.86	0.00
678.80	0.00	0.00	0.00	681.35	0.96	0.95	0.01
678.85	0.00	0.00	0.00	681.40	1.24	1.03	0.22
678.90	0.00	0.00	0.00				
678.95	0.00	0.00	0.00				
679.00	0.01	0.01	0.00				
679.05	0.01	0.01	0.00				
679.10	0.01	0.01	0.00				
679.15	0.01	0.01	0.00				
679.20	0.01	0.01	0.00				
679.25	0.01	0.01	0.00				
679.30	0.01	0.01	0.00				
679.35	0.01	0.01	0.00				
679.40	0.01	0.01	0.00				
679.45	0.01	0.01	0.00				
679.50	0.01	0.01	0.00				
679.55	0.01	0.01	0.00				
679.60	0.01	0.01	0.00				
679.65	0.01	0.01	0.00				
679.70	0.01	0.01	0.00				
679.75	0.01	0.01	0.00				
679.80	0.01	0.01	0.00				
679.85	0.01	0.01	0.00				
679.90	0.01	0.01	0.00				
679.95	0.01	0.01	0.00				
680.00	0.01	0.01	0.00				
680.05	0.01	0.01	0.00				
680.10	0.01	0.01	0.00				
680.15	0.01	0.01	0.00				
680.20	0.01	0.01	0.00				
680.25	0.01	0.01	0.00				
680.30	0.01	0.01	0.00				
680.35	0.01	0.01	0.00				
680.40	0.01	0.01	0.00				
680.45	0.01	0.01	0.00				
680.50	0.03	0.03	0.00				

Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 10-Year Rainfall=4.32"*

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Stage-Area-Storage for Pond 3P: E biofilter LINED

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
678.00	163	0	680.55	496	128
678.05	163	3	680.60	504	137
678.10	163	5	680.65	512	146
678.15	163	8	680.70	521	155
678.20	163	11	680.75	530	165
678.25	163	13	680.80	538	176
678.30	163	16	680.85	547	187
678.35	163	19	680.90	556	198
678.40	163	21	680.95	566	210
678.45	163	24	681.00	575	222
678.50	163	27	681.05	585	235
678.55	163	30	681.10	1,365	248
678.60	163	32	681.15	1,383	287
678.65	163	35	681.20	1,401	327
678.70	163	38	681.25	1,419	368
678.75	163	40	681.30	1,437	409
678.80	163	43	681.35	1,452	443
678.85	163	46	681.40	1,452	443
678.90	163	48			
678.95	163	51			
679.00	326	54			
679.05	326	56			
679.10	326	58			
679.15	326	60			
679.20	326	62			
679.25	326	65			
679.30	326	67			
679.35	326	69			
679.40	326	71			
679.45	326	73			
679.50	326	76			
679.55	326	78			
679.60	326	80			
679.65	326	82			
679.70	326	84			
679.75	326	87			
679.80	326	89			
679.85	326	91			
679.90	326	93			
679.95	326	95			
680.00	326	98			
680.05	326	100			
680.10	326	102			
680.15	326	104			
680.20	326	106			
680.25	326	109			
680.30	326	111			
680.35	326	113			
680.40	326	115			
680.45	326	117			
680.50	488	120			

Summary for Pond 5P: W biofillter UNLINED

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.218 ac, 64.67% Impervious, Inflow Depth > 2.83" for 10-Year event
 Inflow = 0.79 cfs @ 12.15 hrs, Volume= 0.052 af
 Outflow = 0.40 cfs @ 12.31 hrs, Volume= 0.045 af, Atten= 50%, Lag= 9.7 min
 Discarded = 0.00 cfs @ 12.31 hrs, Volume= 0.001 af
 Primary = 0.38 cfs @ 12.31 hrs, Volume= 0.044 af
 Secondary = 0.01 cfs @ 12.30 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 676.16' @ 12.31 hrs Surf.Area= 3,140 sf Storage= 1,059 cf

Plug-Flow detention time= 171.4 min calculated for 0.045 af (87% of inflow)
 Center-of-Mass det. time= 130.5 min (878.3 - 747.8)

Volume	Invert	Avail.Storage	Storage Description
#1	671.75'	107 cf	8.30'W x 39.20'L x 1.00'H sand invert 325 cf Overall x 33.0% Voids
#2	672.75'	176 cf	8.30'W x 39.20'L x 2.00'H media 651 cf Overall x 27.0% Voids
#3	674.75'	728 cf	8.30'W x 39.20'L x 1.35'H top media Z=3.0
#4	676.10'	43 cf	18.00'W x 47.00'L x 0.05'H NDS drain Z=3.0
#5	676.15'	8 cf	18.00'W x 47.00'L x 0.01'H weir overflow Z=3.0
		1,063 cf	Total Available Storage

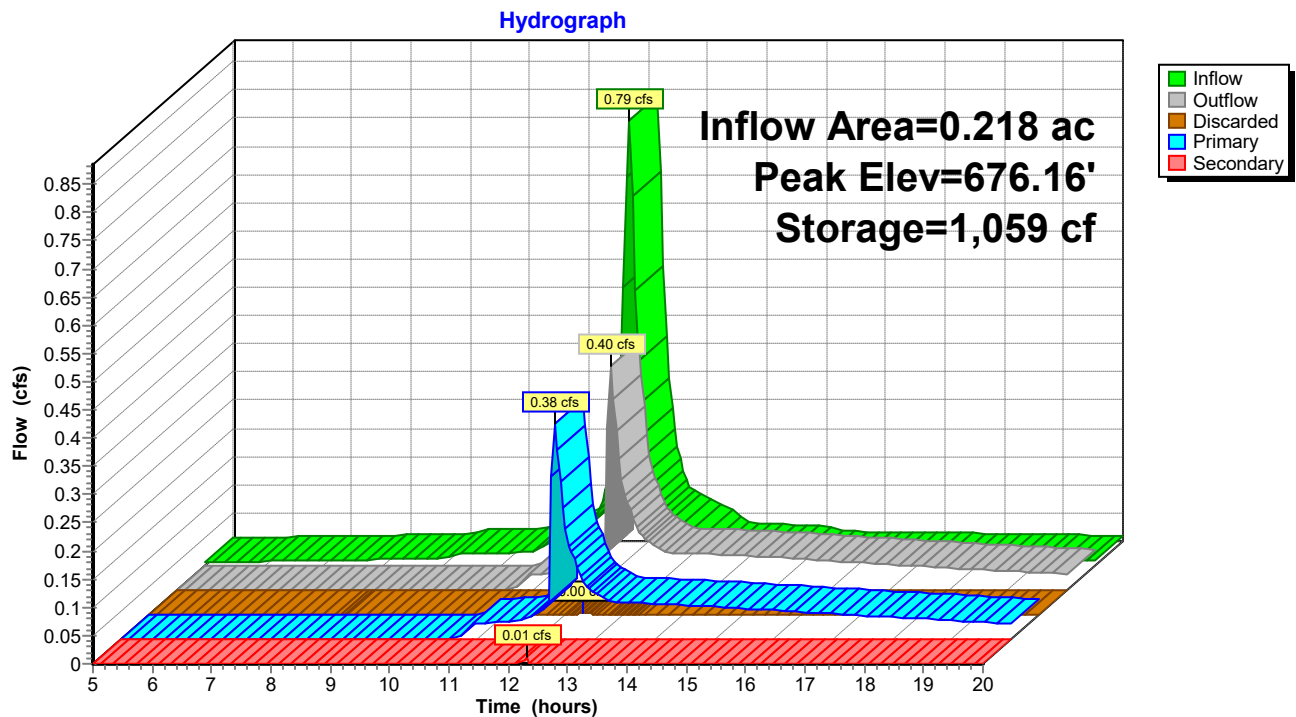
Device	Routing	Invert	Outlet Devices
#1	Secondary	676.15'	10.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	676.10'	0.5" x 2.0" Horiz. NDS drain X 50.00 C= 0.600 in 12.0" x 12.0" Grate (35% open area) Limited to weir flow at low heads
#3	Primary	672.75'	3.600 in/hr underdrain over Horizontal area above 672.75' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 651 sf Phase-In= 0.50'
#4	Discarded	671.75'	0.030 in/hr Exfiltration over Horizontal area above 671.75' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 325 sf Phase-In= 0.50'

Discarded OutFlow Max=0.00 cfs @ 12.31 hrs HW=676.15' (Free Discharge)
↳ **4=Exfiltration** (Controls 0.00 cfs)

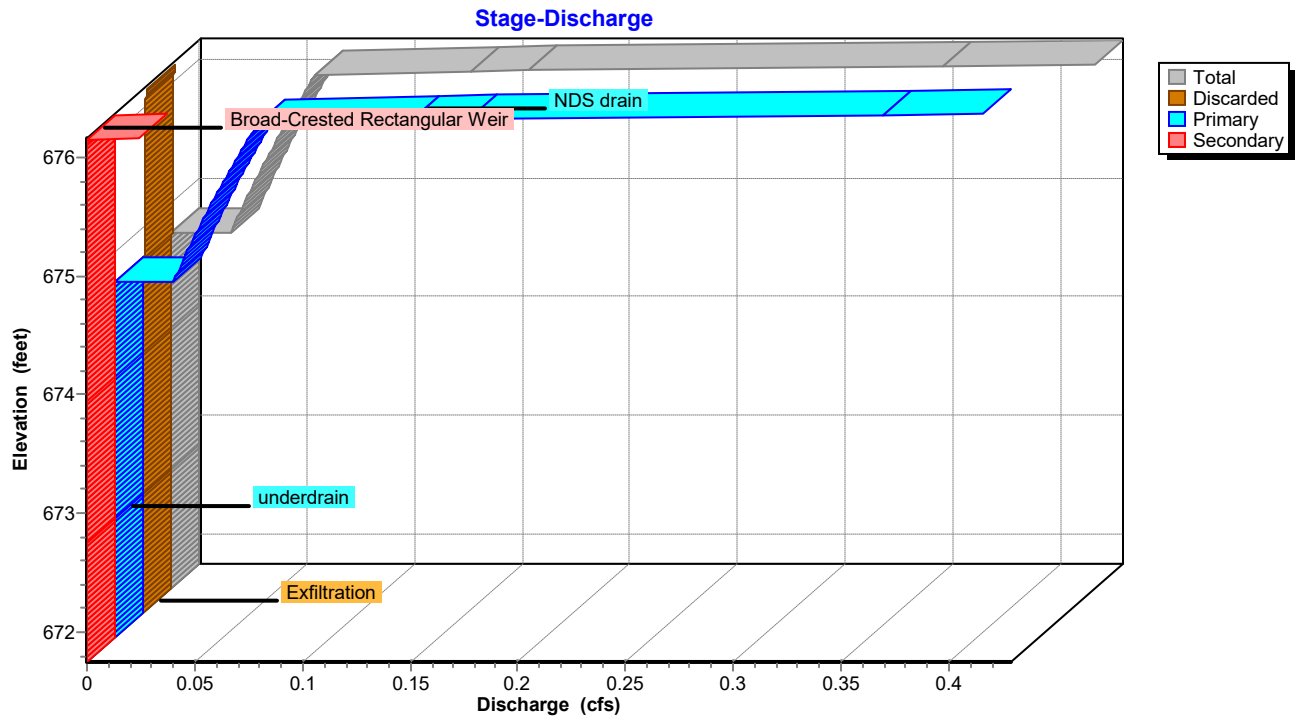
Primary OutFlow Max=0.37 cfs @ 12.31 hrs HW=676.15' (Free Discharge)
↳ **2=NDS drain** (Weir Controls 0.16 cfs @ 0.76 fps)
↳ **3=underdrain** (Controls 0.21 cfs)

Secondary OutFlow Max=0.01 cfs @ 12.30 hrs HW=676.16' (Free Discharge)
↳ **1=Broad-Crested Rectangular Weir** (Weir Controls 0.01 cfs @ 0.18 fps)

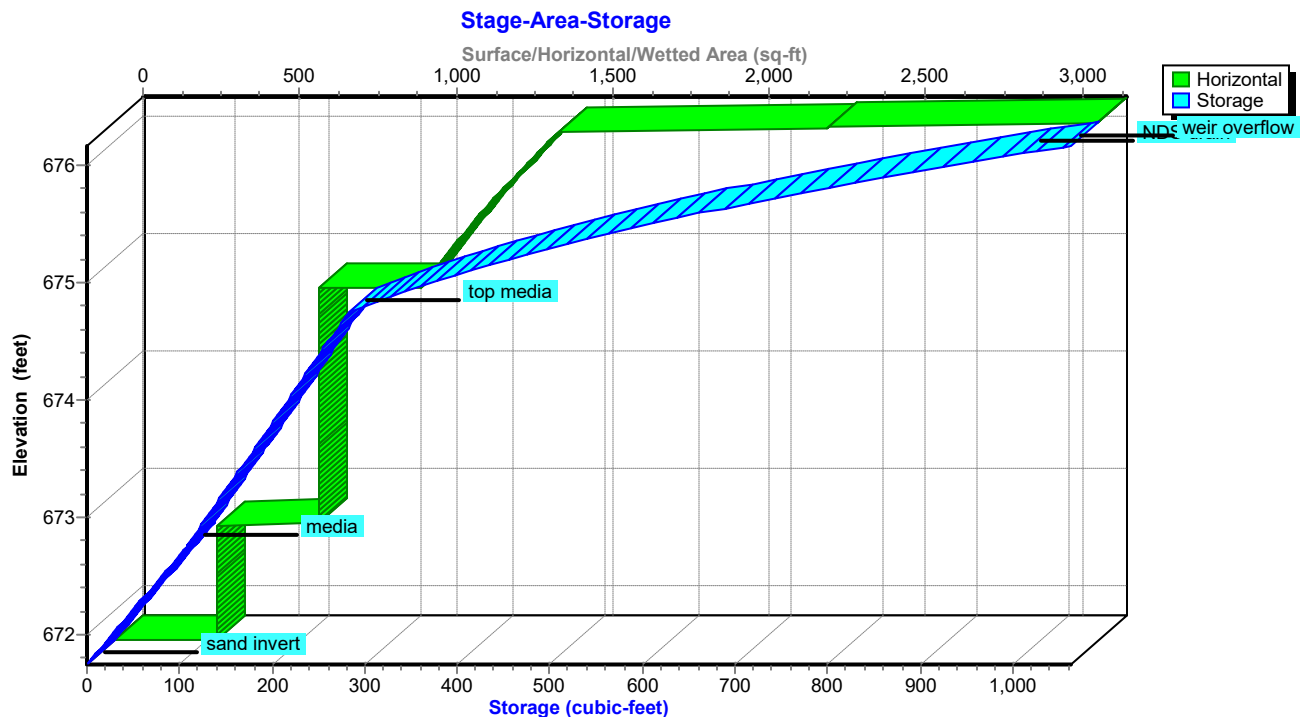
Pond 5P: W biofillter UNLINED



Pond 5P: W biofillter UNLINED



Pond 5P: W biofillter UNLINED



Hydrograph for Pond 5P: W biofilter UNLINED

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.01	1	671.76	0.00	0.00	0.00	0.00
5.50	0.01	12	671.86	0.00	0.00	0.00	0.00
6.00	0.01	26	671.99	0.00	0.00	0.00	0.00
6.50	0.01	41	672.13	0.00	0.00	0.00	0.00
7.00	0.01	57	672.28	0.00	0.00	0.00	0.00
7.50	0.01	75	672.45	0.00	0.00	0.00	0.00
8.00	0.01	95	672.63	0.00	0.00	0.00	0.00
8.50	0.01	115	672.84	0.00	0.00	0.00	0.00
9.00	0.01	137	673.09	0.00	0.00	0.00	0.00
9.50	0.02	170	673.47	0.00	0.00	0.00	0.00
10.00	0.02	209	673.91	0.00	0.00	0.00	0.00
10.50	0.02	251	674.39	0.00	0.00	0.00	0.00
11.00	0.05	296	674.79	0.03	0.00	0.03	0.00
11.50	0.07	350	674.94	0.03	0.00	0.03	0.00
12.00	0.37	565	675.41	0.05	0.00	0.05	0.00
12.50	0.17	1,030	676.12	0.20	0.00	0.19	0.00
13.00	0.08	994	676.08	0.08	0.00	0.08	0.00
13.50	0.05	982	676.06	0.07	0.00	0.07	0.00
14.00	0.03	928	675.99	0.06	0.00	0.06	0.00
14.50	0.03	870	675.91	0.06	0.00	0.06	0.00
15.00	0.03	813	675.83	0.06	0.00	0.06	0.00
15.50	0.02	747	675.72	0.06	0.00	0.05	0.00
16.00	0.02	681	675.62	0.05	0.00	0.05	0.00
16.50	0.02	619	675.51	0.05	0.00	0.05	0.00
17.00	0.01	562	675.41	0.05	0.00	0.04	0.00
17.50	0.01	509	675.30	0.04	0.00	0.04	0.00
18.00	0.01	459	675.20	0.04	0.00	0.04	0.00
18.50	0.01	414	675.10	0.04	0.00	0.04	0.00
19.00	0.01	372	675.00	0.03	0.00	0.03	0.00
19.50	0.01	334	674.90	0.03	0.00	0.03	0.00
20.00	0.01	298	674.80	0.03	0.00	0.03	0.00

Stage-Discharge for Pond 5P: W biofilter UNLINED

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
671.75	0.00	0.00	0.00	0.00
671.85	0.00	0.00	0.00	0.00
671.95	0.00	0.00	0.00	0.00
672.05	0.00	0.00	0.00	0.00
672.15	0.00	0.00	0.00	0.00
672.25	0.00	0.00	0.00	0.00
672.35	0.00	0.00	0.00	0.00
672.45	0.00	0.00	0.00	0.00
672.55	0.00	0.00	0.00	0.00
672.65	0.00	0.00	0.00	0.00
672.75	0.00	0.00	0.00	0.00
672.85	0.00	0.00	0.00	0.00
672.95	0.00	0.00	0.00	0.00
673.05	0.00	0.00	0.00	0.00
673.15	0.00	0.00	0.00	0.00
673.25	0.00	0.00	0.00	0.00
673.35	0.00	0.00	0.00	0.00
673.45	0.00	0.00	0.00	0.00
673.55	0.00	0.00	0.00	0.00
673.65	0.00	0.00	0.00	0.00
673.75	0.00	0.00	0.00	0.00
673.85	0.00	0.00	0.00	0.00
673.95	0.00	0.00	0.00	0.00
674.05	0.00	0.00	0.00	0.00
674.15	0.00	0.00	0.00	0.00
674.25	0.00	0.00	0.00	0.00
674.35	0.00	0.00	0.00	0.00
674.45	0.00	0.00	0.00	0.00
674.55	0.00	0.00	0.00	0.00
674.65	0.00	0.00	0.00	0.00
674.75	0.03	0.00	0.03	0.00
674.85	0.03	0.00	0.03	0.00
674.95	0.03	0.00	0.03	0.00
675.05	0.04	0.00	0.03	0.00
675.15	0.04	0.00	0.04	0.00
675.25	0.04	0.00	0.04	0.00
675.35	0.04	0.00	0.04	0.00
675.45	0.05	0.00	0.05	0.00
675.55	0.05	0.00	0.05	0.00
675.65	0.05	0.00	0.05	0.00
675.75	0.06	0.00	0.06	0.00
675.85	0.06	0.00	0.06	0.00
675.95	0.06	0.00	0.06	0.00
676.05	0.07	0.00	0.07	0.00
676.15	0.36	0.00	0.36	0.00

Stage-Area-Storage for Pond 5P: W biofillter UNLINED

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
671.75	325	0	674.30	651	244
671.80	325	5	674.35	651	248
671.85	325	11	674.40	651	252
671.90	325	16	674.45	651	257
671.95	325	21	674.50	651	261
672.00	325	27	674.55	651	265
672.05	325	32	674.60	651	270
672.10	325	38	674.65	651	274
672.15	325	43	674.70	651	279
672.20	325	48	674.75	976	283
672.25	325	54	674.80	990	300
672.30	325	59	674.85	1,005	317
672.35	325	64	674.90	1,020	335
672.40	325	70	674.95	1,035	354
672.45	325	75	675.00	1,050	373
672.50	325	81	675.05	1,065	394
672.55	325	86	675.10	1,080	415
672.60	325	91	675.15	1,096	437
672.65	325	97	675.20	1,112	459
672.70	325	102	675.25	1,128	483
672.75	651	107	675.30	1,144	507
672.80	651	112	675.35	1,160	532
672.85	651	116	675.40	1,177	558
672.90	651	121	675.45	1,193	585
672.95	651	125	675.50	1,210	612
673.00	651	129	675.55	1,227	641
673.05	651	134	675.60	1,244	670
673.10	651	138	675.65	1,262	700
673.15	651	143	675.70	1,279	731
673.20	651	147	675.75	1,297	763
673.25	651	151	675.80	1,315	796
673.30	651	156	675.85	1,333	829
673.35	651	160	675.90	1,351	864
673.40	651	164	675.95	1,370	899
673.45	651	169	676.00	1,389	936
673.50	651	173	676.05	1,407	973
673.55	651	178	676.10	2,272	1,012
673.60	651	182	676.15	3,138	1,054
673.65	651	186			
673.70	651	191			
673.75	651	195			
673.80	651	200			
673.85	651	204			
673.90	651	208			
673.95	651	213			
674.00	651	217			
674.05	651	222			
674.10	651	226			
674.15	651	230			
674.20	651	235			
674.25	651	239			

Summary for Pond 7P: 48" UG storage

[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.326 ac, 63.36% Impervious, Inflow Depth > 2.47" for 10-Year event
 Inflow = 0.50 cfs @ 12.30 hrs, Volume= 0.067 af
 Outflow = 0.41 cfs @ 12.37 hrs, Volume= 0.067 af, Atten= 17%, Lag= 4.3 min
 Primary = 0.41 cfs @ 12.37 hrs, Volume= 0.067 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 669.66' @ 12.37 hrs Surf.Area= 158 sf Storage= 85 cf

Plug-Flow detention time= 2.0 min calculated for 0.067 af (100% of inflow)
 Center-of-Mass det. time= 1.7 min (844.1 - 842.5)

Volume	Invert	Avail.Storage	Storage Description
#1	668.82'	628 cf	48.0" Round Pipe Storage L= 50.0' S= 0.0026 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	668.82'	5.0" Round Culvert L= 4.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 668.82' / 668.80' S= 0.0050 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.14 sf

Primary OutFlow Max=0.41 cfs @ 12.37 hrs HW=669.65' (Free Discharge)
 ↑1=Culvert (Inlet Controls 0.41 cfs @ 2.99 fps)

Chiro HCAD Proposed Chiro only AMENDED

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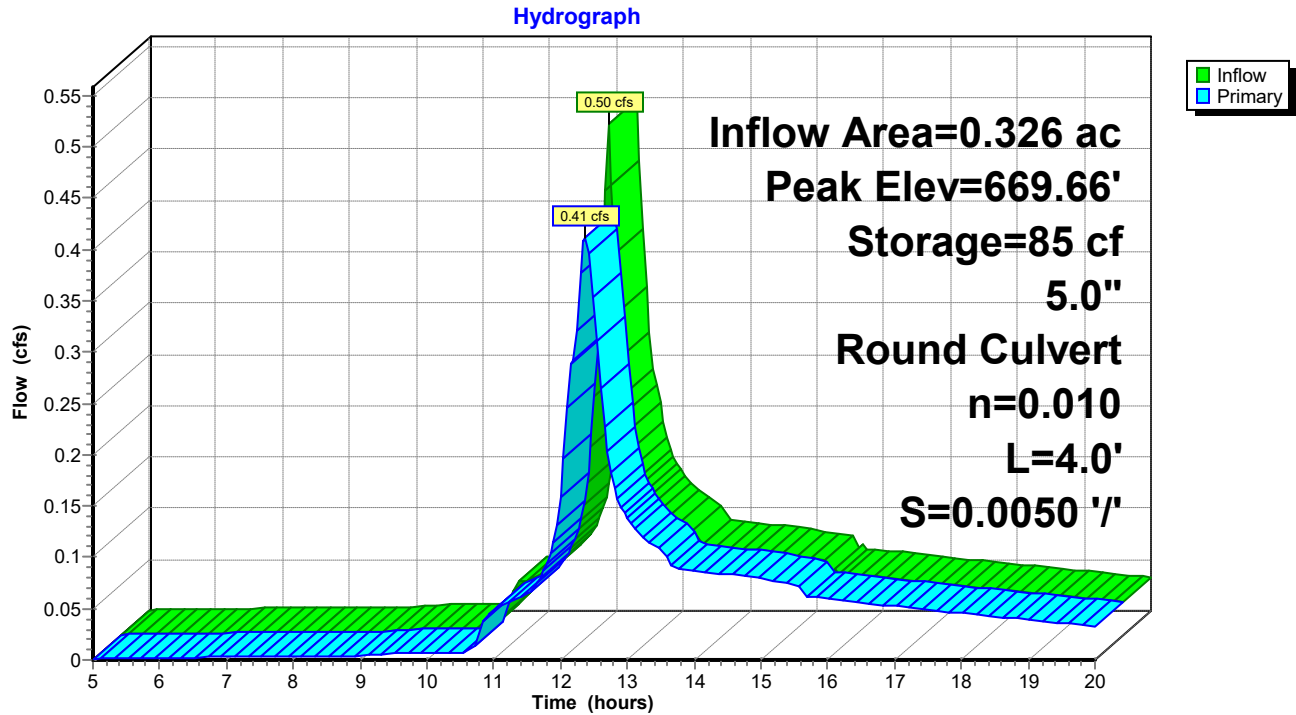
Chiro HCAD Proposed No Run On AMENDED Mar. '26

MSE 24-hr 4 10-Year Rainfall=4.32"

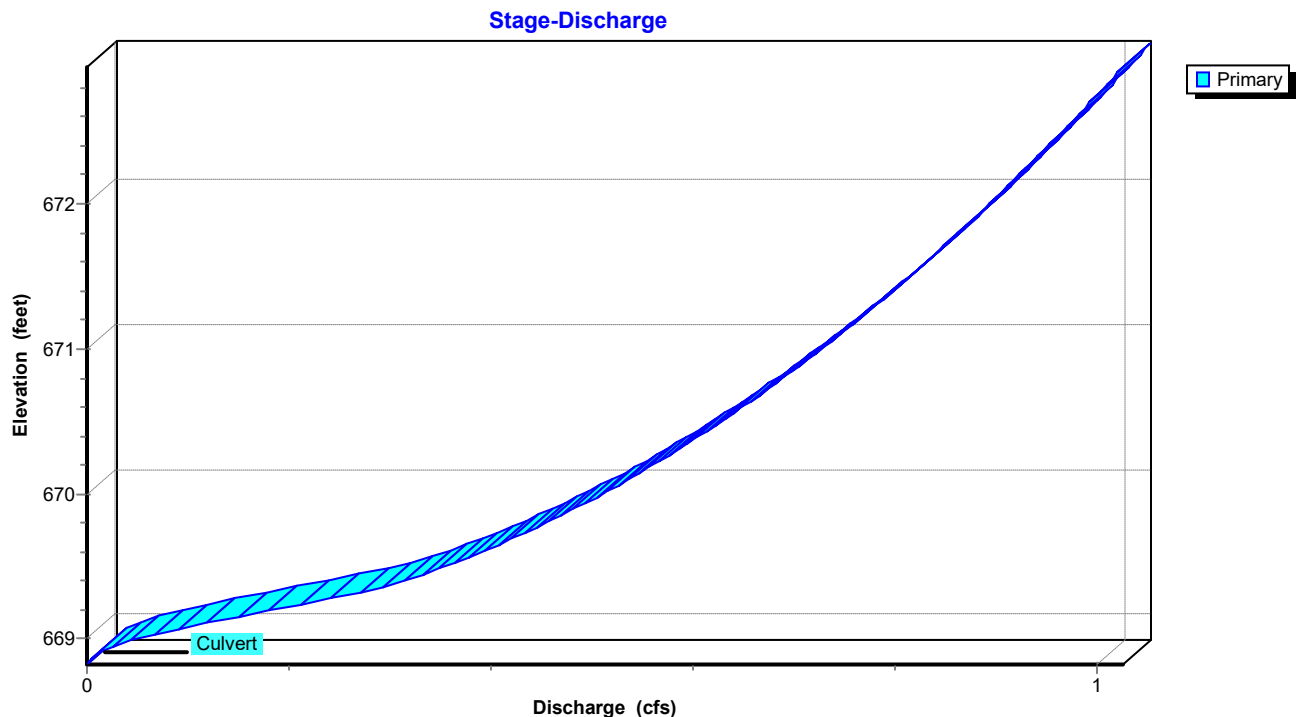
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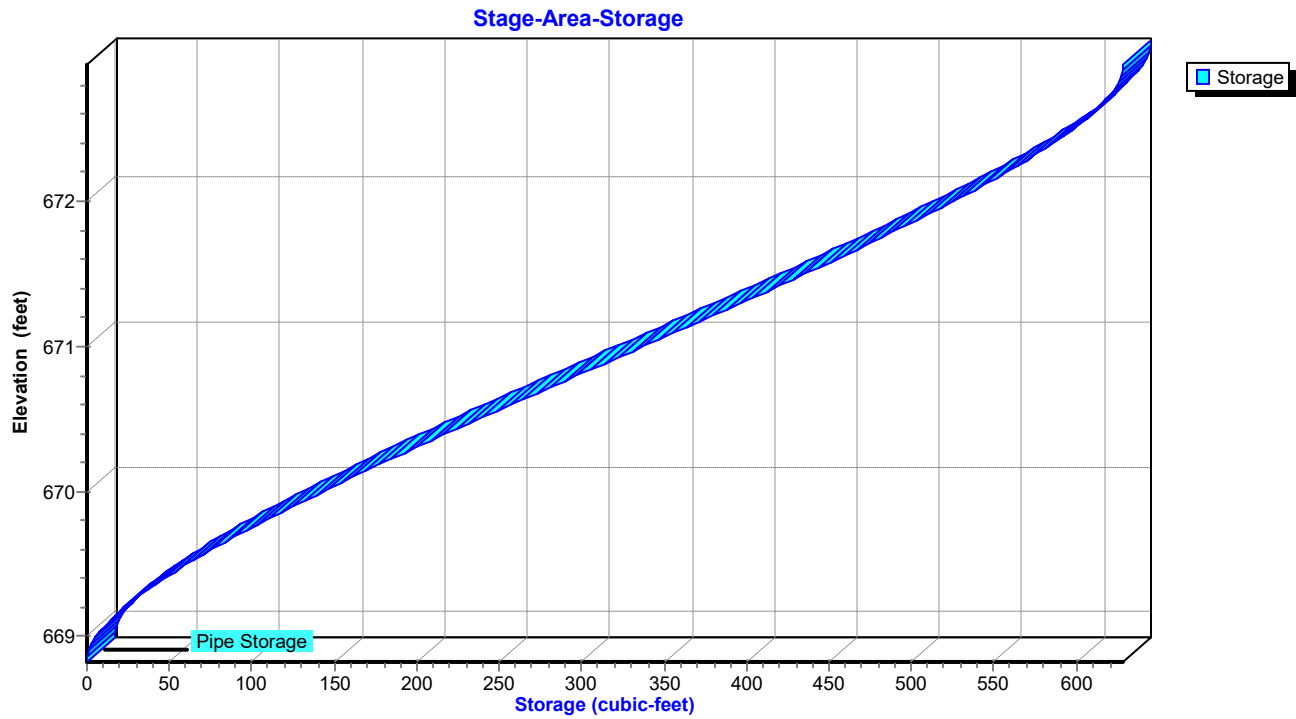
Pond 7P: 48" UG storage



Pond 7P: 48" UG storage



Pond 7P: 48" UG storage



Hydrograph for Pond 7P: 48" UG storage

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
5.00	0.00	0	668.82	0.00
5.50	0.00	0	668.85	0.00
6.00	0.00	0	668.85	0.00
6.50	0.00	0	668.85	0.00
7.00	0.00	0	668.86	0.00
7.50	0.00	0	668.86	0.00
8.00	0.00	0	668.86	0.00
8.50	0.00	0	668.86	0.00
9.00	0.00	0	668.86	0.00
9.50	0.01	0	668.87	0.01
10.00	0.01	0	668.88	0.01
10.50	0.01	0	668.88	0.01
11.00	0.05	5	669.00	0.05
11.50	0.07	7	669.02	0.06
12.00	0.18	19	669.16	0.16
12.50	0.27	60	669.49	0.35
13.00	0.13	16	669.13	0.14
13.50	0.11	13	669.09	0.11
14.00	0.09	10	669.06	0.09
14.50	0.08	9	669.05	0.08
15.00	0.08	9	669.05	0.08
15.50	0.07	8	669.04	0.07
16.00	0.06	6	669.01	0.06
16.50	0.06	6	669.01	0.06
17.00	0.05	5	669.00	0.05
17.50	0.05	5	668.99	0.05
18.00	0.05	5	668.99	0.05
18.50	0.04	4	668.98	0.04
19.00	0.04	4	668.97	0.04
19.50	0.04	3	668.97	0.04
20.00	0.03	3	668.96	0.03

Stage-Discharge for Pond 7P: 48" UG storage

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
668.82	0.00	671.37	0.79
668.87	0.00	671.42	0.80
668.92	0.02	671.47	0.81
668.97	0.04	671.52	0.82
669.02	0.06	671.57	0.83
669.07	0.09	671.62	0.83
669.12	0.13	671.67	0.84
669.17	0.16	671.72	0.85
669.22	0.20	671.77	0.86
669.27	0.24	671.82	0.87
669.32	0.27	671.87	0.87
669.37	0.30	671.92	0.88
669.42	0.32	671.97	0.89
669.47	0.34	672.02	0.90
669.52	0.36	672.07	0.90
669.57	0.38	672.12	0.91
669.62	0.40	672.17	0.92
669.67	0.42	672.22	0.93
669.72	0.43	672.27	0.93
669.77	0.45	672.32	0.94
669.82	0.46	672.37	0.95
669.87	0.48	672.42	0.95
669.92	0.49	672.47	0.96
669.97	0.50	672.52	0.97
670.02	0.52	672.57	0.98
670.07	0.53	672.62	0.98
670.12	0.54	672.67	0.99
670.17	0.55	672.72	1.00
670.22	0.57	672.77	1.00
670.27	0.58	672.82	1.01
670.32	0.59	672.87	1.02
670.37	0.60	672.92	1.02
670.42	0.61		
670.47	0.62		
670.52	0.63		
670.57	0.64		
670.62	0.65		
670.67	0.66		
670.72	0.67		
670.77	0.68		
670.82	0.69		
670.87	0.70		
670.92	0.71		
670.97	0.72		
671.02	0.73		
671.07	0.74		
671.12	0.75		
671.17	0.76		
671.22	0.77		
671.27	0.78		
671.32	0.78		

Stage-Area-Storage for Pond 7P: 48" UG storage

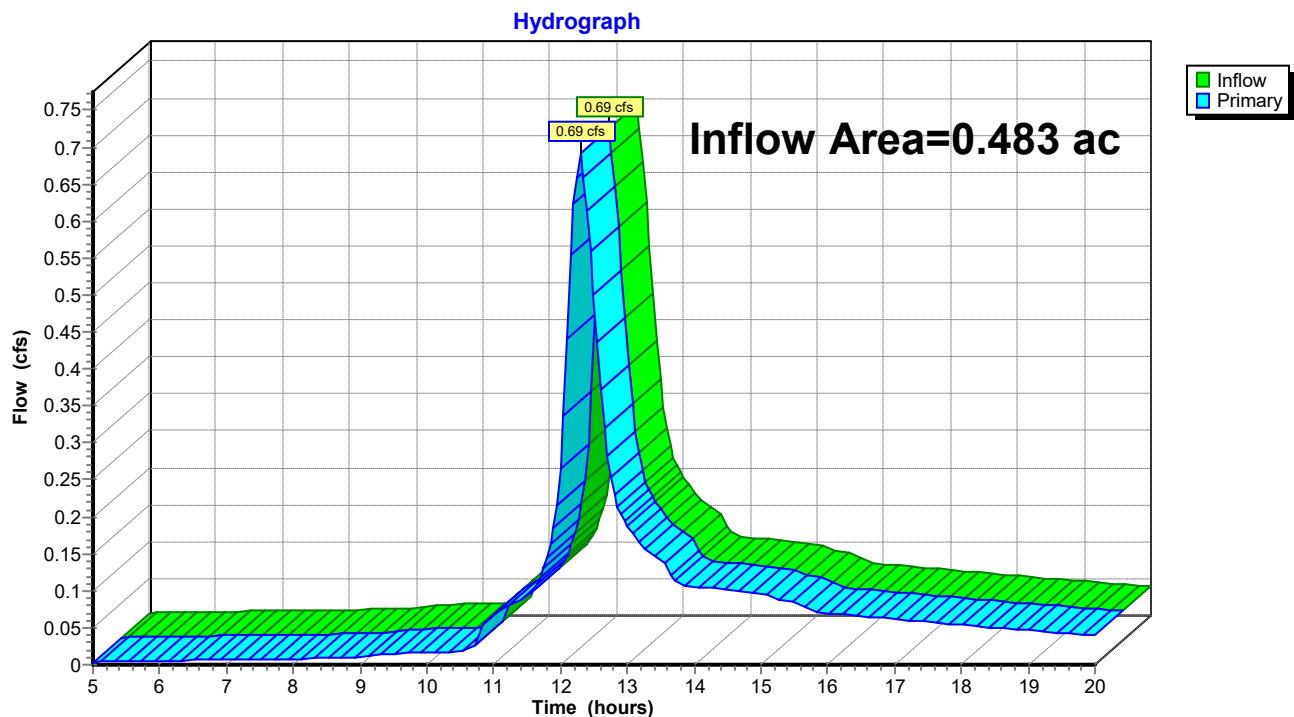
Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
668.82	0	671.37	410
668.87	0	671.42	420
668.92	1	671.47	429
668.97	4	671.52	439
669.02	7	671.57	448
669.07	11	671.62	458
669.12	15	671.67	467
669.17	20	671.72	476
669.22	25	671.77	485
669.27	31	671.82	494
669.32	37	671.87	503
669.37	43	671.92	511
669.42	50	671.97	520
669.47	57	672.02	528
669.52	64	672.07	536
669.57	72	672.12	544
669.62	79	672.17	552
669.67	87	672.22	560
669.72	95	672.27	567
669.77	103	672.32	574
669.82	112	672.37	581
669.87	120	672.42	587
669.92	129	672.47	594
669.97	138	672.52	600
670.02	147	672.57	605
670.07	156	672.62	610
670.12	165	672.67	615
670.17	174	672.72	619
670.22	184	672.77	623
670.27	193	672.82	626
670.32	203	672.87	628
670.37	212	672.92	628
670.42	222		
670.47	232		
670.52	242		
670.57	251		
670.62	261		
670.67	271		
670.72	281		
670.77	291		
670.82	301		
670.87	311		
670.92	321		
670.97	331		
671.02	341		
671.07	351		
671.12	361		
671.17	371		
671.22	381		
671.27	391		
671.32	400		

Summary for Link 2L: frontage rd

Inflow Area = 0.483 ac, 55.51% Impervious, Inflow Depth > 2.34" for 10-Year event
Inflow = 0.69 cfs @ 12.30 hrs, Volume= 0.094 af
Primary = 0.69 cfs @ 12.30 hrs, Volume= 0.094 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: frontage rd



Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 10-Year Rainfall=4.32"*

Prepared by Paragon Associates

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Hydrograph for Link 2L: frontage rd

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00	0.00	0.00	17.75	0.06	0.00	0.06
5.25	0.00	0.00	0.00	18.00	0.05	0.00	0.05
5.50	0.00	0.00	0.00	18.25	0.05	0.00	0.05
5.75	0.01	0.00	0.01	18.50	0.05	0.00	0.05
6.00	0.01	0.00	0.01	18.75	0.05	0.00	0.05
6.25	0.01	0.00	0.01	19.00	0.05	0.00	0.05
6.50	0.01	0.00	0.01	19.25	0.04	0.00	0.04
6.75	0.01	0.00	0.01	19.50	0.04	0.00	0.04
7.00	0.01	0.00	0.01	19.75	0.04	0.00	0.04
7.25	0.01	0.00	0.01	20.00	0.04	0.00	0.04
7.50	0.01	0.00	0.01				
7.75	0.01	0.00	0.01				
8.00	0.01	0.00	0.01				
8.25	0.01	0.00	0.01				
8.50	0.01	0.00	0.01				
8.75	0.01	0.00	0.01				
9.00	0.01	0.00	0.01				
9.25	0.01	0.00	0.01				
9.50	0.01	0.00	0.01				
9.75	0.02	0.00	0.02				
10.00	0.02	0.00	0.02				
10.25	0.02	0.00	0.02				
10.50	0.02	0.00	0.02				
10.75	0.03	0.00	0.03				
11.00	0.07	0.00	0.07				
11.25	0.08	0.00	0.08				
11.50	0.09	0.00	0.09				
11.75	0.13	0.00	0.13				
12.00	0.26	0.00	0.26				
12.25	0.66	0.00	0.66				
12.50	0.50	0.00	0.50				
12.75	0.25	0.00	0.25				
13.00	0.19	0.00	0.19				
13.25	0.16	0.00	0.16				
13.50	0.14	0.00	0.14				
13.75	0.11	0.00	0.11				
14.00	0.11	0.00	0.11				
14.25	0.10	0.00	0.10				
14.50	0.10	0.00	0.10				
14.75	0.10	0.00	0.10				
15.00	0.10	0.00	0.10				
15.25	0.09	0.00	0.09				
15.50	0.08	0.00	0.08				
15.75	0.07	0.00	0.07				
16.00	0.07	0.00	0.07				
16.25	0.07	0.00	0.07				
16.50	0.07	0.00	0.07				
16.75	0.06	0.00	0.06				
17.00	0.06	0.00	0.06				
17.25	0.06	0.00	0.06				
17.50	0.06	0.00	0.06				

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: To E Biofilter	Runoff Area=1,875 sf 57.33% Impervious Runoff Depth>5.00" Flow Length=25' Tc=8.0 min CN=WQ Runoff=0.29 cfs 0.018 af
Subcatchment 3S: to curb inlet	Runoff Area=5,020 sf 68.92% Impervious Runoff Depth>5.45" Flow Length=150' Tc=10.0 min CN=WQ Runoff=0.78 cfs 0.052 af
Subcatchment 4S: to W biofilter	Runoff Area=4,490 sf 59.91% Impervious Runoff Depth>5.10" Flow Length=140' Tc=6.0 min CN=WQ Runoff=0.76 cfs 0.044 af
Subcatchment 5S: to NDS 13-14-15	Runoff Area=1,050 sf 0.00% Impervious Runoff Depth>2.75" Flow Length=175' Tc=8.0 min CN=WQ Runoff=0.10 cfs 0.006 af
Subcatchment 6S: untreated	Runoff Area=6,820 sf 39.15% Impervious Runoff Depth>4.28" Flow Length=100' Tc=15.0 min CN=WQ Runoff=0.74 cfs 0.056 af
Subcatchment 7S: S 1/2 roof to 8" PVC	Runoff Area=1,190 sf 100.00% Impervious Runoff Depth>6.66" Flow Length=25' Tc=5.0 min CN=98 Runoff=0.26 cfs 0.015 af
Subcatchment 8S: NW 1/4 roof	Runoff Area=595 sf 100.00% Impervious Runoff Depth>6.66" Flow Length=25' Tc=5.0 min CN=98 Runoff=0.13 cfs 0.008 af
Reach 3R: S. 8" PVC	Avg. Flow Depth=0.26' Max Vel=2.84 fps Inflow=0.35 cfs 0.021 af 8.0" Round Pipe n=0.010 L=87.0' S=0.0052 '/' Capacity=1.13 cfs Outflow=0.34 cfs 0.021 af
Reach 4R: W. 6" PVC	Avg. Flow Depth=0.19' Max Vel=12.01 fps Inflow=0.84 cfs 0.119 af 6.0" Round Pipe n=0.010 L=77.0' S=0.1335 '/' Capacity=2.67 cfs Outflow=0.84 cfs 0.119 af
Pond 3P: E biofilter LINED	Peak Elev=681.13' Storage=272 cf Inflow=0.29 cfs 0.018 af Primary=0.18 cfs 0.017 af Secondary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.017 af
Pond 5P: W biofillter UNLINED	Peak Elev=676.26' Storage=1,063 cf Inflow=1.50 cfs 0.096 af Discarded=0.00 cfs 0.001 af Primary=0.87 cfs 0.074 af Secondary=0.87 cfs 0.011 af Outflow=1.73 cfs 0.085 af
Pond 7P: 48" UG storage	Peak Elev=671.64' Storage=462 cf Inflow=1.34 cfs 0.119 af 5.0" Round Culvert n=0.010 L=4.0' S=0.0050 '/' Outflow=0.84 cfs 0.119 af
Link 2L: frontage rd	Inflow=2.28 cfs 0.185 af Primary=2.28 cfs 0.185 af
Total Runoff Area = 0.483 ac Runoff Volume = 0.198 af Average Runoff Depth = 4.92"	
44.49% Pervious = 0.215 ac 55.51% Impervious = 0.268 ac	

Summary for Subcatchment 1S: To E Biofilter

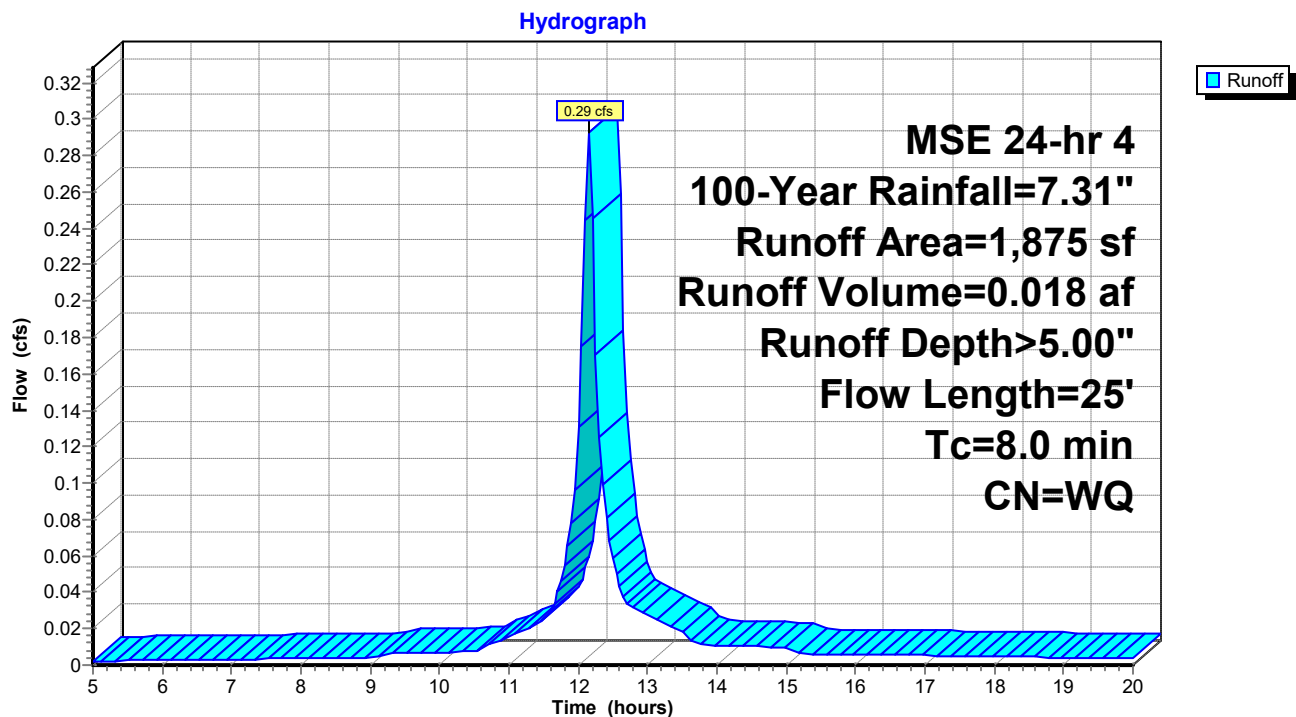
Runoff = 0.29 cfs @ 12.15 hrs, Volume= 0.018 af, Depth> 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.31"

	Area (sf)	CN	Description
*	800	61	lawn, HSG B, good
*	645	98	NE 1/4 roof
*	210	100	bio media
*	220	98	retain wall
	1,875		Weighted Average
	800		42.67% Pervious Area
	1,075		57.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	25		0.05		Direct Entry, lawn above wall to E bio

Subcatchment 1S: To E Biofilter



Hydrograph for Subcatchment 1S: To E Biofilter

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.00	0.00	17.75	6.83	4.76	0.00
5.25	0.36	0.00	0.00	18.00	6.86	4.79	0.00
5.50	0.39	0.00	0.00	18.25	6.89	4.81	0.00
5.75	0.42	0.00	0.00	18.50	6.92	4.84	0.00
6.00	0.45	0.00	0.00	18.75	6.95	4.87	0.00
6.25	0.48	0.00	0.00	19.00	6.97	4.89	0.00
6.50	0.51	0.00	0.00	19.25	7.00	4.92	0.00
6.75	0.55	0.00	0.00	19.50	7.03	4.94	0.00
7.00	0.58	0.01	0.00	19.75	7.05	4.96	0.00
7.25	0.61	0.01	0.00	20.00	7.07	4.98	0.00
7.50	0.65	0.02	0.00				
7.75	0.69	0.03	0.00				
8.00	0.72	0.03	0.00				
8.25	0.76	0.04	0.00				
8.50	0.80	0.05	0.00				
8.75	0.84	0.06	0.00				
9.00	0.88	0.08	0.00				
9.25	0.95	0.10	0.01				
9.50	1.02	0.12	0.01				
9.75	1.09	0.15	0.01				
10.00	1.16	0.18	0.01				
10.25	1.23	0.21	0.01				
10.50	1.31	0.25	0.01				
10.75	1.43	0.31	0.01				
11.00	1.58	0.39	0.02				
11.25	1.77	0.50	0.02				
11.50	1.98	0.64	0.02				
11.75	2.40	0.92	0.05				
12.00	3.43	1.72	0.13				
12.25	4.91	3.00	0.17				
12.50	5.33	3.37	0.06				
12.75	5.54	3.57	0.03				
13.00	5.73	3.74	0.03				
13.25	5.88	3.88	0.02				
13.50	6.00	3.99	0.02				
13.75	6.08	4.06	0.01				
14.00	6.15	4.13	0.01				
14.25	6.22	4.19	0.01				
14.50	6.29	4.26	0.01				
14.75	6.36	4.32	0.01				
15.00	6.43	4.38	0.01				
15.25	6.47	4.42	0.01				
15.50	6.51	4.46	0.01				
15.75	6.55	4.49	0.01				
16.00	6.59	4.53	0.01				
16.25	6.62	4.56	0.01				
16.50	6.66	4.60	0.01				
16.75	6.70	4.63	0.01				
17.00	6.73	4.66	0.01				
17.25	6.76	4.70	0.01				
17.50	6.80	4.73	0.01				

Summary for Subcatchment 3S: to curb inlet

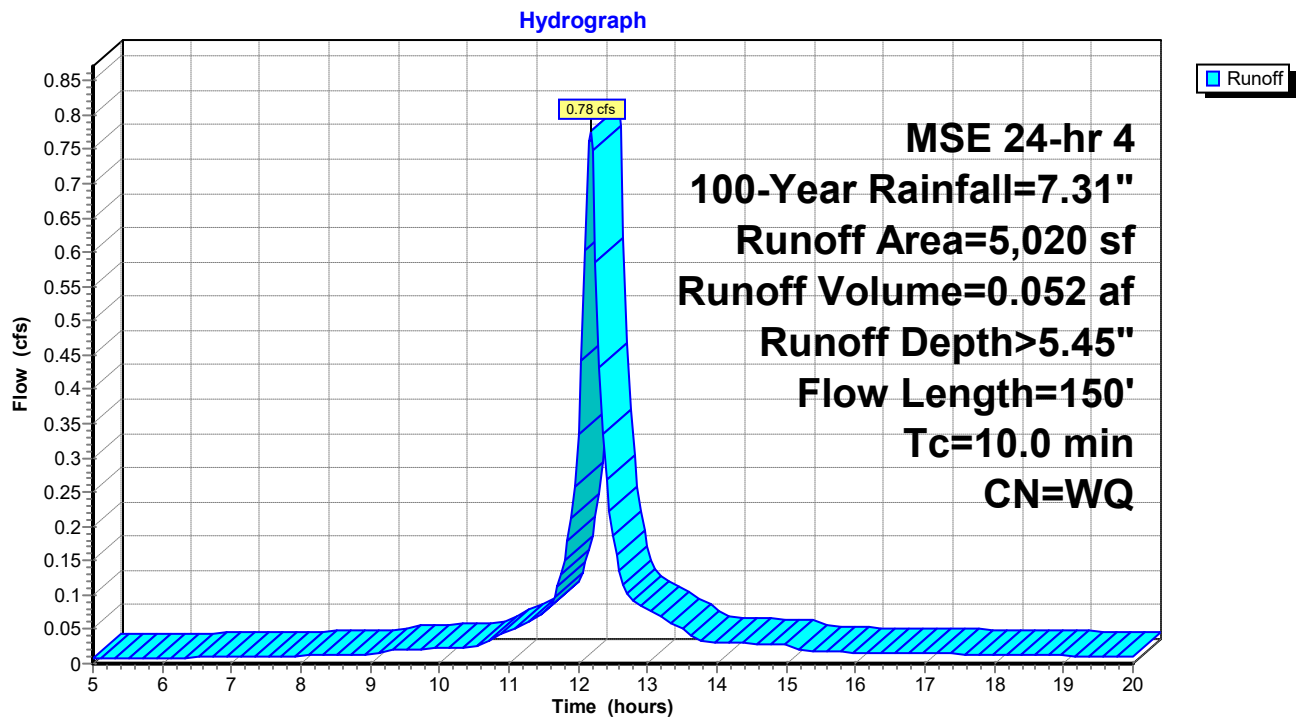
Runoff = 0.78 cfs @ 12.17 hrs, Volume= 0.052 af, Depth> 5.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.31"

	Area (sf)	CN	Description
*	3,200	98	S part parking lot
*	160	98	SW
*	780	61	lawn, HSG B, good
*	780	61	lawn above wall
*	100	98	retain wall
	5,020		Weighted Average
	1,560		31.08% Pervious Area
	3,460		68.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	150		0.25		Direct Entry, LAXVC lawn via AC pavement

Subcatchment 3S: to curb inlet



Hydrograph for Subcatchment 3S: to curb inlet

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.00	0.01	17.75	6.83	5.31	0.01
5.25	0.36	0.00	0.01	18.00	6.86	5.34	0.01
5.50	0.39	0.01	0.01	18.25	6.89	5.37	0.01
5.75	0.42	0.01	0.01	18.50	6.92	5.40	0.01
6.00	0.45	0.01	0.01	18.75	6.95	5.43	0.01
6.25	0.48	0.02	0.01	19.00	6.97	5.45	0.01
6.50	0.51	0.03	0.01	19.25	7.00	5.48	0.01
6.75	0.55	0.03	0.01	19.50	7.03	5.50	0.01
7.00	0.58	0.04	0.01	19.75	7.05	5.53	0.01
7.25	0.61	0.05	0.01	20.00	7.07	5.55	0.01
7.50	0.65	0.07	0.01				
7.75	0.69	0.08	0.01				
8.00	0.72	0.09	0.01				
8.25	0.76	0.11	0.01				
8.50	0.80	0.13	0.01				
8.75	0.84	0.15	0.01				
9.00	0.88	0.17	0.01				
9.25	0.95	0.20	0.02				
9.50	1.02	0.23	0.02				
9.75	1.09	0.27	0.02				
10.00	1.16	0.31	0.02				
10.25	1.23	0.36	0.02				
10.50	1.31	0.41	0.02				
10.75	1.43	0.49	0.04				
11.00	1.58	0.59	0.05				
11.25	1.77	0.73	0.06				
11.50	1.98	0.89	0.07				
11.75	2.40	1.22	0.13				
12.00	3.43	2.12	0.33				
12.25	4.91	3.49	0.59				
12.50	5.33	3.87	0.19				
12.75	5.54	4.08	0.10				
13.00	5.73	4.26	0.08				
13.25	5.88	4.40	0.07				
13.50	6.00	4.52	0.05				
13.75	6.08	4.59	0.03				
14.00	6.15	4.66	0.03				
14.25	6.22	4.73	0.03				
14.50	6.29	4.80	0.03				
14.75	6.36	4.86	0.03				
15.00	6.43	4.93	0.03				
15.25	6.47	4.97	0.02				
15.50	6.51	5.00	0.02				
15.75	6.55	5.04	0.02				
16.00	6.59	5.08	0.02				
16.25	6.62	5.12	0.02				
16.50	6.66	5.15	0.02				
16.75	6.70	5.19	0.02				
17.00	6.73	5.22	0.01				
17.25	6.76	5.25	0.01				
17.50	6.80	5.28	0.01				

Summary for Subcatchment 4S: to W biofilter

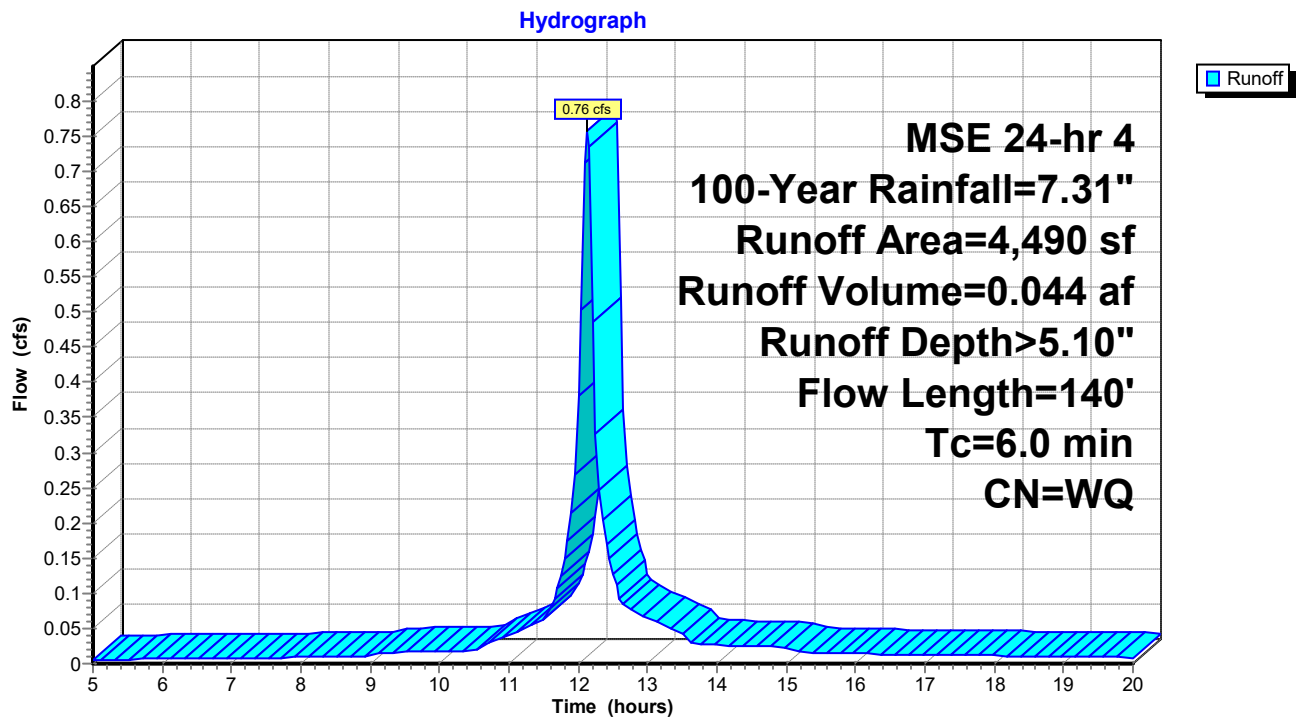
Runoff = 0.76 cfs @ 12.13 hrs, Volume= 0.044 af, Depth> 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.31"

	Area (sf)	CN	Description
*	2,000	98	N part driveway
*	230	98	N part parking lot
*	1,600	61	lawn, HSG B, good
*	460	100	bio media
*	200	61	landscape
	4,490		Weighted Average
	1,800		40.09% Pervious Area
	2,690		59.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	140		0.39		Direct Entry, lawn via parking

Subcatchment 4S: to W biofilter



Hydrograph for Subcatchment 4S: to W biofilter

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.00	0.01	17.75	6.83	4.87	0.01
5.25	0.36	0.00	0.01	18.00	6.86	4.90	0.01
5.50	0.39	0.00	0.01	18.25	6.89	4.92	0.01
5.75	0.42	0.00	0.01	18.50	6.92	4.95	0.01
6.00	0.45	0.00	0.01	18.75	6.95	4.98	0.01
6.25	0.48	0.00	0.01	19.00	6.97	5.00	0.01
6.50	0.51	0.00	0.01	19.25	7.00	5.03	0.01
6.75	0.55	0.01	0.01	19.50	7.03	5.05	0.01
7.00	0.58	0.01	0.01	19.75	7.05	5.07	0.01
7.25	0.61	0.02	0.01	20.00	7.07	5.10	0.01
7.50	0.65	0.03	0.01				
7.75	0.69	0.03	0.01				
8.00	0.72	0.04	0.01				
8.25	0.76	0.05	0.01				
8.50	0.80	0.06	0.01				
8.75	0.84	0.08	0.01				
9.00	0.88	0.09	0.01				
9.25	0.95	0.11	0.02				
9.50	1.02	0.14	0.02				
9.75	1.09	0.17	0.02				
10.00	1.16	0.20	0.02				
10.25	1.23	0.24	0.02				
10.50	1.31	0.27	0.02				
10.75	1.43	0.34	0.03				
11.00	1.58	0.43	0.04				
11.25	1.77	0.54	0.05				
11.50	1.98	0.68	0.06				
11.75	2.40	0.98	0.12				
12.00	3.43	1.80	0.38				
12.25	4.91	3.10	0.33				
12.50	5.33	3.47	0.13				
12.75	5.54	3.67	0.08				
13.00	5.73	3.84	0.06				
13.25	5.88	3.98	0.05				
13.50	6.00	4.09	0.04				
13.75	6.08	4.16	0.03				
14.00	6.15	4.23	0.03				
14.25	6.22	4.30	0.03				
14.50	6.29	4.36	0.03				
14.75	6.36	4.43	0.02				
15.00	6.43	4.49	0.02				
15.25	6.47	4.53	0.02				
15.50	6.51	4.56	0.01				
15.75	6.55	4.60	0.01				
16.00	6.59	4.64	0.01				
16.25	6.62	4.67	0.01				
16.50	6.66	4.71	0.01				
16.75	6.70	4.74	0.01				
17.00	6.73	4.77	0.01				
17.25	6.76	4.81	0.01				
17.50	6.80	4.84	0.01				

Summary for Subcatchment 5S: to NDS 13-14-15

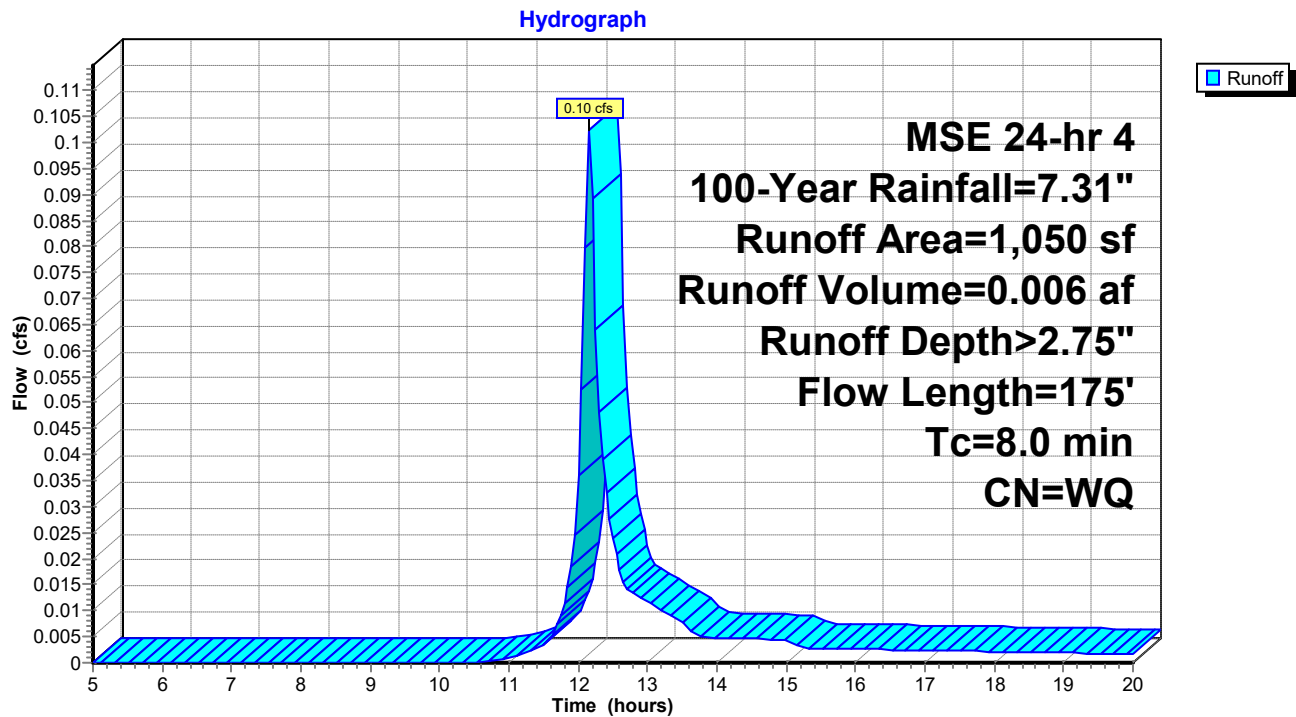
Runoff = 0.10 cfs @ 12.16 hrs, Volume= 0.006 af, Depth> 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.31"

	Area (sf)	CN	Description
*	550	61	NDS 14-15 lawn berm, HSG B, good
*	500	61	NDS 13 lawn
	1,050		Weighted Average
	1,050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	175		0.36		Direct Entry, lawn berm

Subcatchment 5S: to NDS 13-14-15



Hydrograph for Subcatchment 5S: to NDS 13-14-15

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.00	0.00	17.75	6.83	2.58	0.00
5.25	0.36	0.00	0.00	18.00	6.86	2.60	0.00
5.50	0.39	0.00	0.00	18.25	6.89	2.62	0.00
5.75	0.42	0.00	0.00	18.50	6.92	2.64	0.00
6.00	0.45	0.00	0.00	18.75	6.95	2.66	0.00
6.25	0.48	0.00	0.00	19.00	6.97	2.68	0.00
6.50	0.51	0.00	0.00	19.25	7.00	2.70	0.00
6.75	0.55	0.00	0.00	19.50	7.03	2.72	0.00
7.00	0.58	0.00	0.00	19.75	7.05	2.74	0.00
7.25	0.61	0.00	0.00	20.00	7.07	2.75	0.00
7.50	0.65	0.00	0.00				
7.75	0.69	0.00	0.00				
8.00	0.72	0.00	0.00				
8.25	0.76	0.00	0.00				
8.50	0.80	0.00	0.00				
8.75	0.84	0.00	0.00				
9.00	0.88	0.00	0.00				
9.25	0.95	0.00	0.00				
9.50	1.02	0.00	0.00				
9.75	1.09	0.00	0.00				
10.00	1.16	0.00	0.00				
10.25	1.23	0.00	0.00				
10.50	1.31	0.00	0.00				
10.75	1.43	0.00	0.00				
11.00	1.58	0.01	0.00				
11.25	1.77	0.03	0.00				
11.50	1.98	0.07	0.00				
11.75	2.40	0.17	0.01				
12.00	3.43	0.54	0.04				
12.25	4.91	1.32	0.06				
12.50	5.33	1.57	0.02				
12.75	5.54	1.71	0.01				
13.00	5.73	1.83	0.01				
13.25	5.88	1.93	0.01				
13.50	6.00	2.01	0.01				
13.75	6.08	2.06	0.01				
14.00	6.15	2.11	0.00				
14.25	6.22	2.16	0.00				
14.50	6.29	2.20	0.00				
14.75	6.36	2.25	0.00				
15.00	6.43	2.30	0.00				
15.25	6.47	2.32	0.00				
15.50	6.51	2.35	0.00				
15.75	6.55	2.38	0.00				
16.00	6.59	2.41	0.00				
16.25	6.62	2.43	0.00				
16.50	6.66	2.46	0.00				
16.75	6.70	2.48	0.00				
17.00	6.73	2.51	0.00				
17.25	6.76	2.53	0.00				
17.50	6.80	2.56	0.00				

Summary for Subcatchment 6S: untreated

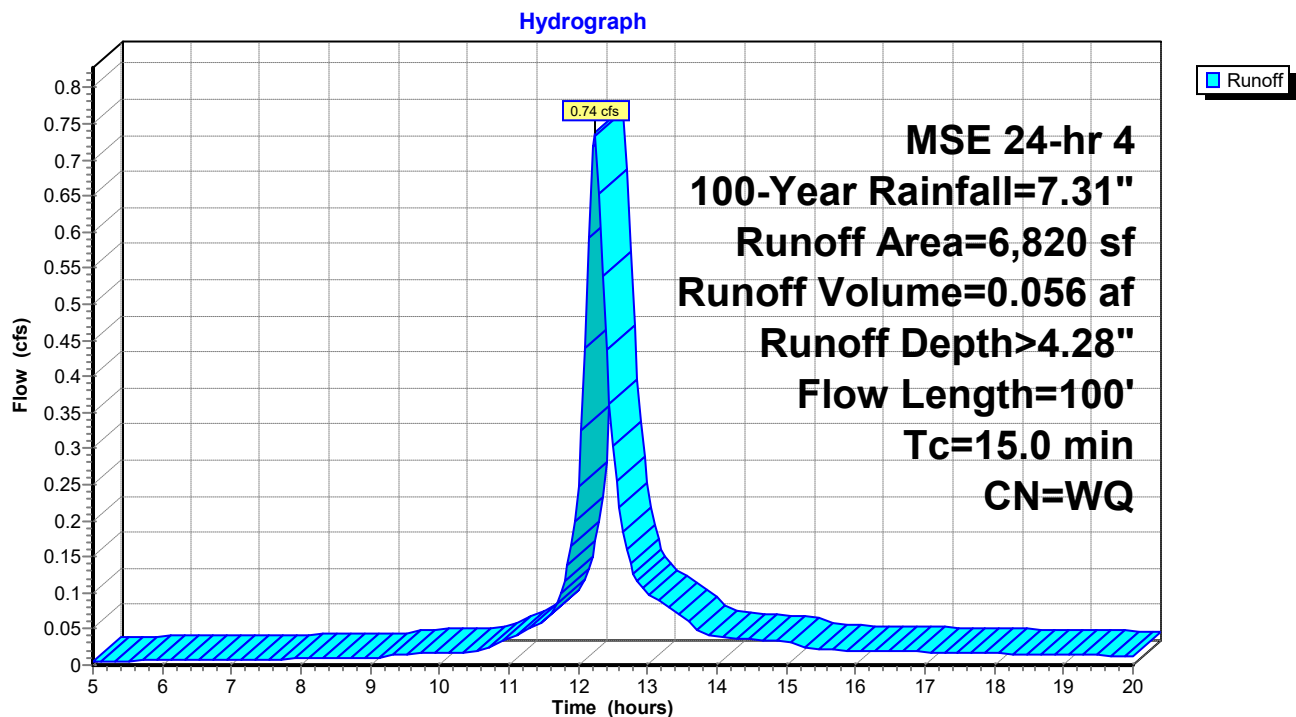
Runoff = 0.74 cfs @ 12.23 hrs, Volume= 0.056 af, Depth> 4.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.31"

	Area (sf)	CN	Description
*	2,400	98	S driveway
*	3,400	61	lawn, HSG B, good
*	750	61	bark mulch landscape
*	270	98	retain wall
	6,820		Weighted Average
	4,150		60.85% Pervious Area
	2,670		39.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100		0.11		Direct Entry, landscape to street

Subcatchment 6S: untreated



Hydrograph for Subcatchment 6S: untreated

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.00	0.01	17.75	6.83	4.00	0.02
5.25	0.36	0.00	0.01	18.00	6.86	4.03	0.02
5.50	0.39	0.00	0.01	18.25	6.89	4.05	0.02
5.75	0.42	0.00	0.01	18.50	6.92	4.08	0.02
6.00	0.45	0.00	0.01	18.75	6.95	4.10	0.01
6.25	0.48	0.00	0.01	19.00	6.97	4.13	0.01
6.50	0.51	0.00	0.01	19.25	7.00	4.15	0.01
6.75	0.55	0.00	0.01	19.50	7.03	4.17	0.01
7.00	0.58	0.00	0.01	19.75	7.05	4.19	0.01
7.25	0.61	0.00	0.01	20.00	7.07	4.21	0.01
7.50	0.65	0.00	0.01				
7.75	0.69	0.00	0.01				
8.00	0.72	0.00	0.01				
8.25	0.76	0.00	0.01				
8.50	0.80	0.01	0.01				
8.75	0.84	0.01	0.01				
9.00	0.88	0.01	0.01				
9.25	0.95	0.02	0.01				
9.50	1.02	0.03	0.02				
9.75	1.09	0.05	0.02				
10.00	1.16	0.06	0.02				
10.25	1.23	0.08	0.02				
10.50	1.31	0.10	0.02				
10.75	1.43	0.14	0.03				
11.00	1.58	0.20	0.04				
11.25	1.77	0.27	0.05				
11.50	1.98	0.37	0.06				
11.75	2.40	0.59	0.10				
12.00	3.43	1.25	0.25				
12.25	4.91	2.38	0.73				
12.50	5.33	2.72	0.30				
12.75	5.54	2.90	0.14				
13.00	5.73	3.05	0.10				
13.25	5.88	3.18	0.08				
13.50	6.00	3.28	0.07				
13.75	6.08	3.35	0.05				
14.00	6.15	3.41	0.04				
14.25	6.22	3.47	0.04				
14.50	6.29	3.53	0.04				
14.75	6.36	3.59	0.03				
15.00	6.43	3.65	0.03				
15.25	6.47	3.68	0.03				
15.50	6.51	3.72	0.02				
15.75	6.55	3.75	0.02				
16.00	6.59	3.79	0.02				
16.25	6.62	3.82	0.02				
16.50	6.66	3.85	0.02				
16.75	6.70	3.88	0.02				
17.00	6.73	3.91	0.02				
17.25	6.76	3.94	0.02				
17.50	6.80	3.97	0.02				

Summary for Subcatchment 7S: S 1/2 roof to 8" PVC

[49] Hint: Tc<2dt may require smaller dt

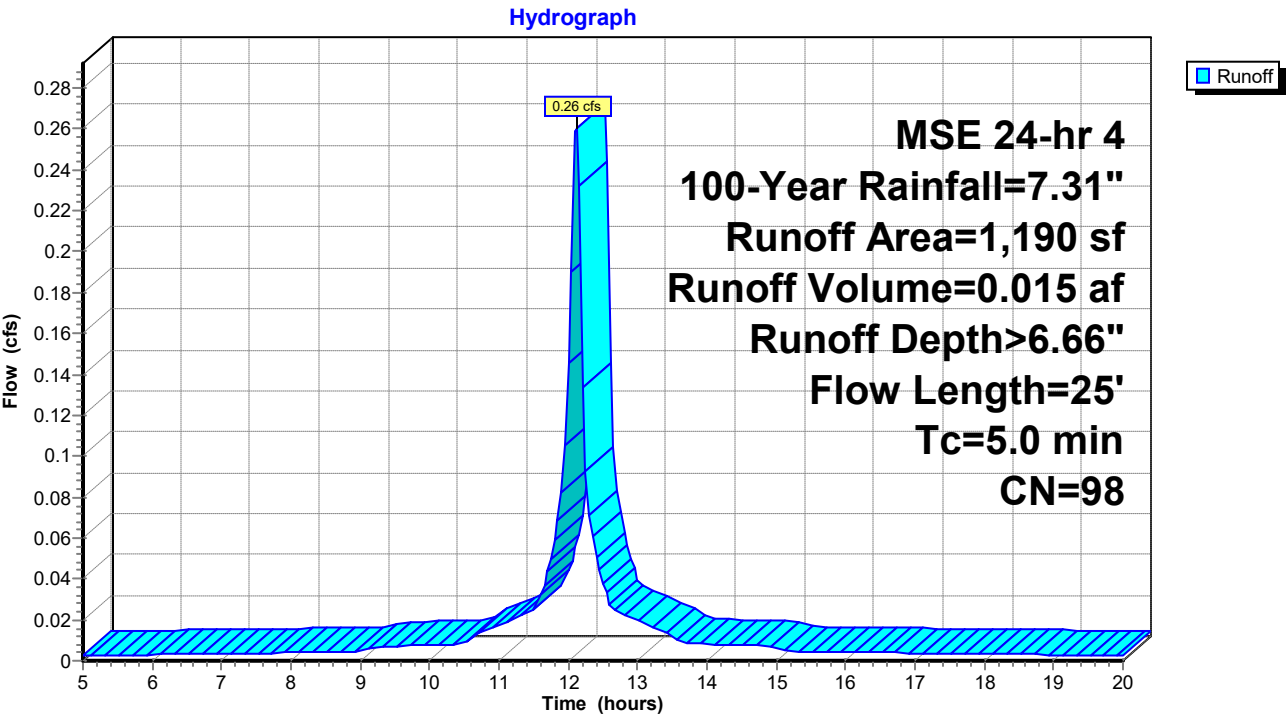
Runoff = 0.26 cfs @ 12.11 hrs, Volume= 0.015 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
MSE 24-hr 4 100-Year Rainfall=7.31"

Area (sf)	CN	Description
* 1,190	98	1/2 roof
1,190		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	25		0.08		Direct Entry, S 1/2 roof

Subcatchment 7S: S 1/2 roof to 8" PVC



Hydrograph for Subcatchment 7S: S 1/2 roof to 8" PVC

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.17	0.00	17.75	6.83	6.59	0.00
5.25	0.36	0.20	0.00	18.00	6.86	6.62	0.00
5.50	0.39	0.22	0.00	18.25	6.89	6.65	0.00
5.75	0.42	0.25	0.00	18.50	6.92	6.68	0.00
6.00	0.45	0.27	0.00	18.75	6.95	6.71	0.00
6.25	0.48	0.30	0.00	19.00	6.97	6.74	0.00
6.50	0.51	0.33	0.00	19.25	7.00	6.76	0.00
6.75	0.55	0.36	0.00	19.50	7.03	6.79	0.00
7.00	0.58	0.39	0.00	19.75	7.05	6.81	0.00
7.25	0.61	0.42	0.00	20.00	7.07	6.83	0.00
7.50	0.65	0.46	0.00				
7.75	0.69	0.49	0.00				
8.00	0.72	0.53	0.00				
8.25	0.76	0.56	0.00				
8.50	0.80	0.60	0.00				
8.75	0.84	0.64	0.00				
9.00	0.88	0.68	0.00				
9.25	0.95	0.74	0.01				
9.50	1.02	0.81	0.01				
9.75	1.09	0.87	0.01				
10.00	1.16	0.94	0.01				
10.25	1.23	1.02	0.01				
10.50	1.31	1.09	0.01				
10.75	1.43	1.21	0.01				
11.00	1.58	1.36	0.02				
11.25	1.77	1.54	0.02				
11.50	1.98	1.76	0.02				
11.75	2.40	2.17	0.05				
12.00	3.43	3.19	0.15				
12.25	4.91	4.68	0.09				
12.50	5.33	5.09	0.04				
12.75	5.54	5.31	0.02				
13.00	5.73	5.49	0.02				
13.25	5.88	5.64	0.02				
13.50	6.00	5.76	0.01				
13.75	6.08	5.84	0.01				
14.00	6.15	5.91	0.01				
14.25	6.22	5.99	0.01				
14.50	6.29	6.05	0.01				
14.75	6.36	6.12	0.01				
15.00	6.43	6.19	0.01				
15.25	6.47	6.23	0.00				
15.50	6.51	6.27	0.00				
15.75	6.55	6.31	0.00				
16.00	6.59	6.35	0.00				
16.25	6.62	6.38	0.00				
16.50	6.66	6.42	0.00				
16.75	6.70	6.46	0.00				
17.00	6.73	6.49	0.00				
17.25	6.76	6.53	0.00				
17.50	6.80	6.56	0.00				

Summary for Subcatchment 8S: NW 1/4 roof

[49] Hint: $T_c < 2dt$ may require smaller dt

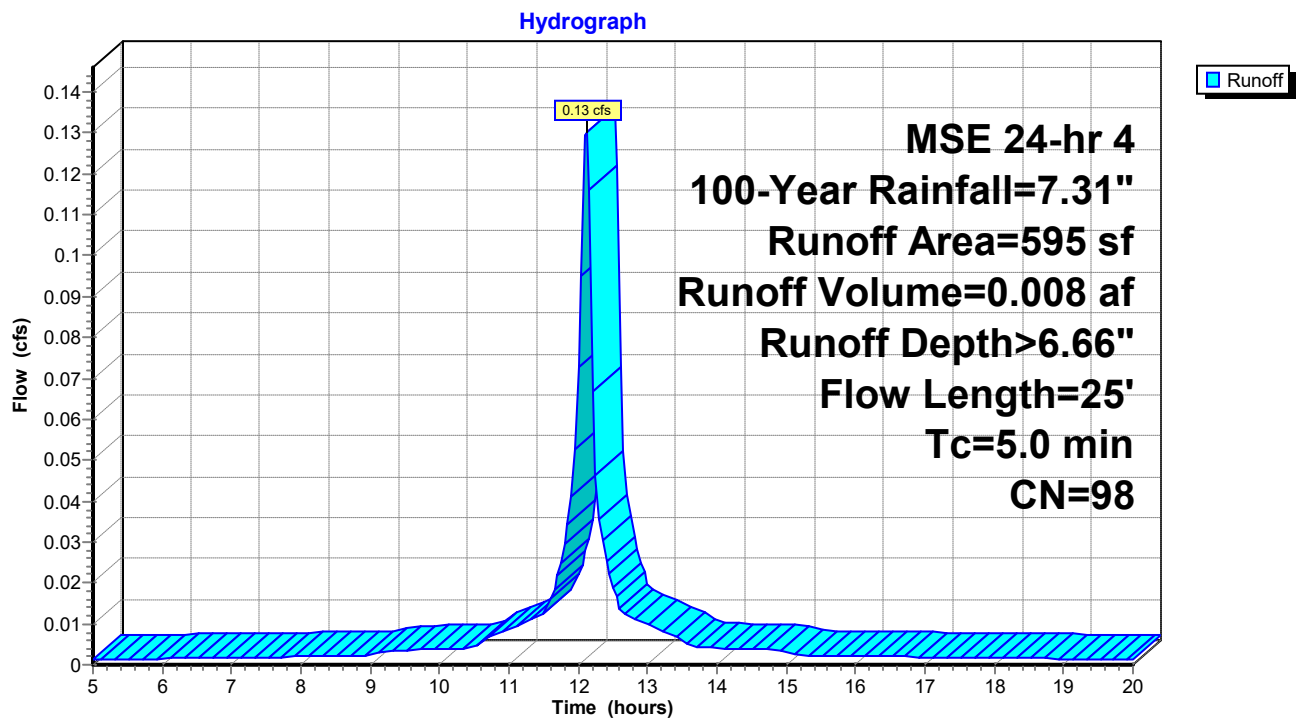
Runoff = 0.13 cfs @ 12.11 hrs, Volume= 0.008 af, Depth> 6.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, $dt= 0.05$ hrs
MSE 24-hr 4 100-Year Rainfall=7.31"

	Area (sf)	CN	Description
*	595	98	NW 1/4 roof
	595		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	25		0.08		Direct Entry, NW 1/4 roof

Subcatchment 8S: NW 1/4 roof



Hydrograph for Subcatchment 8S: NW 1/4 roof

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.17	0.00	17.75	6.83	6.59	0.00
5.25	0.36	0.20	0.00	18.00	6.86	6.62	0.00
5.50	0.39	0.22	0.00	18.25	6.89	6.65	0.00
5.75	0.42	0.25	0.00	18.50	6.92	6.68	0.00
6.00	0.45	0.27	0.00	18.75	6.95	6.71	0.00
6.25	0.48	0.30	0.00	19.00	6.97	6.74	0.00
6.50	0.51	0.33	0.00	19.25	7.00	6.76	0.00
6.75	0.55	0.36	0.00	19.50	7.03	6.79	0.00
7.00	0.58	0.39	0.00	19.75	7.05	6.81	0.00
7.25	0.61	0.42	0.00	20.00	7.07	6.83	0.00
7.50	0.65	0.46	0.00				
7.75	0.69	0.49	0.00				
8.00	0.72	0.53	0.00				
8.25	0.76	0.56	0.00				
8.50	0.80	0.60	0.00				
8.75	0.84	0.64	0.00				
9.00	0.88	0.68	0.00				
9.25	0.95	0.74	0.00				
9.50	1.02	0.81	0.00				
9.75	1.09	0.87	0.00				
10.00	1.16	0.94	0.00				
10.25	1.23	1.02	0.00				
10.50	1.31	1.09	0.00				
10.75	1.43	1.21	0.01				
11.00	1.58	1.36	0.01				
11.25	1.77	1.54	0.01				
11.50	1.98	1.76	0.01				
11.75	2.40	2.17	0.02				
12.00	3.43	3.19	0.07				
12.25	4.91	4.68	0.05				
12.50	5.33	5.09	0.02				
12.75	5.54	5.31	0.01				
13.00	5.73	5.49	0.01				
13.25	5.88	5.64	0.01				
13.50	6.00	5.76	0.01				
13.75	6.08	5.84	0.00				
14.00	6.15	5.91	0.00				
14.25	6.22	5.99	0.00				
14.50	6.29	6.05	0.00				
14.75	6.36	6.12	0.00				
15.00	6.43	6.19	0.00				
15.25	6.47	6.23	0.00				
15.50	6.51	6.27	0.00				
15.75	6.55	6.31	0.00				
16.00	6.59	6.35	0.00				
16.25	6.62	6.38	0.00				
16.50	6.66	6.42	0.00				
16.75	6.70	6.46	0.00				
17.00	6.73	6.49	0.00				
17.25	6.76	6.53	0.00				
17.50	6.80	6.56	0.00				

Summary for Reach 3R: S. 8" PVC

[52] Hint: Inlet/Outlet conditions not evaluated

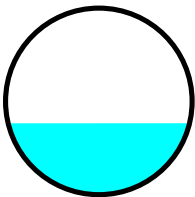
[82] Warning: Early inflow requires earlier time span

Inflow Area = 0.051 ac, 53.13% Impervious, Inflow Depth > 4.83" for 100-Year event
Inflow = 0.35 cfs @ 12.12 hrs, Volume= 0.021 af
Outflow = 0.34 cfs @ 12.14 hrs, Volume= 0.021 af, Atten= 2%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.84 fps, Min. Travel Time= 0.5 min
Avg. Velocity= 0.99 fps, Avg. Travel Time= 1.5 min

Peak Storage= 11 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.13 cfs

8.0" Round Pipe
n= 0.010 PVC, smooth interior
Length= 87.0' Slope= 0.0052 '/'
Inlet Invert= 676.38', Outlet Invert= 675.93'



Chiro HCAD Proposed Chiro only AMENDED

Prepared by Paragon Associates

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Chiro HCAD Proposed No Run On AMENDED Mar. '26

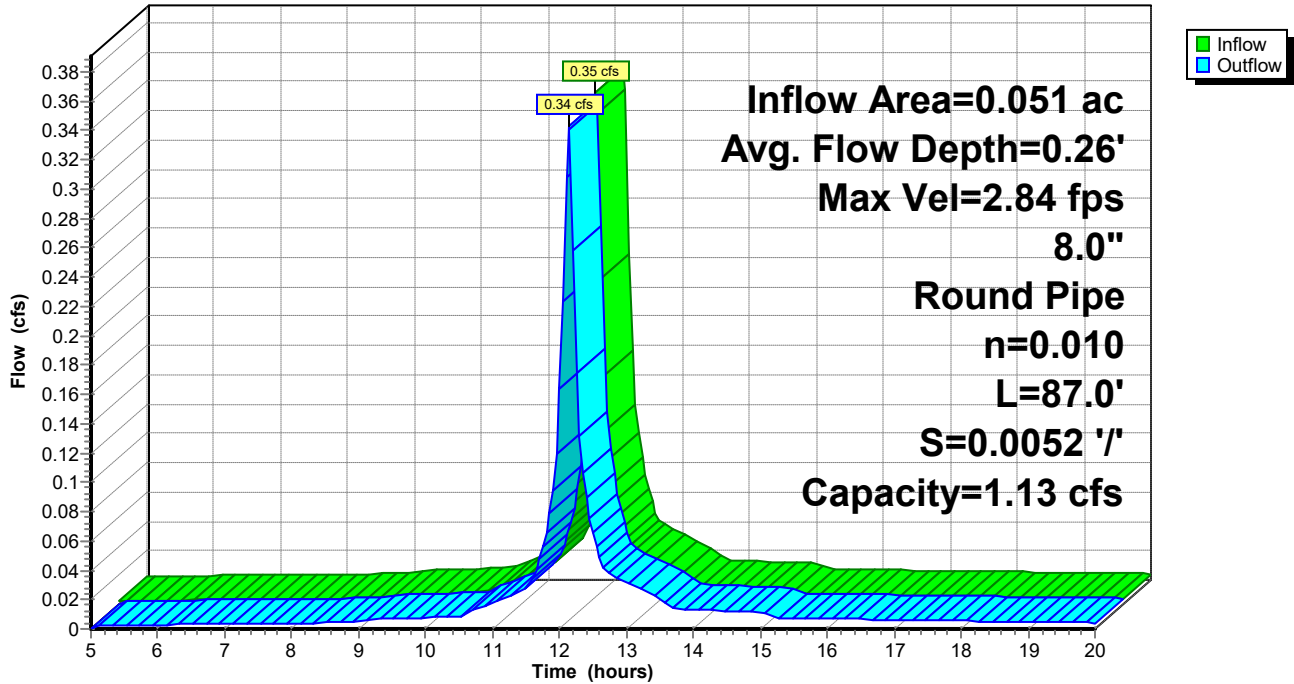
MSE 24-hr 4 100-Year Rainfall=7.31"

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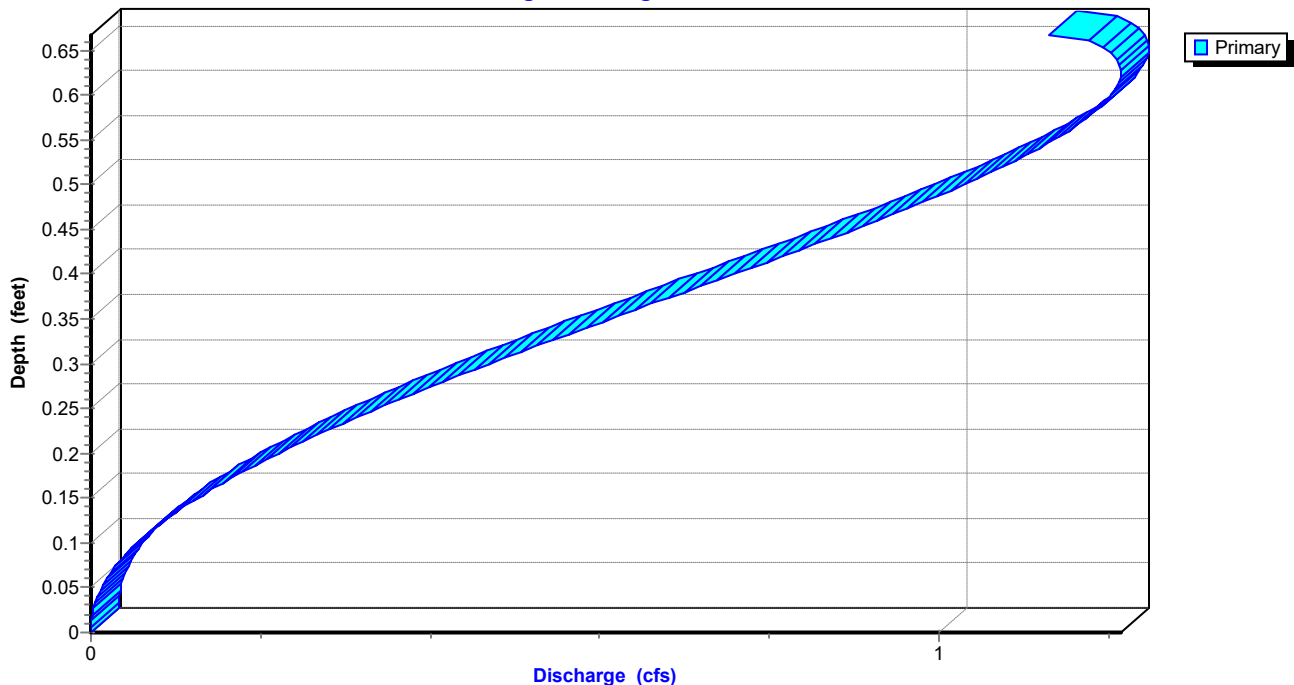
Reach 3R: S. 8" PVC

Hydrograph

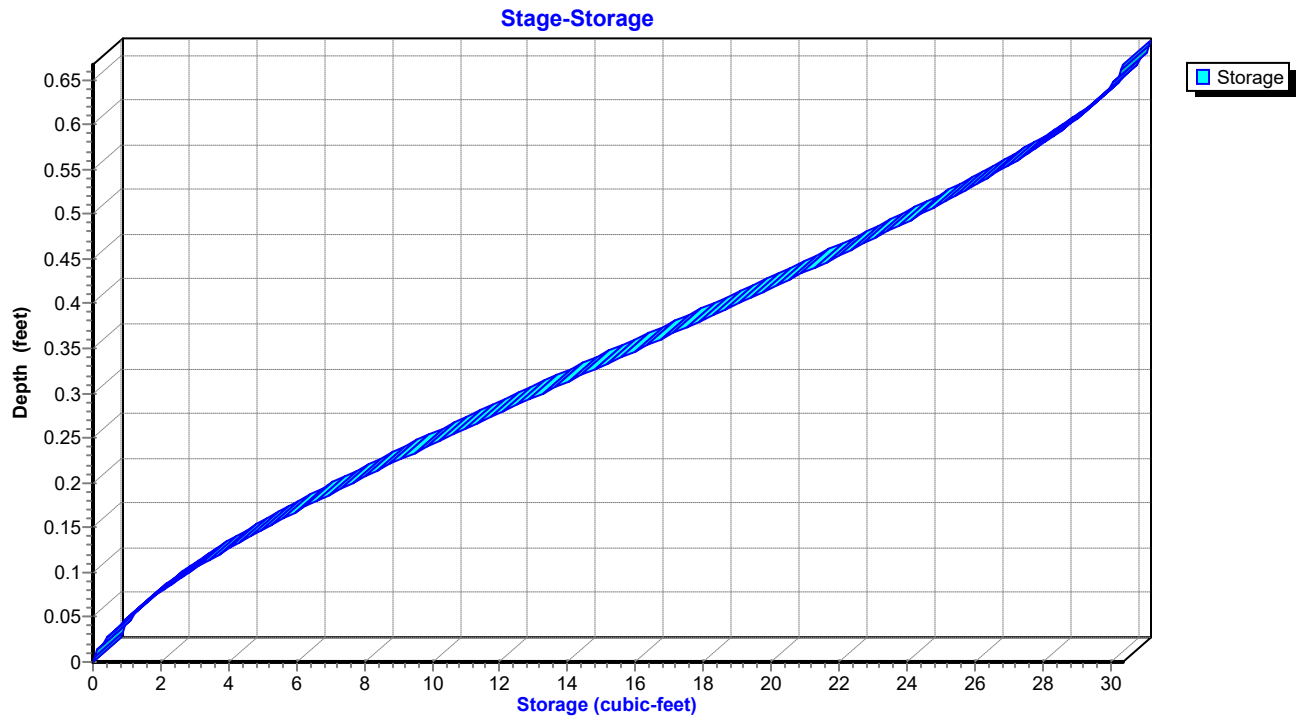


Reach 3R: S. 8" PVC

Stage-Discharge



Reach 3R: S. 8" PVC



Hydrograph for Reach 3R: S. 8" PVC

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	676.38	0.00
5.50	0.00	0	676.40	0.00
6.00	0.00	0	676.40	0.00
6.50	0.00	0	676.41	0.00
7.00	0.00	0	676.41	0.00
7.50	0.00	0	676.41	0.00
8.00	0.00	0	676.41	0.00
8.50	0.00	0	676.41	0.00
9.00	0.00	0	676.41	0.00
9.50	0.01	1	676.42	0.01
10.00	0.01	1	676.42	0.01
10.50	0.01	1	676.42	0.01
11.00	0.02	1	676.44	0.02
11.50	0.03	2	676.45	0.03
12.00	0.18	6	676.56	0.16
12.50	0.06	3	676.49	0.07
13.00	0.03	2	676.46	0.03
13.50	0.02	1	676.44	0.02
14.00	0.01	1	676.43	0.01
14.50	0.01	1	676.43	0.01
15.00	0.01	1	676.43	0.01
15.50	0.01	1	676.42	0.01
16.00	0.01	1	676.42	0.01
16.50	0.01	1	676.42	0.01
17.00	0.01	1	676.42	0.01
17.50	0.01	1	676.41	0.01
18.00	0.01	1	676.41	0.01
18.50	0.01	1	676.41	0.01
19.00	0.00	1	676.41	0.00
19.50	0.00	0	676.41	0.00
20.00	0.00	0	676.41	0.00

Stage-Discharge for Reach 3R: S. 8" PVC

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)	Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
676.38	0.00	0.00	676.89	3.68	1.05
676.39	0.37	0.00	676.90	3.68	1.08
676.40	0.60	0.00	676.91	3.69	1.10
676.41	0.78	0.00	676.92	3.69	1.12
676.42	0.94	0.01	676.93	3.69	1.14
676.43	1.08	0.01	676.94	3.69	1.15
676.44	1.21	0.02	676.95	3.68	1.17
676.45	1.34	0.03	676.96	3.67	1.18
676.46	1.46	0.03	676.97	3.66	1.19
676.47	1.57	0.04	676.98	3.64	1.20
676.48	1.67	0.05	676.99	3.62	1.21
676.49	1.77	0.07	677.00	3.59	1.21
676.50	1.87	0.08	677.01	3.56	1.21
676.51	1.96	0.09	677.02	3.51	1.21
676.52	2.05	0.11	677.03	3.46	1.20
676.53	2.13	0.13	677.04	3.38	1.18
676.54	2.22	0.14	677.05	3.17	1.11
676.55	2.29	0.16			
676.56	2.37	0.18			
676.57	2.44	0.20			
676.58	2.51	0.22			
676.59	2.58	0.24			
676.60	2.65	0.27			
676.61	2.71	0.29			
676.62	2.77	0.31			
676.63	2.83	0.34			
676.64	2.88	0.36			
676.65	2.94	0.39			
676.66	2.99	0.42			
676.67	3.04	0.44			
676.68	3.09	0.47			
676.69	3.14	0.50			
676.70	3.18	0.53			
676.71	3.22	0.56			
676.72	3.26	0.58			
676.73	3.30	0.61			
676.74	3.34	0.64			
676.75	3.38	0.67			
676.76	3.41	0.70			
676.77	3.44	0.73			
676.78	3.47	0.76			
676.79	3.50	0.79			
676.80	3.53	0.82			
676.81	3.55	0.85			
676.82	3.57	0.87			
676.83	3.59	0.90			
676.84	3.61	0.93			
676.85	3.63	0.95			
676.86	3.64	0.98			
676.87	3.66	1.01			
676.88	3.67	1.03			

Stage-Area-Storage for Reach 3R: S. 8" PVC

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
676.38	0.0	0	676.89	0.3	25
676.39	0.0	0	676.90	0.3	25
676.40	0.0	0	676.91	0.3	26
676.41	0.0	0	676.92	0.3	26
676.42	0.0	1	676.93	0.3	27
676.43	0.0	1	676.94	0.3	27
676.44	0.0	1	676.95	0.3	28
676.45	0.0	2	676.96	0.3	28
676.46	0.0	2	676.97	0.3	28
676.47	0.0	2	676.98	0.3	29
676.48	0.0	3	676.99	0.3	29
676.49	0.0	3	677.00	0.3	29
676.50	0.0	4	677.01	0.3	30
676.51	0.0	4	677.02	0.3	30
676.52	0.1	5	677.03	0.3	30
676.53	0.1	5	677.04	0.3	30
676.54	0.1	6	677.05	0.3	30
676.55	0.1	6			
676.56	0.1	7			
676.57	0.1	7			
676.58	0.1	8			
676.59	0.1	8			
676.60	0.1	9			
676.61	0.1	9			
676.62	0.1	10			
676.63	0.1	10			
676.64	0.1	11			
676.65	0.1	12			
676.66	0.1	12			
676.67	0.1	13			
676.68	0.2	13			
676.69	0.2	14			
676.70	0.2	14			
676.71	0.2	15			
676.72	0.2	16			
676.73	0.2	16			
676.74	0.2	17			
676.75	0.2	17			
676.76	0.2	18			
676.77	0.2	18			
676.78	0.2	19			
676.79	0.2	20			
676.80	0.2	20			
676.81	0.2	21			
676.82	0.2	21			
676.83	0.3	22			
676.84	0.3	22			
676.85	0.3	23			
676.86	0.3	23			
676.87	0.3	24			
676.88	0.3	24			

Summary for Reach 4R: W. 6" PVC

[52] Hint: Inlet/Outlet conditions not evaluated

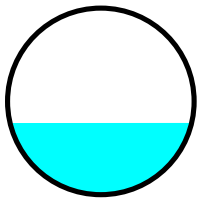
[79] Warning: Submerged Pond 7P Primary device # 1 INLET by 0.17'

Inflow Area = 0.326 ac, 63.36% Impervious, Inflow Depth > 4.36" for 100-Year event
Inflow = 0.84 cfs @ 12.31 hrs, Volume= 0.119 af
Outflow = 0.84 cfs @ 12.32 hrs, Volume= 0.119 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 12.01 fps, Min. Travel Time= 0.1 min
Avg. Velocity= 5.41 fps, Avg. Travel Time= 0.2 min

Peak Storage= 5 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 0.50' Flow Area= 0.2 sf, Capacity= 2.67 cfs

6.0" Round Pipe
n= 0.010
Length= 77.0' Slope= 0.1335 '/
Inlet Invert= 668.80', Outlet Invert= 658.52'



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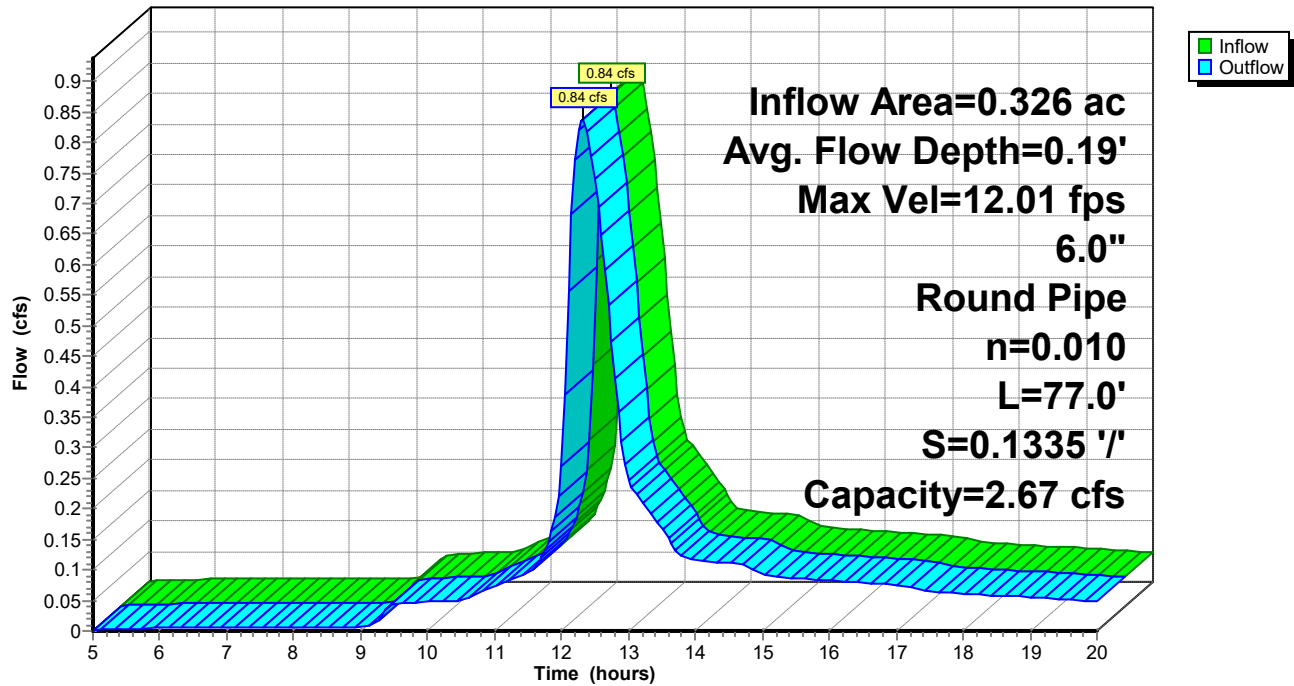
MSE 24-hr 4 100-Year Rainfall=7.31"

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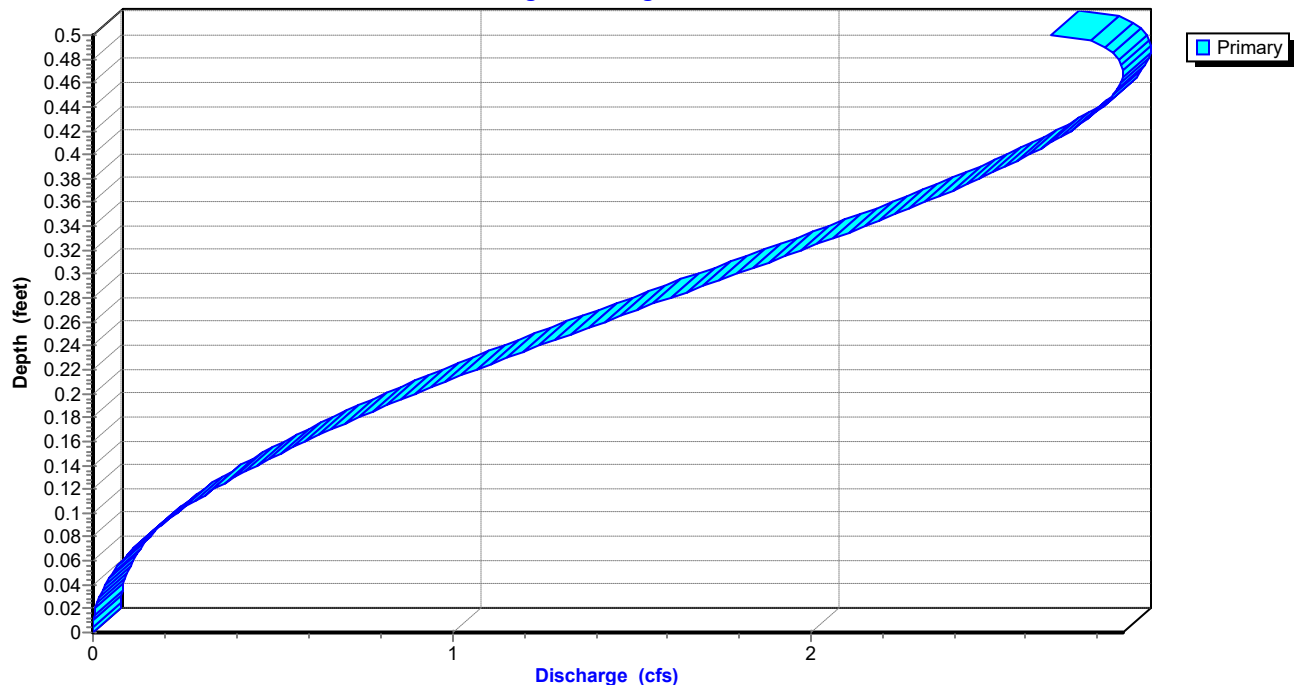
Reach 4R: W. 6" PVC

Hydrograph

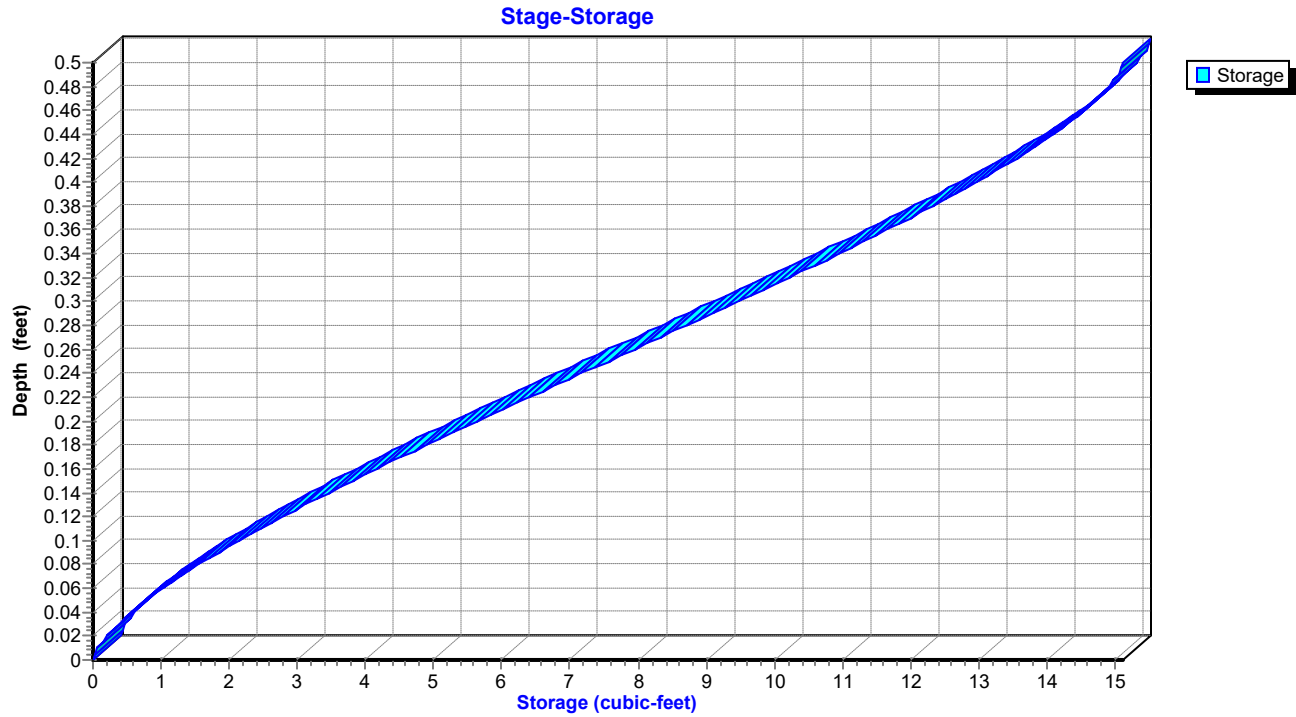


Reach 4R: W. 6" PVC

Stage-Discharge



Reach 4R: W. 6" PVC



Hydrograph for Reach 4R: W. 6" PVC

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
5.00	0.00	0	668.80	0.00
5.50	0.00	0	668.81	0.00
6.00	0.00	0	668.82	0.00
6.50	0.00	0	668.82	0.00
7.00	0.01	0	668.82	0.01
7.50	0.01	0	668.82	0.01
8.00	0.01	0	668.82	0.01
8.50	0.01	0	668.82	0.01
9.00	0.01	0	668.82	0.01
9.50	0.04	1	668.85	0.05
10.00	0.05	1	668.85	0.05
10.50	0.05	1	668.85	0.05
11.00	0.07	1	668.86	0.07
11.50	0.09	1	668.86	0.09
12.00	0.27	2	668.91	0.27
12.50	0.74	5	668.98	0.74
13.00	0.25	2	668.90	0.25
13.50	0.17	2	668.89	0.17
14.00	0.12	1	668.87	0.12
14.50	0.11	1	668.87	0.11
15.00	0.09	1	668.86	0.09
15.50	0.09	1	668.86	0.09
16.00	0.08	1	668.86	0.08
16.50	0.08	1	668.86	0.08
17.00	0.08	1	668.86	0.08
17.50	0.06	1	668.85	0.06
18.00	0.06	1	668.85	0.06
18.50	0.06	1	668.85	0.06
19.00	0.06	1	668.85	0.06
19.50	0.05	1	668.85	0.05
20.00	0.05	1	668.85	0.05

Stage-Discharge for Reach 4R: W. 6" PVC

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
668.80	0.00	0.00
668.81	1.91	0.00
668.82	3.01	0.01
668.83	3.93	0.02
668.84	4.72	0.03
668.85	5.45	0.06
668.86	6.11	0.08
668.87	6.72	0.11
668.88	7.30	0.15
668.89	7.84	0.19
668.90	8.35	0.23
668.91	8.83	0.28
668.92	9.29	0.34
668.93	9.73	0.39
668.94	10.14	0.46
668.95	10.54	0.52
668.96	10.91	0.59
668.97	11.27	0.66
668.98	11.61	0.74
668.99	11.94	0.82
669.00	12.25	0.90
669.01	12.54	0.98
669.02	12.82	1.07
669.03	13.09	1.15
669.04	13.34	1.24
669.05	13.57	1.33
669.06	13.80	1.42
669.07	14.01	1.52
669.08	14.20	1.61
669.09	14.39	1.70
669.10	14.56	1.79
669.11	14.71	1.88
669.12	14.86	1.97
669.13	14.98	2.06
669.14	15.10	2.15
669.15	15.20	2.23
669.16	15.29	2.31
669.17	15.36	2.39
669.18	15.41	2.47
669.19	15.45	2.54
669.20	15.47	2.61
669.21	15.47	2.67
669.22	15.46	2.72
669.23	15.42	2.77
669.24	15.35	2.81
669.25	15.26	2.84
669.26	15.14	2.86
669.27	14.97	2.87
669.28	14.74	2.86
669.29	14.41	2.82
669.30	13.57	2.67

Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 100-Year Rainfall=7.31"*

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Stage-Area-Storage for Reach 4R: W. 6" PVC

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
668.80	0.0	0
668.81	0.0	0
668.82	0.0	0
668.83	0.0	0
668.84	0.0	1
668.85	0.0	1
668.86	0.0	1
668.87	0.0	1
668.88	0.0	2
668.89	0.0	2
668.90	0.0	2
668.91	0.0	2
668.92	0.0	3
668.93	0.0	3
668.94	0.0	3
668.95	0.0	4
668.96	0.1	4
668.97	0.1	5
668.98	0.1	5
668.99	0.1	5
669.00	0.1	6
669.01	0.1	6
669.02	0.1	6
669.03	0.1	7
669.04	0.1	7
669.05	0.1	8
669.06	0.1	8
669.07	0.1	8
669.08	0.1	9
669.09	0.1	9
669.10	0.1	9
669.11	0.1	10
669.12	0.1	10
669.13	0.1	11
669.14	0.1	11
669.15	0.1	11
669.16	0.2	12
669.17	0.2	12
669.18	0.2	12
669.19	0.2	13
669.20	0.2	13
669.21	0.2	13
669.22	0.2	14
669.23	0.2	14
669.24	0.2	14
669.25	0.2	14
669.26	0.2	15
669.27	0.2	15
669.28	0.2	15
669.29	0.2	15
669.30	0.2	15

Summary for Pond 3P: E biofilter LINED

[82] Warning: Early inflow requires earlier time span
 [42] Hint: Gap in defined storage above volume #4 at 681.34'
 [85] Warning: Oscillations may require smaller dt or Finer Routing (severity=12)

Inflow Area = 0.043 ac, 57.33% Impervious, Inflow Depth > 5.00" for 100-Year event
 Inflow = 0.29 cfs @ 12.15 hrs, Volume= 0.018 af
 Outflow = 0.18 cfs @ 12.26 hrs, Volume= 0.017 af, Atten= 40%, Lag= 6.5 min
 Primary = 0.18 cfs @ 12.26 hrs, Volume= 0.017 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 681.13' @ 12.26 hrs Surf.Area= 1,376 sf Storage= 272 cf

Plug-Flow detention time= 90.6 min calculated for 0.017 af (93% of inflow)
 Center-of-Mass det. time= 65.5 min (816.1 - 750.7)

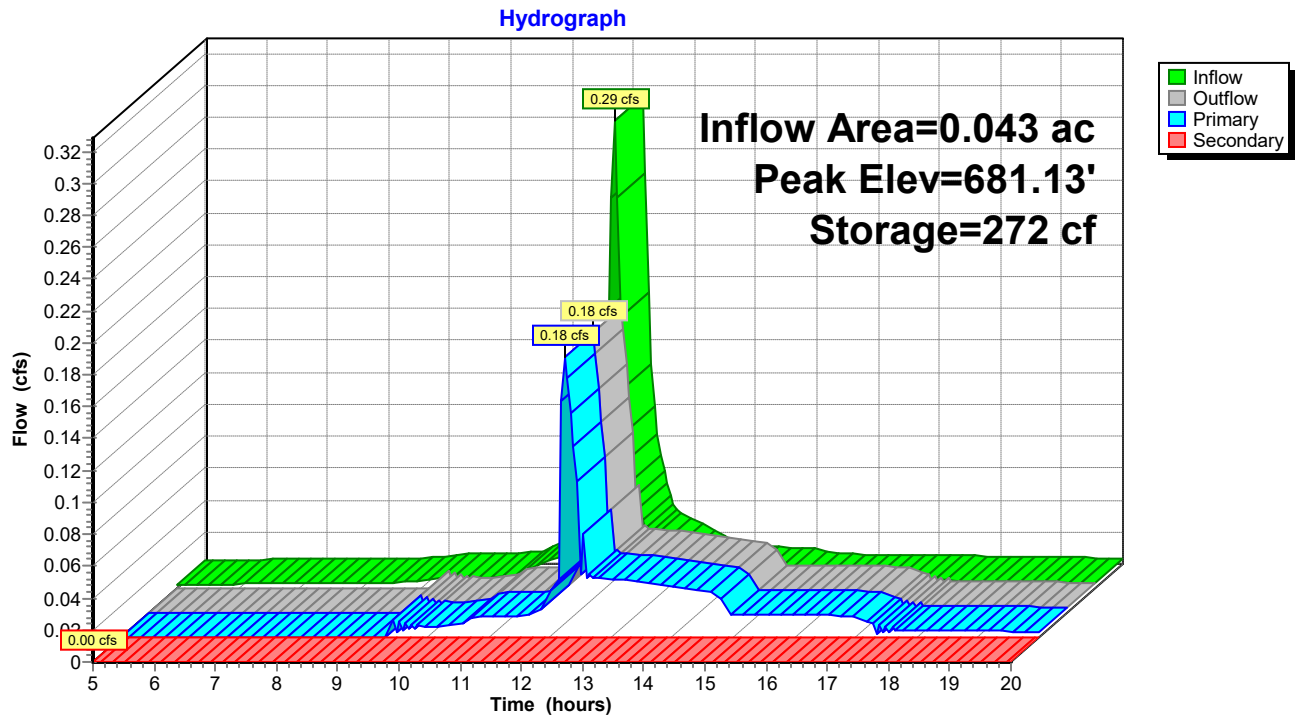
Volume	Invert	Avail.Storage	Storage Description
#1	678.00'	54 cf	10.50'W x 15.50'L x 1.00'H sand invert 163 cf Overall x 33.0% Voids
#2	679.00'	66 cf	10.50'W x 15.50'L x 1.50'H media 244 cf Overall x 27.0% Voids
#3	680.50'	128 cf	10.50'W x 15.50'L x 0.60'H top media Z=3.0
#4	681.10'	195 cf	39.50'W x 19.50'L x 0.24'H NDS drain Z=3.0
#5	681.43'	8 cf	40.00'W x 20.00'L x 0.01'H weir overflow Z=3.0
		451 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Secondary	681.34'	6.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	681.10'	0.5" x 2.0" Horiz. NDS drain X 50.00 C= 0.600 in 12.0" x 12.0" Grate (35% open area) Limited to weir flow at low heads
#3	Primary	678.00'	3.600 in/hr underdrain over Horizontal area above 678.00' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 163 sf Phase-In= 0.50'

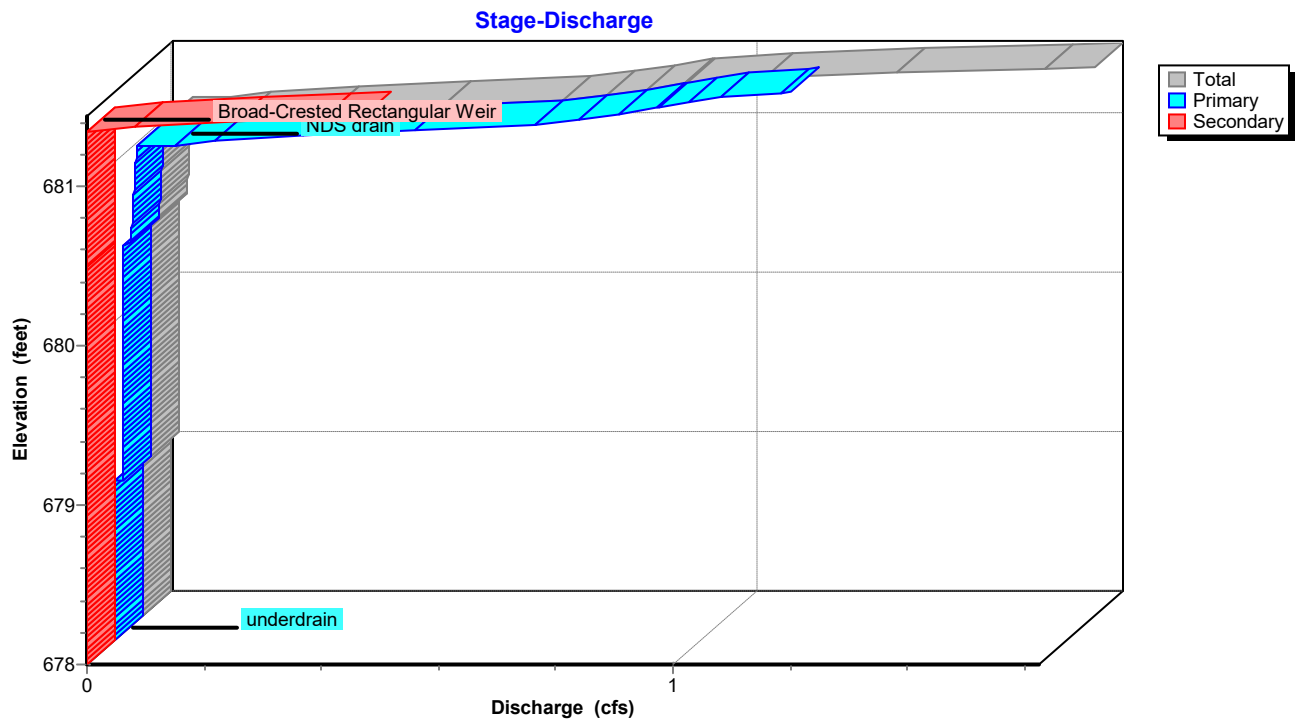
Primary OutFlow Max=0.17 cfs @ 12.26 hrs HW=681.13' (Free Discharge)
 ↑ **2=NDS drain** (Weir Controls 0.07 cfs @ 0.57 fps)
 ↑ **3=underdrain** (Controls 0.10 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=678.00' (Free Discharge)
 ↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

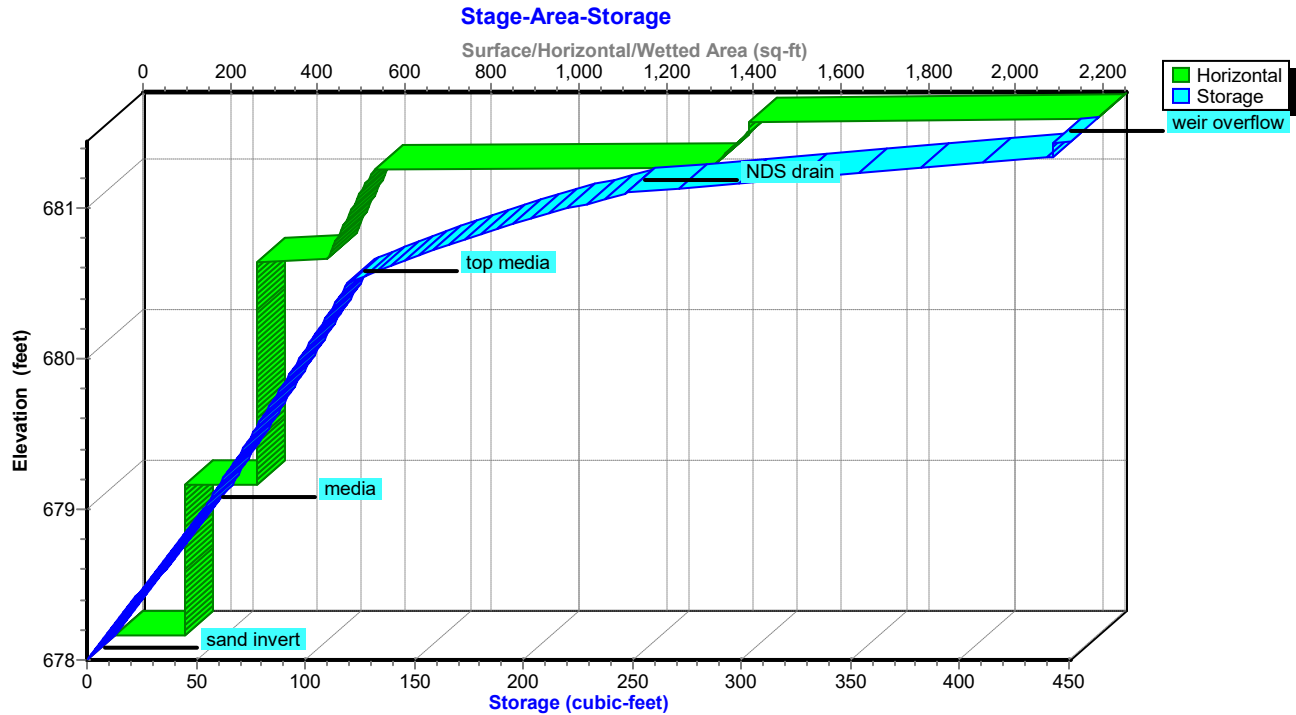
Pond 3P: E biofilter LINED



Pond 3P: E biofilter LINED



Pond 3P: E biofilter LINED



Hydrograph for Pond 3P: E biofilter LINED

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.00	0	678.00	0.00	0.00	0.00
5.50	0.00	4	678.08	0.00	0.00	0.00
6.00	0.00	9	678.17	0.00	0.00	0.00
6.50	0.00	14	678.26	0.00	0.00	0.00
7.00	0.00	20	678.37	0.00	0.00	0.00
7.50	0.00	25	678.47	0.00	0.00	0.00
8.00	0.00	32	678.59	0.00	0.00	0.00
8.50	0.00	38	678.72	0.00	0.00	0.00
9.00	0.00	45	678.85	0.00	0.00	0.00
9.50	0.01	54	679.00	0.00	0.00	0.00
10.00	0.01	54	679.00	0.01	0.01	0.00
10.50	0.01	54	679.00	0.01	0.01	0.00
11.00	0.02	54	679.01	0.01	0.01	0.00
11.50	0.02	66	679.27	0.01	0.01	0.00
12.00	0.13	136	680.59	0.03	0.03	0.00
12.50	0.06	247	681.10	0.04	0.04	0.00
13.00	0.03	239	681.07	0.04	0.04	0.00
13.50	0.02	215	680.97	0.04	0.04	0.00
14.00	0.01	177	680.81	0.03	0.03	0.00
14.50	0.01	141	680.62	0.03	0.03	0.00
15.00	0.01	116	680.42	0.01	0.01	0.00
15.50	0.01	104	680.13	0.01	0.01	0.00
16.00	0.01	89	679.81	0.01	0.01	0.00
16.50	0.01	75	679.47	0.01	0.01	0.00
17.00	0.01	60	679.14	0.01	0.01	0.00
17.50	0.01	54	679.00	0.01	0.01	0.00
18.00	0.00	54	679.00	0.00	0.00	0.00
18.50	0.00	54	679.00	0.00	0.00	0.00
19.00	0.00	54	679.00	0.00	0.00	0.00
19.50	0.00	54	679.00	0.00	0.00	0.00
20.00	0.00	54	679.00	0.00	0.00	0.00

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Stage-Discharge for Pond 3P: E biofilter LINED

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
678.00	0.00	0.00	0.00	680.55	0.03	0.03	0.00
678.05	0.00	0.00	0.00	680.60	0.03	0.03	0.00
678.10	0.00	0.00	0.00	680.65	0.03	0.03	0.00
678.15	0.00	0.00	0.00	680.70	0.03	0.03	0.00
678.20	0.00	0.00	0.00	680.75	0.03	0.03	0.00
678.25	0.00	0.00	0.00	680.80	0.03	0.03	0.00
678.30	0.00	0.00	0.00	680.85	0.03	0.03	0.00
678.35	0.00	0.00	0.00	680.90	0.03	0.03	0.00
678.40	0.00	0.00	0.00	680.95	0.03	0.03	0.00
678.45	0.00	0.00	0.00	681.00	0.04	0.04	0.00
678.50	0.00	0.00	0.00	681.05	0.04	0.04	0.00
678.55	0.00	0.00	0.00	681.10	0.10	0.10	0.00
678.60	0.00	0.00	0.00	681.15	0.25	0.25	0.00
678.65	0.00	0.00	0.00	681.20	0.52	0.52	0.00
678.70	0.00	0.00	0.00	681.25	0.75	0.75	0.00
678.75	0.00	0.00	0.00	681.30	0.86	0.86	0.00
678.80	0.00	0.00	0.00	681.35	0.96	0.95	0.01
678.85	0.00	0.00	0.00	681.40	1.24	1.03	0.22
678.90	0.00	0.00	0.00				
678.95	0.00	0.00	0.00				
679.00	0.01	0.01	0.00				
679.05	0.01	0.01	0.00				
679.10	0.01	0.01	0.00				
679.15	0.01	0.01	0.00				
679.20	0.01	0.01	0.00				
679.25	0.01	0.01	0.00				
679.30	0.01	0.01	0.00				
679.35	0.01	0.01	0.00				
679.40	0.01	0.01	0.00				
679.45	0.01	0.01	0.00				
679.50	0.01	0.01	0.00				
679.55	0.01	0.01	0.00				
679.60	0.01	0.01	0.00				
679.65	0.01	0.01	0.00				
679.70	0.01	0.01	0.00				
679.75	0.01	0.01	0.00				
679.80	0.01	0.01	0.00				
679.85	0.01	0.01	0.00				
679.90	0.01	0.01	0.00				
679.95	0.01	0.01	0.00				
680.00	0.01	0.01	0.00				
680.05	0.01	0.01	0.00				
680.10	0.01	0.01	0.00				
680.15	0.01	0.01	0.00				
680.20	0.01	0.01	0.00				
680.25	0.01	0.01	0.00				
680.30	0.01	0.01	0.00				
680.35	0.01	0.01	0.00				
680.40	0.01	0.01	0.00				
680.45	0.01	0.01	0.00				
680.50	0.03	0.03	0.00				

Stage-Area-Storage for Pond 3P: E biofilter LINED

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
678.00	163	0	680.55	496	128
678.05	163	3	680.60	504	137
678.10	163	5	680.65	512	146
678.15	163	8	680.70	521	155
678.20	163	11	680.75	530	165
678.25	163	13	680.80	538	176
678.30	163	16	680.85	547	187
678.35	163	19	680.90	556	198
678.40	163	21	680.95	566	210
678.45	163	24	681.00	575	222
678.50	163	27	681.05	585	235
678.55	163	30	681.10	1,365	248
678.60	163	32	681.15	1,383	287
678.65	163	35	681.20	1,401	327
678.70	163	38	681.25	1,419	368
678.75	163	40	681.30	1,437	409
678.80	163	43	681.35	1,452	443
678.85	163	46	681.40	1,452	443
678.90	163	48			
678.95	163	51			
679.00	326	54			
679.05	326	56			
679.10	326	58			
679.15	326	60			
679.20	326	62			
679.25	326	65			
679.30	326	67			
679.35	326	69			
679.40	326	71			
679.45	326	73			
679.50	326	76			
679.55	326	78			
679.60	326	80			
679.65	326	82			
679.70	326	84			
679.75	326	87			
679.80	326	89			
679.85	326	91			
679.90	326	93			
679.95	326	95			
680.00	326	98			
680.05	326	100			
680.10	326	102			
680.15	326	104			
680.20	326	106			
680.25	326	109			
680.30	326	111			
680.35	326	113			
680.40	326	115			
680.45	326	117			
680.50	488	120			

Summary for Pond 5P: W biofillter UNLINED

[82] Warning: Early inflow requires earlier time span
 [93] Warning: Storage range exceeded by 0.10'
 [88] Warning: Qout>Qin may require smaller dt or Finer Routing
 [85] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.218 ac, 64.67% Impervious, Inflow Depth > 5.28" for 100-Year event
 Inflow = 1.50 cfs @ 12.15 hrs, Volume= 0.096 af
 Outflow = 1.73 cfs @ 12.10 hrs, Volume= 0.085 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 12.10 hrs, Volume= 0.001 af
 Primary = 0.87 cfs @ 12.10 hrs, Volume= 0.074 af
 Secondary = 0.87 cfs @ 12.11 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 676.26' @ 12.10 hrs Surf.Area= 3,142 sf Storage= 1,063 cf

Plug-Flow detention time= 110.0 min calculated for 0.085 af (88% of inflow)
 Center-of-Mass det. time= 74.2 min (821.8 - 747.6)

Volume	Invert	Avail.Storage	Storage Description
#1	671.75'	107 cf	8.30'W x 39.20'L x 1.00'H sand invert 325 cf Overall x 33.0% Voids
#2	672.75'	176 cf	8.30'W x 39.20'L x 2.00'H media 651 cf Overall x 27.0% Voids
#3	674.75'	728 cf	8.30'W x 39.20'L x 1.35'H top media Z=3.0
#4	676.10'	43 cf	18.00'W x 47.00'L x 0.05'H NDS drain Z=3.0
#5	676.15'	8 cf	18.00'W x 47.00'L x 0.01'H weir overflow Z=3.0
		1,063 cf	Total Available Storage

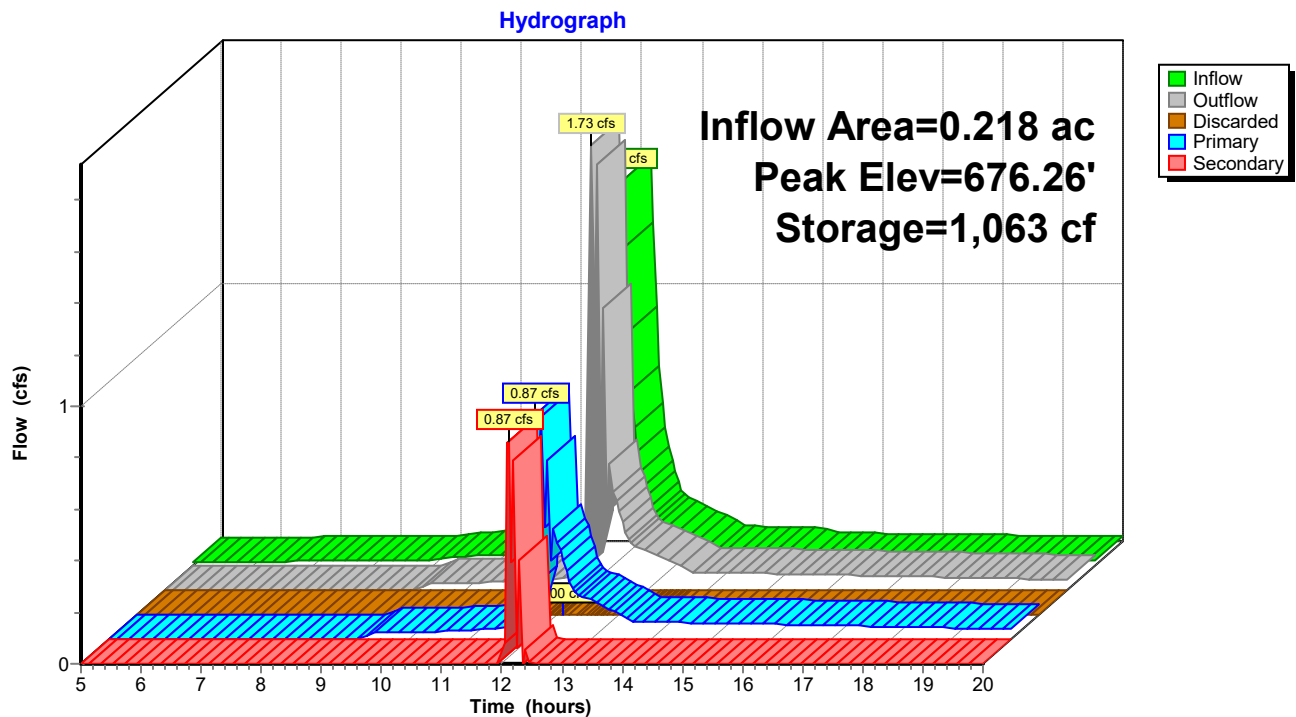
Device	Routing	Invert	Outlet Devices
#1	Secondary	676.15'	10.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Primary	676.10'	0.5" x 2.0" Horiz. NDS drain X 50.00 C= 0.600 in 12.0" x 12.0" Grate (35% open area) Limited to weir flow at low heads
#3	Primary	672.75'	3.600 in/hr underdrain over Horizontal area above 672.75' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 651 sf Phase-In= 0.50'
#4	Discarded	671.75'	0.030 in/hr Exfiltration over Horizontal area above 671.75' Conductivity to Groundwater Elevation = 650.00' Excluded Horizontal area = 325 sf Phase-In= 0.50'

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=676.26' (Free Discharge)
↳ **4=Exfiltration** (Controls 0.00 cfs)

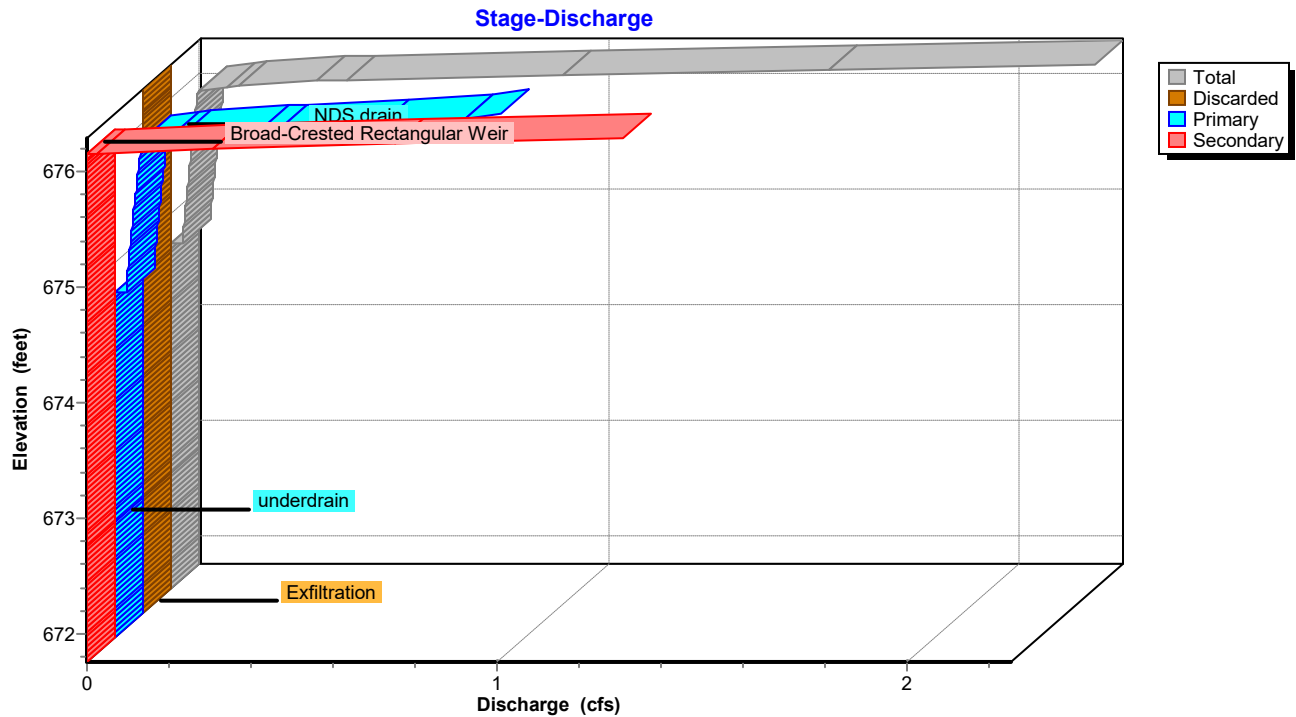
Primary OutFlow Max=0.87 cfs @ 12.10 hrs HW=676.26' (Free Discharge)
↳ **2=NDS drain** (Orifice Controls 0.66 cfs @ 1.91 fps)
↳ **3=underdrain** (Controls 0.21 cfs)

Secondary OutFlow Max=0.78 cfs @ 12.11 hrs HW=676.25' (Free Discharge)
↳ **1=Broad-Crested Rectangular Weir** (Weir Controls 0.78 cfs @ 0.78 fps)

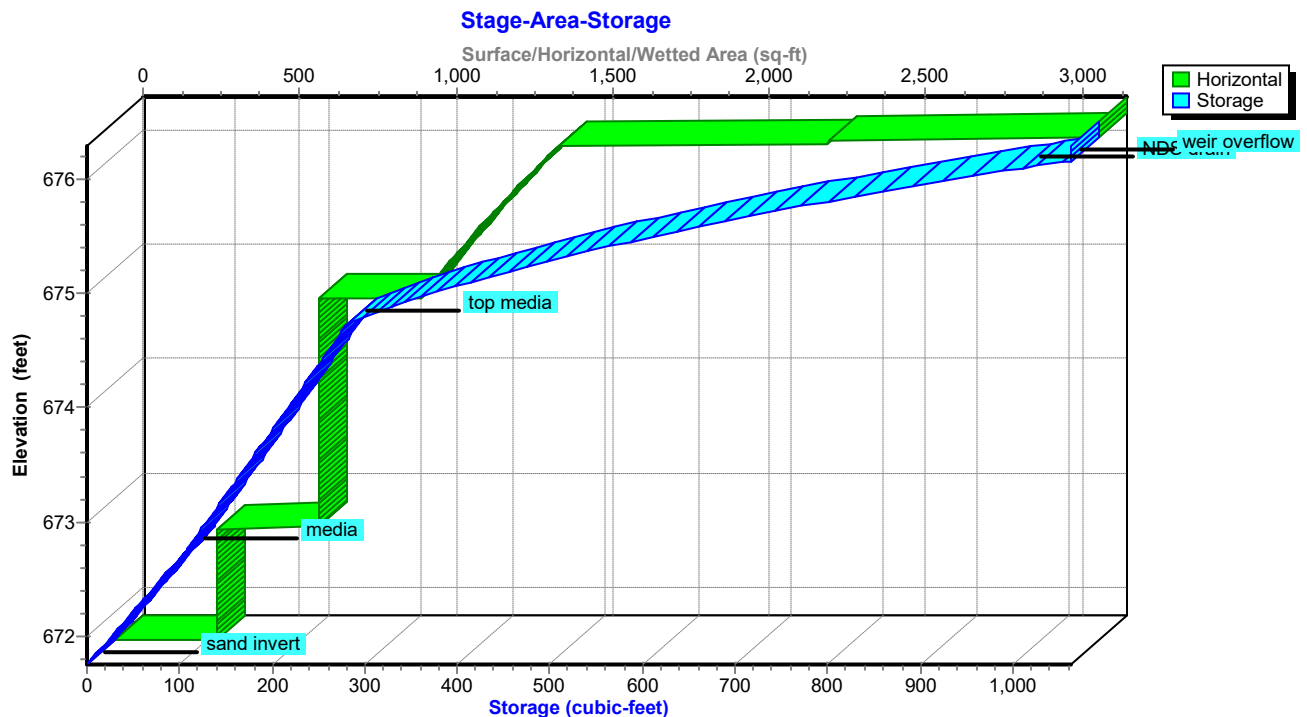
Pond 5P: W biofillter UNLINED



Pond 5P: W biofilter UNLINED



Pond 5P: W biofilter UNLINED



Chiro HCAD Proposed Chiro only AMENDED*MSE 24-hr 4 100-Year Rainfall=7.31"*

Prepared by Paragon Associates

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Hydrograph for Pond 5P: W biofilter UNLINED

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
5.00	0.01	1	671.76	0.00	0.00	0.00	0.00
5.50	0.01	25	671.98	0.00	0.00	0.00	0.00
6.00	0.02	51	672.22	0.00	0.00	0.00	0.00
6.50	0.02	79	672.49	0.00	0.00	0.00	0.00
7.00	0.02	110	672.78	0.00	0.00	0.00	0.00
7.50	0.02	143	673.16	0.00	0.00	0.00	0.00
8.00	0.02	178	673.56	0.00	0.00	0.00	0.00
8.50	0.02	216	673.98	0.00	0.00	0.00	0.00
9.00	0.02	255	674.43	0.00	0.00	0.00	0.00
9.50	0.04	291	674.78	0.03	0.00	0.03	0.00
10.00	0.04	309	674.83	0.03	0.00	0.03	0.00
10.50	0.04	328	674.88	0.03	0.00	0.03	0.00
11.00	0.09	389	675.04	0.04	0.00	0.03	0.00
11.50	0.13	519	675.32	0.04	0.00	0.04	0.00
12.00	0.71	967	676.04	0.07	0.00	0.07	0.00
12.50	0.31	1,053	676.15	0.35	0.00	0.35	0.00
13.00	0.14	1,019	676.11	0.15	0.00	0.15	0.00
13.50	0.09	1,000	676.09	0.10	0.00	0.10	0.00
14.00	0.06	983	676.06	0.07	0.00	0.07	0.00
14.50	0.05	964	676.04	0.07	0.00	0.06	0.00
15.00	0.05	942	676.01	0.06	0.00	0.06	0.00
15.50	0.03	894	675.94	0.06	0.00	0.06	0.00
16.00	0.03	840	675.87	0.06	0.00	0.06	0.00
16.50	0.03	788	675.79	0.06	0.00	0.06	0.00
17.00	0.03	737	675.71	0.05	0.00	0.05	0.00
17.50	0.03	689	675.63	0.05	0.00	0.05	0.00
18.00	0.02	642	675.55	0.05	0.00	0.05	0.00
18.50	0.02	597	675.47	0.05	0.00	0.05	0.00
19.00	0.02	554	675.39	0.05	0.00	0.04	0.00
19.50	0.02	512	675.31	0.04	0.00	0.04	0.00
20.00	0.02	472	675.23	0.04	0.00	0.04	0.00

Stage-Discharge for Pond 5P: W biofilter UNLINED

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)
671.75	0.00	0.00	0.00	0.00
671.85	0.00	0.00	0.00	0.00
671.95	0.00	0.00	0.00	0.00
672.05	0.00	0.00	0.00	0.00
672.15	0.00	0.00	0.00	0.00
672.25	0.00	0.00	0.00	0.00
672.35	0.00	0.00	0.00	0.00
672.45	0.00	0.00	0.00	0.00
672.55	0.00	0.00	0.00	0.00
672.65	0.00	0.00	0.00	0.00
672.75	0.00	0.00	0.00	0.00
672.85	0.00	0.00	0.00	0.00
672.95	0.00	0.00	0.00	0.00
673.05	0.00	0.00	0.00	0.00
673.15	0.00	0.00	0.00	0.00
673.25	0.00	0.00	0.00	0.00
673.35	0.00	0.00	0.00	0.00
673.45	0.00	0.00	0.00	0.00
673.55	0.00	0.00	0.00	0.00
673.65	0.00	0.00	0.00	0.00
673.75	0.00	0.00	0.00	0.00
673.85	0.00	0.00	0.00	0.00
673.95	0.00	0.00	0.00	0.00
674.05	0.00	0.00	0.00	0.00
674.15	0.00	0.00	0.00	0.00
674.25	0.00	0.00	0.00	0.00
674.35	0.00	0.00	0.00	0.00
674.45	0.00	0.00	0.00	0.00
674.55	0.00	0.00	0.00	0.00
674.65	0.00	0.00	0.00	0.00
674.75	0.03	0.00	0.03	0.00
674.85	0.03	0.00	0.03	0.00
674.95	0.03	0.00	0.03	0.00
675.05	0.04	0.00	0.03	0.00
675.15	0.04	0.00	0.04	0.00
675.25	0.04	0.00	0.04	0.00
675.35	0.04	0.00	0.04	0.00
675.45	0.05	0.00	0.05	0.00
675.55	0.05	0.00	0.05	0.00
675.65	0.05	0.00	0.05	0.00
675.75	0.06	0.00	0.06	0.00
675.85	0.06	0.00	0.06	0.00
675.95	0.06	0.00	0.06	0.00
676.05	0.07	0.00	0.07	0.00
676.15	0.36	0.00	0.36	0.00
676.25	1.63	0.00	0.86	0.77

Stage-Area-Storage for Pond 5P: W biofillter UNLINED

Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Horizontal (sq-ft)	Storage (cubic-feet)
671.75	325	0	674.30	651	244
671.80	325	5	674.35	651	248
671.85	325	11	674.40	651	252
671.90	325	16	674.45	651	257
671.95	325	21	674.50	651	261
672.00	325	27	674.55	651	265
672.05	325	32	674.60	651	270
672.10	325	38	674.65	651	274
672.15	325	43	674.70	651	279
672.20	325	48	674.75	976	283
672.25	325	54	674.80	990	300
672.30	325	59	674.85	1,005	317
672.35	325	64	674.90	1,020	335
672.40	325	70	674.95	1,035	354
672.45	325	75	675.00	1,050	373
672.50	325	81	675.05	1,065	394
672.55	325	86	675.10	1,080	415
672.60	325	91	675.15	1,096	437
672.65	325	97	675.20	1,112	459
672.70	325	102	675.25	1,128	483
672.75	651	107	675.30	1,144	507
672.80	651	112	675.35	1,160	532
672.85	651	116	675.40	1,177	558
672.90	651	121	675.45	1,193	585
672.95	651	125	675.50	1,210	612
673.00	651	129	675.55	1,227	641
673.05	651	134	675.60	1,244	670
673.10	651	138	675.65	1,262	700
673.15	651	143	675.70	1,279	731
673.20	651	147	675.75	1,297	763
673.25	651	151	675.80	1,315	796
673.30	651	156	675.85	1,333	829
673.35	651	160	675.90	1,351	864
673.40	651	164	675.95	1,370	899
673.45	651	169	676.00	1,389	936
673.50	651	173	676.05	1,407	973
673.55	651	178	676.10	2,272	1,012
673.60	651	182	676.15	3,138	1,054
673.65	651	186	676.20	3,142	1,063
673.70	651	191	676.25	3,142	1,063
673.75	651	195			
673.80	651	200			
673.85	651	204			
673.90	651	208			
673.95	651	213			
674.00	651	217			
674.05	651	222			
674.10	651	226			
674.15	651	230			
674.20	651	235			
674.25	651	239			

Summary for Pond 7P: 48" UG storage

Inflow Area = 0.326 ac, 63.36% Impervious, Inflow Depth > 4.36" for 100-Year event
 Inflow = 1.34 cfs @ 12.10 hrs, Volume= 0.119 af
 Outflow = 0.84 cfs @ 12.31 hrs, Volume= 0.119 af, Atten= 38%, Lag= 12.7 min
 Primary = 0.84 cfs @ 12.31 hrs, Volume= 0.119 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 671.64' @ 12.31 hrs Surf.Area= 185 sf Storage= 462 cf

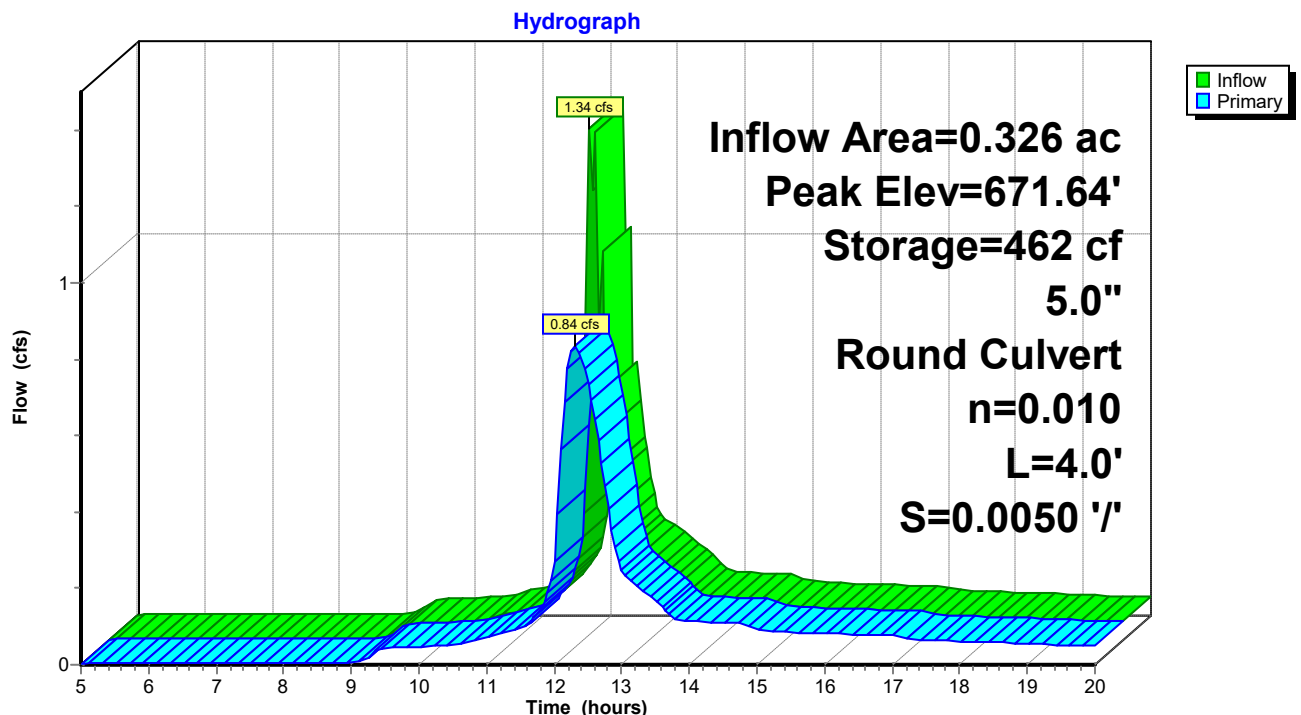
Plug-Flow detention time= 3.9 min calculated for 0.118 af (100% of inflow)
 Center-of-Mass det. time= 3.5 min (815.0 - 811.6)

Volume	Invert	Avail.Storage	Storage Description
#1	668.82'	628 cf	48.0" Round Pipe Storage L= 50.0' S= 0.0026 '/

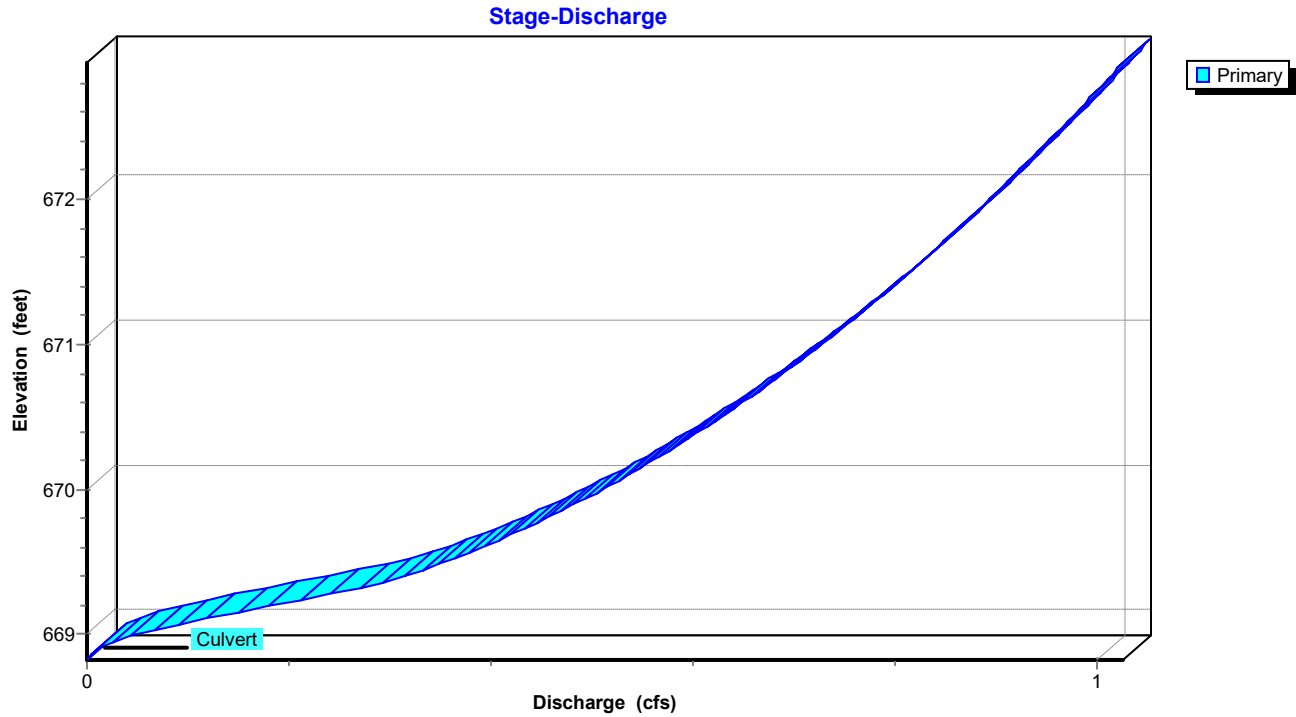
Device	Routing	Invert	Outlet Devices
#1	Primary	668.82'	5.0" Round Culvert L= 4.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 668.82' / 668.80' S= 0.0050 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.14 sf

Primary OutFlow Max=0.84 cfs @ 12.31 hrs HW=671.63' (Free Discharge)
 ←1=Culvert (Inlet Controls 0.84 cfs @ 6.13 fps)

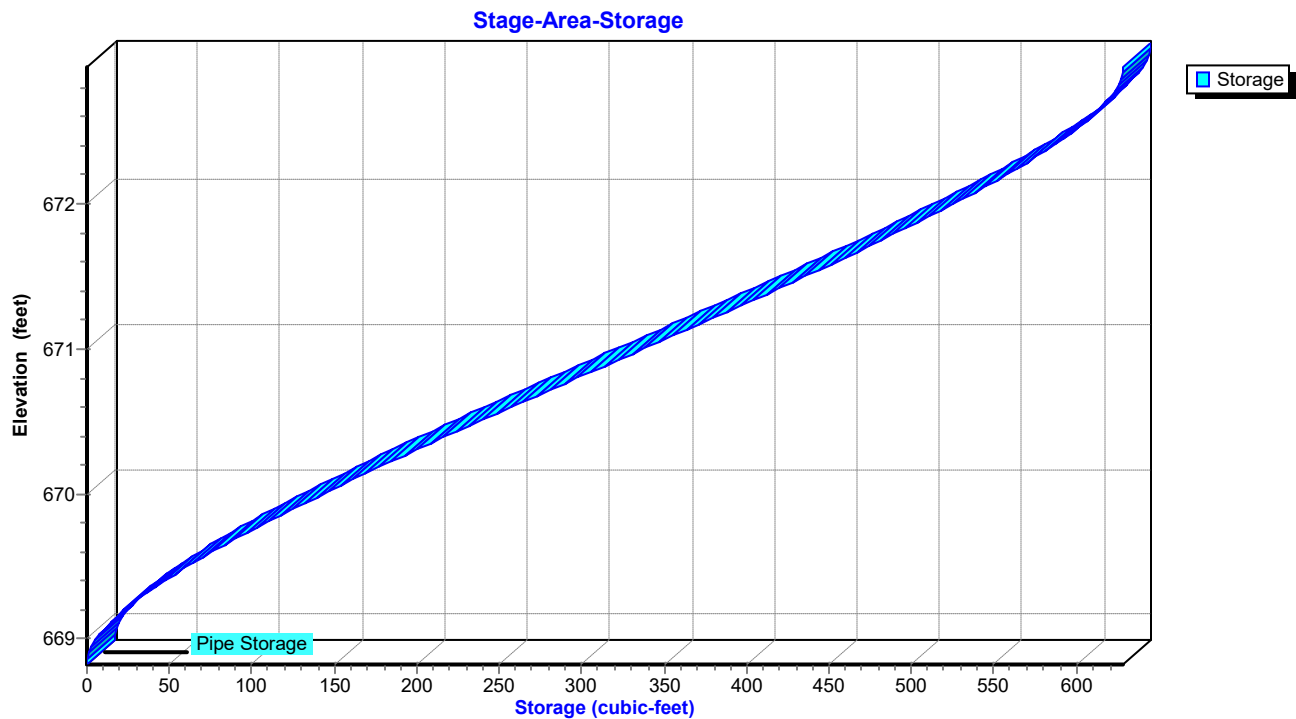
Pond 7P: 48" UG storage



Pond 7P: 48" UG storage



Pond 7P: 48" UG storage



Hydrograph for Pond 7P: 48" UG storage

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
5.00	0.00	0	668.83	0.00
5.50	0.00	0	668.86	0.00
6.00	0.00	0	668.87	0.00
6.50	0.00	0	668.87	0.00
7.00	0.01	0	668.87	0.01
7.50	0.01	0	668.87	0.01
8.00	0.01	0	668.87	0.01
8.50	0.01	0	668.88	0.01
9.00	0.01	0	668.88	0.01
9.50	0.04	4	668.99	0.04
10.00	0.05	5	668.99	0.05
10.50	0.05	5	669.00	0.05
11.00	0.07	8	669.04	0.07
11.50	0.10	11	669.07	0.09
12.00	0.33	37	669.32	0.27
12.50	0.47	347	671.05	0.74
13.00	0.23	32	669.28	0.25
13.50	0.16	21	669.18	0.17
14.00	0.12	13	669.10	0.12
14.50	0.11	13	669.10	0.11
15.00	0.09	11	669.07	0.09
15.50	0.09	10	669.06	0.09
16.00	0.08	9	669.05	0.08
16.50	0.08	9	669.05	0.08
17.00	0.08	8	669.04	0.08
17.50	0.07	7	669.02	0.06
18.00	0.06	7	669.02	0.06
18.50	0.06	6	669.01	0.06
19.00	0.05	6	669.01	0.06
19.50	0.05	5	669.00	0.05
20.00	0.05	5	668.99	0.05

Stage-Discharge for Pond 7P: 48" UG storage

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
668.82	0.00	671.37	0.79
668.87	0.00	671.42	0.80
668.92	0.02	671.47	0.81
668.97	0.04	671.52	0.82
669.02	0.06	671.57	0.83
669.07	0.09	671.62	0.83
669.12	0.13	671.67	0.84
669.17	0.16	671.72	0.85
669.22	0.20	671.77	0.86
669.27	0.24	671.82	0.87
669.32	0.27	671.87	0.87
669.37	0.30	671.92	0.88
669.42	0.32	671.97	0.89
669.47	0.34	672.02	0.90
669.52	0.36	672.07	0.90
669.57	0.38	672.12	0.91
669.62	0.40	672.17	0.92
669.67	0.42	672.22	0.93
669.72	0.43	672.27	0.93
669.77	0.45	672.32	0.94
669.82	0.46	672.37	0.95
669.87	0.48	672.42	0.95
669.92	0.49	672.47	0.96
669.97	0.50	672.52	0.97
670.02	0.52	672.57	0.98
670.07	0.53	672.62	0.98
670.12	0.54	672.67	0.99
670.17	0.55	672.72	1.00
670.22	0.57	672.77	1.00
670.27	0.58	672.82	1.01
670.32	0.59	672.87	1.02
670.37	0.60	672.92	1.02
670.42	0.61		
670.47	0.62		
670.52	0.63		
670.57	0.64		
670.62	0.65		
670.67	0.66		
670.72	0.67		
670.77	0.68		
670.82	0.69		
670.87	0.70		
670.92	0.71		
670.97	0.72		
671.02	0.73		
671.07	0.74		
671.12	0.75		
671.17	0.76		
671.22	0.77		
671.27	0.78		
671.32	0.78		

Stage-Area-Storage for Pond 7P: 48" UG storage

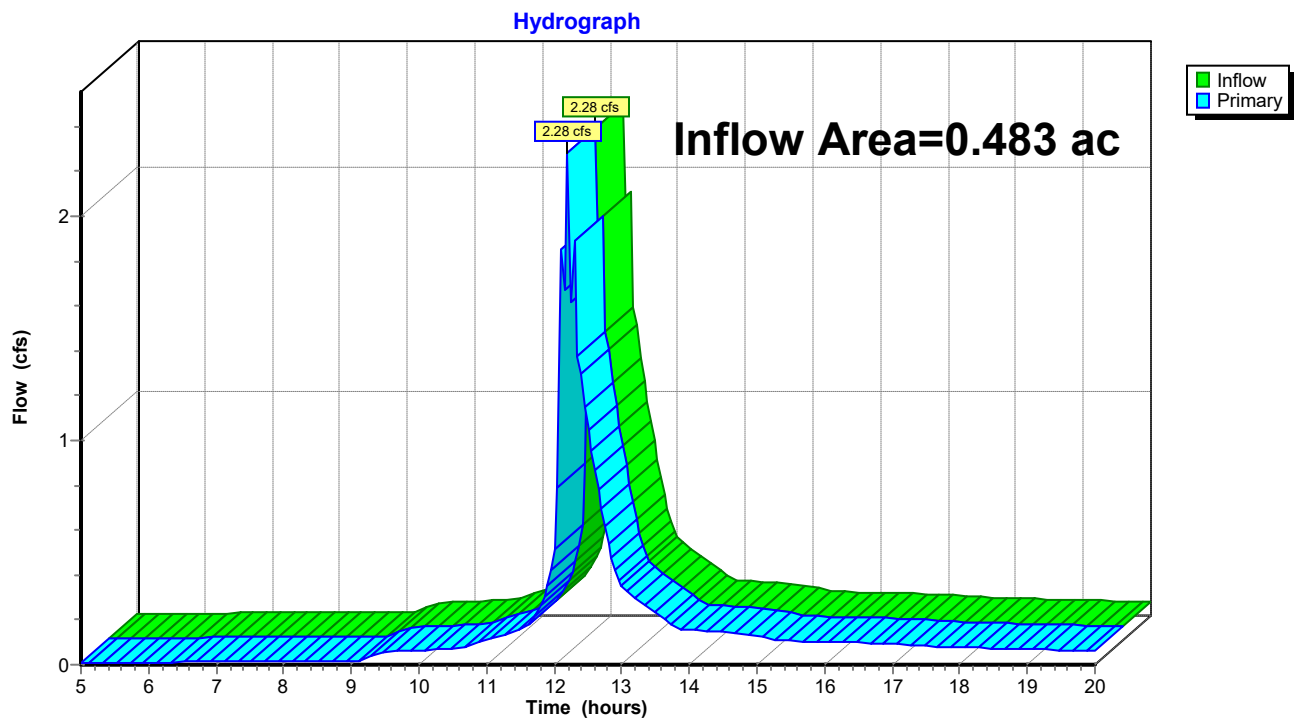
Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
668.82	0	671.37	410
668.87	0	671.42	420
668.92	1	671.47	429
668.97	4	671.52	439
669.02	7	671.57	448
669.07	11	671.62	458
669.12	15	671.67	467
669.17	20	671.72	476
669.22	25	671.77	485
669.27	31	671.82	494
669.32	37	671.87	503
669.37	43	671.92	511
669.42	50	671.97	520
669.47	57	672.02	528
669.52	64	672.07	536
669.57	72	672.12	544
669.62	79	672.17	552
669.67	87	672.22	560
669.72	95	672.27	567
669.77	103	672.32	574
669.82	112	672.37	581
669.87	120	672.42	587
669.92	129	672.47	594
669.97	138	672.52	600
670.02	147	672.57	605
670.07	156	672.62	610
670.12	165	672.67	615
670.17	174	672.72	619
670.22	184	672.77	623
670.27	193	672.82	626
670.32	203	672.87	628
670.37	212	672.92	628
670.42	222		
670.47	232		
670.52	242		
670.57	251		
670.62	261		
670.67	271		
670.72	281		
670.77	291		
670.82	301		
670.87	311		
670.92	321		
670.97	331		
671.02	341		
671.07	351		
671.12	361		
671.17	371		
671.22	381		
671.27	391		
671.32	400		

Summary for Link 2L: frontage rd

Inflow Area = 0.483 ac, 55.51% Impervious, Inflow Depth > 4.60" for 100-Year event
Inflow = 2.28 cfs @ 12.20 hrs, Volume= 0.185 af
Primary = 2.28 cfs @ 12.20 hrs, Volume= 0.185 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: frontage rd



Hydrograph for Link 2L: frontage rd

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.01	0.00	0.01	17.75	0.08	0.00	0.08
5.25	0.01	0.00	0.01	18.00	0.08	0.00	0.08
5.50	0.01	0.00	0.01	18.25	0.08	0.00	0.08
5.75	0.01	0.00	0.01	18.50	0.07	0.00	0.07
6.00	0.01	0.00	0.01	18.75	0.07	0.00	0.07
6.25	0.01	0.00	0.01	19.00	0.07	0.00	0.07
6.50	0.01	0.00	0.01	19.25	0.07	0.00	0.07
6.75	0.01	0.00	0.01	19.50	0.07	0.00	0.07
7.00	0.01	0.00	0.01	19.75	0.06	0.00	0.06
7.25	0.01	0.00	0.01	20.00	0.06	0.00	0.06
7.50	0.01	0.00	0.01				
7.75	0.01	0.00	0.01				
8.00	0.01	0.00	0.01				
8.25	0.02	0.00	0.02				
8.50	0.02	0.00	0.02				
8.75	0.02	0.00	0.02				
9.00	0.02	0.00	0.02				
9.25	0.02	0.00	0.02				
9.50	0.06	0.00	0.06				
9.75	0.06	0.00	0.06				
10.00	0.06	0.00	0.06				
10.25	0.07	0.00	0.07				
10.50	0.07	0.00	0.07				
10.75	0.09	0.00	0.09				
11.00	0.11	0.00	0.11				
11.25	0.13	0.00	0.13				
11.50	0.16	0.00	0.16				
11.75	0.23	0.00	0.23				
12.00	0.52	0.00	0.52				
12.25	1.62	0.00	1.62				
12.50	1.04	0.00	1.04				
12.75	0.61	0.00	0.61				
13.00	0.35	0.00	0.35				
13.25	0.29	0.00	0.29				
13.50	0.24	0.00	0.24				
13.75	0.17	0.00	0.17				
14.00	0.15	0.00	0.15				
14.25	0.15	0.00	0.15				
14.50	0.15	0.00	0.15				
14.75	0.14	0.00	0.14				
15.00	0.13	0.00	0.13				
15.25	0.11	0.00	0.11				
15.50	0.11	0.00	0.11				
15.75	0.10	0.00	0.10				
16.00	0.10	0.00	0.10				
16.25	0.10	0.00	0.10				
16.50	0.10	0.00	0.10				
16.75	0.10	0.00	0.10				
17.00	0.09	0.00	0.09				
17.25	0.09	0.00	0.09				
17.50	0.08	0.00	0.08				

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.043	98	ex AC drive (1S)
0.018	98	ex CABC drive (1S)
0.423	61	grass, HSG B, DNR max (1S)
0.484	66	TOTAL AREA

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Page 3

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.423	HSG B	1S
0.000	HSG C	
0.000	HSG D	
0.061	Other	1S
0.484		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	0.043	0.043	ex AC drive	1S
0.000	0.000	0.000	0.000	0.018	0.018	ex CABC drive	1S
0.000	0.423	0.000	0.000	0.000	0.423	grass	1S
0.000	0.423	0.000	0.000	0.061	0.484	TOTAL AREA	

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Notes Listing (all nodes)

Line#	Node Number	Notes
1	Project	Rainfall events imported from "NRCS-Rain.txt" for 9170 WI La Crosse
2		Rainfall events imported from "NRCS-Rain.txt" for 9170 WI La Crosse

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MSE 24-hr 4 2-Year Rainfall=2.94"

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Page 6

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: all ex site

Runoff Area=21,065 sf 12.56% Impervious Runoff Depth>0.59"

Flow Length=100' Tc=5.0 min CN=WQ Runoff=0.37 cfs 0.024 af

Link 2L: frontage rd

Inflow=0.37 cfs 0.024 af

Primary=0.37 cfs 0.024 af

Total Runoff Area = 0.484 ac Runoff Volume = 0.024 af Average Runoff Depth = 0.59"

87.44% Pervious = 0.423 ac 12.56% Impervious = 0.061 ac

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Chiro HCAD Existing AMENDED Mar. '26

MSE 24-hr 4 2-Year Rainfall=2.94"

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Summary for Subcatchment 1S: all ex site

[49] Hint: $T_c < 2dt$ may require smaller dt

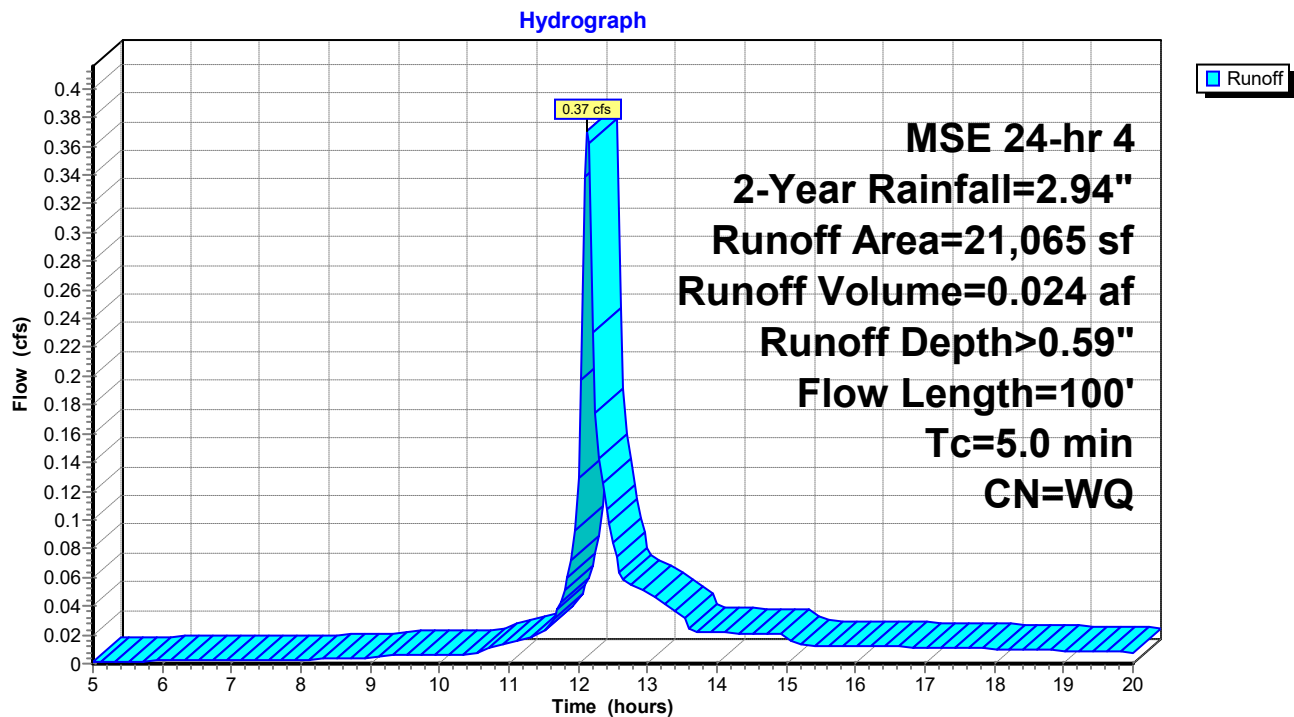
Runoff = 0.37 cfs @ 12.13 hrs, Volume= 0.024 af, Depth> 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, $dt= 0.05$ hrs
MSE 24-hr 4 2-Year Rainfall=2.94"

	Area (sf)	CN	Description
*	1,855	98	ex AC drive
*	790	98	ex CABC drive
*	18,420	61	grass, HSG B, DNR max
	21,065		Weighted Average
	18,420		87.44% Pervious Area
	2,645		12.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100		0.33		Direct Entry, mowed grass

Subcatchment 1S: all ex site



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MSE 24-hr 4 2-Year Rainfall=2.94"

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Hydrograph for Subcatchment 1S: all ex site

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.13	0.00	0.00	17.75	2.75	0.43	0.01
5.25	0.15	0.00	0.00	18.00	2.76	0.43	0.01
5.50	0.16	0.00	0.00	18.25	2.77	0.44	0.01
5.75	0.17	0.00	0.00	18.50	2.78	0.44	0.01
6.00	0.18	0.00	0.00	18.75	2.79	0.45	0.01
6.25	0.19	0.00	0.00	19.00	2.81	0.45	0.01
6.50	0.21	0.00	0.00	19.25	2.82	0.46	0.01
6.75	0.22	0.00	0.00	19.50	2.83	0.46	0.01
7.00	0.23	0.00	0.00	19.75	2.84	0.47	0.01
7.25	0.25	0.00	0.00	20.00	2.84	0.47	0.01
7.50	0.26	0.00	0.00				
7.75	0.28	0.00	0.00				
8.00	0.29	0.00	0.00				
8.25	0.31	0.00	0.00				
8.50	0.32	0.00	0.00				
8.75	0.34	0.00	0.00				
9.00	0.36	0.00	0.00				
9.25	0.38	0.00	0.01				
9.50	0.41	0.00	0.01				
9.75	0.44	0.00	0.01				
10.00	0.47	0.00	0.01				
10.25	0.50	0.00	0.01				
10.50	0.53	0.00	0.01				
10.75	0.57	0.00	0.01				
11.00	0.64	0.00	0.01				
11.25	0.71	0.00	0.02				
11.50	0.80	0.00	0.02				
11.75	0.96	0.00	0.04				
12.00	1.38	0.02	0.13				
12.25	1.98	0.15	0.17				
12.50	2.14	0.20	0.08				
12.75	2.23	0.23	0.06				
13.00	2.30	0.25	0.05				
13.25	2.37	0.27	0.04				
13.50	2.41	0.29	0.03				
13.75	2.44	0.30	0.02				
14.00	2.47	0.32	0.02				
14.25	2.50	0.33	0.02				
14.50	2.53	0.34	0.02				
14.75	2.56	0.35	0.02				
15.00	2.58	0.36	0.02				
15.25	2.60	0.37	0.01				
15.50	2.62	0.37	0.01				
15.75	2.63	0.38	0.01				
16.00	2.65	0.39	0.01				
16.25	2.66	0.39	0.01				
16.50	2.68	0.40	0.01				
16.75	2.69	0.41	0.01				
17.00	2.71	0.41	0.01				
17.25	2.72	0.42	0.01				
17.50	2.73	0.42	0.01				

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Chiro HCAD Existing AMENDED Mar. '26

MSE 24-hr 4 2-Year Rainfall=2.94"

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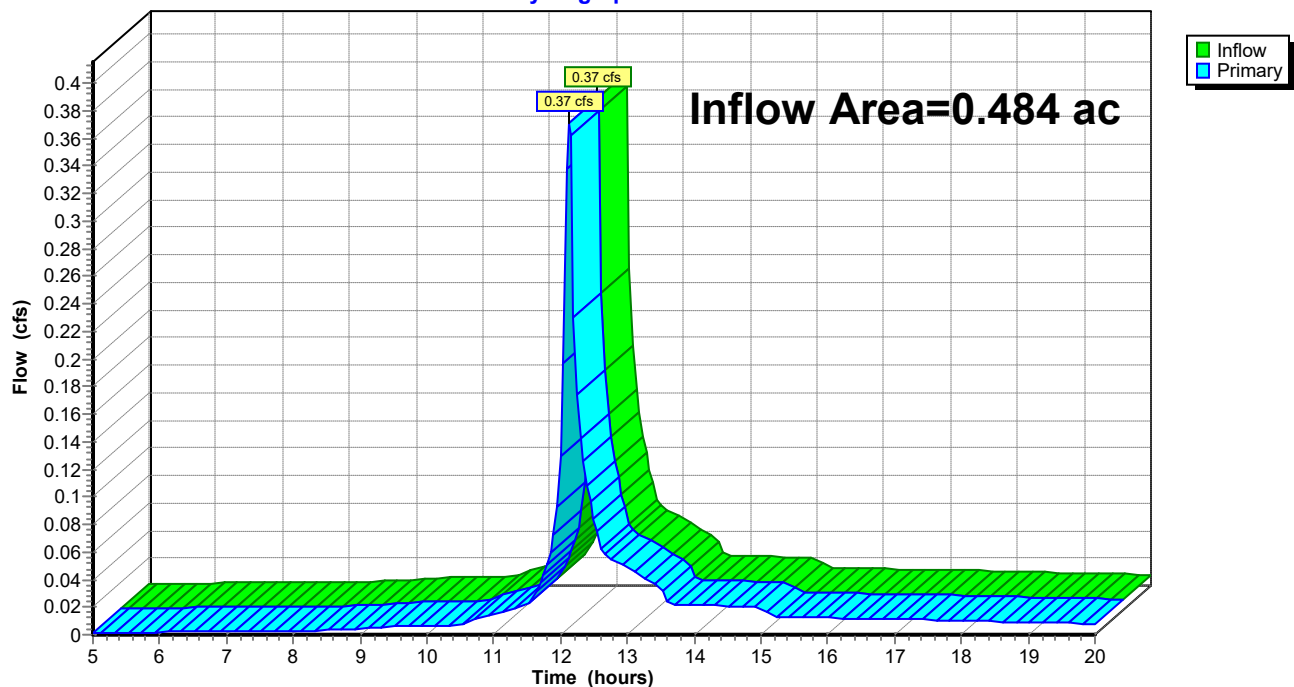
Summary for Link 2L: frontage rd

Inflow Area = 0.484 ac, 12.56% Impervious, Inflow Depth > 0.59" for 2-Year event
Inflow = 0.37 cfs @ 12.13 hrs, Volume= 0.024 af
Primary = 0.37 cfs @ 12.13 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: frontage rd

Hydrograph



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MSE 24-hr 4 2-Year Rainfall=2.94"

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Hydrograph for Link 2L: frontage rd

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00	0.00	0.00	17.75	0.01	0.00	0.01
5.25	0.00	0.00	0.00	18.00	0.01	0.00	0.01
5.50	0.00	0.00	0.00	18.25	0.01	0.00	0.01
5.75	0.00	0.00	0.00	18.50	0.01	0.00	0.01
6.00	0.00	0.00	0.00	18.75	0.01	0.00	0.01
6.25	0.00	0.00	0.00	19.00	0.01	0.00	0.01
6.50	0.00	0.00	0.00	19.25	0.01	0.00	0.01
6.75	0.00	0.00	0.00	19.50	0.01	0.00	0.01
7.00	0.00	0.00	0.00	19.75	0.01	0.00	0.01
7.25	0.00	0.00	0.00	20.00	0.01	0.00	0.01
7.50	0.00	0.00	0.00				
7.75	0.00	0.00	0.00				
8.00	0.00	0.00	0.00				
8.25	0.00	0.00	0.00				
8.50	0.00	0.00	0.00				
8.75	0.00	0.00	0.00				
9.00	0.00	0.00	0.00				
9.25	0.01	0.00	0.01				
9.50	0.01	0.00	0.01				
9.75	0.01	0.00	0.01				
10.00	0.01	0.00	0.01				
10.25	0.01	0.00	0.01				
10.50	0.01	0.00	0.01				
10.75	0.01	0.00	0.01				
11.00	0.01	0.00	0.01				
11.25	0.02	0.00	0.02				
11.50	0.02	0.00	0.02				
11.75	0.04	0.00	0.04				
12.00	0.13	0.00	0.13				
12.25	0.17	0.00	0.17				
12.50	0.08	0.00	0.08				
12.75	0.06	0.00	0.06				
13.00	0.05	0.00	0.05				
13.25	0.04	0.00	0.04				
13.50	0.03	0.00	0.03				
13.75	0.02	0.00	0.02				
14.00	0.02	0.00	0.02				
14.25	0.02	0.00	0.02				
14.50	0.02	0.00	0.02				
14.75	0.02	0.00	0.02				
15.00	0.02	0.00	0.02				
15.25	0.01	0.00	0.01				
15.50	0.01	0.00	0.01				
15.75	0.01	0.00	0.01				
16.00	0.01	0.00	0.01				
16.25	0.01	0.00	0.01				
16.50	0.01	0.00	0.01				
16.75	0.01	0.00	0.01				
17.00	0.01	0.00	0.01				
17.25	0.01	0.00	0.01				
17.50	0.01	0.00	0.01				

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MSE 24-hr 4 10-Year Rainfall=4.32"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: all ex site

Runoff Area=21,065 sf 12.56% Impervious Runoff Depth>1.28"

Flow Length=100' Tc=5.0 min CN=WQ Runoff=0.95 cfs 0.051 af

Link 2L: frontage rd

Inflow=0.95 cfs 0.051 af

Primary=0.95 cfs 0.051 af

Total Runoff Area = 0.484 ac Runoff Volume = 0.051 af Average Runoff Depth = 1.28"

87.44% Pervious = 0.423 ac 12.56% Impervious = 0.061 ac

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MSE 24-hr 4 10-Year Rainfall=4.32"

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Summary for Subcatchment 1S: all ex site

[49] Hint: $T_c < 2dt$ may require smaller dt

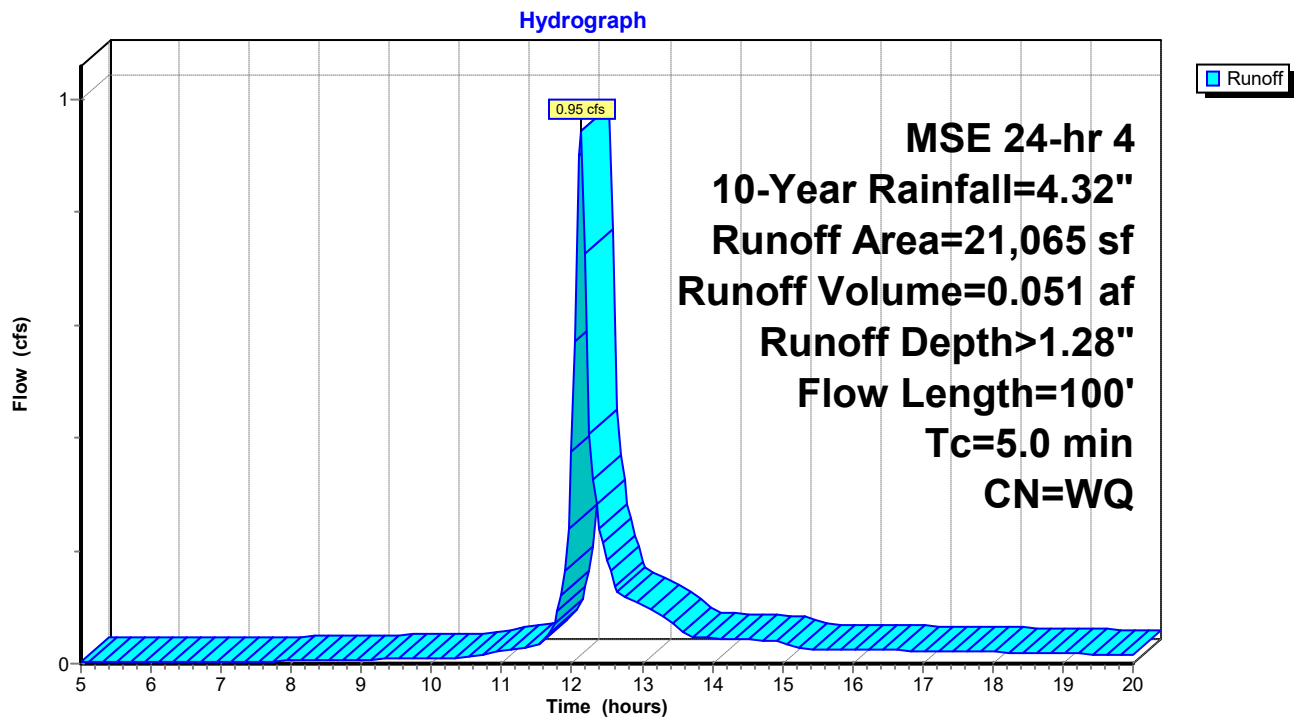
Runoff = 0.95 cfs @ 12.13 hrs, Volume= 0.051 af, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, $dt=0.05$ hrs
MSE 24-hr 4 10-Year Rainfall=4.32"

	Area (sf)	CN	Description
*	1,855	98	ex AC drive
*	790	98	ex CABC drive
*	18,420	61	grass, HSG B, DNR max
	21,065		Weighted Average
	18,420		87.44% Pervious Area
	2,645		12.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100		0.33		Direct Entry, mowed grass

Subcatchment 1S: all ex site



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MSE 24-hr 4 10-Year Rainfall=4.32"

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Hydrograph for Subcatchment 1S: all ex site

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.20	0.00	0.00	17.75	4.04	1.11	0.02
5.25	0.21	0.00	0.00	18.00	4.05	1.12	0.02
5.50	0.23	0.00	0.00	18.25	4.07	1.13	0.02
5.75	0.25	0.00	0.00	18.50	4.09	1.14	0.02
6.00	0.27	0.00	0.00	18.75	4.11	1.15	0.02
6.25	0.28	0.00	0.00	19.00	4.12	1.16	0.02
6.50	0.30	0.00	0.00	19.25	4.14	1.17	0.02
6.75	0.32	0.00	0.00	19.50	4.15	1.18	0.02
7.00	0.34	0.00	0.00	19.75	4.17	1.19	0.02
7.25	0.36	0.00	0.00	20.00	4.18	1.19	0.02
7.50	0.38	0.00	0.00				
7.75	0.41	0.00	0.00				
8.00	0.43	0.00	0.00				
8.25	0.45	0.00	0.00				
8.50	0.47	0.00	0.01				
8.75	0.50	0.00	0.01				
9.00	0.52	0.00	0.01				
9.25	0.56	0.00	0.01				
9.50	0.60	0.00	0.01				
9.75	0.64	0.00	0.01				
10.00	0.68	0.00	0.01				
10.25	0.73	0.00	0.01				
10.50	0.77	0.00	0.01				
10.75	0.84	0.00	0.02				
11.00	0.93	0.00	0.02				
11.25	1.04	0.00	0.03				
11.50	1.17	0.00	0.03				
11.75	1.42	0.03	0.07				
12.00	2.02	0.16	0.38				
12.25	2.90	0.50	0.41				
12.50	3.15	0.62	0.18				
12.75	3.28	0.68	0.12				
13.00	3.39	0.74	0.10				
13.25	3.48	0.79	0.09				
13.50	3.55	0.83	0.07				
13.75	3.59	0.85	0.05				
14.00	3.64	0.88	0.04				
14.25	3.68	0.90	0.04				
14.50	3.72	0.92	0.04				
14.75	3.76	0.94	0.04				
15.00	3.80	0.97	0.04				
15.25	3.82	0.98	0.03				
15.50	3.85	0.99	0.03				
15.75	3.87	1.01	0.03				
16.00	3.89	1.02	0.02				
16.25	3.91	1.04	0.02				
16.50	3.94	1.05	0.02				
16.75	3.96	1.06	0.02				
17.00	3.98	1.07	0.02				
17.25	4.00	1.08	0.02				
17.50	4.02	1.10	0.02				

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MSE 24-hr 4 10-Year Rainfall=4.32"

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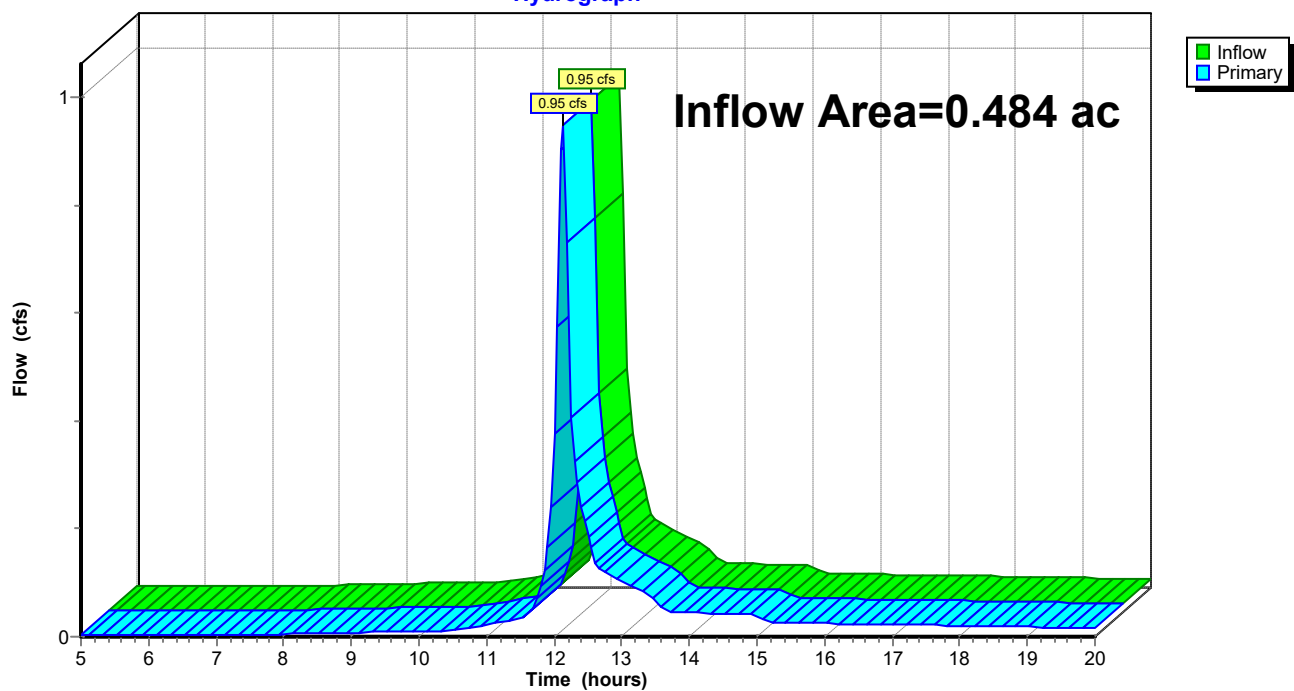
Summary for Link 2L: frontage rd

Inflow Area = 0.484 ac, 12.56% Impervious, Inflow Depth > 1.28" for 10-Year event
Inflow = 0.95 cfs @ 12.13 hrs, Volume= 0.051 af
Primary = 0.95 cfs @ 12.13 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: frontage rd

Hydrograph



Chiro HCAD Existing

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Chiro HCAD Existing AMENDED Mar. '26

MSE 24-hr 4 10-Year Rainfall=4.32"

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Hydrograph for Link 2L: frontage rd

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.00	0.00	0.00	17.75	0.02	0.00	0.02
5.25	0.00	0.00	0.00	18.00	0.02	0.00	0.02
5.50	0.00	0.00	0.00	18.25	0.02	0.00	0.02
5.75	0.00	0.00	0.00	18.50	0.02	0.00	0.02
6.00	0.00	0.00	0.00	18.75	0.02	0.00	0.02
6.25	0.00	0.00	0.00	19.00	0.02	0.00	0.02
6.50	0.00	0.00	0.00	19.25	0.02	0.00	0.02
6.75	0.00	0.00	0.00	19.50	0.02	0.00	0.02
7.00	0.00	0.00	0.00	19.75	0.02	0.00	0.02
7.25	0.00	0.00	0.00	20.00	0.02	0.00	0.02
7.50	0.00	0.00	0.00				
7.75	0.00	0.00	0.00				
8.00	0.00	0.00	0.00				
8.25	0.00	0.00	0.00				
8.50	0.01	0.00	0.01				
8.75	0.01	0.00	0.01				
9.00	0.01	0.00	0.01				
9.25	0.01	0.00	0.01				
9.50	0.01	0.00	0.01				
9.75	0.01	0.00	0.01				
10.00	0.01	0.00	0.01				
10.25	0.01	0.00	0.01				
10.50	0.01	0.00	0.01				
10.75	0.02	0.00	0.02				
11.00	0.02	0.00	0.02				
11.25	0.03	0.00	0.03				
11.50	0.03	0.00	0.03				
11.75	0.07	0.00	0.07				
12.00	0.38	0.00	0.38				
12.25	0.41	0.00	0.41				
12.50	0.18	0.00	0.18				
12.75	0.12	0.00	0.12				
13.00	0.10	0.00	0.10				
13.25	0.09	0.00	0.09				
13.50	0.07	0.00	0.07				
13.75	0.05	0.00	0.05				
14.00	0.04	0.00	0.04				
14.25	0.04	0.00	0.04				
14.50	0.04	0.00	0.04				
14.75	0.04	0.00	0.04				
15.00	0.04	0.00	0.04				
15.25	0.03	0.00	0.03				
15.50	0.03	0.00	0.03				
15.75	0.03	0.00	0.03				
16.00	0.02	0.00	0.02				
16.25	0.02	0.00	0.02				
16.50	0.02	0.00	0.02				
16.75	0.02	0.00	0.02				
17.00	0.02	0.00	0.02				
17.25	0.02	0.00	0.02				
17.50	0.02	0.00	0.02				

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Prepared by Paragon Associates

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Chiro HCAD Existing AMENDED Mar. '26

MSE 24-hr 4 100-Year Rainfall=7.31"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: all ex site

Runoff Area=21,065 sf 12.56% Impervious Runoff Depth>3.24"

Flow Length=100' Tc=5.0 min CN=WQ Runoff=2.56 cfs 0.131 af

Link 2L: frontage rd

Inflow=2.56 cfs 0.131 af

Primary=2.56 cfs 0.131 af

Total Runoff Area = 0.484 ac Runoff Volume = 0.131 af Average Runoff Depth = 3.24"

87.44% Pervious = 0.423 ac 12.56% Impervious = 0.061 ac

Chiro HCAD Existing

Prepared by Paragon Associates

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Chiro HCAD Existing AMENDED Mar. '26

MSE 24-hr 4 100-Year Rainfall=7.31"

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Summary for Subcatchment 1S: all ex site

[49] Hint: $T_c < 2dt$ may require smaller dt

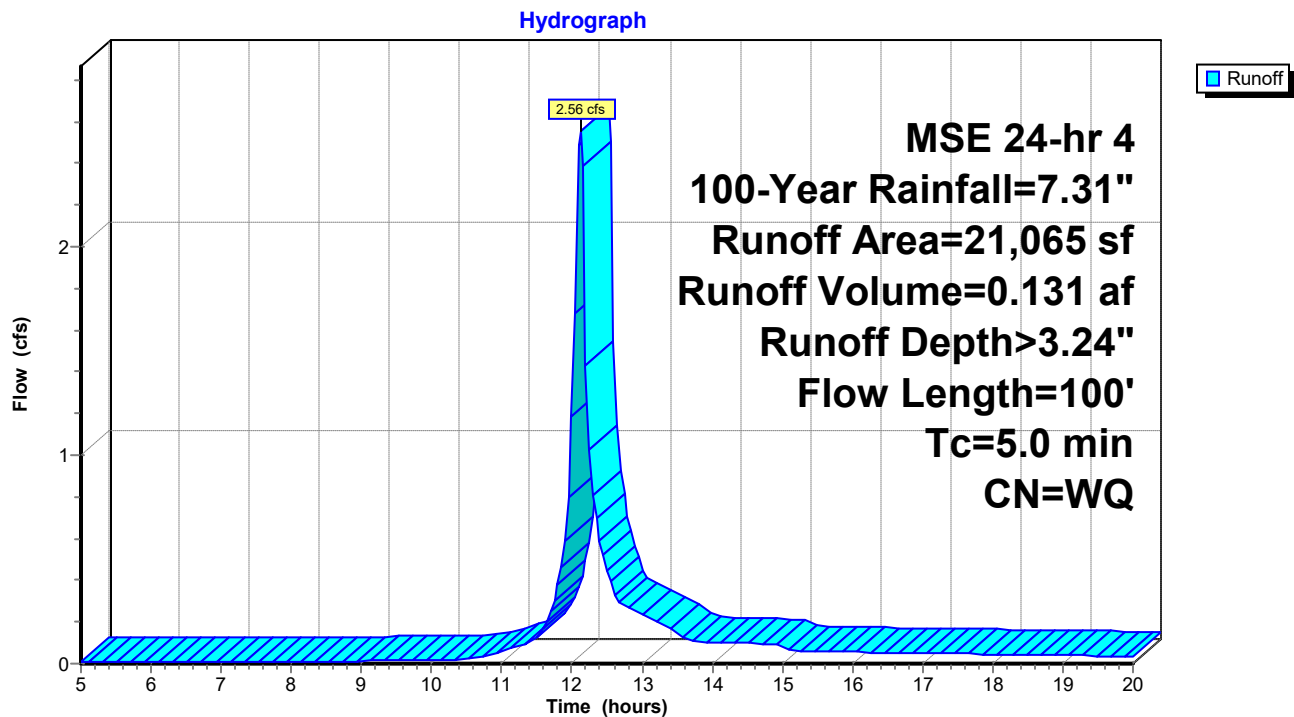
Runoff = 2.56 cfs @ 12.12 hrs, Volume= 0.131 af, Depth> 3.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-20.00 hrs, $dt=0.05$ hrs
MSE 24-hr 4 100-Year Rainfall=7.31"

	Area (sf)	CN	Description
*	1,855	98	ex AC drive
*	790	98	ex CABC drive
*	18,420	61	grass, HSG B, DNR max
	21,065		Weighted Average
	18,420		87.44% Pervious Area
	2,645		12.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100		0.33		Direct Entry, mowed grass

Subcatchment 1S: all ex site



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MSE 24-hr 4 100-Year Rainfall=7.31"

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Hydrograph for Subcatchment 1S: all ex site

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.34	0.00	0.01	17.75	6.83	3.07	0.05
5.25	0.36	0.00	0.01	18.00	6.86	3.10	0.04
5.50	0.39	0.00	0.01	18.25	6.89	3.12	0.04
5.75	0.42	0.00	0.01	18.50	6.92	3.14	0.04
6.00	0.45	0.00	0.01	18.75	6.95	3.16	0.04
6.25	0.48	0.00	0.01	19.00	6.97	3.18	0.04
6.50	0.51	0.00	0.01	19.25	7.00	3.20	0.04
6.75	0.55	0.00	0.01	19.50	7.03	3.22	0.04
7.00	0.58	0.00	0.01	19.75	7.05	3.24	0.04
7.25	0.61	0.00	0.01	20.00	7.07	3.26	0.03
7.50	0.65	0.00	0.01				
7.75	0.69	0.00	0.01				
8.00	0.72	0.00	0.01				
8.25	0.76	0.00	0.01				
8.50	0.80	0.00	0.01				
8.75	0.84	0.00	0.01				
9.00	0.88	0.00	0.01				
9.25	0.95	0.00	0.02				
9.50	1.02	0.00	0.02				
9.75	1.09	0.00	0.02				
10.00	1.16	0.00	0.02				
10.25	1.23	0.01	0.02				
10.50	1.31	0.01	0.02				
10.75	1.43	0.03	0.04				
11.00	1.58	0.05	0.06				
11.25	1.77	0.09	0.09				
11.50	1.98	0.15	0.12				
11.75	2.40	0.29	0.30				
12.00	3.43	0.76	1.18				
12.25	4.91	1.67	1.02				
12.50	5.33	1.95	0.45				
12.75	5.54	2.11	0.28				
13.00	5.73	2.24	0.24				
13.25	5.88	2.35	0.20				
13.50	6.00	2.44	0.16				
13.75	6.08	2.50	0.11				
14.00	6.15	2.55	0.10				
14.25	6.22	2.61	0.10				
14.50	6.29	2.66	0.10				
14.75	6.36	2.71	0.09				
15.00	6.43	2.76	0.09				
15.25	6.47	2.79	0.06				
15.50	6.51	2.82	0.06				
15.75	6.55	2.85	0.06				
16.00	6.59	2.88	0.06				
16.25	6.62	2.91	0.05				
16.50	6.66	2.94	0.05				
16.75	6.70	2.97	0.05				
17.00	6.73	2.99	0.05				
17.25	6.76	3.02	0.05				
17.50	6.80	3.05	0.05				

Chiro HCAD Existing

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Chiro HCAD Existing AMENDED Mar. '26

MSE 24-hr 4 100-Year Rainfall=7.31"

Printed 3/11/2026

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Summary for Link 2L: frontage rd

Inflow Area = 0.484 ac, 12.56% Impervious, Inflow Depth > 3.24" for 100-Year event

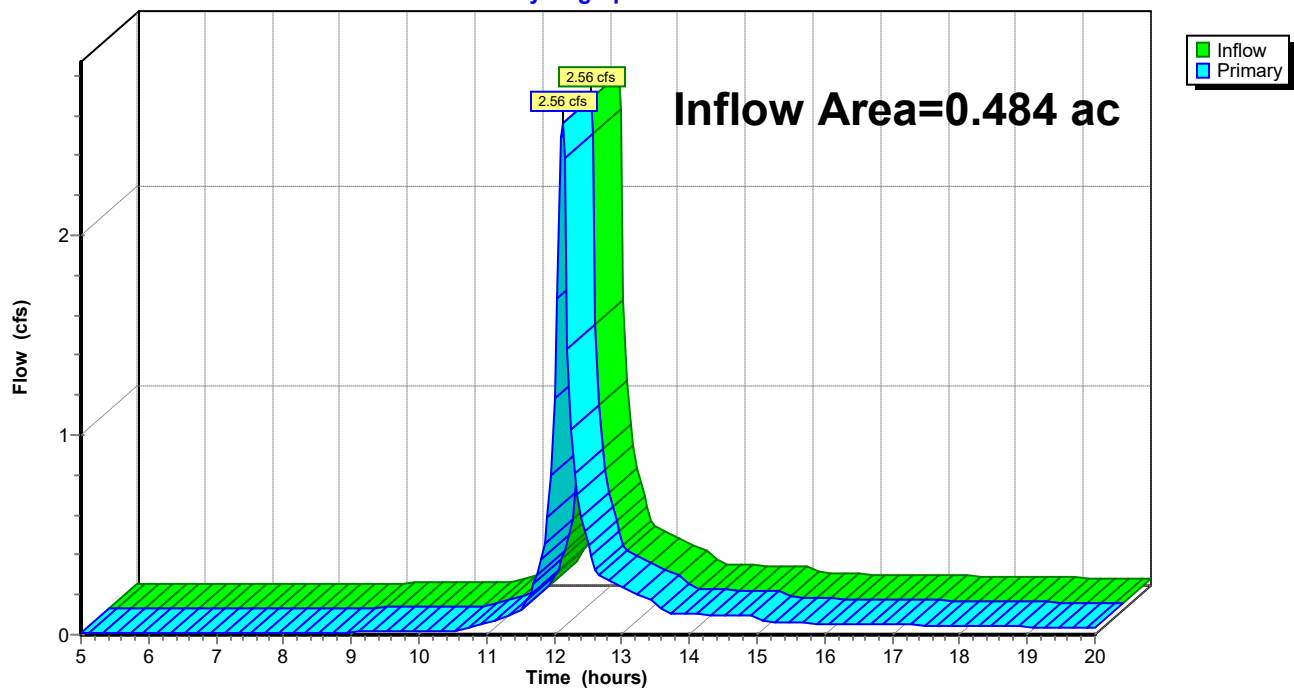
Inflow = 2.56 cfs @ 12.12 hrs, Volume= 0.131 af

Primary = 2.56 cfs @ 12.12 hrs, Volume= 0.131 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: frontage rd

Hydrograph



Chiro HCAD Existing

Prepared by Paragon Associates

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Chiro HCAD Existing AMENDED Mar. '26

MSE 24-hr 4 100-Year Rainfall=7.31"

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Hydrograph for Link 2L: frontage rd

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.01	0.00	0.01	17.75	0.05	0.00	0.05
5.25	0.01	0.00	0.01	18.00	0.04	0.00	0.04
5.50	0.01	0.00	0.01	18.25	0.04	0.00	0.04
5.75	0.01	0.00	0.01	18.50	0.04	0.00	0.04
6.00	0.01	0.00	0.01	18.75	0.04	0.00	0.04
6.25	0.01	0.00	0.01	19.00	0.04	0.00	0.04
6.50	0.01	0.00	0.01	19.25	0.04	0.00	0.04
6.75	0.01	0.00	0.01	19.50	0.04	0.00	0.04
7.00	0.01	0.00	0.01	19.75	0.04	0.00	0.04
7.25	0.01	0.00	0.01	20.00	0.03	0.00	0.03
7.50	0.01	0.00	0.01				
7.75	0.01	0.00	0.01				
8.00	0.01	0.00	0.01				
8.25	0.01	0.00	0.01				
8.50	0.01	0.00	0.01				
8.75	0.01	0.00	0.01				
9.00	0.01	0.00	0.01				
9.25	0.02	0.00	0.02				
9.50	0.02	0.00	0.02				
9.75	0.02	0.00	0.02				
10.00	0.02	0.00	0.02				
10.25	0.02	0.00	0.02				
10.50	0.02	0.00	0.02				
10.75	0.04	0.00	0.04				
11.00	0.06	0.00	0.06				
11.25	0.09	0.00	0.09				
11.50	0.12	0.00	0.12				
11.75	0.30	0.00	0.30				
12.00	1.18	0.00	1.18				
12.25	1.02	0.00	1.02				
12.50	0.45	0.00	0.45				
12.75	0.28	0.00	0.28				
13.00	0.24	0.00	0.24				
13.25	0.20	0.00	0.20				
13.50	0.16	0.00	0.16				
13.75	0.11	0.00	0.11				
14.00	0.10	0.00	0.10				
14.25	0.10	0.00	0.10				
14.50	0.10	0.00	0.10				
14.75	0.09	0.00	0.09				
15.00	0.09	0.00	0.09				
15.25	0.06	0.00	0.06				
15.50	0.06	0.00	0.06				
15.75	0.06	0.00	0.06				
16.00	0.06	0.00	0.06				
16.25	0.05	0.00	0.05				
16.50	0.05	0.00	0.05				
16.75	0.05	0.00	0.05				
17.00	0.05	0.00	0.05				
17.25	0.05	0.00	0.05				
17.50	0.05	0.00	0.05				

Control Practice 1: Biofilter CP# 1 (DS) - W Biofilter UNLINED

1. Top area (square feet) = 850
2. Bottom area (square feet) = 325
3. Depth (ft): 4.41
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.03
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 0.001
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 1
10. Porosity of rock filled volume = 0.33
11. Engineered soil infiltration rate: 3.6
12. Engineered soil depth (ft) = 2
13. Engineered soil porosity = 0.27
14. Percent solids reduction due to flow through engineered soil = 80
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

User-Defined Media Type 1.000

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 10
2. Weir crest width (ft): 2
3. Height of datum to bottom of weir opening: 4.4

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 0.5
2. Stand pipe height above datum (ft): 4.35

Outlet type: Drain Tile/Underdrain

1. Underdrain outlet diameter (ft): 0.5
2. Invert elevation above datum (ft): 1
3. Number of underdrain outlets: 1

Control Practice 2: Biofilter CP# 2 (DS) - E biofilter LINED

1. Top area (square feet) = 800
2. Bottom area (square feet) = 163
3. Depth (ft): 3.35
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 0.001
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 1
10. Porosity of rock filled volume = 0.33
11. Engineered soil infiltration rate: 3.6
12. Engineered soil depth (ft) = 1.5
13. Engineered soil porosity = 0.27
14. Percent solids reduction due to flow through engineered soil = 60
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

User-Defined Media Type 1.000

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 8
2. Weir crest width (ft): 2
3. Height of datum to bottom of weir opening: 3.34

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 0.5
2. Stand pipe height above datum (ft): 3.1

Outlet type: Drain Tile/Underdrain

1. Underdrain outlet diameter (ft): 0.5
2. Invert elevation above datum (ft): 0
3. Number of underdrain outlets: 1

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Soil Data Soil Type Fraction in Eng. Soil

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1. Underdrain outlet diameter (ft): 0.5
2. Invert elevation above datum (ft): 0
3. Number of underdrain outlets: 1

LIVE WELL CHIROPRACTIC CLINIC NEW BUILDING

PHASE 2 OF STH 16 CLINICS DEVELOPMENT – LA CROSSE

Storm Water Management Plan

APPENDIX D – Operations & Maintenance Plan

OPERATION AND MAINTENANCE PLAN

Live Well Chiropractic Clinic New Building - La Crosse
1822 STH 16 Frontage Road

In accordance with the State of Wisconsin Department of Safety and Professional Services and the Department of Natural Resources, a maintenance plan for the LIVE WELL CHIROPRACTIC CLINIC NEW BUILDING project is detailed below. The intent of this plan is to set forth maintenance procedures to be performed by Angela Frank of Onalaska in order to ensure proper operation of the storm water facilities that are located on the project site. A copy of this plan shall be kept onsite at all times and be available for inspection if requested. Written record of inspection activities and maintenance shall be retained for the life of the facilities discussed in this plan.

1) BIOFILTRATION DEVICES:

- A) Accumulated solids or byproduct removal requirements:** Practices shall include removal of all trash and excess sediment from within the site's biofiltration devices; periodic removal of sediment may be required to insure proper operation. Repair erosion as necessary on the outer banks of the basins. Remove fall leaves prior to first snow fall. Do not use biofiltration areas for snow storage during winter months. Refrain from using sodium chloride salt-based applications for snow and ice removal on contributing parking and drive areas as this may contribute to quick failure of the device. A calcium chloride salt-based application may be used moderately for snow and ice removal on contributing parking and drive areas.
- B) Identification of safety hazards:** Verify that the system is operating properly by inspecting after one inch of rain for the first year and then quarterly each succeeding year. If standing water is observed over 50% of the basin floor 3 days after rainfall and the drains are not clogged with debris, the basin is clogged and measures should be undertaken to unclog it. Keep vegetation in check on the downstream side of structure. Maintain embankment downstream of structure.
- C) Cleaning and inspection schedule:** Note the condition of vegetation at quarterly inspections. Identify and replace ailing vegetation. Replace mulch in void areas as determined during inspections. Check for runoff pooling areas or blockages of flow. Water plants in biofiltration devices during dry conditions. Confirm that irrigation is adequate and not excessive. Application of pesticides and fertilizers shall be minimal. Biological, physical, and cultural controls shall be used prior to chemical pesticide and fertilizer use.
- D) Inspection and maintenance checklist:**
- 1) **Filters** – Constructed and Planted Biofiltration Device
 - 2) **Disinfection units** - does not apply to this system
 - 3) **Sedimentation chambers** - does not apply to this system
 - 4) **Detention devices** - does not apply to this system

5) **Drains** – This biofiltration device is equipped with overflow drains that must be inspected and cleaned of debris on a frequent basis to ensure proper operation.

6) **Infiltration systems:**

(a) **Native Vegetation Planting**

(1) **Establishment** - Immediately after the completion of cell construction, water plant material for 14 consecutive days unless there is sufficient natural rainfall. Bi-weekly weeding will be required for the first one to two years. Carefully remove by hand plants certain to be weeds. Remove entire root of the weedy plants. If chemical weed treatment is required, use the least toxic approach.

(2) **Maintenance**

(i) **Mowing:** After vegetation establishment, if burning cannot be accommodated, mow the plants to a height of 5 to 6 inches once in the fall (after November 1).

(ii) **Burning:** Beginning the second year, burning can occur in the early spring (prior to May 1st) or in the late fall (after November 1st). Burn two consecutive years and then up to three years can pass before the next burning. Do not burn every other year.

(3) **Restoration Procedures**

(i) Twice a year, from March 15th to April 30th and October 1st to November 30th, remove and replace all dead and diseased vegetation considered beyond treatment.

(ii) Once every 2 to 3 years, in the spring, remove old mulch layer before applying new one.

E) **Start up and shutdown procedures:** Discourage infiltration of runoff water during winter months. The system should be “off-line” in the winter.

F) **Vector control requirements:** Abate potential vectors by filling holes in the ground in and around the biofiltration device and by insuring that there are no areas where water stands longer than three days following a storm. If any obstructions develop (e.g. debris accumulation, invasive vegetation, growth of woody or shrubby vegetation, clogging of outlets and/or under drains) within the device, appropriate maintenance activities shall be implemented to correct the obstructions.

G) **Contingency plan in the event of system failure:** Immediate measures should be employed to sandbag the area and stabilize any lawn areas as soon as possible until the system can be evaluated and reconstructed to plan.

STORM SEWER AND DETENTION SYSTEM:

A) Accumulated solids or byproduct removal requirements

Practices shall include removal of excess sediment from within the site’s storm water inlets, conveyance piping, and storage chambers. Note that the storage chambers are a confined access space and special equipment and training are required to enter them.

Periodic removal of sediment will insure proper operation. Also, remove any litter or debris that may obstruct inflow and outflow conditions.

B) Identification of safety hazards

Inspect annually, in the spring, inlet structures to verify they remain installed correctly. This is important for inlets located in pavement areas which may endure heavy traffic and create a hazard if they are not properly seated.

C) Cleaning and inspection schedule

Inspect inlets, piping, and storage chambers annually, in the spring. Observe the system components during rain events to verify the system is operating at top capacity. Identify structures and conveyance piping which may need repair or replacement parts. Remove any debris or litter blocking the inlet structures and pipes. Remove snow and ice from and around inlets to facilitate flow into the system. There are backflow prevention devices and a flow diversion structure installed as part of the project. These should be inspected annually in the spring and after major precipitation events.

D) Inspection and maintenance checklist

- a. Filters - does not apply to this site
- b. Disinfection units - does not apply to this site
- c. Sedimentation chambers - does not apply to this site
- d. Detention devices – annually in spring
- e. Infiltration systems – does not apply to storm sewer
- f. Flow control devices – annually in spring and after major events

E) Start up and shutdown procedures

Not Applicable.

F) Vector control requirements – periodic removal of sediment from the detention tanks will limit the potential for standing water that may attract mosquitoes and other insects.

LIVE WELL CHIROPRACTIC CLINIC NEW BUILDING

PHASE 2 OF STH 16 CLINICS DEVELOPMENT – LA CROSSE

Storm Water Management Plan

APPENDIX E – Long Term Maintenance Agreement (Draft)

DECLARATION OF CONDITIONS, COVENANTS AND RESTRICTIONS
FOR MAINTENANCE OF STORMWATER MANAGEMENT MEASURES

RECITALS:

- A. Angela Frank, is the owner of Live Well Chiropractic Clinic Building, which has stormwater management structures constructed on the property that is more particularly described on Exhibit A attached hereto (“Property”).
- B. Owner desires to construct stormwater management structures on the Property in accordance with certain plans and specifications approved by the City.
- C. The City requires Owners to record this Declaration regarding maintenance of stormwater management measures to be located on the Property. Owners agree to maintain the stormwater management measures and to grant to the City the rights set forth below.

NOW, THEREFORE, in consideration of the declarations herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the owners agree as follows:

- 1. Maintenance. Owners and their successors and assigns shall be responsible to repair and maintain the stormwater management measures located on the Property in good condition and in working order and such that the measures comply with the approved plans on file with the City Engineer. Said maintenance shall be at the Owner’s sole cost and expense. Owners will conduct such maintenance or repair work in accordance with all applicable laws, codes, regulations, and similar requirements, and pursuant to the Maintenance Provisions attached hereto as Exhibit B.
 - 2. Easement to City. If Owners fail to maintain the stormwater management measures as required in Section 1, then City shall have the right, after providing Owners with written notice of the maintenance issue (“Maintenance Notice”) and thirty (30) days to comply with the City’s maintenance request, to enter the Property in order to conduct the maintenance specified in the Maintenance Notice. City will conduct such maintenance work in accordance with all applicable laws, codes, regulations, and similar requirements and will not unreasonably interfere with Owner’s use of the Property. All costs and expenses incurred by the City in conducting such maintenance may be charged to the owner of the Property by placing the amount on the tax roll for the Property as a special charge in accordance with Section 66.0627, Wis. Stats.
 - 3. Term/Termination. The term of this Agreement shall commence on the date that this Agreement is filed of record with the Register of Deeds Office for La Crosse County, Wisconsin, and except as otherwise herein specifically provided, shall continue in perpetuity. Notwithstanding the foregoing, this Agreement may be terminated by recording with the Register of Deeds Office for La Crosse County, Wisconsin, a written instrument of termination signed by the City and all of the then-owners of the Property.
 - 4. Miscellaneous.
 - (a) Notices. Any notice, request or demand required or permitted under this Agreement shall be in writing and shall be deemed given when personally served or three (3) days after the same has been deposited with the United States Post Office, registered or certified mail, return receipt requested, postage prepaid and addressed as follows:

If to Owners:

Dr. Angela Frank
Live Well Chiropractic Clinic
1810 Pine Ridge Dr.
Onalaska, WI 54650

If to City:

City of La Crosse
Engineering Department
400 La Crosse Street
La Crosse, WI 54601
Attention: City Engineer
- Any party may change its address for the receipt of notice by written notice to the other.
- (b) Governing Law. This Agreement shall be governed and construed in accordance with the laws of the State of Wisconsin.
 - (c) Amendments or Further Agreements to be in Writing. This Agreement may not be modified in whole or in part unless such agreement is in writing and signed by all parties bound hereby.
 - (d) Covenants Running with the Land. All of the easements, restrictions, covenants and agreements set forth in this Agreement are intended to be and shall be construed as covenants running with the land, binding upon, inuring to the benefit of, and enforceable by the parties hereto and their respective successors and assigns.
 - (e) Partial Invalidity. If any provisions, or portions thereof, of this Agreement or the application thereof to any person or circumstance shall, to any extent, be invalid or unenforceable, the remainder of this Agreement, or the application of such provision, or portion thereof, to any other persons or circumstances shall not be affected thereby and each provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

This space is reserved for recording data

Return to:

City of La Crosse
Engineering Department
400 La Crosse Street
La Crosse, Wisconsin 54601

Tax Parcel No.: 17-10460-110

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of October, 2025.

X _____
Angela Frank

Date _____

STATE OF WISCONSIN)
COUNTY OF LA CROSSE) SS

Personally came before me this _____ day of _____, 20_____, the above named
_____, to me known to be the person(s) who executed the foregoing instrument and
acknowledged the same.

NOTARY PUBLIC

My Commission Expires: _____

Drafted by: City of La Crosse
 Engineering Department
 400 La Crosse Street
 La Crosse, Wisconsin 54601

EXHIBIT A
Legal Description

Angela Frank parcel 17-10460-110 @ 1822 STH 16 Frontage Road

LEGAL DESCRIPTION:

Part of government lot 7 of Section 21, Township 16 North, Range 7 West, City of La Crosse, La Crosse County, Wisconsin further described as follows:

Cold Springs Addition lots 12 and 13 of block 2, lot 20 of block 3 and the west half of the vacated alley adjacent to said lots 12 and 13 of block 2 and lot 20 of block 3, except for the part taken for highway purposes.

The above described lands contain 21,999 square feet, or 0.50 acres, as surveyed. The above described lands are subject to all covenants, restrictions and easements, implied or recorded.

EXHIBIT B
Maintenance Provisions

Operation and Maintenance Plan
Construction plan sheet C100
Construction plan sheet C400

OPERATION AND MAINTENANCE PLAN

Live Well Chiropractic Clinic New Building - La Crosse
1822 STH 16 Frontage Road

In accordance with the State of Wisconsin Department of Safety and Professional Services and the Department of Natural Resources, a maintenance plan for the LIVE WELL CHIROPRACTIC CLINIC NEW BUILDING project is detailed below. The intent of this plan is to set forth maintenance procedures to be performed by Angela Frank of Onalaska in order to ensure proper operation of the storm water facilities that are located on the project site. A copy of this plan shall be kept onsite at all times and be available for inspection if requested. Written record of inspection activities and maintenance shall be retained for the life of the facilities discussed in this plan.

1) BIOFILTRATION DEVICES:

- A) Accumulated solids or byproduct removal requirements:** Practices shall include removal of all trash and excess sediment from within the site's biofiltration devices; periodic removal of sediment may be required to insure proper operation. Repair erosion as necessary on the outer banks of the basins. Remove fall leaves prior to first snow fall. Do not use biofiltration areas for snow storage during winter months. Refrain from using sodium chloride salt-based applications for snow and ice removal on contributing parking and drive areas as this may contribute to quick failure of the device. A calcium chloride salt-based application may be used moderately for snow and ice removal on contributing parking and drive areas.
- B) Identification of safety hazards:** Verify that the system is operating properly by inspecting after one inch of rain for the first year and then quarterly each succeeding year. If standing water is observed over 50% of the basin floor 3 days after rainfall and the drains are not clogged with debris, the basin is clogged and measures should be undertaken to unclog it. Keep vegetation in check on the downstream side of structure. Maintain embankment downstream of structure.
- C) Cleaning and inspection schedule:** Note the condition of vegetation at quarterly inspections. Identify and replace ailing vegetation. Replace mulch in void areas as determined during inspections. Check for runoff pooling areas or blockages of flow. Water plants in biofiltration devices during dry conditions. Confirm that irrigation is adequate and not excessive. Application of pesticides and fertilizers shall be minimal. Biological, physical, and cultural controls shall be used prior to chemical pesticide and fertilizer use.
- D) Inspection and maintenance checklist:**
 - 1) **Filters** – Constructed and Planted Biofiltration Device
 - 2) **Disinfection units** - does not apply to this system
 - 3) **Sedimentation chambers** - does not apply to this system
 - 4) **Detention devices** - does not apply to this system

5) **Drains** – This biofiltration device is equipped with overflow drains that must be inspected and cleaned of debris on a frequent basis to ensure proper operation.

6) **Infiltration systems:**

(a) **Native Vegetation Planting**

(1) **Establishment** - Immediately after the completion of cell construction, water plant material for 14 consecutive days unless there is sufficient natural rainfall. Bi-weekly weeding will be required for the first one to two years. Carefully remove by hand plants certain to be weeds. Remove entire root of the weedy plants. If chemical weed treatment is required, use the least toxic approach.

(2) **Maintenance**

(i) **Mowing:** After vegetation establishment, if burning cannot be accommodated, mow the plants to a height of 5 to 6 inches once in the fall (after November 1).

(ii) **Burning:** Beginning the second year, burning can occur in the early spring (prior to May 1st) or in the late fall (after November 1st). Burn two consecutive years and then up to three years can pass before the next burning. Do not burn every other year.

(3) **Restoration Procedures**

(i) Twice a year, from March 15th to April 30th and October 1st to November 30th, remove and replace all dead and diseased vegetation considered beyond treatment.

(ii) Once every 2 to 3 years, in the spring, remove old mulch layer before applying new one.

E) **Start up and shutdown procedures:** Discourage infiltration of runoff water during winter months. The system should be “off-line” in the winter.

F) **Vector control requirements:** Abate potential vectors by filling holes in the ground in and around the biofiltration device and by insuring that there are no areas where water stands longer than three days following a storm. If any obstructions develop (e.g. debris accumulation, invasive vegetation, growth of woody or shrubby vegetation, clogging of outlets and/or under drains) within the device, appropriate maintenance activities shall be implemented to correct the obstructions.

G) **Contingency plan in the event of system failure:** Immediate measures should be employed to sandbag the area and stabilize any lawn areas as soon as possible until the system can be evaluated and reconstructed to plan.

STORM SEWER AND DETENTION SYSTEM:

A) Accumulated solids or byproduct removal requirements

Practices shall include removal of excess sediment from within the site’s storm water inlets, conveyance piping, and storage chambers. Note that the storage chambers are a confined access space and special equipment and training are required to enter them.

Periodic removal of sediment will insure proper operation. Also, remove any litter or debris that may obstruct inflow and outflow conditions.

B) Identification of safety hazards

Inspect annually, in the spring, inlet structures to verify they remain installed correctly. This is important for inlets located in pavement areas which may endure heavy traffic and create a hazard if they are not properly seated.

C) Cleaning and inspection schedule

Inspect inlets, piping, and storage chambers annually, in the spring. Observe the system components during rain events to verify the system is operating at top capacity. Identify structures and conveyance piping which may need repair or replacement parts. Remove any debris or litter blocking the inlet structures and pipes. Remove snow and ice from and around inlets to facilitate flow into the system. There are backflow prevention devices and a flow diversion structure installed as part of the project. These should be inspected annually in the spring and after major precipitation events.

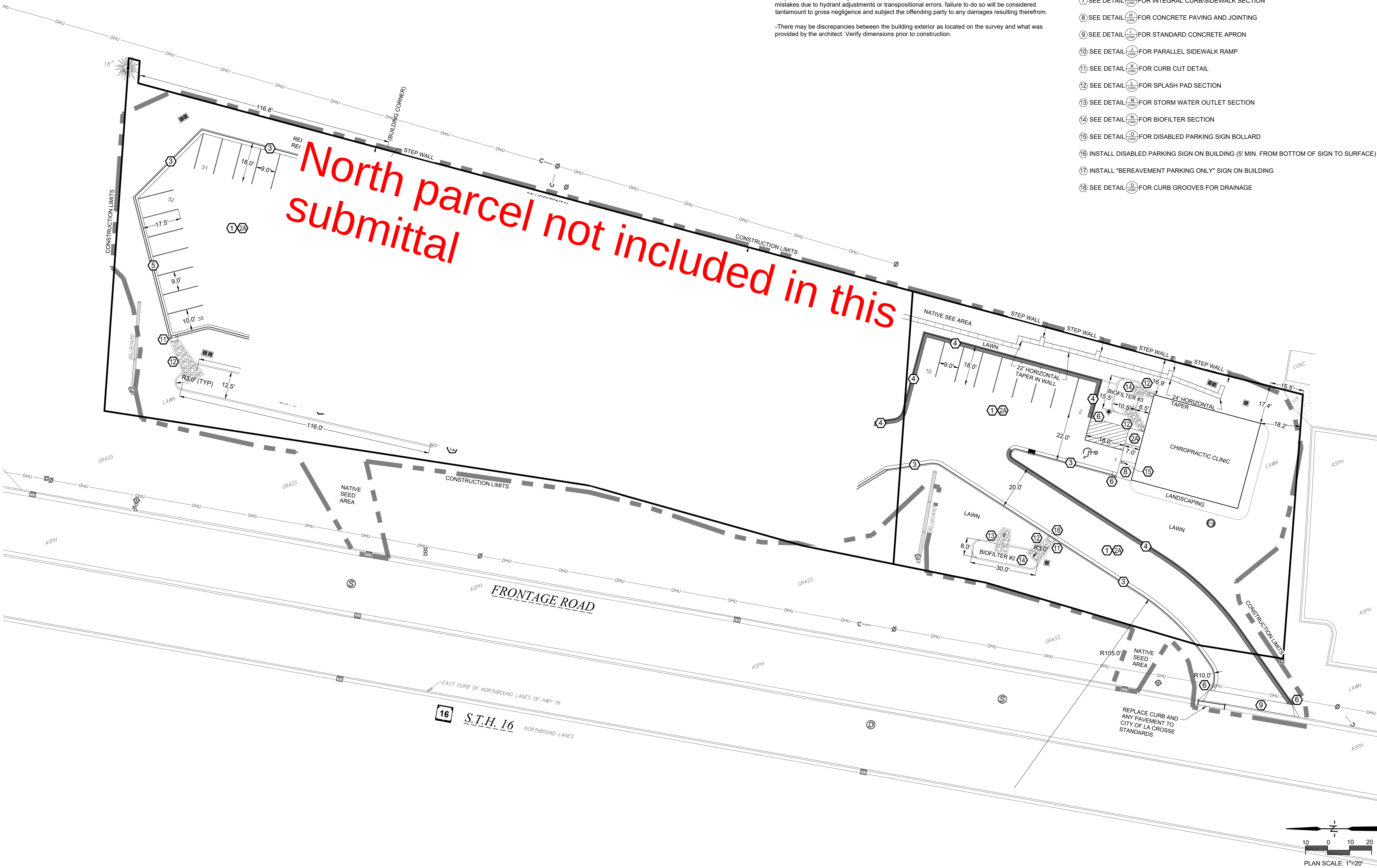
D) Inspection and maintenance checklist

- a. Filters - does not apply to this site
- b. Disinfection units - does not apply to this site
- c. Sedimentation chambers - does not apply to this site
- d. Detention devices – annually in spring
- e. Infiltration systems – does not apply to storm sewer
- f. Flow control devices – annually in spring and after major events

E) Start up and shutdown procedures

Not Applicable.

F) Vector control requirements – periodic removal of sediment from the detention tanks will limit the potential for standing water that may attract mosquitoes and other insects.



SITE NOTES

- The location of existing utilities, both underground and overhead are approximate only and have not been independently verified by the owner or its representatives. The contractor shall be responsible for determining the exact location of all existing utilities, whether shown on these plans or not, before commencing work, and shall be fully responsible for any and all damages which might be caused by the contractor's failure to exactly locate and preserve any and all utilities. CALL DIGGERS HOTLINE (800) 242-8511
- The underground locations of the Public Utilities were marked by representatives of those companies. The locations of the privately owned underground utilities were not marked.
- There may be more underground utility installations within the project area that are not shown.
- It shall be the contractors responsibility to arrange for any necessary inspections by local government that may be required.
- Any and all parties utilizing vertical datum shall always check into at least two (2) benchmarks to avoid mistakes due to hydrant adjustments or transpositional errors. failure to do so will be considered tantamount to gross negligence and subject the offending party to any damages resulting therefrom.
- There may be discrepancies between the building exterior as located on the survey and what was provided by the architect. Verify dimensions prior to construction.

SITE NOTES

- 1 SEE DETAIL (A) FOR ASPHALT PAVEMENT
- 2A SEE DETAIL (B) FOR CONCRETE PAVEMENT - TYPE 1
- 2B SEE DETAIL (B) FOR CONCRETE PAVEMENT - TYPE 2
- 3 SEE DETAIL (C) FOR TYPICAL 24" CURB AND GUTTER SECTION
- 4 SEE DETAIL (D) FOR 24" CURB AND GUTTER SECTION - REVERSE SLOPE
- 5 SEE DETAIL (E) FOR TYPICAL 24" MOUNTABLE CURB & GUTTER
- 6 SEE DETAIL (F) FOR END SECTION CURB AND GUTTER
- 7 SEE DETAIL (G) FOR INTEGRAL CURB/SIDEWALK SECTION
- 8 SEE DETAIL (H) FOR CONCRETE PAVING AND JOINTING
- 9 SEE DETAIL (I) FOR STANDARD CONCRETE APRON
- 10 SEE DETAIL (J) FOR PARALLEL SIDEWALK RAMP
- 11 SEE DETAIL (K) FOR CURB CUT DETAIL
- 12 SEE DETAIL (L) FOR SPLASH PAD SECTION
- 13 SEE DETAIL (M) FOR STORM WATER OUTLET SECTION
- 14 SEE DETAIL (N) FOR BIOFILTER SECTION
- 15 SEE DETAIL (O) FOR DISABLED PARKING SIGN BOLLARD
- 16 INSTALL DISABLED PARKING SIGN ON BUILDING (5' MIN. FROM BOTTOM OF SIGN TO SURFACE)
- 17 INSTALL "BEREAVEMENT PARKING ONLY" SIGN ON BUILDING
- 18 SEE DETAIL (P) FOR CURB GROOVES FOR DRAINAGE

REVISIONS	BY

PARAGON ASSOCIATES

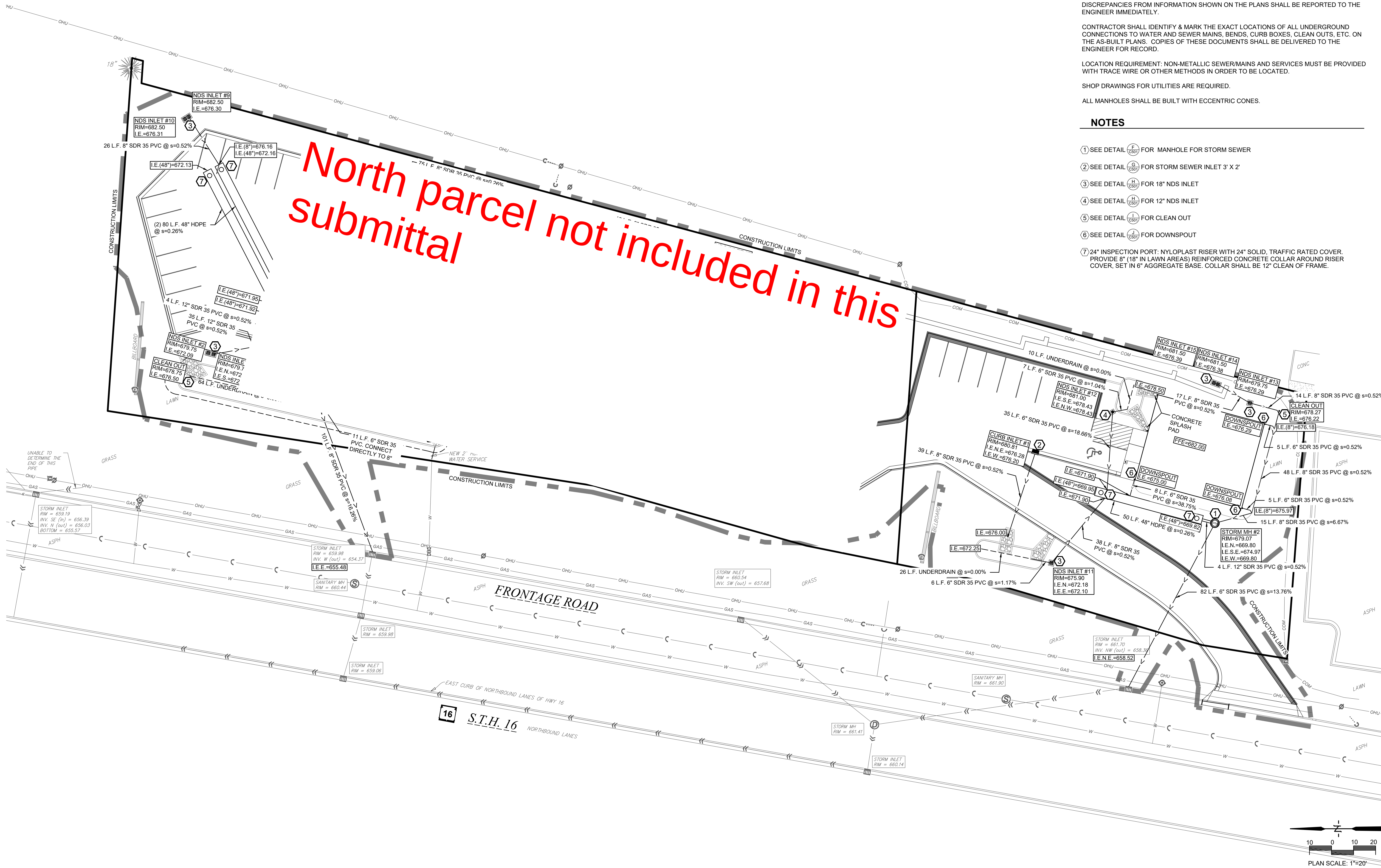
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PREPARED FOR:
DALE JACOBSON

HIGHWAY 16 CLINICS
STATE ROAD 16
LA CROSSE, WISCONSIN
SITE PLAN

DRAWN C.G.
PROJECT No 25-089
DATE 10/06/2025
SCALE 1"=20'
CAD FILE 25-089 La Crosse Vet 06.DWG
SHEET

C100



UTILITY NOTES

ALL WATER & SEWER (STORM & SANITARY) CONSTRUCTION SHALL COMPLY WITH THE LATEST EDITION OF "STANDARD SPECIFICATIONS FOR SEWER & WATER IN THE STATE OF WISCONSIN," ALONG WITH THE CITY OF LA CROSSE STANDARD SPECIFICATIONS, AS APPROPRIATE.

ALL WATER & SANITARY LATERALS SHALL HAVE A MINIMUM DEPTH 6' BELOW FINISHED FLOOR ELEVATIONS. THE CONTRACTOR IS TO COORDINATE ACTIVITIES & CONFIRM LOCATION & ELEVATION OF SERVICES WITH THE ENGINEER.

USE C.L.D.I.P. FOR ALL WATER MAIN.

ALL WATER MAINS SHALL HAVE A MINIMUM OF 7.5' OF COVER.

SUITABLE ON-SITE GRANULAR MATERIAL SHALL BE USED FOR TRENCH BACKFILL TO PROPOSED ELEVATIONS. BACKFILL SHALL BE COMPACTED AS SPECIFIED.

ALL EXISTING INVERTS & LOCATIONS SHALL BE VERIFIED PRIOR TO CONSTRUCTION. ALL DISCREPANCIES FROM INFORMATION SHOWN ON THE PLANS SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.

CONTRACTOR SHALL IDENTIFY & MARK THE EXACT LOCATIONS OF ALL UNDERGROUND CONNECTIONS TO WATER AND SEWER MAINS, BENDS, CURB BOXES, CLEAN OUTS, ETC. ON THE AS-BUILT PLANS. COPIES OF THESE DOCUMENTS SHALL BE DELIVERED TO THE ENGINEER FOR RECORD.

LOCATION REQUIREMENT: NON-METALLIC SEWER/MAINS AND SERVICES MUST BE PROVIDED WITH TRACE WIRE OR OTHER METHODS IN ORDER TO BE LOCATED.

SHOP DRAWINGS FOR UTILITIES ARE REQUIRED.

ALL MANHOLES SHALL BE BUILT WITH ECCENTRIC CONES.

NOTES

- SEE DETAIL (F) FOR MANHOLE FOR STORM SEWER
- SEE DETAIL (G) FOR STORM SEWER INLET 3' X 2'
- SEE DETAIL (H) FOR 18" NDS INLET
- SEE DETAIL (I) FOR 12" NDS INLET
- SEE DETAIL (J) FOR CLEAN OUT
- SEE DETAIL (K) FOR DOWNSPOUT
- 24" INSPECTION PORT: NYLOPLAST RISER WITH 24" SOLID, TRAFFIC RATED COVER. PROVIDE 8" (18" IN LAWN AREAS) REINFORCED CONCRETE COLLAR AROUND RISER COVER. SET IN 6" AGGREGATE BASE. COLLAR SHALL BE 12" CLEAN OF FRAME.

REVISIONS	BY

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PREPARED FOR:
DALE JACOBSON

HIGHWAY 16 CLINICS
STATE ROAD 16
LA CROSSE, WISCONSIN
UTILITY PLAN

DRAWN C.G.
PROJECT No 25-089
DATE 10/09/2025
SCALE 1"=20'
CAD FILE 25-089 La Crosse Vet 06 DWG
SHEET

C400

LIVE WELL CHIROPRACTIC CLINIC NEW BUILDING

PHASE 2 OF STH 16 CLINICS DEVELOPMENT – LA CROSSE

Storm Water Management Plan

APPENDIX F – Universal Soil Loss Equation Results



Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin

WDNR Official Version 1.0 (05-15-2015)



YEAR 1

Developer:

Angela Frank

Project:

Live Well Chiropractic Clinic New Building - 1822 STH 16, La Crosse

Date:

10/13/2025

County:

La Crosse

Version 1.0

Activity	Begin Date	End Date	Period % R	Annual R Factor	Sub Soil Texture	Soil Erodibility K Factor	Slope (%)	Slope Length (feet)	LS Factor	Land Cover C Factor	Soil loss A (tons/acre)	Sediment Control Practice	Sediment Discharge (tons/acre)
Bare Ground	12/1/2025	4/15/2026	6.9%	160	Silt Loam	0.43	10.0%	125	1.54	1.00	7.4	Silt Fence	3.7
Seed with Mulch or Er	4/15/2026	9/30/2026	84.8%	160	Silt Loam	0.43	10.0%	125	1.54	0.10	9.0	Sediment Basin	0.0
End	9/30/2026	-----	-----	-----	-----	-----	10.0%	125	1.54	-----	-----	Sediment Basin	0.0
		-----	-----	-----	-----	-----	10.0%	125	1.54	-----	-----		0.0
		-----	-----	-----	-----	-----	10.0%	0	-----	-----	-----		0.0
		-----	-----	-----	-----	-----	0.0%	0	-----	-----	-----		0.0
TOTAL											16.3	TOTAL	3.7
												% Reduction Required	NONE

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes.

The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization.

For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Recommended Permanent Seeding Dates:

4/15-6/1 and 8/1-8/21 Turf, introduced grasses and legumes
Thaw-6/30 Native Grasses, forbs, and legumes

Designed By:	Robert Haines
Date	10/1/2025