PLANNING AND ZONING BOARD/BOARD OF ZONING APPEALS MEETING AGENDA

Tuesday, August 26, 2025
7:00 PM

THE PLANNING AND ZONING BOARD SHALL HOLD ITS REGULAR MEETING IN THE COUNCIL CHAMBER IN THE CITY HALL, LOCATED AT 121 S. MERIDIAN AVE., BEGINNING AT 7:00 P.M. (MEETING WILL ALSO BE BROADCASTED ON CITY'S YOUTUBE CHANNEL AND/OR COX PUBLIC ACCESS CHANNEL 7)

1) **CALL TO ORDER THE PLANNING AND ZONING BOARD/BOARD OF ZONING APPEALS**

2) **PLEDGE OF ALLEGIANCE**

3) **ROLL CALL**

___Gary Janzen	___Steve Conway	___Dalton Wilson
___Paul Spranger	___Rick Shellenbarger	
___Amy Bradley	___Scot Phillips	

4) **SET/AMEND AGENDA**
Motion made by (_____). Seconded by (_____). For___Against___

5) **APPROVAL OF DRAFT MINUTES**
July 29th, 2025 DRAFT meeting minutes
Motion made by (_____). Seconded by (_____). For___Against___

6) **COMMUNICATIONS**

7) **PUBLIC HEARINGS BEFORE THE PLANNING AND ZONING BOARD/BOARD OF ZONING APPEALS**

1. Review of V-2025-05, application of Larry Hall, Big Larry's Burgers, pursuant to City Code 17.10.08, who is petitioning for a variance to exceed the square footage allowance for signage on property addressed as 328 S. Meridian Ave. Valley Center, KS 67147.

- Chairperson opens hearing for comments from the public: TIME_____
- Chairperson closes public hearing: TIME_____

RECOMMENDED MOTION: Based on the City Staff recommendations, public comments, and discussion by the Board of Zoning Appeals, I _____ make a motion to (**approve**, **deny**, or **table**) V-2025-05. Seconded by_____. For___ Against___

2. Review of RZ-2025-06, application of Spike Anderson, pursuant to City Code 17.11, who is petitioning for a rezoning of land that is currently zoned C-2, which is the City's designation for General Business District, to R-1B, which is the City's designations for Single-Family Residential District. The property is currently vacant, and addressed as 525 S. Abilene Ave. Valley Center, KS 67147.

- Chairperson opens hearing for comments from the public: TIME_____
- Chairperson closes public hearing: TIME_____

RECOMMENDED MOTION: Based on the City staff recommendations, public comments, and discussion by the Planning and Zoning Board, I _____ make a motion to (**approve**, **deny**, or **table**) RZ-2025-06. Seconded by_____. For___ Against___

3. Review of V-2025-06, application of Spike Anderson, pursuant to City Code 17.10.08, who is petitioning for a variance have a lot width narrower than required on property addressed as 525 S. Abilene Ave. Valley Center, KS 67147.

- Chairperson opens hearing for comments from the public: TIME_____
- Chairperson closes public hearing: TIME_____

RECOMMENDED MOTION: Based on the City Staff recommendations, public comments, and discussion by the Board of Zoning Appeals, I _____ make a motion to (**approve**, **deny**, or **table**) V-2025-06. Seconded by_____. For___ Against___

4. Review of SD-2025-03, application of 4Front LLC, pursuant to City Code 16.04, who is petitioning for approval of a preliminary plat for land located on the east side of Interurban Dr. between Meadow Rd and 93rd St N (not currently addressed), Valley Center, KS 67147.

- Chairperson opens hearing for comments from the public: TIME_____
- Chairperson closes public hearing: TIME_____

RECOMMENDED MOTION: Based on the City Staff recommendations, public comments, and discussion by the Board of Zoning Appeals, I _____ make a motion to (**approve**, **deny**, or **table**) SD-2025-03. Seconded by_____. For___ Against___

5. Review of SU-2025-01, application of Howard Hancock and Terry Sowers, pursuant to City Code 17.11, who are petitioning for a special use application for a pallet recycling facility on property addressed as 201 S. Cedar Ave. Valley Center, KS 67147.

- Chairperson opens hearing for comments from the public: TIME_____
- Chairperson closes public hearing: TIME_____

RECOMMENDED MOTION: Based on the City Staff recommendations, public comments, and discussion by the Board of Zoning Appeals, I _____ make a motion to (**approve**, **deny**, or **table**) SU-2025-01. Seconded by_____. For___ Against___

8) OLD/UNFINISHED BUSINESS

1. V-2025-03

9) NEW BUSINESS

1. Consider changing the October meeting date.

10) STAFF REPORTS

11) ITEMS BY PLANNING AND ZONING BOARD/BZA MEMBERS:

___Gary Janzen	___Steve Conway	___Dalton Wilson
___Paul Spranger	___Rick Shellenbarger	
___Amy Bradley	___Scot Phillips	

12) ADJOURNMENT OF THE PLANNING AND ZONING BOARD/BZA

Motion made by _____. Seconded by _____. For___ Against___

Note to Planning and Zoning Board Members: If you are unable to attend this meeting, please contact Kyle Fiedler (316-755-7320) prior to the meeting.

*All items listed on this agenda are potential action items unless otherwise noted. The agenda may be modified or changed at the meeting without prior notice. At anytime during the regular Planning and Zoning Board meeting, the Planning and Zoning Board may meet in executive session for consultation concerning cases to be deliberated. This is an open meeting, open to the public, subject to the Kansas Open Meetings Act (KOMA). The City of Valley Center is committed to providing reasonable accommodations for persons with disabilities upon request of the individual. Individuals with disabilities requiring an accommodation to attend the meeting should contact the Community Development Department in a timely manner, at **communitydevelopment@valleycenterks.org** or by phone at (316)755-7320. For additional information on any item on the agenda, please visit **www.valleycenterks.org** or call (316) 755-7320.*

PLANNING AND ZONING BOARD/BOARD OF ZONING APPEALS MEETING MINUTES

CITY OF VALLEY CENTER, KANSAS

Tuesday, July 29, 2025 7:00 P.M.

CALL TO ORDER: Vice-Chair, Paul Spranger, called the meeting to order at 7:05 P.M. with the following board members present: Steve Conway, Rick Shellenbarger, Scot Phillips, Dalton Wilson, Gary Janzen.

Members Absent: Amy Bradley

City Staff Present: Kyle Fiedler

Audience: Jonathan Suda, Jake Vasa, Jeremy Spexarth and Genni Trilli.

AGENDA: A motion was made by Spranger and seconded by Wilson to set the agenda, with a correction to Public Hearing 2, correcting the applicant's name to K2 Investments LLC. Motion passed unanimously.

APPROVAL OF DRAFT MINUTES: Spranger made a motion to approve May 27, 2025, meeting minutes. The motion was seconded by Wilson. Motion passed unanimously.

COMMUNICATIONS: none

PUBLIC HEARING BEFORE THE PLANNING AND ZONING BOARD/BOARD OF ZONING APPEALS:

1. Review of V-2025-03, application of Carlos Torres & Sonnee Fisher, pursuant to City Code 17.10.08, who is petitioning for a variance to construct an accessory structure prior to a principal structure on property addressed as 2525 E Ford St. Valley Center, KS 67147.

Fiedler briefly reviewed this item, which was tabled at the last meeting. After speaking with the applicant, staff are recommending to table for one more month and bring this back at the August 26, 2025 meeting.

Based on the City Staff recommendations, public comments, and discussion by the Planning and Zoning Board, Wilson made a motion to table the variance for V-2025-03 until the August 26, 2025 PZB Meeting. Motion was seconded by Shellenbarger. The vote was unanimous. Motion passed.

2. Review of RZ-2025-05, application of K2 Investments LLC, pursuant to City Code 17.10.08, who is petitioning for a rezoning of land that is currently zoned R-1B, which is the City's designation for a Single-Family Residential District, to R-2, which is the City's designation for Two-Family Residential District. The property is currently un-addressed, located between 409 N Meeds and 431 W 3rd, Valley Center, KS 67147.

Fiedler reviewed his staff report, sharing that this lot meets the minimum size requirements for R-2 zoning, about one block away, another spot-zone was approved for R-2. There have been no communications from the public about this re-zone and notification was sent to those within 200 feet of this property. Staff are recommending approval.

Janzen opened the hearing for comments from the public: 7:12 PM

Janzen asked if there were any members in the audience who would like to speak on this item.

Janzen closed the hearing for comments from the public: 7:13 PM

Shellenbarger confirmed that the lot size met the requirements of R-2 and asked if a duplex would fit. Fiedler shared that no site plan has been submitted to show the layout of the proposed building.

Wilson voiced concerns over parking issue on the curve, as this was a major issue discussed during another recent rezoning in the area.

Based on the City Staff recommendations, public comments, and discussion by the Planning and Zoning Board, Janzen made a motion to approve RZ-2025-05. Motion was seconded by Conway. The vote was 5 to 1 with Wilson voting against. Motion passed.

OLD/UNFINISHED BUSINESS: none

NEW BUSINESS:

1. Due to scheduling conflicts, Fiedler is requesting the September Planning and Zoning meeting be rescheduled to September 18th. Consensus from the board was to move the meeting.
2. 4Front LLC requested that Planning and Zoning look at their sketch of a plat they intend to bring back as a preliminary plat. Fiedler shared that the plat is proposed as R-2, but after speaking with the Applicant's engineer, they might change to R-1B as they intend to build single family homes. There might be some requested/ recommended changes to lot width, while they meet the minimum in the proposed zoning, there might be future parking issues created by the narrow lots. Jake Vasa with SEH reviewed the plat as the engineer on the project. Jeremy Spexarth and Jonathan Suda shared their vision for 1,200-1,400 square foot slab on grade homes with higher-end finishings. The consensus was for staff and the applicant to review and bring back as a preliminary plat.

STAFF REPORTS: none

ITEMS BY PLANNING AND ZONING BOARD/BZA MEMBERS:
Gary Janzen - none
Paul Spranger - none
Rick Shellenbarger - none
Scot Phillips - none
Steve Conway - none
Dalton Wilson – none

Amy Bradley – absent

ADJOURNMENT OF THE PLANNING AND ZONING BOARD/BOARD OF ZONING APPEALS MEETING: At 7:35 P.M., a motion was made by Janzen to adjourn and seconded by Shellenbarger. The vote was unanimous, and the meeting was adjourned.

Respectfully submitted,

_____
/s/ Kyle Fiedler, Secretary

_____
Gary Janzen, Chairperson

Date: August 26th, 2025

Present Zoning: C-2 (General Business District)

Variance Requests: The applicant, Larry Hall, Big Larry's Burgers, pursuant to City Code 17.10.08, is petitioning to exceed the square footage limit for signage.

Applicant: Larry Hall

Property Address: 328 S Meridian, Valley Center, KS 67147 (outlined in red below)

Applicant's Reasons for Variance Request:
Per the City of Valley Center's Zoning Code (17.07.08), the maximum gross surface area allowed on a C-2 zoned lot is two square feet of sign area for each one foot lineal street frontage; provided, no single sign shall exceed a gross surface area of 150 square feet, except for advertising signs that shall not exceed 200 square feet, and for a monument sign, a maximum width of 5 feet, and a maximum length of 15 feet.

Review Standards for a Variance per 17.10.08.D. *(standards in italics)*:

1. *That the variance requested arises from such condition which is unique to the property in question, and which is not ordinarily found in the same zoning district and is not created by an action or actions of the property owner or the applicant.*

   This variance request is unique to this property, the applicant has already placed new/ additional signs on the property, which appears to have five businesses occupying the building. Neighboring C-2 properties do not have this much square footage of signage.

   The property in question has 127 feet of street frontage, allowing for 254 square feet of signage.

2. *That granting of the variance will not adversely affect the rights of adjacent property owners or residents.*

   The granting of this variance will not adversely affect the rights of adjacent property owners/residents. A public notice was published in *The Ark Valley News* and notice letters were mailed to all property owners within 200 feet of the applicant's property boundaries in the City limits. To date there has been no contact with the City Staff regarding this variance request. Any further responses received after the creation of this staff report will be shared with the Board of Zoning Appeals during the August 26th, 2025, board meeting.

3. *That strict application of the provisions of these regulations from which a variance is requested will constitute unnecessary hardship upon the property owner represented in the application.*

   The variance requested would allow the property owner to keep the signage that they have already placed on the property. If the variance is not approved, the property owner would be out the cost of the new signage that has been placed on the property.

4. *That the variance desired will not adversely affect the public health, safety, morals, order, convenience, prosperity, or general welfare.*

   The variance will not adversely affect the public health, safety, morals, order, convenience, prosperity, or general welfare of the surrounding neighbors or the community in general, if the variance request is approved.

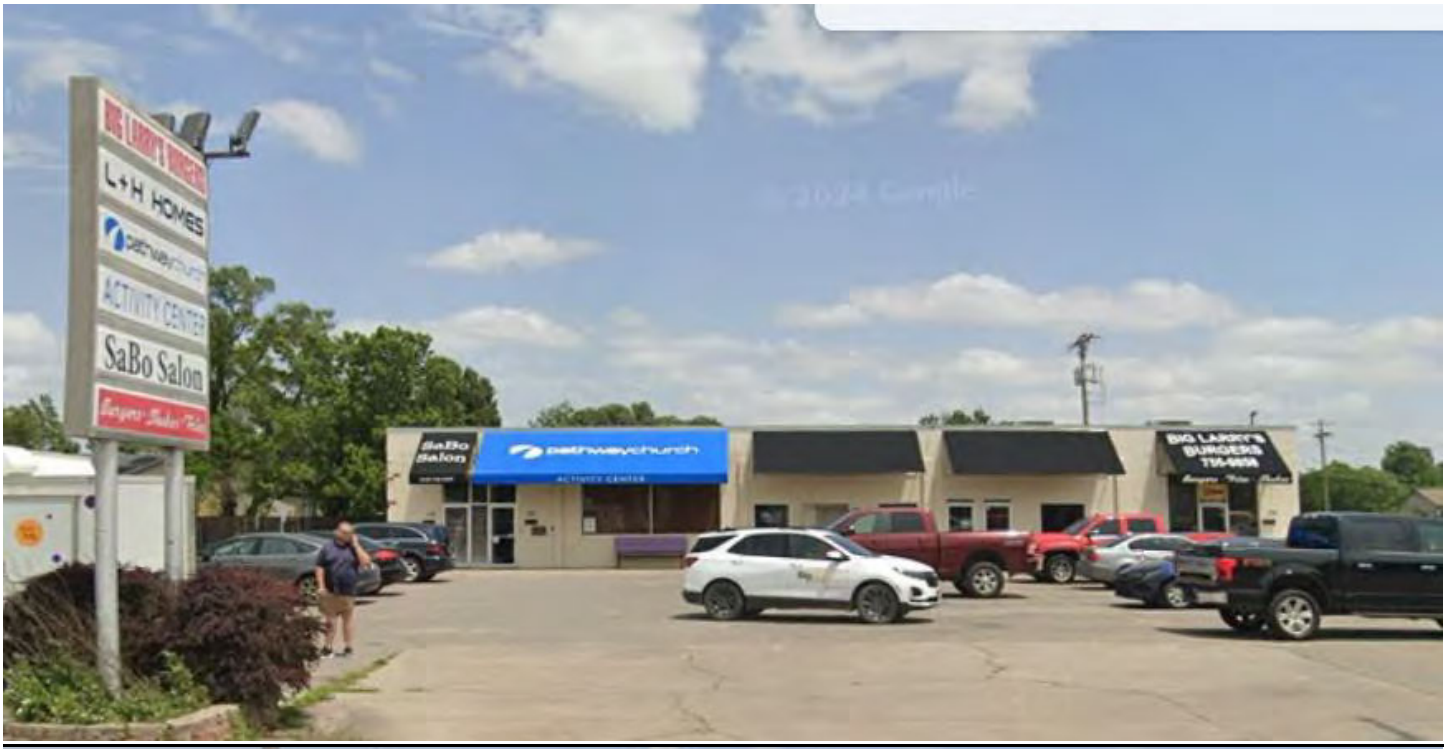
5. *That granting the variance desired will not be opposed to the general spirit and intent of these regulations.*

   The spirit and intent of the Zoning Regulations regarding signage will generally be met, as they are allowed one of each structural type of sign on their property. They currently have one pole sign, one banner sign. They have multiple awnings signs, which Big Larry's has two. The property owners will be required to get sign permits for the two new signs that have recently been placed on the property.

Staff Review: The property is allowed to have the pole sign, an awning sign and a banner sign, however the regulations allow for the total signage to be 254 square foot based on the street frontage of 127 feet.
The pole sign has approximately 108 square feet.
The awnings that have signage now are approximately 544 square feet.
The banner sign is 204 square feet.
The total square footage of signage on this property is currently approximately 856 square feet.
Prior to the two recent signs that were added, there was approximately 526 square feet of signage.

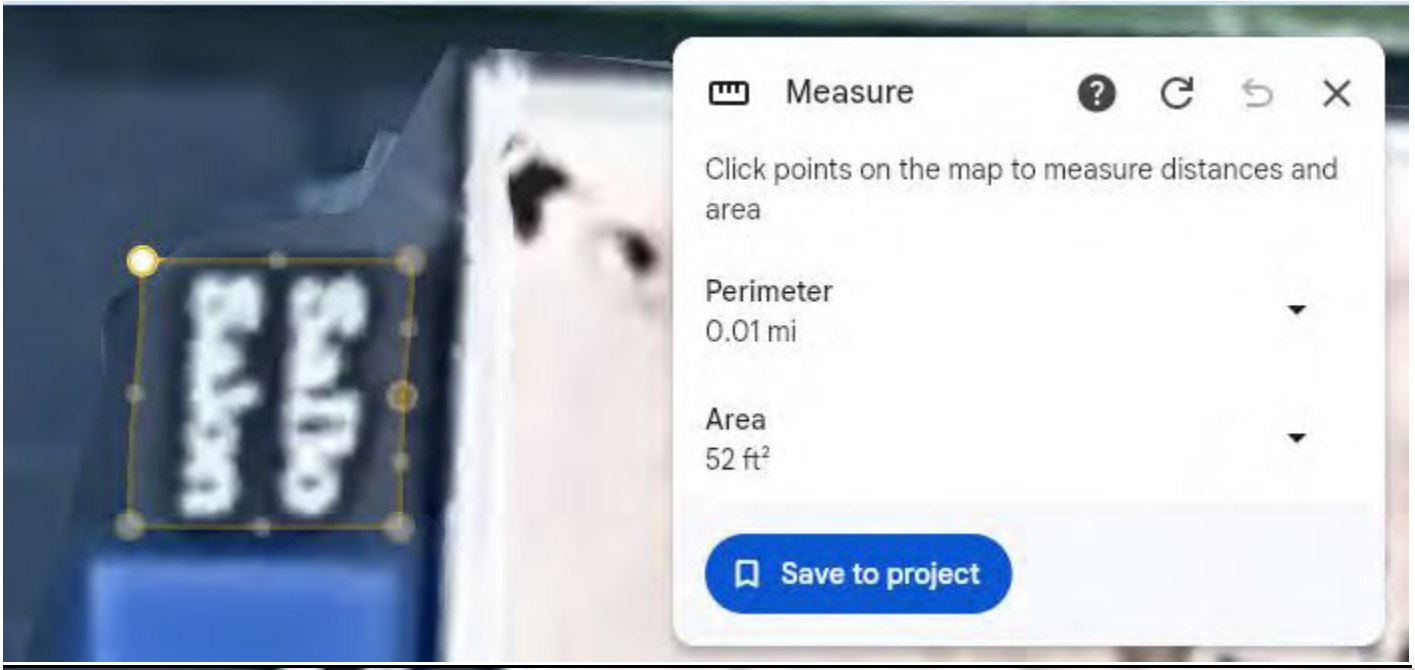
Staff Recommendation: Staff remain neutral on a recommendation as 328 S. Meridian, Valley Center KS 67147 is unique in the number of businesses that occupy space; however they are considerably over the square footage that code allows.

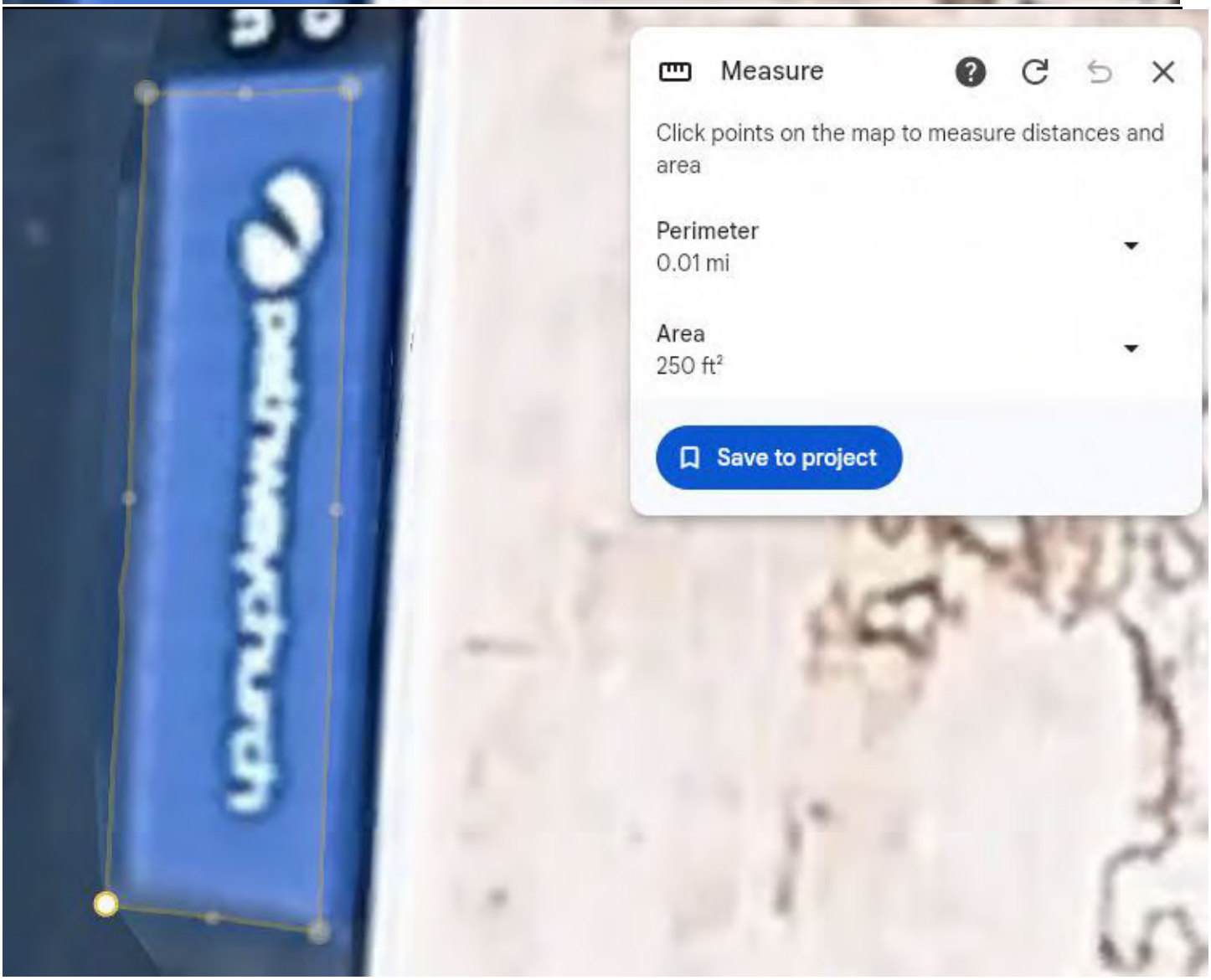
Signage Prior:



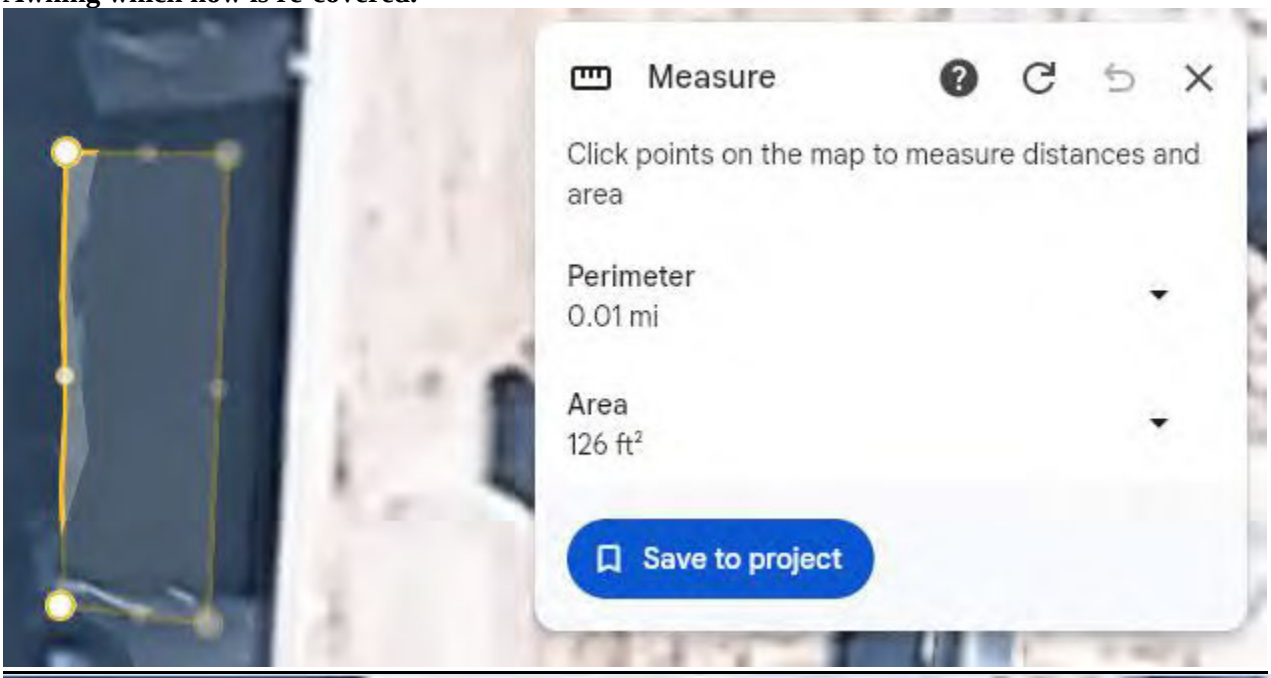
Current Signage:

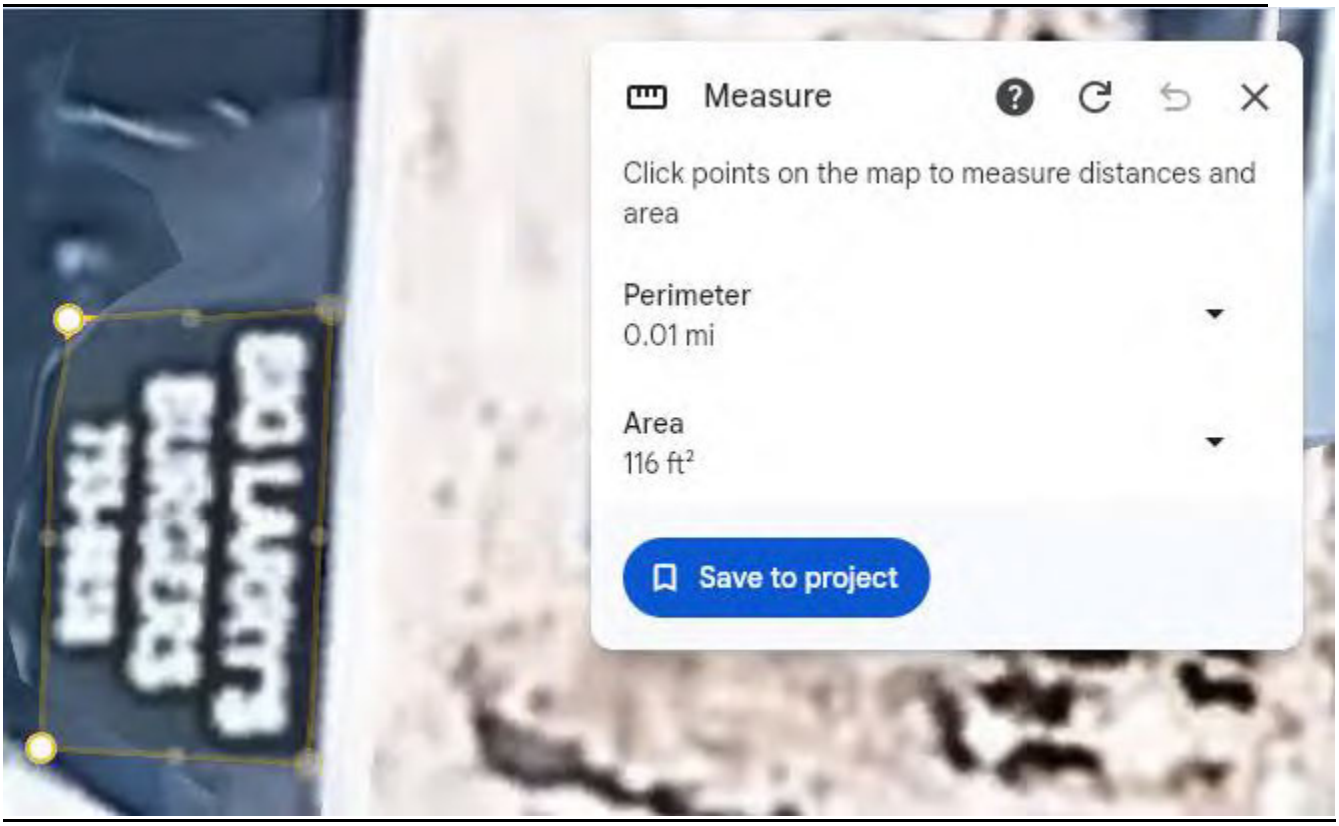
Signage measured using Google Earth





Awning which now is re-covered.





City of Valley Center

Case No. VAR 2025-05 250353

VARIANCE APPLICATION

This application is for a Variance before the City Board of Appeals. The form must be completed in accordance with directions on the accompanying instructions and filed with the Zoning Administrator at Public Works, 545 W. Clay Street, Valley Center, Kansas 67147-0188 or FAX: (316) 755-7324. An incomplete application will not be accepted. For questions, call (316) 755-7310.

Property owner(s) Name & Address Bogers bait hole LLC 328 S. Meridian Valley Center KS

Phone 316-871-3413 fax# _____

Petitioners Name & Address Larry Hall (Big Larry's Burgers LLC) 328. S. Meridian Valley Center KS 67147

Phone 316-755-9858 fax# _____

Contact email address [redacted].com Contact Cell Phone 316-640-2312

Relationship of applicant to property is that of X Owner ____Tenant ____Lessee ____Other

Variance Requested:
Requesting to go over on square footage of signage for the strip mall and allow Big Larrys Burgers LLC to keep the banner up by the drive thru window

Address/Location of Request 328 S. Meridian ave, Valley Center, KS. 67147

Parcel number(s) 0870293103205010000

Property Zoning is now Commercial

The applicant or his/her authorized agent acknowledges all of the following:

1. That he/she has received instruction material concerning the filing and hearing of this matter.
2. That he/she has been advised of the fee requirements established and that the fee accompanies this application.
3. That he/she has been advised of his/her rights to bring action in the District Court of the County to appeal a decision of the Board of Zoning Appeals.
4. That all documents are attached to this petition as noted in the instructions.

Larry S. Hall	7-9-25		
Applicant	Date	Agent (If any)	Date

Office use only

A pre-application meeting occurred with the applicant on _____. This application was received at _____ (am) (pm) on _____, 20__ by the Zoning Administrator acting on behalf of the Board of Zoning Appeals. It has been checked and found to be complete and accompanied by the required documents and a nonrefundable fee of **$200.**


Big Larry's Burgers
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316-755-9858
OR
Order Online
BigLarrysBurgers.com
Open Daily
11-9
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Date: August 26th, 2025

Present Zoning: C-2 (General Business District)

Variance Requests: The applicant, Spike Anderson, pursuant to City Code 17.10.08, is petitioning to have a smaller lot width than required.

Applicant: Spike Anderson

Property Address: 525 S Abilene, Valley Center, KS 67147 (outlined in red below)

Applicant's Reasons for Variance Request:
Per the City of Valley Center's Zoning Code (17.04.05), the minimum lot width in R-1B zoning is 60 feet at the setback line. Due to the nature of the shape of the lot the measurement at the setback line based on GIS measurements is just shy of the 60' minimum. The applicant is seeking this variance in conjunction with a re-zoning to be able to build a single-family home.

Review Standards for a Variance per 17.10.08.D. *(standards in italics)*:

1. *That the variance requested arises from such condition which is unique to the property in question, and which is not ordinarily found in the same zoning district and is not created by an action or actions of the property owner or the applicant.*

   This variance request is unique to this property, as this parcel was recently split off of the parcel behind it and then sold to the applicant. This lot is currently zoned C-2, but a proposed rezone will allow this property to be developed similar to those around it. The nature of the shape and size it due to this originally being platted for commercial use, and now being proposed to be developed as single-family like the adjacent neighborhood.

2. *That granting of the variance will not adversely affect the rights of adjacent property owners or residents.*

   The granting of this variance will not adversely affect the rights of adjacent property owners/residents. A public notice was published in *The Ark Valley News* and notice letters were mailed to all property owners within 200 feet of the applicant's property boundaries in the City limits. To date there has been one contact with the City Staff regarding this variance request. The party was curious as to the intent but did not share any opposition. Any further responses received after the creation of this staff report will be shared with the Board of Zoning Appeals during the August 26th, 2025, board meeting.

3. *That strict application of the provisions of these regulations from which a variance is requested will constitute unnecessary hardship upon the property owner represented in the application.*

   The variance requested would allow the property owner to build a single-family home if his re-zoning request is also approved. If both requests are denied, the owner may experience a hardship as he owns the lot in question already.

4. *That the variance desired will not adversely affect the public health, safety, morals, order, convenience, prosperity, or general welfare.*

   The variance will not adversely affect the public health, safety, morals, order, convenience, prosperity, or general welfare of the surrounding neighbors or the community in general, if the variance request is approved.

5. *That granting the variance desired will not be opposed to the general spirit and intent of these regulations.*

   The spirit and intent of the Zoning Regulations regarding all requirements for R-1B will be met except minimum lot width, which is very close, will be met. Because all of the requirements but one are met, this variance wouldn't be against the general spirit and intent of the regulations.

Staff Recommendation: Staff recommend approval of the variance for the minimum lot width to be less than 60' at the setback line at the property addressed as 525 S. Abilene Ave, Valley Center, KS 67147, contingent upon the rezoning request being approved.

250383

City of Valley Center Case No. VAR 2025 - 06

VARIANCE APPLICATION

This application is for a Variance before the City Board of Appeals. The form must be completed in accordance with directions on the accompanying instructions and filed with the Zoning Administrator at Public Works, 545 W. Clay Street, Valley Center, Kansas 67147-0188 or FAX: (316) 755-7324. An incomplete application will not be accepted. For questions, call (316) 755-7310.

Property owner(s) Name & Address Spike Anderson

Phone 316-871-3413 fax# _____

Petitioners Name & Address _____

Phone _____ fax# _____

Contact email address [redacted]tmail.com Contact Cell Phone _____

Relationship of applicant to property is that of ✓ Owner ____Tenant ____Lessee ____Other

Variance Requested:
To have a minimum lot width of 50' instead of 60' if rezone is approved.

Address/Location of Request 525 S. Abilene

Parcel number(s) 30030217

Property Zoning is now C-2

The applicant or his/her authorized agent acknowledges all of the following:

1. That he/she has received instruction material concerning the filing and hearing of this matter.
2. That he/she has been advised of the fee requirements established and that the fee accompanies this application.
3. That he/she has been advised of his/her rights to bring action in the District Court of the County to appeal a decision of the Board of Zoning Appeals.
4. That all documents are attached to this petition as noted in the instructions.

Spike Anderson 8/5/25 _____ _____

Applicant Date Agent (If any) Date

Office use only

A pre-application meeting occurred with the applicant on _____. This application was received at _____ (am) (pm) on _____, 20__ by the Zoning Administrator acting on behalf of the Board of Zoning Appeals. It has been checked and found to be complete and accompanied by the required documents and a nonrefundable fee of **$200.**

Kyle Fiedler

From: Spike Anderson <[redacted]>
Sent: Monday, July 28, 2
To: Kyle Fiedler
Subject: re-zoning and variance request

Mr. Fielder,

I am reques. ng a re-zoning of 525 S Abilene from C-2 to R-1B. We recently bought the lot from a business to the west and split the lot from that property.

My intentions are to build a single-family residence, aligning more closely with the neighborhood.

Additionally, the lot is bigger than most in the area but it is an odd shape and I am requesting a variance to the minimum lot width.

Please let me know if you have other questions. Thank you for your time.

Spike Anderson
(316) 871-3413

Date: August 26th, 2025

Present Zoning: C-2 (General District)

Proposed Zoning: R-1B (Single-Family Residential District)

Rezoning Application Case Number: RZ-2025-06

Applicant: Spike Anderson

Property Address: 525 S. Abilene, vacant lot, Valley Center, KS 67147 (outlined in red below)

Applicant's Reasons for Rezoning: The applicant is requesting a rezoning from C-2 (general business) to R-1B (single-family) to build a new single-family structure. The applicant's request letter is attached to the end of this staff report.

Review Criteria for a Zoning Amendment per 17.11.01.H *(criteria in italics)*

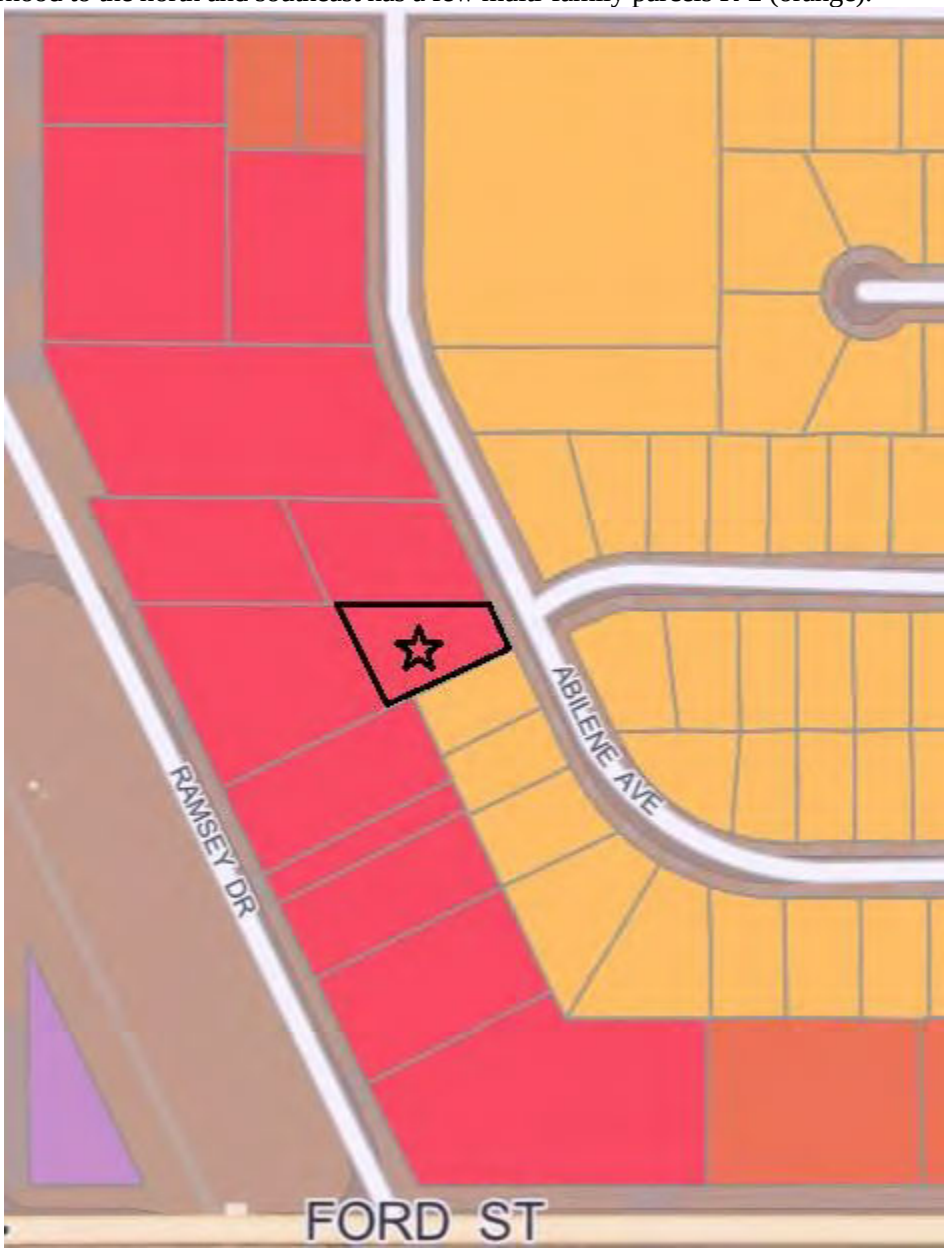
1. *What is the character of the subject property and the surrounding neighborhood in relation to existing uses and their condition?*

   The subject property currently is vacant. Adjacent to the east, northeast and south are R-1B. To the north, west and southwest are C-2.

2. *What is the current zoning of the subject property and that of the surrounding neighborhood in relationship to the requested change?*

The current zoning of the subject property is C-2 (General Business District). The surrounding zoning and land uses are as follows (see map below, subject property denoted by red star):

- Adjacent properties to the North are C-2 (red).
- Adjacent properties to the West and Southwest are C-2 (red).
- Adjacent properties to the South, Southeast, East and Northeast are R-1B (yellow)
- Neighborhood to the north and southeast has a few multi-family parcels R-2 (orange).



3. *Is the length of time that the subject property has remained undeveloped or vacant as zoned a factor in the consideration?*

   Yes, this property has either never been developed, or has been vacant many years and was recently split off of another parcel of land. With the recent split, this is an appropriate time to consider the rezone, especially with it being within/ adjacent to an existing residential neighborhood.

4. *Would the request correct an error in the application of these regulations?*

   No

5. *Is the request caused by changed or changing conditions in the area of the subject property and, if so, what is the nature and significance of such changed or changing conditions?*

Yes, the parcel was recently split off of a commercial parcel with and exiting business on it. This parcel has road frontage in a residential neighborhood.

6. *Do adequate sewage disposal and water supply and all other necessary public facilities including street access exist or can they be provided to serve the uses that would be permitted on the subject property?*

   Yes, public water, sanitary sewer, paved street, storm sewer and waste services are available to the subject property.

7. *Would the subject property need to be platted or replatted or in lieu of dedications made for rights-of-way, easements, and access control or building setback lines?*

   N/A, the subject property has already been platted and does not need to be replatted.

8. *Would a screening plan be necessary for existing and/or potential uses of the subject property?*

   No

9. *Is there suitable vacant land or buildings available or not available for development that currently has the same zoning?*

   While there are many R-1B parcels available in town, this property in an existing residential neighborhood is unique.

10. *If the request is for business or industrial uses, are such uses needed to provide more services or employment opportunities?*

    N/A

11. *Is the subject property suitable for the uses in the current zoning to which it has been restricted?*

    Yes, it meets the requirements for the current zoning designation.

12. *To what extent would the removal of the restrictions, i.e., the approval of the zoning request detrimentally affect other property in the neighborhood?*

    The rezoning request will not have a negative impact on the surrounding properties. This neighborhood is split at this property between single-family and general business. The make up of the neighborhood wouldn't be drastically different with the addition of one more home.

13. *Would the request be consistent with the purpose of the zoning district classification and the intent and purpose of these regulations?*

    Yes

14. *Is the request in conformance with the Comprehensive Plan and does it further enhance the implementation of the Plan?*

    Yes, the Plan calls for additional housing variety.

15. *What is the nature of the support or opposition of the request?*

    - City staff supports this rezoning. The standard public notice was published in *The Ark Valley News* and notices were sent out to surrounding property owners. As of the date of this report, there has been one contact, who was just asking for clarification and did not speak in favor or opposition of the rezoning.
    - Other public comments in support or opposition will not be known until the public hearing. Any comments received by staff between the day the packet is sent and the hearing will be shared with the Board.

16. *Is there any information or are there recommendations on this request available from professional persons or persons with related expertise which would be helpful in its evaluation?*

    No

17. *By comparison, does the relative gain to the public health, safety and general welfare outweigh the loss in value or the hardship imposed upon the applicant by not approving the request?*

    No

City staff recommends approval of this rezoning application.

250367
RZ 2025-06

City of Valley Center

Case No. PL_____

REZONING/LAND USE AMENDMENT APPLICATION

This application is for a Rezoning/Land Use Amendment before the City Planning Commission. The form must be completed and filed with the Zoning Administrator at Public Works, 545 W Clay Street, Valley Center, Kansas 67147-0188 or FAX: (316) 755-7324. An incomplete application will not be accepted. For questions, call (316) 755-7310, ext. 103.

Property owner(s) Name & Address Spike Anderson 533 N Valley Creek Cir

Phone 316.871.3413 fax# _____

Petitioner's Name & Address _____

Phone _____ fax# _____

Contact email address [redacted] Contact Cell Phone _____

Relationship of applicant to property is that of ✓ Owner ___ Tenant ___ Lessee ___ Other

Property Zoning/Land Use Plan is now C-2

Proposed Rezoning/Land Use Plan Amendment R-1B

Property shown on Valley Center Land Use Plan is now _____

Address/Location of Request 525 S. Abilene

Justification for Rezoning/Land Use Plan Amendment (attach narrative to application)

The undersigned petitioner understands the following conditions of this application:

1. That he/she has been advised of the fee requirements established and that the fee accompanies this application for a Rezoning/Land Use Amendment.
2. That the Planning Commission can only recommend action and the City Council must ratify the Planning Commission's decision as the final decision of the City.

Spike Anderson — Applicant; 7/20/25 — Date; _____ — Agent (If any); _____ — Date

---

Office use only

A pre-application meeting occurred with the applicant on _____. This application was received at _____ (am) (pm) on _____, 20__ by the Zoning Administrator acting on behalf of the Planning Commission and City Council. It has been checked and found to be complete. Nonrefundable fee varies, depending upon the zoning classification being requested.

Zoning Application fee for a rezoning is $300 other than a PUD, which is $500

Kyle Fiedler

From: Spike Anderson <[redacted]>
Sent: Monday, July 28, 2025 11:59 AM
To: Kyle Fiedler
Subject: re-zoning and variance request

Mr. Fielder,

I am requesting a re-zoning of 525 S Abilene from C-2 to R-1B. We recently bought the lot from a business to the west and split the lot from that property.

My intentions are to build a single-family residence, aligning more closely with the neighborhood.

Additionally, the lot is bigger than most in the area but it is an odd shape and I am requesting a variance to the minimum lot width.

Please let me know if you have other questions. Thank you for your time.

Spike Anderson
(316) 871-3413

Date: August 26th, 2025

To: City of Valley Center Planning and Zoning Board

From: Kyle Fiedler, *Community Development Director*

Preliminary Plat Approval for Vale Pointe (SD-2025-03)

4Front LLC, pursuant to Section 16.04., is petitioning the City of Valley Center Planning and Zoning Board to approve a preliminary plat for the land (outlined in red below) currently not addressed, but east of Interurban Dr between 93rd St N and of the intersection of High Point Rd and East Point Rd in Valley Center, KS 67147.

Applicant's Reasons for Platting:

The applicant is seeking to sub-divide these 61-acres into 181 single-family residential lots through the platting process.

Staff Comments:

The preliminary plat has been reviewed by the City Staff Review Team, which has provided multiple comments/revisions that have been incorporated into the preliminary plat documents, which are included as a separate attachment with this staff report. The preliminary plat meets all the requirements listed in the required contents section (16.05.01) for preliminary plats submitted to the City of Valley Center for approval. Once the preliminary plat is approved by the Planning and Zoning Board, the final plat will be reviewed by City Staff and the Planning and Zoning Board for approval (which will be scheduled for a later date). Once the final plat is approved by this board, it will go to City Council for final approval. At the time of platting, it is proposed to zone R-1B (Single-Family Residential). As currently shown, this plat will create a total of 181 new residential parcels.

A public notice was published in *The Ark Valley News*, along with letters sent to all property owners within 200 feet of the boundary inside the City Limits and within 1,000 feet in the County of the proposed preliminary plat. As of the date of this report, there have been three contacts made. Concerns raised include traffic on Quail, drainage, and preserving the trees along the eastern boundary of this plat.

Staff Recommendation:

City staff recommend approval of this preliminary plat application.

CITY OF VALLEY CENTER PLATTING APPLICATION

x	**PRELIMINARY PLAT**	$350 (fee is nonrefundable)
x	**FINAL PLAT**	$150 (fee is nonrefundable)
_____	**CORRECTING PLATTING ERROR**	$100 (fee is nonrefundable)

Property owner(s) Name & Address 4Front, LLC - 8918 W. 21ST STREET, STE. 200 WICHITA, KS 67205

Phone (316) 558-0067 fax# _____

Petitioners Name & Address SAME

Phone _____ fax# _____

Email address/ Cell Phone of contact person: [redacted]

Location of Subdivision WEST OF VILLAGE MEADOWS ALONG INTERURBAN DR.

Parcel(s) numbers 30031002 & 00315194

Property shown on Valley Center Land Use Plan as RESIDENTIAL

Total acreage of Plat 60.997

Total number of lots 181

The following materials must be submitted with the plat. The application is not considered complete and ready for review until all materials are submitted.

- _____ This Application Form
- _____ One (1) original copy, two (2) scaled copies (24" x 36") and 12 11" x 17" copies
- _____ Layout of public improvements
- _____ Street plans and profiles (if applicable)
- _____ Soil testing results (if necessary)
- _____ Any Restrictive covenants
- _____ A list of all benchmarks
- _____ Property owners association (if applicable)
- _____ Final storm water runoff and erosion control plans
- _____ Copy of Developers Agreement (if any)
- _____ Dedication of Right-of-Way

Filed by:

Jeremy Spexarth JEREMY SPEXARTH

Office use only

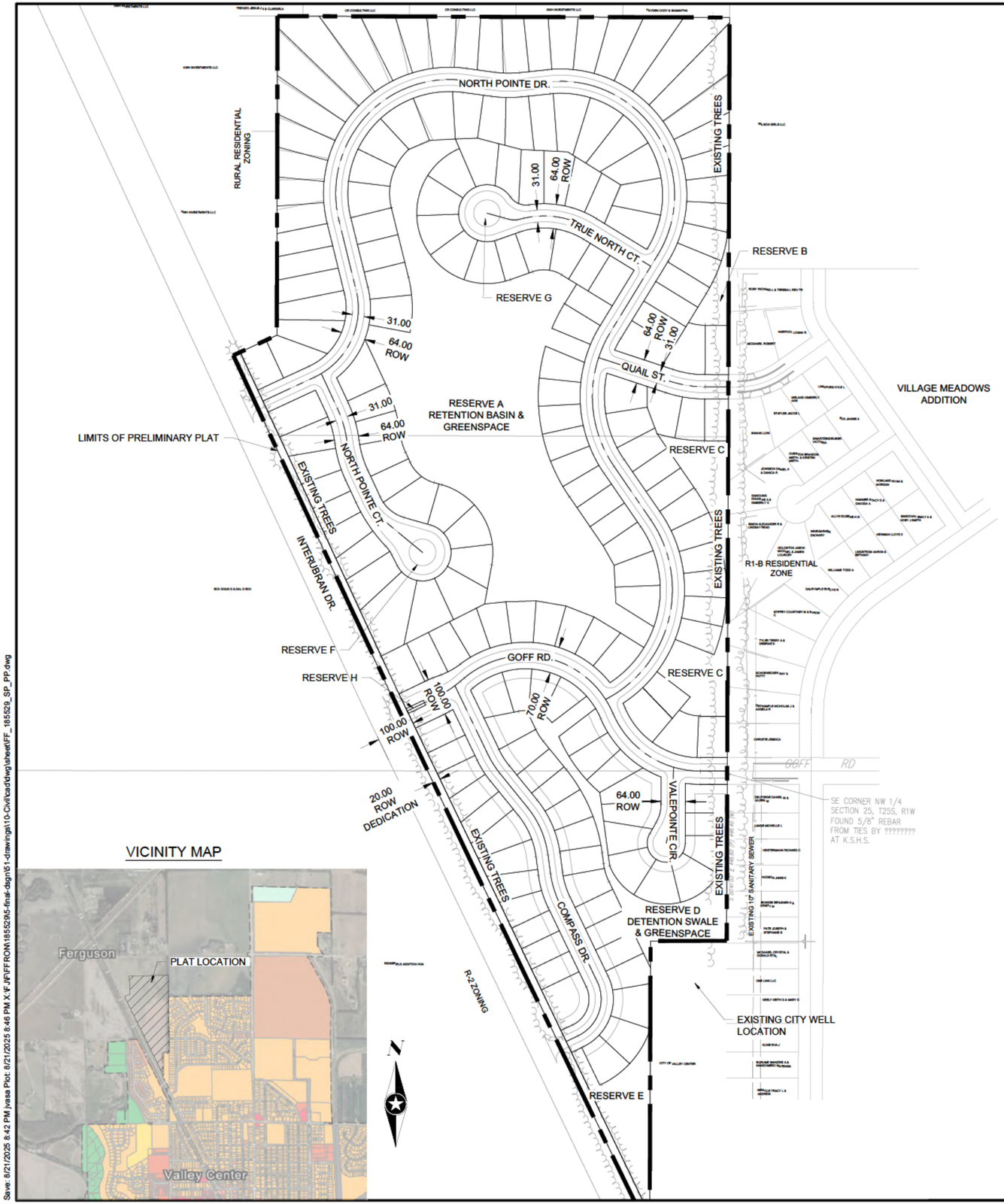
Has pre-application consultation been completed? _____

Date of filing _____

Person certifying date and time of submittal _____

Application Number _____

VALEPOINTE ADDITION



PROJECT DATA TABLE		
LEGAL	NW CORNER SECT. 25 TWP 22 S RNG 1 W	
SPECIFICATIONS	CITY OF VALLEY CENTER	
PROJECT AREA	60.977 ACRES	
OWNER	4FRONT, LLC - JEREMY SPEXARTH	
PROJECT COORDINATION	CITY OF VALLEY CENTER	SEDGWICK COUNTY
ENGINEER / PREPARER	JAKE VASA, PE - SEH INC.	
	15750 DODGE RD SUITE 304, OMAHA, NEBRASKA 68118	
SURVEYOR	LLOYD DORZWEILER L.S. 885 - ALPHA LAND SURVEYS, INC.	
	102 E. 4TH AVENUE, HUTCHINSON, KS	

N

150 0 150 300
scale 75 feet

GENERAL SITE NOTES:

1. PROPOSED ROW IN OF GOFF RD SHALL BE 70' WITH 36' WIDE (BACK OF CURB TO BACK OF CURB) COLLECTOR ROADWAY. PROPOSED ROW IN THE RESIDENTIAL AREA SHALL BE 64' WITH 31' WIDE (BACK OF CURB TO BACK OF CURB) LOCAL ROADWAY.
2. SANITARY SEWER PIPES SHALL BE A MINIMUM OF 8" UNLESS SHOWN OTHERWISE.
3. WATER MAIN PIPES SHALL BE 8" UNLESS SHOWN OTHERWISE.
4. THE CURRENT ZONING IS RR-1 SUBURBAN RESIDENTIAL DISTRICT.
5. PROPOSED ZONING IS R1-B SINGLE FAMILY RESIDENTIAL.
6. SIDEWALKS AND PEDESTRIAN WALKING PATHS SHALL BE A MINIMUM OF 5' WIDE, CONCRETE MATERIAL. PEDESTRIAN PATH AND CROSSING LOCATIONS WILL BE COORDINATED WITH THE CITY OF VALLEY CENTER TO DETERMINE THE LOCATIONS THAT ARE IN THE BEST INTEREST OF THE CITY AND SAFE FOR PEDESTRIANS. SIDEWALKS WILL BE ON ONE SIDE OF EACH STREET, AND INTERCONNECTING THROUGH RESERVE A.
7. DRAINAGE FROM THE PROPOSED SUBDIVISION WILL BE DETAINED ONSITE IN THE RETENTION POND IN RESERVE A AND IN THE DETENTION SWALE IN RESERVE F, AND REGULATED TO MAINTAIN NO NET INCREASE AT THE IMPACT POINTS ON THE EAST, SOUTHEAST, AND SOUTH EDGES OF THE SITE.
8. NO FLOODPLAIN EXISTS ON THE PROPERTY.
9. THE PROPOSED RETENTION POND SHALL BE LESS THAN 15 ACRE-FT OF WET STORAGE.
10. GRADING OPERATIONS AND EROSION CONTROL MEASURES WILL FOLLOW THE KANSAS DEPT. OF HEALTH AND ENVIRONMENT STANDARDS AND GUIDELINES. NOI PERMIT REQUIRED TO GRADING OPERATIONS COMMENCING.
11. ROADWAY INTERSECTION ANGLES ARE BETWEEN 80 AND 90 DEGREES.
12. STOPPING SIGHT DISTANCE FOR ALL HORIZONTAL AND VERTICAL CURVES ARE 200' OR GREATER.
13. CURB RADII AT INTERSECTIONS ARE 25' UNLESS NOTED OTHERWISE. CURB RADII AT INTERSECTIONS THAT ARE ON A COLLECTOR ROADWAY ARE 30' OR MORE.
14. INTERSECTIONS ARE OFFSET (JOGGED) GREATER THAN 150'.
15. RESERVE AREAS ARE INTENDED TO BE MAINTAINED BY EITHER THE HOME OWNER'S ASSOCIATION OR THE CITY OF VALLEY CENTER, AS CALLED OUT ON THE PLAT.

VICINITY MAP

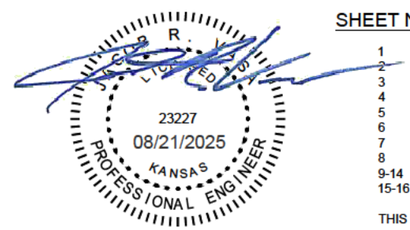
LAND USE OVERVIEW (EXCLUDES FUTURE RP-3 AREA)			
ZONING/LAND USE	ACREAGE	TOTAL UNITS	DENSITY (UNIT/ACRE)
R1-B LOTS	36.21 AC	181	3.0/AC
GREENSPACE/RESERVES	12.32 AC		
ROW	11.28 AC		
INTERURBAN ROW	1.16 AC		

GROSS AREA (R1-B LOTS): 60.977 AC
NET AREA (LESS R/W): 48.53 AC

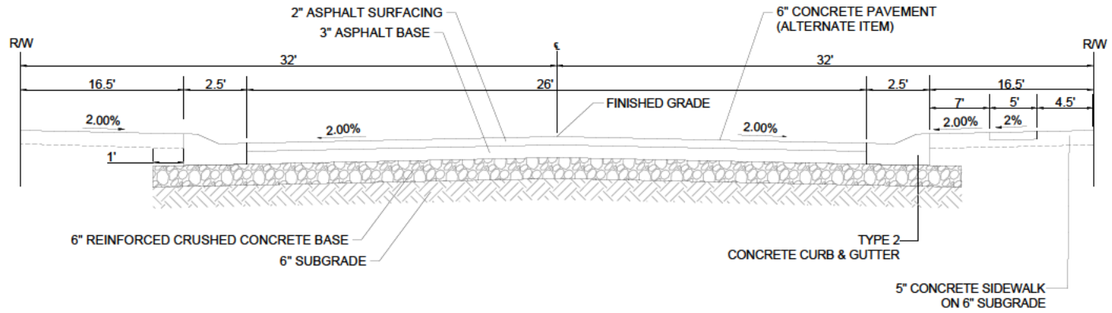
INDEX

SHEET NO.	DESCRIPTION
1	SITE PLAN
2	TYPICAL SECTIONS
3	UTILITY LAYOUT
4	GRADING PLAN
5	EXISTING DRAINAGE EXHIBIT
6	DRAINAGE PLAN
7	DRAINAGE CALCULATIONS
8	HORIZONTAL CONTROL PLAN
9-14	ROAD PROFILES
15-16	PRELIMINARY PLAT

THIS PLAN CONTAINS 16 SHEETS.



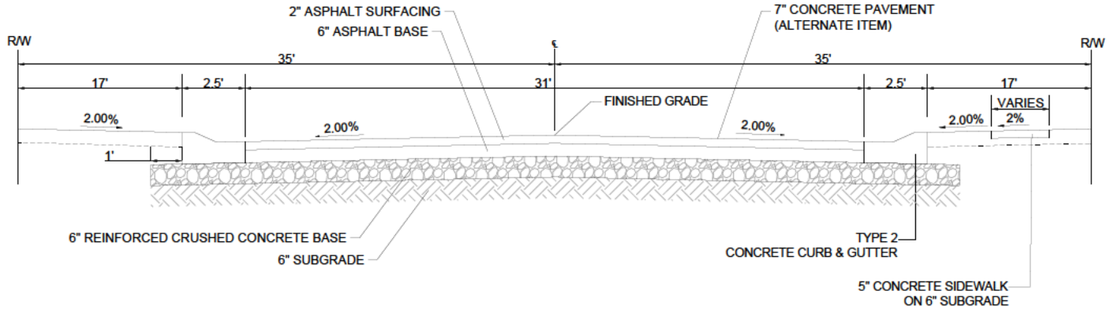
SEH
PHONE: 402.513.8200
15750 DODGE ROAD
SUITE 304
OMAHA, NEBRASKA 68118
www.sehinc.com



TYPICAL RESIDENTIAL STREET SECTION

TYPICAL SECTION NOTES:

1. MAX. LONGITUDINAL JOINT SPACING SHALL BE 13'
2. MAX. TRANSVERSE JOINT SPACING SHALL BE 12'
3. EXPANSION JOINTS SHALL BE PLACED EVERY 600' MAX. OR AS SHOWN ON THE PLANS FOR CONCRETE PAVING, AND CONCRETE CURB AND GUTTER.
4. ALL CRUSHED CONCRETE BASE SHALL BE REINFORCED WITH GEOGRID
5. EXPANSION JOINT SHALL BE PLACED WHERE CONCRETE PAVEMENT THICKNESSES CHANGE.
6. ALL SIDEWALKS SHALL BE PLACED ON 6" OF COMPACTED SUBGRADE, COMPACTION SHALL BE 95% STD. PROCTOR (ASTM D698), THIS SHALL BE CONSIDERED SUBSIDIARY TO SIDEWALK BID ITEMS
7. ALL SUBGRADE SHALL BE 6" OF SCARIFIED AND MOISTURE CONDITIONED SOIL COMPACTED TO 95% STD. PROCTOR (ASTM D698), THIS SHALL BE CONSIDERED SUBSIDIARY TO PAVEMENT BID ITEMS



TYPICAL COLLECTOR STREET SECTION

SEH Project	FF185529	Rev.#	Plan Revision Issue Description	Date	Rev.#	Sheet Revision Issue Description	Date
Drawn By	--						
Designed By	--						
Checked By	--						

SEH

VALEPOINTE ADDITION
VALLEY CENTER, KANSAS

TYPICAL SECTIONS

EXISTING 8" WATER MAIN CONNECTION

EXISTING SANITARY MANHOLE CONNECTION
RIM: 1330.37
FL = 1341.92

EXISTING 10" SANITARY

EXISTING 8" WATER MAIN

GOFF ROAD

EXISTING SANITARY MANHOLE CONNECTION
RIM: 1351.35
FL: 1339.90

EXISTING 10" SANITARY

100 0 100 200
scale 50 feet

RIM = 1351.90
FL =1342.25

RIM = 1355.25
FL =1346.14

RIM = 1354.88
FL =1342.70

RIM = 1355.12
FL =1343.20

RIM = 1351.94
FL =1347.54

RIM = 1352.20
FL =1343.33

RIM = 1348.51
FL =1340 57

RIM = 1352.70
FL =1342.83

VALEPOINTE CIR

RIM = 1352.90
FL =1347.04

RIM = 1352.93
FL =1342.03

RIM = 1353.46
FL =1342.53

RIM = 1352.12
FL =1341.46

RIM = 1358.01
FL =1347.59

RIM = 1356.93
FL =1346.60

RIM = 1356.23
FL =1346.02

RIM = 1354.15
FL =1343.36

QUAIL STREET

RIM = 1353.40
FL =1344.30

NORTH POINTE DRIVE

PROPOSED 8" WATER MAIN

RIM = 1355.00
FL =1346.53

RIM = 1354.45
FL =1346.13

RIM = 1357.36
FL =1348.58

TRUE NORTH COURT

RIM = 1354.85
FL =1347.31

RIM = 1354.69
FL =1344.94

PROPOSED 8" WATER MAIN

COMPASS DRIVE

PROPOSED 8" WATER MAIN

RIM = 1353.40
FL =1342.72

GOFF ROAD

RIM = 1354.04
FL =1345.10

RIM = 1354.95
FL =1344.32

FUTURE LOOP CONNECTION

RIM = 1355.37
FL =1350.13

RIM = 1355.74
FL =1348.35

RIM = 1354.80
FL =1343.71

NORTH POINTE DRIVE

RIM = 1355.10
FL =1345.24

RIM = 1356.02
FL =1351.14

RIM = 1356.54
FL =1351.72

RIM = 1356.77
FL =1350.43

RIM = 1356.40
FL =1349.86

PROPOSED 8" WATER MAIN

RIM = 1355.64
FL =1342.33

PROPOSED 8" WATER MAIN

NORTH POINTE COURT

RIM = 1354.29
FL =1345.85

RIM = 1355.23
FL =1345.24

FUTURE LOOP CONNECTION

RIM = 1356.75
FL =1347.53

RIM = 1357.13
FL =1347.93

INTERURBAN DRIVE

FUTURE LOOP CONNECTION

LEGEND

8" PVC SANITARY SEWER AND MANHOLE

8" WATER MAIN, HYDRANT, AND VALVE

NOTE: SEE DRAINAGE PLAN FOR STORM SEWER LAYOUT

FINAL VALVE AND WATER MAIN FITTINGS LOCATIONS TO BE DETERMINED IN FINAL DESIGN.

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SEH Project	FF185529	Rev.#	Plan Revision Issue Description	Date	Rev.#	Sheet Revision Issue Description	Date	SEH	VALEPOINTE ADDITION VALLEY CENTER, KANSAS	UTILITY PLAN	3
Drawn By	--										of 16
Designed By	--										
Checked By	--										

EXISTING 72" RCP CULVERT W/ RIP RAP
(NOT SHOWN ON SHEET,
LOCATED AT INTERSECTION OF
MEADOW ROAD & INTERURBAN DRIVE)

EXISTING CITY WELL
LOCATION

EXISTING DRAINAGE SWALE

EXISTING DRAINAGE SWALE

GOFF ROAD

DRAINAGE SWALE

VALEPOINTE CIR

QUAIL STREET

NORTH POINTE DRIVE

TRUE NORTH COURT

RETENTION POND

BOTTOM OF POND
1344.50

NORTH POINTE DRIVE

GOFF ROAD

DRAINAGE SWALE

COMPASS DRIVE

EXISTING DITCH

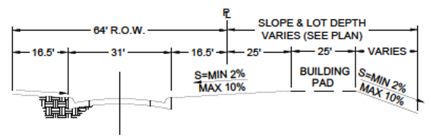
EXISTING DITCH

NORTH POINTE COURT

EXISTING DITCH

INTERURBAN DRIVE

100 0 100 200
scale 50 feet



TYPICAL FLAT LOT
NOT TO SCALE

PROJECT NOTES

- ALL LOTS ARE FLAT LOTS

LEGEND

- 1150 — EXISTING MAJOR CONTOUR
- 1152 — EXISTING MINOR CONTOUR
- 1150 — PROPOSED MAJOR CONTOUR
- 1152 — PROPOSED MINOR CONTOUR

BENCHMARK EL. XXX.XXLT
BENCHMARK DESCRIPTION (LT)

SEH Project	FF185529	Rev.#	Plan Revision Issue Description	Date	Rev.#	Sheet Revision Issue Description	Date
Drawn By	--	.			.		
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Checked By	--	.			.		

VALEPOINTE ADDITION
VALLEY CENTER, KANSAS

GRADING PLAN

4
of 16

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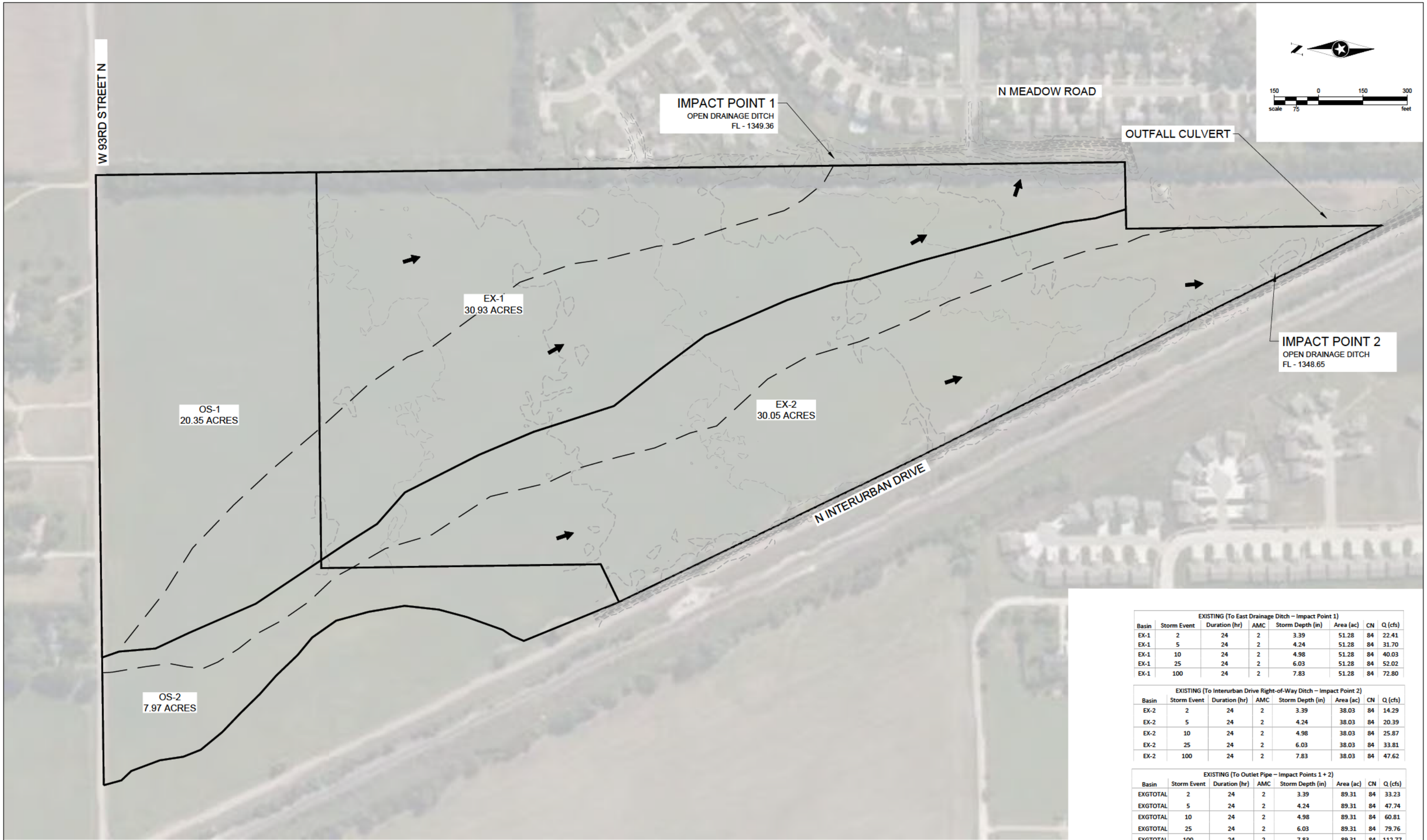

EXISTING (To East Drainage Ditch – Impact Point 1)

Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
EX-1	2	24	2	3.39	51.28	84	22.41
EX-1	5	24	2	4.24	51.28	84	31.70
EX-1	10	24	2	4.98	51.28	84	40.03
EX-1	25	24	2	6.03	51.28	84	52.02
EX-1	100	24	2	7.83	51.28	84	72.80

EXISTING (To Interurban Drive Right-of-Way Ditch – Impact Point 2)

Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
EX-2	2	24	2	3.39	38.03	84	14.29
EX-2	5	24	2	4.24	38.03	84	20.39
EX-2	10	24	2	4.98	38.03	84	25.87
EX-2	25	24	2	6.03	38.03	84	33.81
EX-2	100	24	2	7.83	38.03	84	47.62

EXISTING (To Outlet Pipe – Impact Points 1 + 2)

Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
EXGTOTAL	2	24	2	3.39	89.31	84	33.23
EXGTOTAL	5	24	2	4.24	89.31	84	47.74
EXGTOTAL	10	24	2	4.98	89.31	84	60.81
EXGTOTAL	25	24	2	6.03	89.31	84	79.76
EXGTOTAL	100	24	2	7.83	89.31	84	112.77

EXISTING DRAINAGE EXHIBIT

		Rev.#	Plan Revision Issue Description	Date	Rev.#	Sheet Revision Issue Description	Date
SEH Project	FF185529	.			.		
Drawn By	--	.			.		
Designed By	--	.			.		
Checked By	--	.			.		

SEH

VALEPOINTE ADDITION
VALLEY CENTER, KANSAS

EXISTING DRAINAGE EXHIBIT

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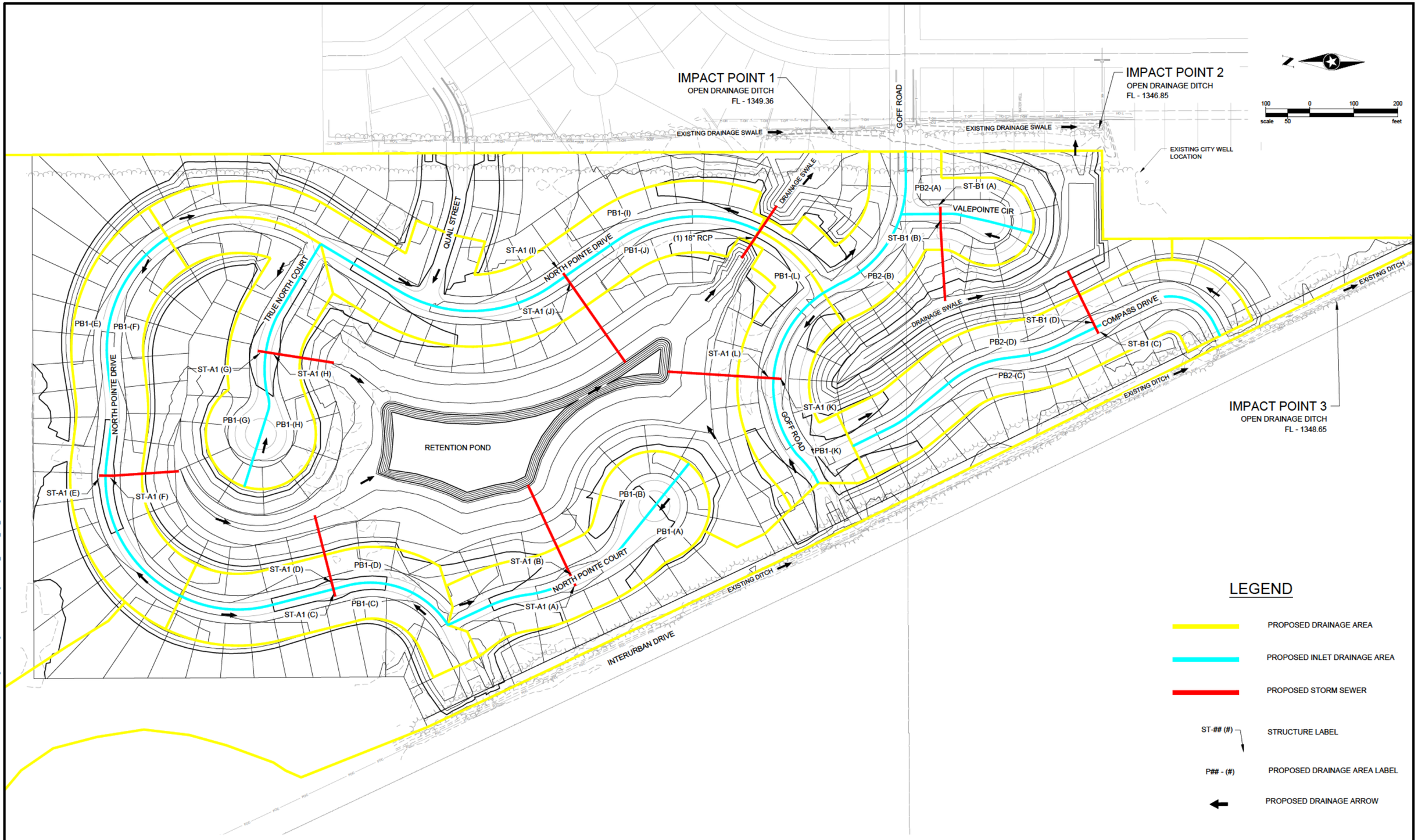

LEGEND

- PROPOSED DRAINAGE AREA
- PROPOSED INLET DRAINAGE AREA
- PROPOSED STORM SEWER
- ST-## (#) — STRUCTURE LABEL
- P## - (#) — PROPOSED DRAINAGE AREA LABEL
- PROPOSED DRAINAGE ARROW

DRAINAGE PLAN

SEH Project	FF185529	Rev.#	Plan Revision Issue Description	Date	Rev.#	Sheet Revision Issue Description	Date	VALEPOINTE ADDITION VALLEY CENTER, KANSAS	**PROPOSED DRAINAGE PLAN**	6 of 16
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Designed By	--	.			.					
Checked By	--	.			.					

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COMPUTATION FORM

STORM DRAINAGE SYSTEM DESIGN BY THE RATIONAL METHOD

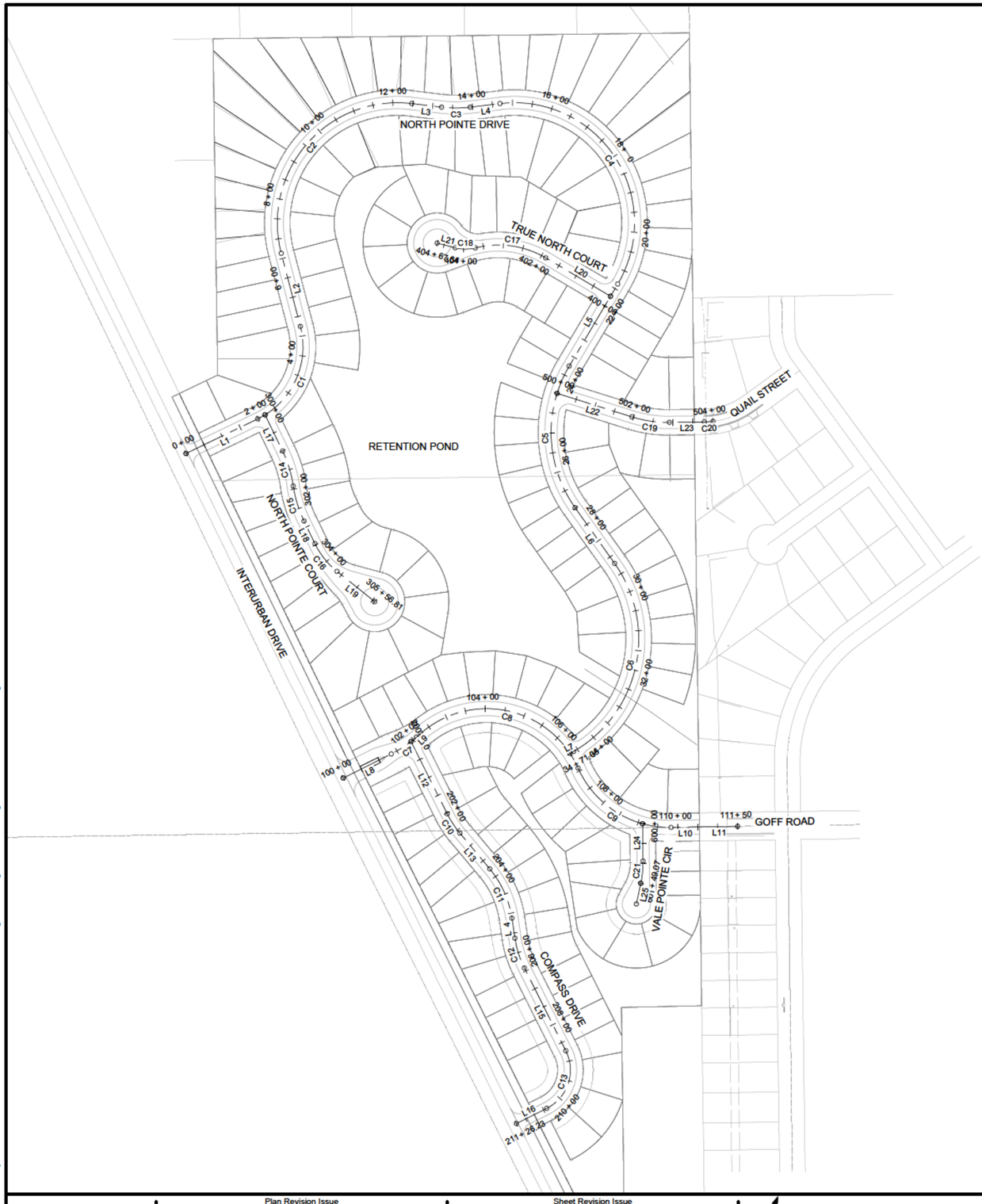
STORM SEWER DESIGN 2 YEAR STORM

Calculated by: GJR
Date: 7/28/2025
Checked by: JRV

Preliminary / Final / **Design**

Drainage Area: AC
Project No.:
Design Storm: 2 Year Storm (5 Year in Commerical)
n = 0.013

Location	Conveyance		Direct Runoff						Sys.	Travel Time (System Design)								Total Runoff					Remarks
	From	To	W.S. or S.B. No.	Ti	i	A	C	q	Q	Convey Sys./ Size Descr. (in)	Slope min. %	Slope des. %	V des. f.p.s.	Cap. (all.) c.f.s.	Leng.	t	T.O.C.	Comp T.O.C.	i	Total A	Comp C	Des. Q	
				min.	in./hr.	Ac.		c.f.s.	c.f.s.							min.	min.	min.	in/hr.	Ac.		c.f.s.	
(1)	(2)	(3)	(4)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
PB1-(A)	PB1-(A)	ST-A1 (A)	PB1-(A)	15.0	4.2	1.41	0.35	2.06															
									2.06	15	0.10	0.50	3.7	4.57		0.0							
PB1-(B)	ST-A1 (A)	ST-A1 (B)	PB1-(B)	15.0	4.2	1.33	0.35	1.95															
									4.01	15	0.39	0.50	3.7	4.57		0.0							
PB1-(C)	PB1-(C)	ST-A1 (C)	PB1-(C)	15.0	4.2	1.41	0.35	2.06															
									2.06	15	0.10	0.50	3.7	4.57		0.0							
PB1-(D)	ST-A1 (C)	ST-A1 (D)	PB1-(D)	15.0	4.2	1.15	0.35	1.68															
									3.75	15	0.34	0.50	3.7	4.57		0.0							
PB1-(E)	PB1-(E)	ST-A1 (E)	PB1-(E)	15.0	4.2	1.89	0.35	2.77															
									2.77	15	0.18	0.50	3.7	4.57		0.0							
PB1-(F)	ST-A1 (E)	ST-A1 (F)	PB1-(F)	15.0	4.2	1.60	0.35	2.34															
									5.11	18	0.24	0.50	4.2	7.43		0.0							
PB1-(G)	PB1-(G)	ST-A1 (G)	PB1-(G)	15.0	4.2	1.70	0.35	2.49															
									2.49	15	0.15	0.50	3.7	4.57		0.0							
PB1-(H)	ST-A1 (G)	ST-A1 (H)	PB1-(H)	15.0	4.2	1.13	0.35	1.65															
									4.14	15	0.41	0.50	3.7	4.57		0.0							
PB1-(I)	PB1-(I)	ST-A1 (I)	PB1-(I)	15.0	4.2	3.08	0.35	4.51															
									4.51	15	0.49	0.50	3.7	4.57		0.0							
PB1-(J)	ST-A1 (I)	ST-A1 (J)	PB1-(J)	15.0	4.2	1.93	0.35	2.82															
									7.33	18	0.49	0.50	4.2	7.43		0.0							
PB1-(K)	PB1-(J)	ST-A1 (K)	PB1-(K)	15.0	4.2	0.98	0.35	1.43															
									1.43	15	0.05	0.50	3.7	4.57		0.0							
PB1-(L)	ST-A1 (K)	ST-A1 (L)	PB1-(L)	15.0	4.2	1.24	0.35	1.81															
									3.25	15	0.25	0.50	3.7	4.57		0.0							
PB2-(A)	PB2-(A)	ST-B1 (A)	PB2-(A)	15.0	4.2	0.95	0.35	1.39															
									1.39	15	0.05	0.50	3.7	4.57		0.0							
PB2-(B)	ST-B1 (A)	ST-B1 (B)	PB2-(B)	15.0	4.2	1.62	0.35	2.37															
									3.76	15	0.34	0.50	3.7	4.57		0.0							
PB2-(C)	PB2-(A)	ST-B1 (C)	PB2-(C)	15.0	4.2	1.68	0.35	2.46															
									2.46	15	0.14	0.50	3.7	4.57		0.0							
PB2-(D)	ST-B1 (C)	ST-B1 (D)	PB2-(D)	15.0	4.2	1.93	0.35	2.82															
									5.28	18	0.25	0.50	4.2	7.43		0.0							



ALIGNMENT TABULATION - NORTH POINTE DRIVE

POINT D	POINT	STATION	DELTA	RADIUS	TANGENT	LENGTH	NORTHING	EASTING	BEARING	START STATION	END STATION	START NORTHING	START EASTING	END NORTHING	END EASTING
L1		0+00.00				199.06	1744909.8624	1634104.0563	N 64° 13' 51" E	0+00.00	1+99.06	1744909.8624	1634104.0563	1744996.2022	1634283.3183
C1		1+99.06	078° 56' 00"	200.00	164.67	275.53	1744996.2022	1634283.3183		1+99.06	4+74.59	1744996.2022	1634283.3183	1745227.0731	1634389.8202
L2		4+74.59				188.65	1745227.0731	1634389.8202	N 14° 42' 09" W	4+74.59	6+63.23	1745227.0731	1634389.8202	1745409.5433	1634341.9411
C2		6+63.23	111° 33' 04"	300.00	441.03	584.08	1745409.5433	1634341.9411		6+63.23	12+47.31	1745409.5433	1634341.9411	1745783.5433	1634667.8914
L3		12+47.31				75.11	1745783.5433	1634667.8914	S 83° 09' 05" E	12+47.31	13+22.42	1745783.5433	1634667.8914	1745774.5872	1634742.4627
C3		13+22.42	013° 41' 49"	300.00	36.03	71.72	1745774.5872	1634742.4627		13+22.42	13+94.14	1745774.5872	1634742.4627	1745774.5872	1634814.0095
L4		13+94.14				75.11	1745774.5872	1634814.0095	N 83° 09' 05" E	13+94.14	14+69.25	1745774.5872	1634814.0095	1745783.5433	1634888.5808
C4		14+69.25	127° 28' 00"	300.00	607.90	667.41	1745783.5433	1634888.5808		14+69.25	21+36.66	1745783.5433	1634888.5808	1745332.8892	1635182.5281
L5		21+36.66				238.17	1745332.8892	1635182.5281	S 30° 37' 06" W	21+36.66	23+74.83	1745332.8892	1635182.5281	1745127.9244	1635061.2242
C5		23+74.83	065° 59' 59"	325.00	211.06	374.37	1745127.9244	1635061.2242		23+74.83	27+49.20	1745127.9244	1635061.2242	1744774.2158	1635075.9356
L6		27+49.20				170.63	1744774.2158	1635075.9356	S 35° 22' 54" E	27+49.20	29+19.84	1744774.2158	1635075.9356	1744635.0953	1635174.7360
C6		29+19.84	095° 22' 54"	325.00	357.05	541.03	1744635.0953	1635174.7360		29+19.84	34+60.87	1744635.0953	1635174.7360	1744165.4559	1635072.2589
L7		34+60.87				10.17	1744165.4559	1635072.2589	S 60° 00' 00" W	34+60.87	34+71.05	1744165.4559	1635072.2589	1744160.3686	1635063.4474

ALIGNMENT TABULATION - GOFF ROAD

POINT D	POINT	STATION	DELTA	RADIUS	TANGENT	LENGTH	NORTHING	EASTING	BEARING	START STATION	END STATION	START NORTH NG	START EAST NG	END NORTHING	END EAST NG
L8		100+00.00				133.93	1744099.2598	1634496.9719	N 63° 24' 18" E	100+00.00	101+33.93	1744099.2598	1634496.9719	1744159.2195	1634618.7348
C7		101+33.93	014° 27' 46"	300.00	38.07	75.73	1744159.2195	1634618.7348		101+33.93	102+09.66	1744159.2195	1634618.7348	1744201.2635	1634679.4766
L9		102+09.66				14.86	1744201.2635	1634679.4766	N 48° 56' 32" E	102+09.66	102+24.53	1744201.2635	1634679.4766	1744211.0263	1634690.6846
C8		102+24.53	107° 04' 41"	250.00	338.34	467.22	1744211.0263	1634690.6846		102+24.53	106+91.74	1744211.0263	1634690.6846	1744124.1182	1635083.3120
C9		106+91.74	068° 54' 28"	250.00	185.18	291.94	1744124.1182	1635083.3120		106+91.74	109+83.68	1744124.1182	1635083.3120	1743975.7518	1635315.6063
L10		109+83.68				71.09	1743975.7518	1635315.6063	N 89° 08' 45" E	109+83.68	110+54.77	1743975.7518	1635315.6063	1743978.8529	1635386.6910
L11		110+54.77				95.23	1743978.8529	1635386.6910	N 89° 08' 45" E	110+54.77	111+50.00	1743978.8529	1635386.6910	1743978.3278	1635481.9054

ALIGNMENT TABULATION - COMPASS DRIVE

POINT D	POINT	STATION	DELTA	RADIUS	TANGENT	LENGTH	NORTHING	EASTING	BEAR NG	START STATION	END STATION	START NORTHING	START EAST NG	END NORTHING	END EASTING
L12		200+00.00				201.59	1744190.2874	1634866.1172	S 26° 35' 42" E	200+00.00	202+01.59	1744190.2874	1634866.1172	1744010.0255	1634756.3660
C10		202+01.59	013° 18' 48"	250.00	29.18	58.09	1744010.0255	1634756.3660		202+01.59	202+59.68	1744010.0255	1634756.3660	1743961.5551	1634788.1467
L13		202+59.68				116.19	1743961.5551	1634788.1467	S 39° 54' 30" E	202+59.68	203+75.88	1743961.5551	1634788.1467	1743872.4258	1634862.6927
C11		203+75.88	031° 20' 31"	250.00	70.14	136.76	1743872.4258	1634862.6927		203+75.88	205+12.63	1743872.4258	1634862.6927	1743749.2741	1634918.1360
L14		205+12.63				50.55	1743749.2741	1634918.1360	S 08° 33' 59" E	205+12.63	205+63.19	1743749.2741	1634918.1360	1743699.2850	1634925.6662
C12		205+63.19	018° 01' 43"	250.00	39.66	78.66	1743699.2850	1634925.6662		205+63.19	206+41.85	1743699.2850	1634925.6662	1743624.6037	1634949.3289
L15		206+41.85				231.31	1743624.6037	1634949.3289	S 28° 35' 42" E	206+41.85	208+73.16	1743624.6037	1634949.3289	1743417.7688	1635052.8816
C13		208+73.16	090° 00' 00"	107.00	107.00	168.08	1743417.7688	1635052.8816		208+73.16	210+41.23	1743417.7688	1635052.8816	1743274.1882	1635005.1048
L16		210+41.23				85.00	1743274.1882	1635005.1048	S 63° 24' 18" W	210+41.23	211+26.23	1743274.1882	1635005.1048	1743236.1353	1634929.0984

ALIGNMENT TABULATION - NORTH POINTE COURT

POINT D	POINT	STATION	DELTA	RADIUS	TANGENT	LENGTH	NORTHING	EAST NG	BEAR NG	START STATION	END STATION	START NORTH NG	START EAST NG	END NORTHING	END EASTING
L17		300+00.00				100.71	1745006.2174	1634301.6090	S 25° 46' 09" E	300+00.00	301+00.71	1745006.2174	1634301.6090	1744915.5227	1634345.3924
C14		301+00.71	017° 30' 43"	300.00	46.21	91.69	1744915.5227	1634345.3924		301+00.71	301+92.40	1744915.5227	1634345.3924	1744828.1837	1634372.1186
C15		301+92.40	017° 31' 39"	300.00	46.25	91.77	1744828.1837	1634372.1186		301+92.40	302+84.18	1744828.1837	1634372.1186	1744740.7716	1634398.8761
L18		302+84.18				62.74	1744740.7716	1634398.8761	S 25° 47' 05" E	302+84.18	303+46.92	1744740.7716	1634398.8761	1744684.2787	1634426.1682
C16		303+46.92	025° 34' 16"	200.00	45.39	89.26	1744684.2787	1634426.1682		303+46.92	304+36.18	1744684.2787	1634426.1682	1744615.0671	1634481.3587
L19		304+36.18				120.63	1744615.0671	1634481.3587	S 51° 21' 21" E	304+36.18	305+56.81	1744615.0671	1634481.3587	1744539.7339	1634575.5777

ALIGNMENT TABULATION - TRUE NORTH COURT

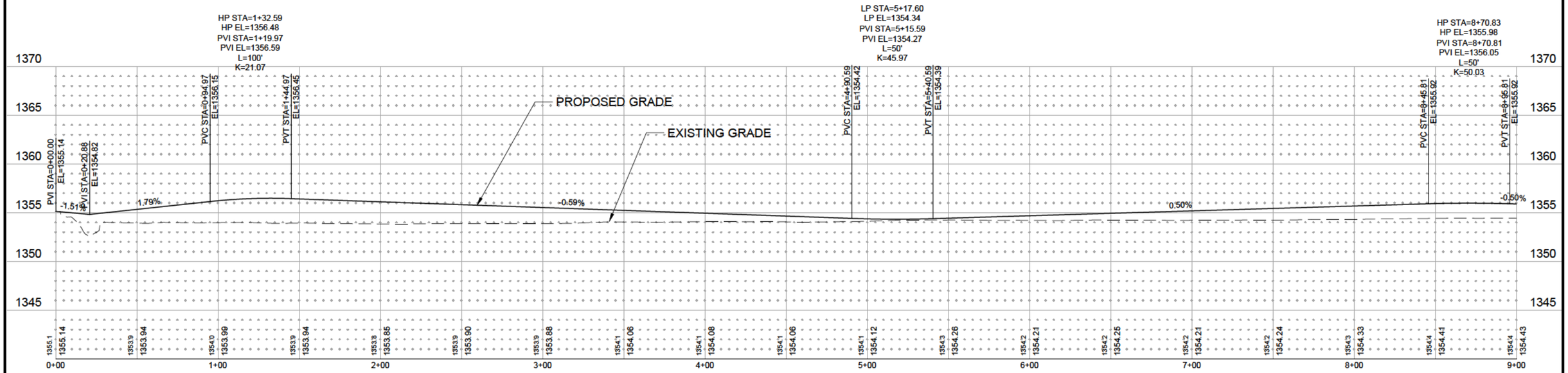
POINT D	POINT	STATION	DELTA	RADIUS	TANGENT	LENGTH	NORTHING	EASTING	BEAR NG	START STATION	END STATION	START NORTHING	START EASTING	END NORTHING	END EASTING
L20		400+00.00				187.90	1745302.3972	1635164.4821	N 59° 22' 54" W	400+00.00	401+87.90	1745302.3972	1635164.4821	1745398.0990	1635002.7767
C17		401+87.90	045° 03' 28"	252.00	96.23	182.44	1745398.0990	1635002.7767		401+87.90	403+70.35	1745398.0990	1635002.7767	1745423.1164	1634826.7666
C18		403+70.35	029° 07' 38"	100.00	25.98	50.84	1745423.1164	1634826.7666		403+70.35	404+21.18	1745423.1164	1634826.7666	1745423.2256	1634778.4767
L21		404+21.18				46.46	1745423.2256	1634778.4767	N 75° 18' 44" W	404+21.18	404+67.64	1745423.2256	1634778.4767	1745435.0045	1634731.5389

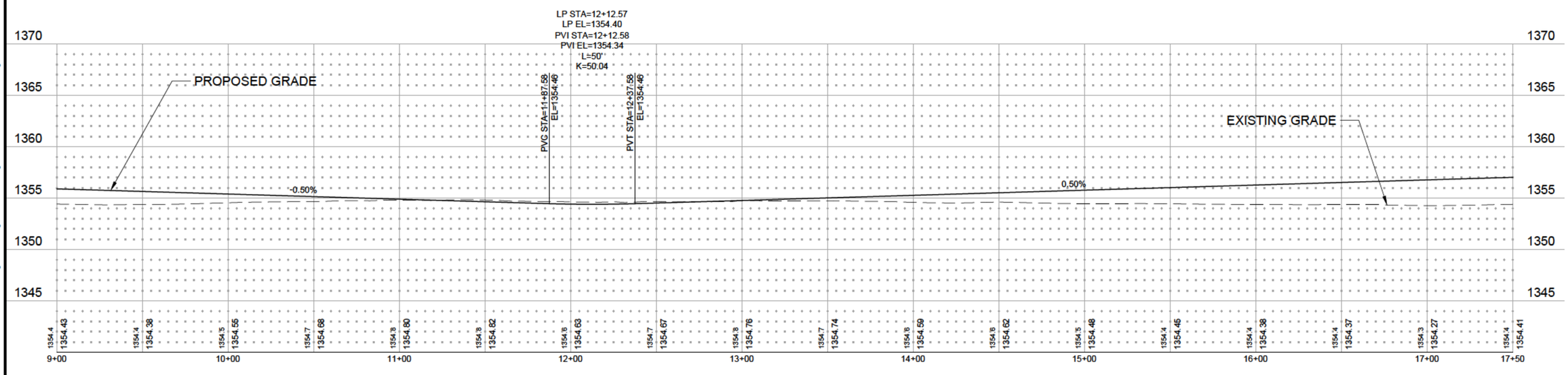
ALIGNMENT TABULATION - QUAIL STREET

POINT D	POINT	STATION	DELTA	RADIUS	TANGENT	LENGTH	NORTHING	EASTING	BEAR NG	START STATION	END STATION	START NORTHING	START EASTING	END NORTHING	END EASTING
L22		500+00.00				196.18	1745059.7485	1635030.8358	S 72° 34' 11" E	500+00.00	501+96.18	1745059.7485	1635030.8358	1745000.9852	1635218.0042
C19		501+96.18	018° 09' 31"	300.00	47.94	95.08	1745000.9852	1635218.0042		501+96.18	502+91.26	1745000.9852	1635218.0042	1744987.2343	1635311.6819
L23		502+91.26				86.90	1744987.2343	1635311.6819	N 89° 16' 17" E	502+91.26	503+78.15	1744987.2343	1635311.6819	1744988.3392	1635398.5736
C20		503+78.15	006° 15' 30"	200.00	10.93	21.85	1744988.3392	1635398.5736		503+78.15	504+00.00	1744988.3392	1635398.5736	1744989.8083	1635420.3593

ALIGNMENT TABULATION - VALE POINTE CIRCLE

POINT D	POINT	STATION	DELTA	RADIUS	TANGENT	LENGTH	NORTHING	EAST NG	BEAR NG	START STATION	END STATION	START NORTHING	START EASTING	END NORTHING	END EASTING
L25		???				53.04	1743784.4092	1635228.8804	N 12° 08' 09" E	???	???	1743784.4092	1635228.8804	1743838.2804	1635240.0302
L24		600+00.00				93.14	1743884.9359	1635244.4874	S 00° 41' 03" E	600+00.00	600+93.14	1743884.9359	1635244.4874	1743891.8026	1635245.5994
C21		600+93.14	012° 49' 04"	250.00	28.08	55.93	1743891.8026	1635245.5994		600+93.14	601+49.07	1743891.8026	1635245.5994	1743838.2899	1635240.0323





NORTH POINTE DRIVE

SEH Project	FF185529	Rev.#	Plan Revision Issue Description	Date	Rev.#	Sheet Revision Issue Description	Date
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Designed By	--						
Checked By	--						

SEH

VALEPOINTE ADDITION
CENTER VALLEY, KANSAS

NORTH POINTE DRIVE 1 - ROAD PROFILE

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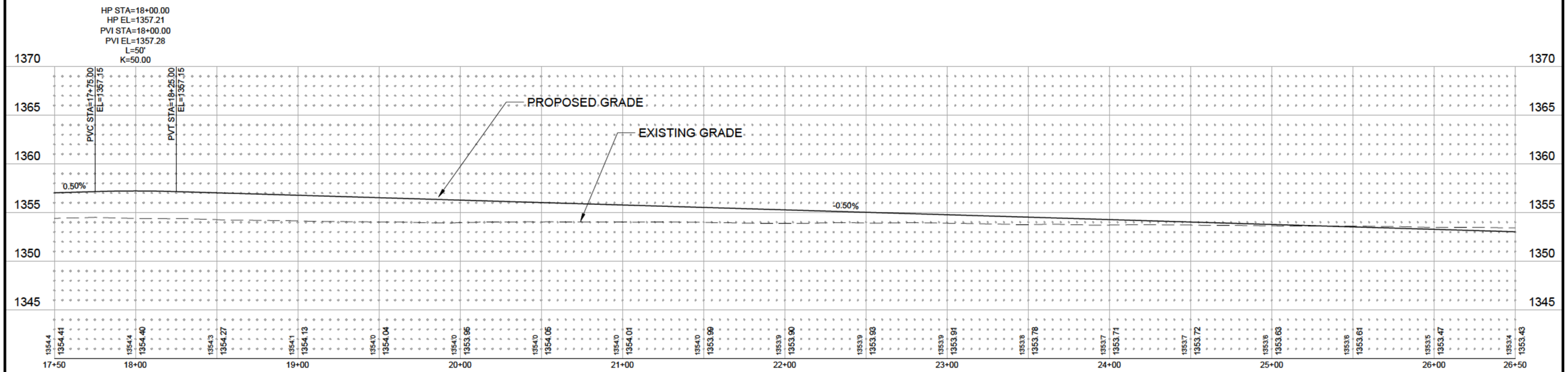

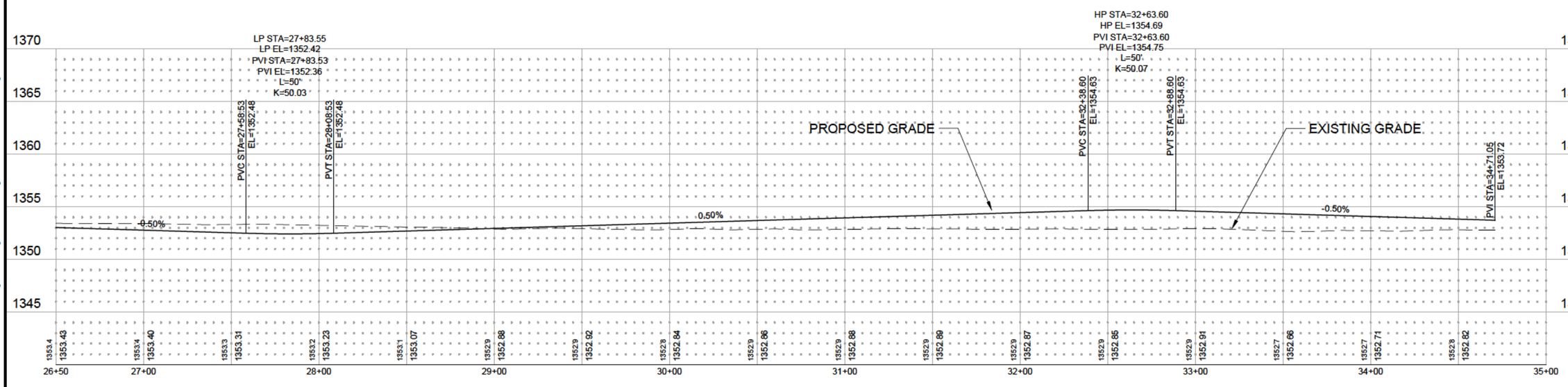

NORTH POINTE DRIVE

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SEH Project	FF185529	Rev.#	Plan Revision Issue Description	Date	Rev.#	Sheet Revision Issue Description	Date	SEH	VALEPOINTE ADDITION VALLEY CENTER, KANSAS	**NORTH POINTE DRIVE 2 - ROAD PROFILE**	10 of 16
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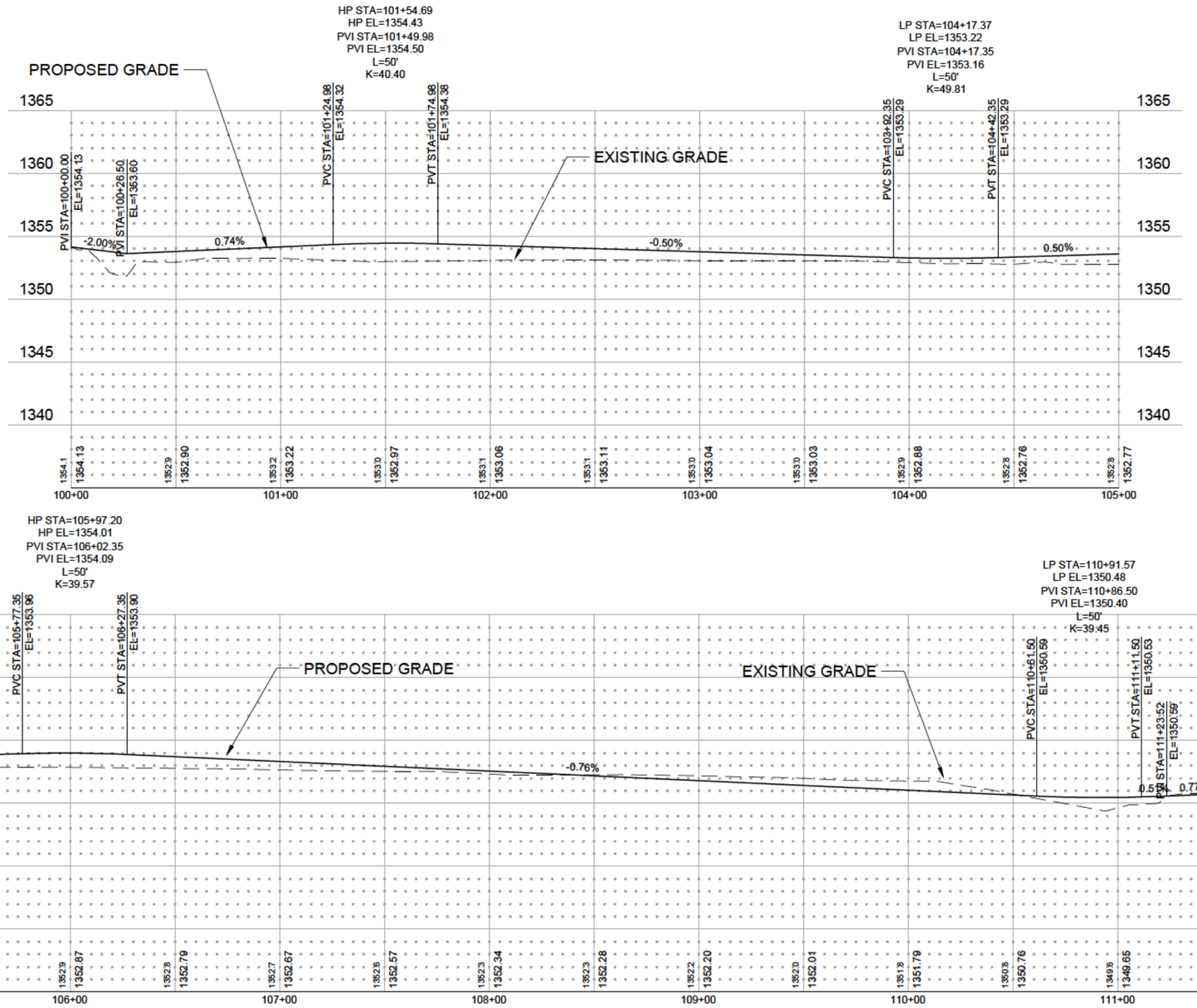

GOFF ROAD

SEH Project	FF185529	Rev.#	Plan Revision Issue Description	Date	Rev.#	Sheet Revision Issue Description	Date	VALEPOINTE ADDITION VALLEY CENTER, KANSAS	GOFF ROAD - ROAD PROFILE
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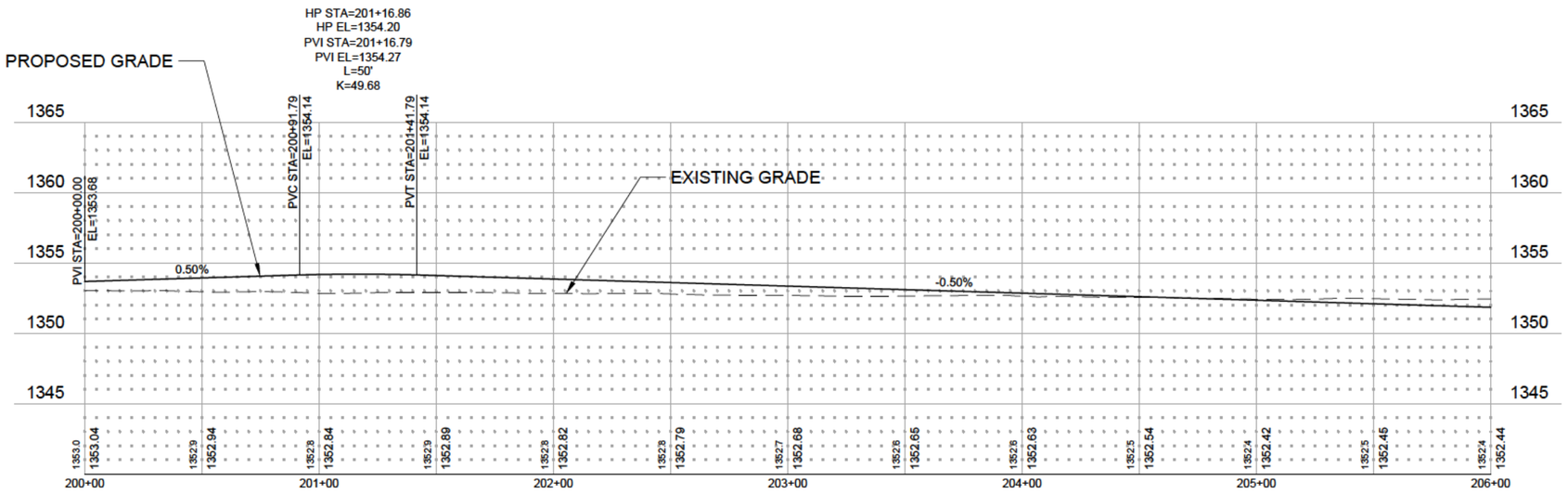

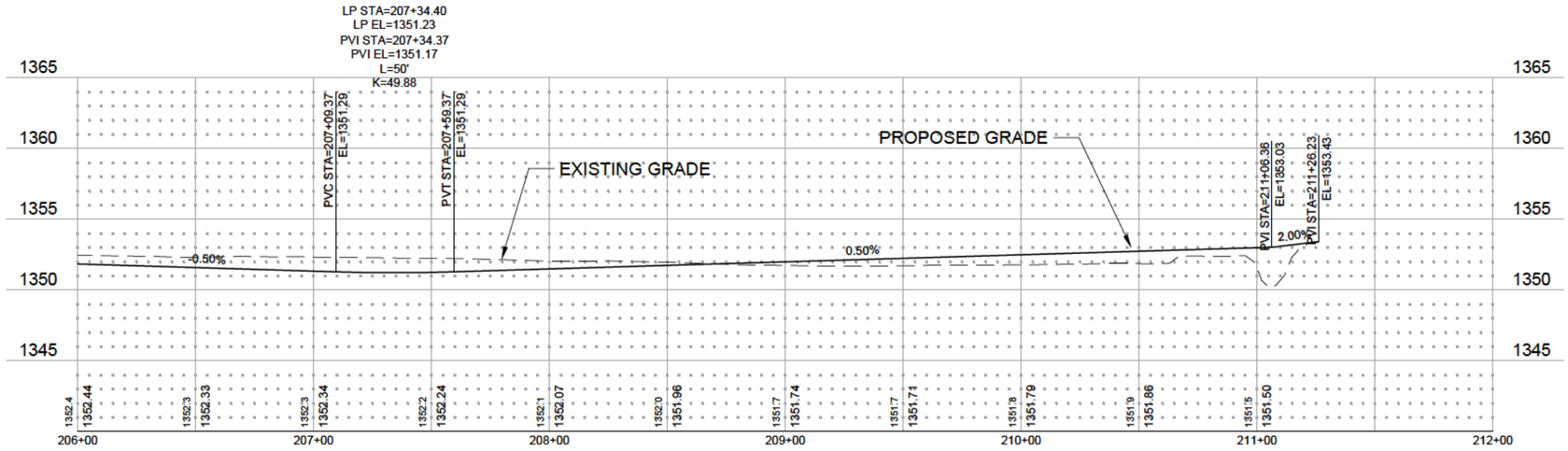

COMPASS DRIVE

SEH Project	FF185529	Rev.#	Plan Revision Issue Description	Date	Rev.#	Sheet Revision Issue Description	Date	VALEPOINTE ADDITION VALLEY CENTER, KANSAS	COMPASS DRIVE - ROAD PROFILE	12 of 16
Drawn By	--									
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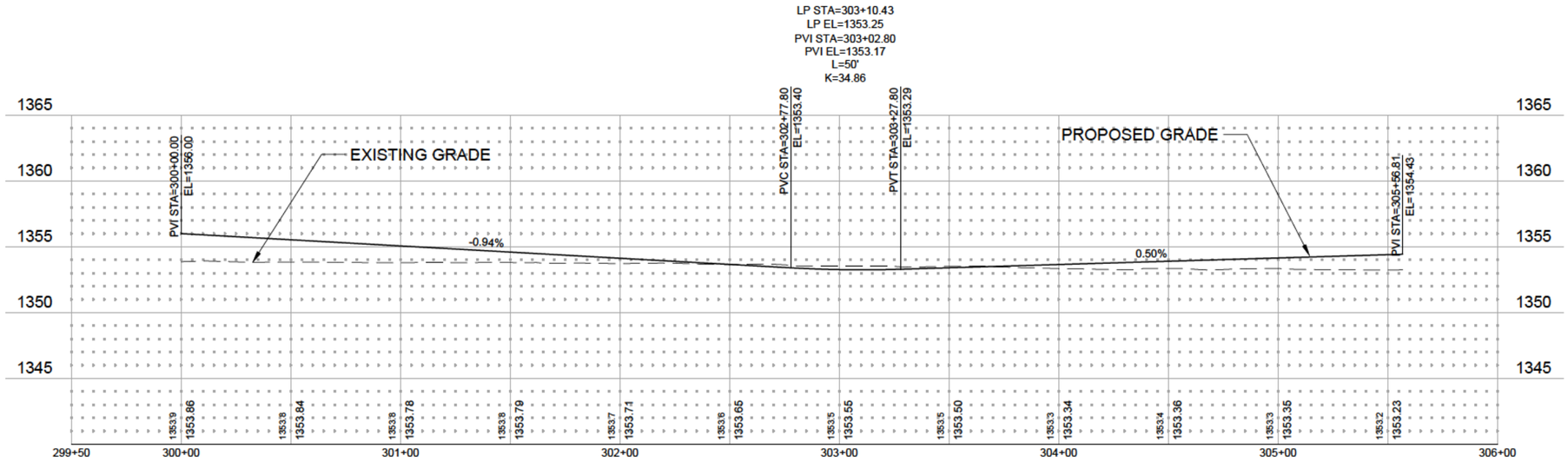
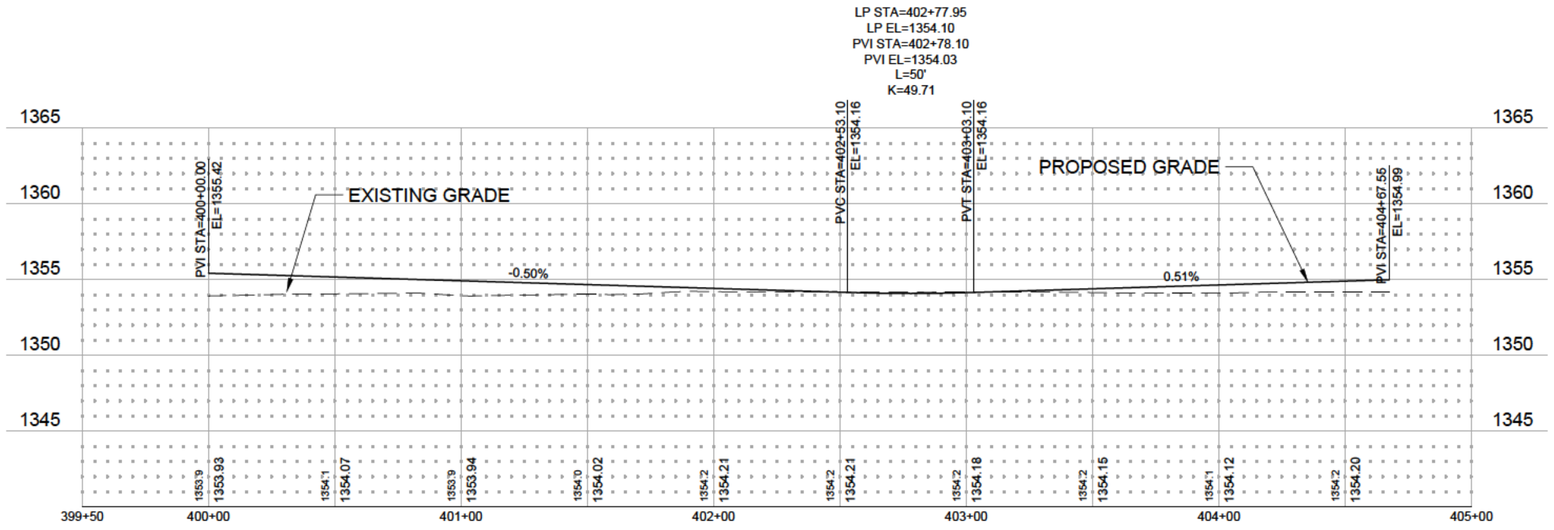


NORTH POINTE COURT



TRUE NORTH COURT

SEH Project	FF185529	Rev.#	Plan Revision Issue Description	Date	Rev.#	Sheet Revision Issue Description	Date
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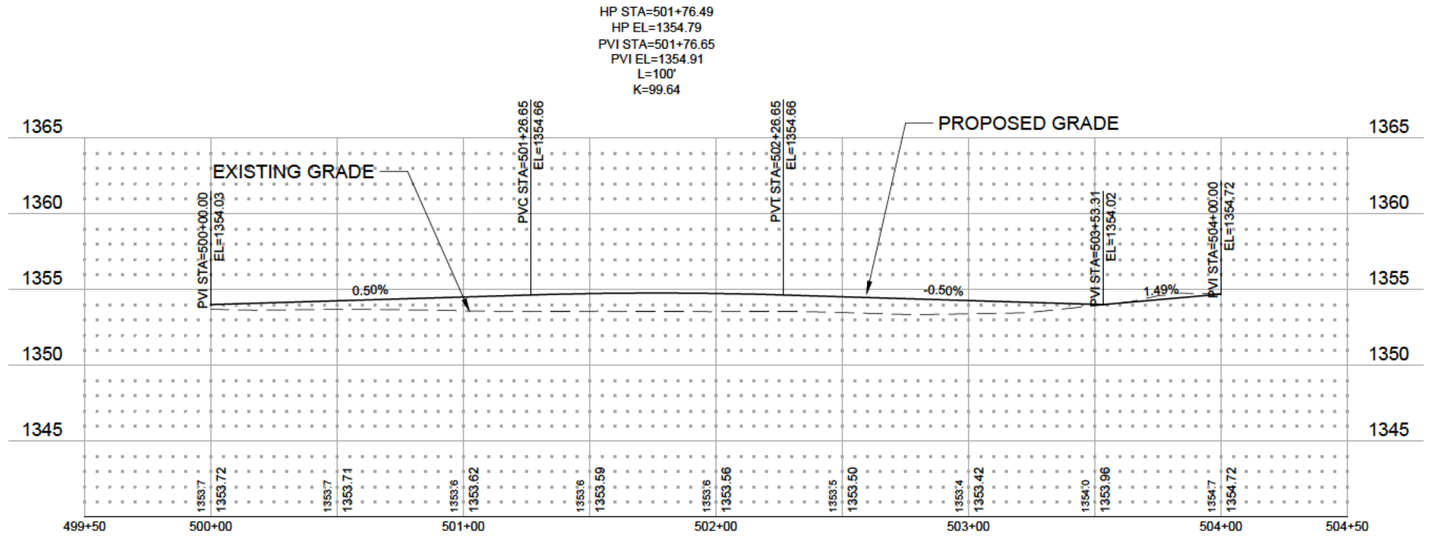
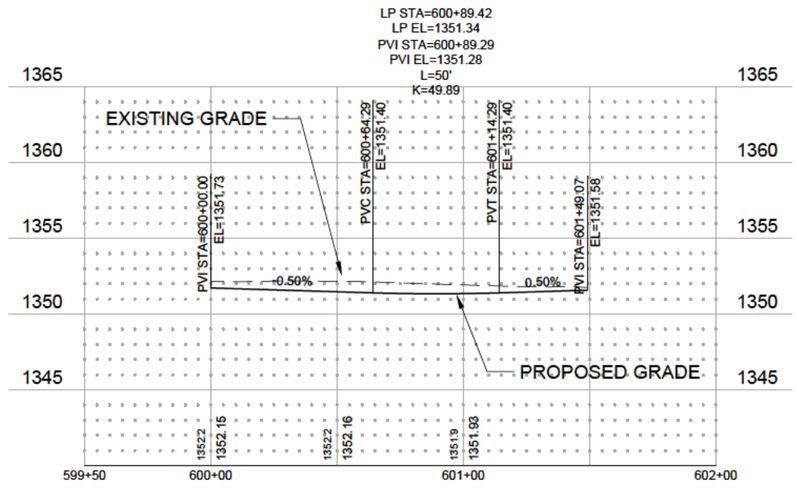
VALEPOINTE ADDITION
VALLEY CENTER, KANSAS

NORTH POINTE COURT & TRUE NORTH COURT - ROAD PROFILES



QUAIL STREET



VALEPOINT CIRCLE

SEH Project	FF185529	Rev.#	Plan Revision Issue Description	Date	Rev.#	Sheet Revision Issue Description	Date
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SEH

VALEPOINTE ADDITION
VALLEY CENTER, KANSAS

QUAIL STREET & VALEPOINT CIRCLE - ROAD PROFILES

PRELIMINARY PLAT

VALEPOINTE

AN ADDITION TO VALLEY CENTER, SEDGWICK COUNTY, KANSAS.

SURVEYORS DESCRIPTION

A PORTION OF THE WEST HALF OF SECTION 25, TOWNSHIP 25 SOUTH, RANGE 1 WEST OF THE 6TH PRINCIPAL MERIDIAN, SEDGWICK COUNTY, KANSAS PREPARED BY LLOYD P. DORZWEILER, LS885 ON JULY 13, 2025, DESCRIBED AS FOLLOWS:
COMMENCING AT THE NORTHEAST CORNER OF THE NORTHWEST QUARTER OF SAID SECTION 25 SAID POINT ALSO BEING THE NORTHEAST CORNER OF BOBWHITE SUBDIVISION A PORTION OF THE NORTHWEST QUARTER OF SECTION 25, TOWNSHIP 25 SOUTH, RANGE 1 WEST OF THE 6TH PRINCIPAL MERIDIAN, SEDGWICK COUNTY, KANSAS; THENCE SOUTH 00°43'43" EAST (BASIS OF BEARING IS NAD83 GRID KANSAS SOUTH ZONE) ALONG THE EAST LINE OF SAID NORTHWEST QUARTER AND ALSO ALONG THE EAST LINE OF SAID BOBWHITE SUBDIVISION 662.78 FEET (661.08 FEET RECORD) TO THE SOUTHEAST CORNER OF LOT 1, BLOCK A OF SAID BOBWHITE SUBDIVISION FOR THE POINT OF BEGINNING; THENCE CONTINUING SOUTH 00°43'43" EAST ALONG THE EAST LINE OF SAID NORTHWEST QUARTER 1983.37 FEET (1983.01 FEET RECORD) TO THE SOUTHEAST CORNER OF THE NORTHWEST QUARTER; THENCE SOUTH 00°41'03" EAST ALONG THE EAST LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 25 A DISTANCE OF 446.40 FEET (446.60 FEET RECORD); THENCE SOUTH 88°47'37" WEST 200.19 FEET (200.00 FEET RECORD AND 200.31 FEET PREVIOUS SURVEY); THENCE SOUTH 00°43'02" EAST 767.04 FEET (766.96 FEET PREVIOUS SURVEY) TO THE NORTHEASTERLY RIGHT-OF-WAY OF NORTH INTERURBAN DRIVE; THENCE NORTH 26°35'42" WEST ALONG THE NORTHEASTERLY RIGHT-OF-WAY OF NORTH INTERURBAN DRIVE 1561.71 FEET (1561.57 FEET PREVIOUS SURVEY); THENCE FOLLOWING THE ARC OF A CURVE TO THE RIGHT HAVING A RADIUS OF 5539.65 FEET NORTHWESTERLY ALONG THE NORTHEASTERLY RIGHT-OF-WAY OF NORTH INTERURBAN DRIVE 78.40 FEET (78.56 FEET PREVIOUS SURVEY) (CHORD BEARS NORTH 26°13'05" WEST 78.40 FEET); THENCE NORTH 25°47'05" WEST ALONG THE NORTHEASTERLY RIGHT-OF-WAY OF NORTH INTERURBAN DRIVE 915.64 FEET (915.58 FEET PREVIOUS SURVEY) TO THE SOUTH CORNER OF SAID BOBWHITE SUBDIVISION; THENCE NORTH 64°13'51" EAST ALONG THE SOUTHEASTERLY LINE OF SAID BOBWHITE SUBDIVISION 126.27 FEET (126.29 FEET PLATTED) TO THE SOUTHEAST CORNER OF LOT 9, BLOCK A OF SAID BOBWHITE SUBDIVISION; THENCE NORTH 00°46'56" WEST ALONG THE EAST LINE OF SAID BOBWHITE SUBDIVISION 839.94 FEET (839.92 FEET PLATTED) TO THE NORTHEAST CORNER OF LOT 8, BLOCK A OF SAID BOBWHITE SUBDIVISION; THENCE NORTH 89°17'25" EAST ALONG THE SOUTH LINE OF SAID BOBWHITE SUBDIVISION 1189.91 FEET (1189.24 FEET PLATTED) TO THE POINT OF BEGINNING, CONTAINING 60.977 ACRES.

BENCHMARKS

VERTICAL DATUM (NAVD88):
ELEVATION BASED UPON GPS OBSERVATION SUBMITTED TO NATIONAL GEODETIC SURVEY & PROCESSED THROUGH OPUS SOFTWARE.

CP-2 – CHISELED "X" CUT ON NORTHWEST CORNER OF INLET ALONG SOUTH SIDE OF MEADOW ROAD 75.0± FEET NORTHEASTERLY OF THE CENTERLINE OF INTERURBAN DRIVE.
N 1742255.4942 E 1635489.1868
ELEV=1351.03

CP-4 – CHISELED "X" CUT ON NORTH END OF METAL RETAINING WALL 36.3± WEST AND 28.4± FEET SOUTH OF THE INTERSECTION OF W 93RD ST N AND INTERURBAN DR.
N 1746567.5926 E 1633244.2891
ELEV=1364.59

CP-8 – CHISELED "X" CUT IN TOP OF CURB NEAR THE SOUTHEAST CORNER OF THE PROPERTY AT 1165 N LONGVIEW DR.
N 1745223.2141 E 1635577.2963
ELEV=1354.14

CP-11 – CHISELED "X" CUT IN TOP OF WEST END OF CMP 38.7± FEET WEST AND 26.3± FEET NORTH OF THE NORTHEAST CORNER OF THE NORTHWEST QUARTER OF SECTION 25, T25S, R1W.
N 1746649.0578 E 1635314.2312
ELEV=1356.00

OWNER / SUBDIVIDER

4FRONT, LLC
JEREMY SPEXARTH, OWNER
8918 W 21ST ST, STE 200
WICHITA, KS 67205

ENGINEER / PREPARER

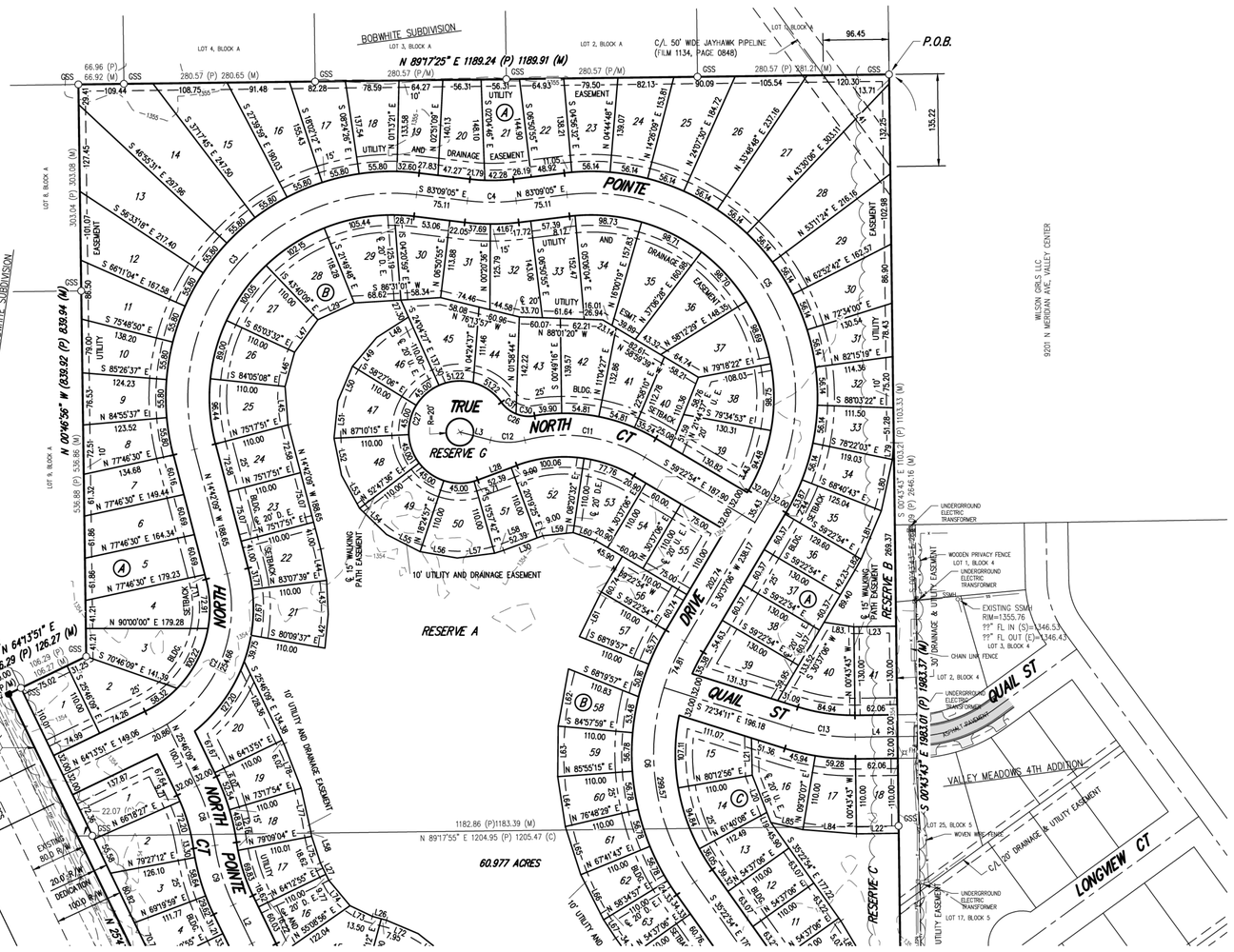
JAKE VASA, PE
SEH, INC.
15750 DODGE RD – SUITE 304
OMAHA, NE 68118

SURVEYOR

LLOYD P. DORZWEILER, LS 885
ALPHA LAND SURVEYS, INC.
102 EAST 4TH AVENUE, HUTCHINSON, KS
PHONE: 620-728-0012 (O)

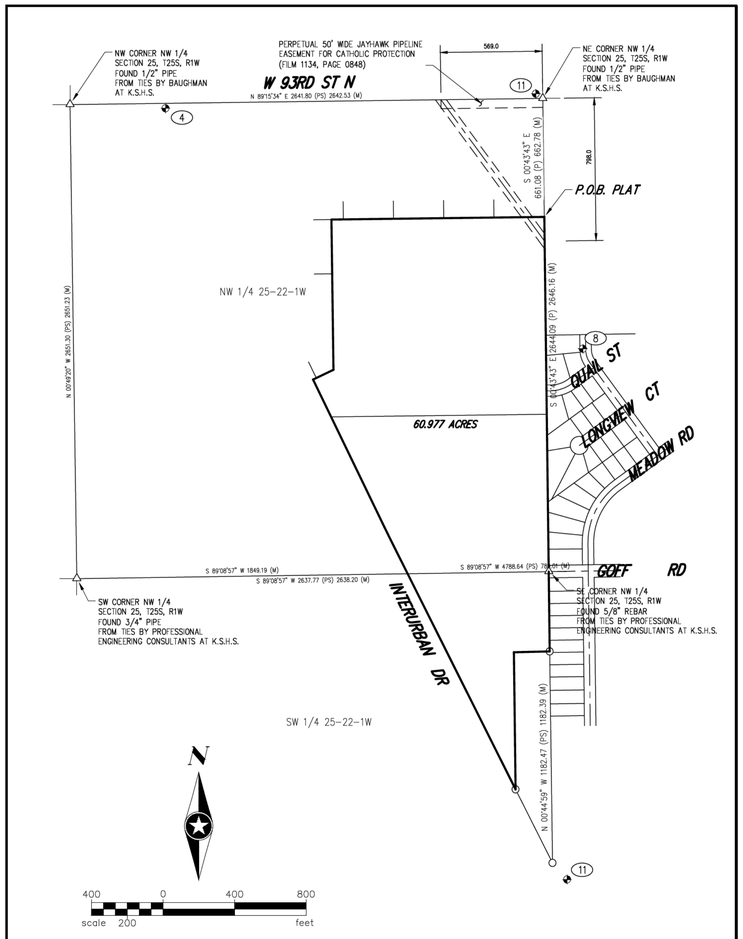
ZONING CLASSIFICATIONS

PROPOSED ZONING: R-1B: SINGLE FAMILY RESIDENTIAL DISTRICT



VICINITY MAP

(NOT TO SCALE)



LEGEND

△	SECTION SUBDIVISION CORNER FOUND
UO1 ○	FOUND 1/2" PIPE UNKNOWN ORIGIN
PEC ○	FOUND 1/2" REBAR WITH PLASTIC CAP STAMPED "PROFESSIONAL ENGINEERING CONSULTANTS"
GSS ○	FOUND 5/8" REBAR WITH PLASTIC CAP STAMPED "GARBER"
●	SET 1/2" REBAR WITH CAP STAMPED "ALPHA CLS-184"
	POWER POLE
	GUY ANCHOR
E	UNDERGROUND ELECTRIC BOX
T	UNDERGROUND TELEPHONE PEDESTAL
TV	UNDERGROUND CABLE TELEVISION PEDESTAL
GM ○	GAS METER
MH ○	MANHOLE
SSMH ○	SANITARY SEWER MANHOLE
CO ○	CLEANOUT
SWSMH ○	STORM WATER SEWER MANHOLE
WM ○	WATER METER
WV ○	WATER VALVE
FH ○	FIRE HYDRANT
OHE	OVERHEAD ELECTRIC
UGE	UNDERGROUND ELECTRIC
T	UNDERGROUND TELEPHONE
G	GAS LINE
TV	UNDERGROUND TELEVISION CABLE
SS	SANITARY SEWER LINE
W	WATER LINE
X	FENCE

N.	NORTH
S.	SOUTH
E.	EAST
W.	WEST
°	DEGREES
'	FEET OR MINUTES
"	INCHES OR SECONDS
SQ.	SQUARE
FT.	FEET
PG.	PAGE
C.	CALCULATED
R.	RECORD
M.	MEASURED
R/W	RIGHT OF WAY
C/L	CENTERLINE
RCP	REINFORCED CONCRETE PIPE
CMP	CORRUGATED METAL PIPE
FL	FLOWLINE
C.A.C.	COMPLETE ACCESS CONTROL
D. E.	DRAINAGE EASEMENT
U. E.	UTILITY EASEMENT
S.S. E.	SANITARY SEWER EASEMENT
P.	PLATTED DISTANCE PER THE PLAT OF BOBWHITE SUBDIVISION AS RECORDED IN DOC#:2025-015600 AT THE SEDGWICK COUNTY REGISTER OF DEEDS OFFICE
PS	PREVIOUS SURVEY BY GARBER SURVEYING AS RECORDED IN DOC#/FLM-PG: 30358034 AT THE SEDGWICK COUNTY REGISTER OF DEEDS OFFICE

N

100 0 100 200
scale 50 feet

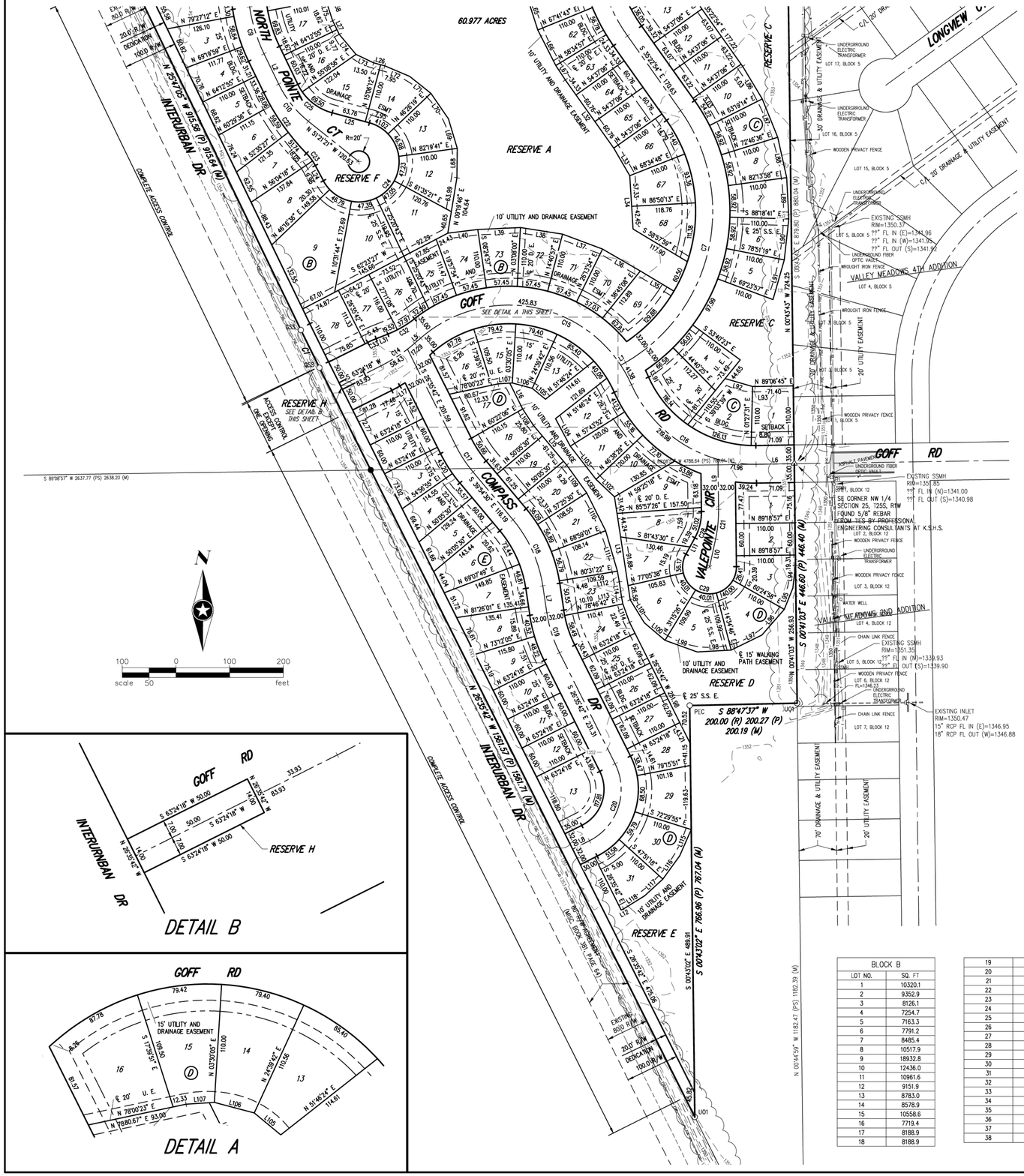
SEH
15750 DODGE RD, SUITE 304
OMAHA, NE 68118
PH: (402) 513-8200

SURVEY DATE: 07/11/2025	PLOT DATE: 08/21/2025
DRAWN BY: RDB	SEH PROJECT: 185529
CHECKED BY: LPD-JV	SHEET 1 OF 2

PRELIMINARY PLAT

VALEPOINTE

AN ADDITION TO VALLEY CENTER, SEDGWICK COUNTY, KANSAS.



CURVE TABLE

CURVE #	RADIUS	DELTA	ARC LENGTH	TANGENT	CHORD BEARING/DISTANCE
C1	5599.65	0°48'08"	78.40	39.20	S 26°13'05" E 78.40
C2	200.00	78°56'00"	275.53	164.67	N 24°45'51" E 254.25
C3	300.00	111°33'04"	584.08	441.03	S 41°04'23" W 496.10
C4	300.00	13°41'49"	71.72	36.03	N 90°00'00" E 71.55
C5	300.00	127°28'00"	667.41	607.90	N 33°06'54" W 538.05
C6	325.00	65°59'59"	374.37	211.06	S 2°22'54" E 354.01
C7	325.00	95°22'54"	541.03	357.05	N 12°18'33" E 480.69
C8	300.00	17°30'43"	91.69	46.21	N 17°00'48" W 91.34
C9	300.00	17°31'39"	91.77	46.25	S 17°01'15" E 91.42
C10	200.00	25°34'16"	89.26	45.39	S 38°34'13" E 88.52
C11	232.00	45°03'26"	182.44	96.23	N 81°54'37" W 177.78
C12	100.00	29°07'36"	50.84	25.98	S 89°52'32" E 50.29
C13	300.00	18°09'31"	95.08	47.94	S 81°38'57" E 94.68
C14	300.00	14°27'46"	75.73	38.07	N 56°10'25" E 75.53
C15	250.00	107°04'41"	467.22	338.34	N 77°31'08" W 402.13
C16	250.00	66°54'28"	291.94	165.18	S 57°26'01" E 275.63

CURVE TABLE

CURVE #	RADIUS	DELTA	ARC LENGTH	TANGENT	CHORD BEARING/DISTANCE
C17	250.00	13°18'48"	58.09	29.18	S 33°15'06" E 57.96
C18	250.00	31°20'31"	136.76	70.14	N 24°14'15" W 135.06
C19	250.00	18°01'43"	78.66	39.66	S 17°34'51" E 78.34
C20	107.00	90°00'00"	168.08	107.00	N 18°24'18" E 151.32
C21	250.00	12°49'04"	55.93	28.08	N 5°43'29" E 55.81
C22	432.00	18°29'14"	139.39	70.31	S 35°01'42" E 138.79
C23	100.00	16°03'10"	28.02	14.10	N 36°14'44" W 27.93
C24	75.00	226°40'39"	296.72	173.82	N 38°26'32" E 137.73
C25	100.00	49°06'43"	85.72	45.69	S 50°20'26" E 83.12
C26	50.00	63°39'43"	55.56	31.04	S 67°38'57" E 52.74
C27	75.00	254°30'19"	333.15	98.62	S 16°55'45" W 119.40
C28	100.00	29°14'05"	51.02	26.08	N 13°56'00" E 50.47
C29	50.00	209°14'05"	182.59	191.72	S 76°04'00" E 96.76
C30	50.00	31°49'51"	27.78	14.26	S 83°33'52" E 27.42
C31	50.00	31°49'51"	27.78	14.26	S 51°44'01" E 27.42
C32	200.00	16°28'22"	57.50	28.95	N 60°10'16" E 57.30

LINE TABLE

LINE #	BEARING	DISTANCE
L1	S 60°00'00" W	10.17
L2	N 25°47'05" W	62.74
L3	S 75°18'44" E	46.46
L4	N 89°16'17" E	62.06
L5	S 48°56'32" W	14.86
L6	N 89°06'45" E	71.00
L7	N 08°33'59" W	50.55
L8	S 63°24'18" W	35.00
L9	N 00°41'03" W	93.14
L10	N 12°08'09" E	53.04
L11	N 28°33'02" E	34.58
L12	N 63°24'18" E	5.00
L13	N 08°40'56" W	194.12
L14	N 08°33'59" W	28.59
L15	N 39°54'30" W	96.33
L16	N 26°35'42" W	53.90
L17	S 58°24'09" W	11.33
L18	N 21°27'52" W	74.67
L19	N 21°27'52" W	16.05
L20	N 21°27'52" W	58.63
L21	N 01°12'45" W	54.55
L22	S 89°16'17" W	62.06
L23	N 89°16'17" E	62.06
L24	N 28°13'09" W	32.08
L25	S 74°53'48" E	71.71
L26	N 74°53'48" W	21.45
L27	N 25°47'05" W	28.39
L28	S 69°40'35" W	61.38
L29	S 65°11'25" W	58.86
L30	S 69°40'35" W	61.38

LINE TABLE

LINE #	BEARING	DISTANCE
L31	S 68°24'27" W	23.17
L32	S 35°22'54" E	155.84
L33	S 30°08'29" E	59.19
L34	N 03°36'40" W	99.78
L35	S 58°57'59" E	72.97
L36	S 59°54'10" E	81.31
L37	S 69°32'35" E	79.49
L38	S 81°05'32" E	79.49
L39	N 87°21'32" E	79.49
L40	N 83°05'22" E	56.32
L41	S 36°13'22" E	166.12
L42	N 05°39'42" E	49.83
L43	N 02°41'40" W	49.83
L44	N 10°47'15" W	46.70
L45	N 04°23'39" W	56.55
L46	N 15°25'40" E	52.23
L47	N 35°38'10" E	58.64
L48	S 57°19'53" W	55.29
L49	S 40°08'34" W	55.29
L50	S 22°57'14" W	55.29
L51	S 05°45'55" W	55.29
L52	S 11°25'25" E	55.29
L53	S 28°36'44" E	55.29
L54	S 45°48'03" E	55.29
L55	S 62°59'23" E	55.29
L56	S 80°10'42" E	55.29
L57	N 82°37'58" E	55.29
L58	N 71°51'27" E	14.08
L59	N 84°00'33" E	44.56
L60	S 70°31'11" E	34.77

LINE TABLE

LINE #	BEARING	DISTANCE
L61	S 26°08'34" W	72.88
L62	S 10°16'39" W	85.36
L63	S 00°28'38" W	74.20
L64	S 08°38'08" E	74.20
L65	S 17°44'54" E	74.20
L66	S 26°51'40" E	74.20
L67	S 33°23'57" E	32.29
L68	N 00°49'43" E	54.69
L69	N 16°38'40" W	57.70
L70	N 34°35'21" W	57.70
L71	N 51°23'43" W	50.43
L72	N 67°03'46" W	50.43
L73	N 64°24'52" W	36.39
L74	N 39°51'30" W	48.63
L75	N 18°18'36" W	41.03
L76	N 09°38'11" W	7.18
L77	N 12°28'46" W	65.08
L78	N 21°14'12" W	69.90
L79	S 04°56'21" W	24.71
L80	S 12°00'50" W	76.92
L81	S 22°43'57" W	77.00
L82	S 29°21'23" W	18.15
L83	S 81°31'06" E	44.18
L84	N 85°36'48" W	78.82
L85	N 77°22'29" W	48.17
L86	S 31°01'50" E	70.86
L87	S 21°57'05" E	76.99
L88	S 12°29'43" E	76.99
L89	S 03°02'22" E	76.99
L90	S 06°25'00" W	76.99

LINE TABLE

LINE #	BEARING	DISTANCE
L91	S 15°52'22" W	76.99
L92	S 73°50'09" E	53.31
L93	S 89°42'52" E	4.30
L94	S 06°35'46" W	42.67
L95	S 21°55'17" W	42.67
L96	S 41°02'35" W	63.57
L97	S 63°57'41" W	63.57
L98	S 86°52'47" W	63.57
L99	N 70°12'07" W	63.57
L100	N 49°40'05" W	50.47
L101	N 31°31'08" W	50.47
L102	N 46°42'23" W	47.30
L103	N 37°48'49" W	78.26
L104	N 28°08'48" W	58.23
L105	S 50°29'46" E	32.01
L106	S 75°05'50" E	38.46
L107	N 86°16'26" E	26.42
L108	S 33°15'06" E	36.63
L109	S 35°45'13" E	64.05
L110	S 26°29'48" E	78.61
L111	S 16°17'37" E	78.60
L112	S 09°52'46" E	20.26
L113	S 10°54'39" E	12.93
L114	S 19°55'31" E	36.70
L115	S 23°39'44" W	53.45
L116	S 35°59'03" W	53.45
L117	S 47°27'36" W	46.13
L118	S 58°05'24" W	46.13

BLOCK C	
LOT NO.	SQ. FT
1	8557.8
2	10024.8
3	9544.7
4	7131.0
5	7398.0
6	7398.0
7	7398.0
8	7398.0
9	7398.0
10	7372.5
11	6954.0
12	6937.7
13	7567.3
14	8641.2
15	8978.2
16	8680.7
17	7508.5
18	6826.4

BLOCK D	
LOT NO.	SQ. FT
1	8281.2
2	6600.0
3	8262.0
4	8969.0
5	8968.8
6	9039.7
7	7914.5
8	7914.5
9	10453.6
10	7409.5
11	7914.0
12	7718.3
13	6630.2
14	6556.6
15	6514.7
16	8605.5
17	8148.7
18	7999.8
19	6737.5
20	7213.5
21	7243.9
22	7272.5
23	6979.6
24	8199.2
25	6830.2
26	6830.2
27	6830.2
28	7361.1
29	9386.5
30	9076.0
31	8402.5

BLOCK E	
LOT NO.	SQ. FT
1	8023.6
2	6600.0
3	7181.1
4	7654.6
5	8180.6
6	8180.6
7	9473.9
8	8138.1
9	7293.8
10	6600.0
11	6600.0
12	6600.0
13	11860.9

BLOCK B	
LOT NO.	SQ. FT
1	10320.1
2	9352.9
3	8126.1
4	7254.7
5	7163.3
6	7791.2
7	8485.4
8	10517.9
9	18932.8
10	12436.0
11	10961.6
12	9151.9
13	8783.0
14	8578.9
15	10558.6
16	7719.4
17	8188.9
18	8188.9
19	7334.5
20	10056.3
21	9148.1
22	8799.4
23	8257.7
24	7983.6
25	8527.2
26	7856.4
27	8854.4
28	9288.3
29	10732.3
30	8351.9
31	7915.5
32	9199.2
33	9356.5
34	10832.8
35	11104.1
36	10920.3
37	9779.0
38	9265.9
39	9862.4
40	6510.4
41	8175.8
42	9620.9
43	9068.8
44	7777.0
45	10020.2
46	8426.7
47	8426.7
48	8426.7
49	8426.7
50	8426.7
51	6850.0
52	9053.2
53	8539.9
54	6600.0
55	8250.0
56	6681.2
57	7010.7
58	7532.0
59	7135.1
60	7135.1
61	7135.1
62	7135.1
63	6905.5
64	6683.2
65	6683.2
66	8086.8
67	8683.2
68	8904.6
69	8664.6
70	7599.2
71	7432.5
72	7432.5
73	7432.5
74	7733.9
75	6809.9
76	8090.8
77	7365.5
78	8354.6

BLOCK A	
LOT NO.	SQ. FT
1	8250.9
2	9248.7
3	11096.0
4	10961.2
5	10415.9
6	9512.7
7	8537.9
8	8171.9
9	8119.5
10	8679.6
11	10384.7
12	13693.8
13	19684.8
14	22880.1
15	16039.4
16	12019.7
17	9879.9
18	9021.6
19	8487.2
20	9022.1
21	9183.5
22	8814.4
23	9319.6
24	9937.9
25	11804.3
26	15427.4
27	21922.2
28	19975.3
29	13492.8
30	9929.4
31	8053.3
32	7338.4
33	7575.4
34	8026.7
35	8402.0
36	7844.2
37	7847.8
38	7847.8
39	9748.6
40	10491.9
41	8054.0

SEH
15750 DODGE RD, SUITE 304
OMAHA, NE 68118
PH: (402) 513-8200

SURVEY DATE: 07/11/2025	PLOT DATE: 08/21/2025
DRAWN BY: ROB	SEH PROJECT: 185529
CHECKED BY: LPD-JV	SHEET 2 OF 2

Building a Better World for All of Us®

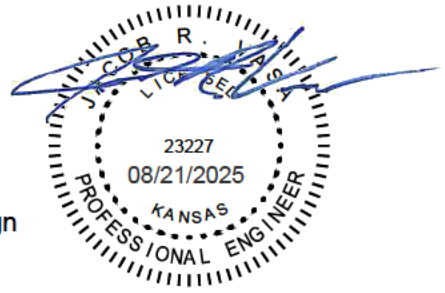
MEMORANDUM

TO: Valley Center, Kansas

FROM: Jake Vasa, PE

DATE: August 21, 2025

RE: ValePointe Residential Development, Preliminary Drainage Design
Valley Center, Kansas



This memo addresses the preliminary storm water design for Sedgwick County, Vale Pointe Residential Development located at the Southeast corner of the intersection of W 93rd St N and N Interurban Drive (N West Street), Valley Center, Kansas. This memo is preliminary but aligns with the standards set in place by the following:

- Valley Center Stormwater Manual
- Wichita/Sedgwick County Stormwater Manual
- Valley Center Master Drainage Analysis

The drainage design will be revised/refined and permitted through the necessary agencies during construction document design for the grading and infrastructure. Additional permits will be obtained as necessary, including but not limited to; water storage permit and stormwater and erosion permit

Background Information

The total site is 60.74 acres, consisting of small grain crops with hydrological type C & D soils. A city well house and utility outlot is located south of the property and is elevated to allow runoff to divert around the building and flow to an existing outfall culvert located at the intersection of N Interurban Drive and N Meadow Road. Additional areas outside of the project boundary flow onto the site via sheeting and shallow concentrated flows from W 93rd Street N. Additional offsite flows from north of W 93rd Street N concentrate to the intersection of 93rd and West, and flow into an existing drainage culvert, but diverts into an existing right-of-way ditch on the east side of Interurban Drive that does not contribute flow onto the site. A large portion of the existing flow patterns that contribute to the project site concentrate to the far southeast of the property and flow into an existing utility and drainage easement. This existing easement incorporates a well-defined and contoured ditch that services runoff from the site and a portion of the neighboring Valley Meadows subdivision to the east. This ditch flows south to the existing outfall culvert at N Interurban Drive and N Meadow Road where it serves as the Impact Point of the project. This location is analyzed for the impacts (or reduction of impacts) from the concentration of the offsite flows and proposed project runoff for capacity and handling capability. Based on the current physical condition of

the existing site and outfall culvert, it is not expected that additional reinforcement or flow mitigation practices will be necessary for this existing outfall.

The following storm events from the Valley Center Stormwater Manual (Section 4.3, Table 4-1) that were calculated with the SCS TR-20 Rainfall Method for this site runoff were used:

- 2 year storm event – 3.39 inches (24 hour duration)
- 5 year storm event – 4.24 inches (24 hour duration)
- 10 year storm event – 4.98 inches (24 hour duration)
- 25 year storm event – 6.03 inches (24 hour duration)
- 100 year storm event – 7.83 inches (24 hour duration)

Proposed Site Information
The proposed project is a development that will include 181 residential single-family lots. One on-site retention pond will provide regional detention for the development in the free board above the normal pool elevation. Outflow from the pond will be regulated through a structure to control flow rates, with significantly reduced flow rates in the 2 and 5 year rain events, aiding in maintaining normal pool elevation during dry weather. Water quality will be provided on flows prior to entrance to the pond, but any remaining sediment will diffuse into the pond water, serving as water quality. One onsite swale will provide a smaller volume of detention but provide water quality management for the development. All site flows will have considerable decrease along the impact points to the existing drainage ditch and outfall culvert located at the intersection of N Interurban Drive and N Meadow Road. In the interim condition prior to the full design and construction of the development, preventative grading along the north edge of the site will divert offsite flows from north of the site to the east and west where existing ditches provide downhill conveyance and temporary storage of runoff in large storm events.

The retention pond is intended to have a permanent pool elevation of 1351.50 and allow for additional runoff to pool in the reserve along the back lot lines for the adjacent properties (home elevations at minimum 2’ higher than water storage elevations of the 100-year flood at 1352.78). This temporarily detained water will flow through the reserve to an onsite outlet culvert, located in the southeast corner of the reserve, to outfall into the existing drainage ditch in a lesser volume compared to the pre-developed condition. This preliminary runoff design shows the reduction and/or maintaining of the pre-developed flow rates, and will be refined through grading and storm conveyance design to reduce the 100 year event elevation.

The accommodated runoff is 89.31 acres total. The weighted Curve Number (CN) is based on the amount of differing runoff areas and the hydrological soil group (HSG). The site is split between HSG C & HSG D. The weighted CN’s are summarized in the attachments.

Downstream Channel Protection Assumptions/Analysis

The existing site is flow regulated by the drainage ditch along the east portion of the property line adjacent to the neighboring subdivision, Valley Meadows. The drainage ditch is regulated and protected with a 70-foot drainage and utility easement. The proposed site is expected to produce two impact points that both access the drainage ditch, where neither will have a detention or retention pond in the proposed condition, as the outlets are already flow limited. These impact points will allow for excess runoff that is not detained on site to be conveyed to an existing facility (N Meadow Road drainage culvert) and continue to outfall to the Little Arkansas River regional watershed. The hydraulic analysis of the proposed site expects unretained runoff from the detention basin and onsite swale to have significantly decreased flow to the impact points, so additional construction, maintenance, or management should not be necessary for the existing facilities to handle the produced runoff from the site. Analysis of the downstream effects show minimal change as our drainage design is not extending release of runoff volume for long durations, but rather retaining a significant portion onsite. This is beneficial to the area, which sees consistent low level flooding during high channel volumes of Chisholm creek.

Runoff Flow Summary Tables

EXISTING (To East Drainage Ditch – Impact Point 1)							
Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
EX-1	2	24	2	3.39	51.28	84	22.41
EX-1	5	24	2	4.24	51.28	84	31.70
EX-1	10	24	2	4.98	51.28	84	40.03
EX-1	25	24	2	6.03	51.28	84	52.02
EX-1	100	24	2	7.83	51.28	84	72.80

EXISTING (To Interurban Drive Right-of-Way Ditch – Impact Point 2)							
Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
EX-2	2	24	2	3.39	38.03	84	14.29
EX-2	5	24	2	4.24	38.03	84	20.39
EX-2	10	24	2	4.98	38.03	84	25.87
EX-2	25	24	2	6.03	38.03	84	33.81
EX-2	100	24	2	7.83	38.03	84	47.62

EXISTING (To Outlet Pipe – Impact Points 1 + 2)							
Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
EXG_{TOTAL}	2	24	2	3.39	89.31	84	33.23
EXG_{TOTAL}	5	24	2	4.24	89.31	84	47.74
EXG_{TOTAL}	10	24	2	4.98	89.31	84	60.81
EXG_{TOTAL}	25	24	2	6.03	89.31	84	79.76
EXG_{TOTAL}	100	24	2	7.83	89.31	84	112.77

The runoff contributing to the Outlet Pipe is comprised of the runoff produced at Impact Points 1 and 2 but is not a direct sum of the two runoff amounts. The existing drainage ditch where the outfall of Impact Point 1 is received contributes a certain volume for temporary retention before being outlet. This is more evident in larger storm events where the total runoff is decreased significantly when compared to the direct sum of the runoff from the impact points.

PROPOSED (To East Drainage Ditch – Impact Point 1)							
Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
BASIN A, EX-1,OS-1	2	24	2	3.39	61.34	82	22.38
BASIN A, EX-1,OS-1	5	24	2	4.24	61.34	82	29.34
BASIN A, EX-1,OS-1	10	24	2	4.98	61.34	82	35.58
BASIN A, EX-1,OS-1	25	24	2	6.03	61.34	82	44.56
BASIN A, EX-1,OS-1	100	24	2	7.83	61.34	82	60.08

PROPOSED (To East Drainage Ditch – Impact Point 2)							
Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
BASIN B	2	24	2	3.39	12.35	80	7.40
BASIN B	5	24	2	4.24	12.35	80	13.53
BASIN B	10	24	2	4.98	12.35	80	20.03
BASIN B	25	24	2	6.03	12.35	80	29.57
BASIN B	100	24	2	7.83	12.35	80	45.80

PROPOSED (To Interurban Drive Right-of-Way Ditch - Impact Point 3)							
Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
OS-2, EX-2	2	24	2	3.39	15.61	84	6.51
OS-2, EX-2	5	24	2	4.24	15.61	84	9.47
OS-2, EX-2	10	24	2	4.98	15.61	84	12.13
OS-2, EX-2	25	24	2	6.03	15.61	84	16.01
OS-2, EX-2	100	24	2	7.83	15.61	84	22.78

PROPOSED (To Outlet Pipe – Impact Points 1 + 2 + 3)							
Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
$PROP_{TOTAL}$	2	24	2	3.39	89.31	82	27.06
$PROP_{TOTAL}$	5	24	2	4.24	89.31	82	36.54
$PROP_{TOTAL}$	10	24	2	4.98	89.31	82	45.12
$PROP_{TOTAL}$	25	24	2	6.03	89.31	82	57.61
$PROP_{TOTAL}$	100	24	2	7.83	89.31	82	79.44

The runoff contributing to the Outlet Pipe is comprised of the runoff produced at Impact Points 1, 2, and 3 but is not a direct sum of the three runoff amounts. The existing drainage ditch where the outfall of Impact Points 1 and 2 is received contributes a certain volume for temporary retention before being outlet. This is more evident in larger storm events where the total runoff is decreased significantly when compared to the direct sum of the runoff from the impact points.

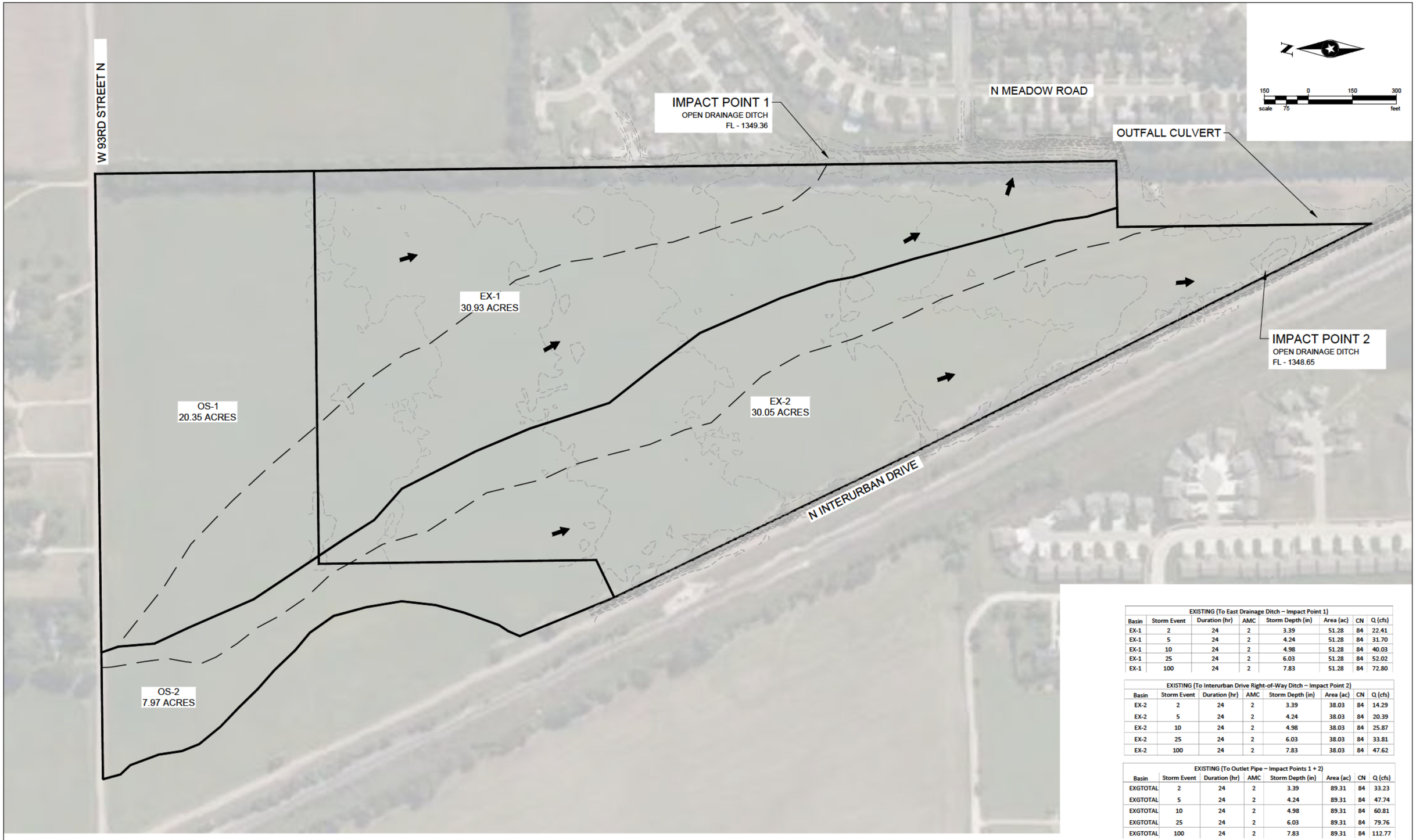
The runoff is significantly less in the proposed compared to the existing conditions to outfall culvert. This is largely due to the regulated release rates and water storage quantity within the onsite regional retention system.

Attachments:

1. HydroCAD figures depicting the existing subcatchments for the existing offsite flows.
2. HydroCAD figures depicting the proposed subcatchments for the proposed offsite flows.
3. Drawdown Table for Basin A
4. Existing Runoff Exhibit
5. Proposed Runoff Exhibit/Grading Plan

Please do not hesitate to contact me if further information is needed. Thank you.

Email: [redacted] Phone: 402.480.4096



EXISTING (To East Drainage Ditch – Impact Point 1)

Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
EX-1	2	24	2	3.39	51.28	84	22.41
EX-1	5	24	2	4.24	51.28	84	31.70
EX-1	10	24	2	4.98	51.28	84	40.03
EX-1	25	24	2	6.03	51.28	84	52.02
EX-1	100	24	2	7.83	51.28	84	72.80

EXISTING (To Interurban Drive Right-of-Way Ditch – Impact Point 2)

Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
EX-2	2	24	2	3.39	38.03	84	14.29
EX-2	5	24	2	4.24	38.03	84	20.39
EX-2	10	24	2	4.98	38.03	84	25.87
EX-2	25	24	2	6.03	38.03	84	33.81
EX-2	100	24	2	7.83	38.03	84	47.62

EXISTING (To Outlet Pipe – Impact Points 1 + 2)

Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
EXGTOTAL	2	24	2	3.39	89.31	84	33.23
EXGTOTAL	5	24	2	4.24	89.31	84	47.74
EXGTOTAL	10	24	2	4.98	89.31	84	60.81
EXGTOTAL	25	24	2	6.03	89.31	84	79.76
EXGTOTAL	100	24	2	7.83	89.31	84	112.77

EXISTING DRAINAGE EXHIBIT

SEH Project	FF185529	Rev.#	Plan Revision Issue Description	Date	Rev.#	Sheet Revision Issue Description	Date
Drawn By	--						
Designed By	--						
Checked By	--						

SEH

VALEPOINTE ADDITION
VALLEY CENTER, KANSAS

EXISTING DRAINAGE EXHIBIT

5 of 16

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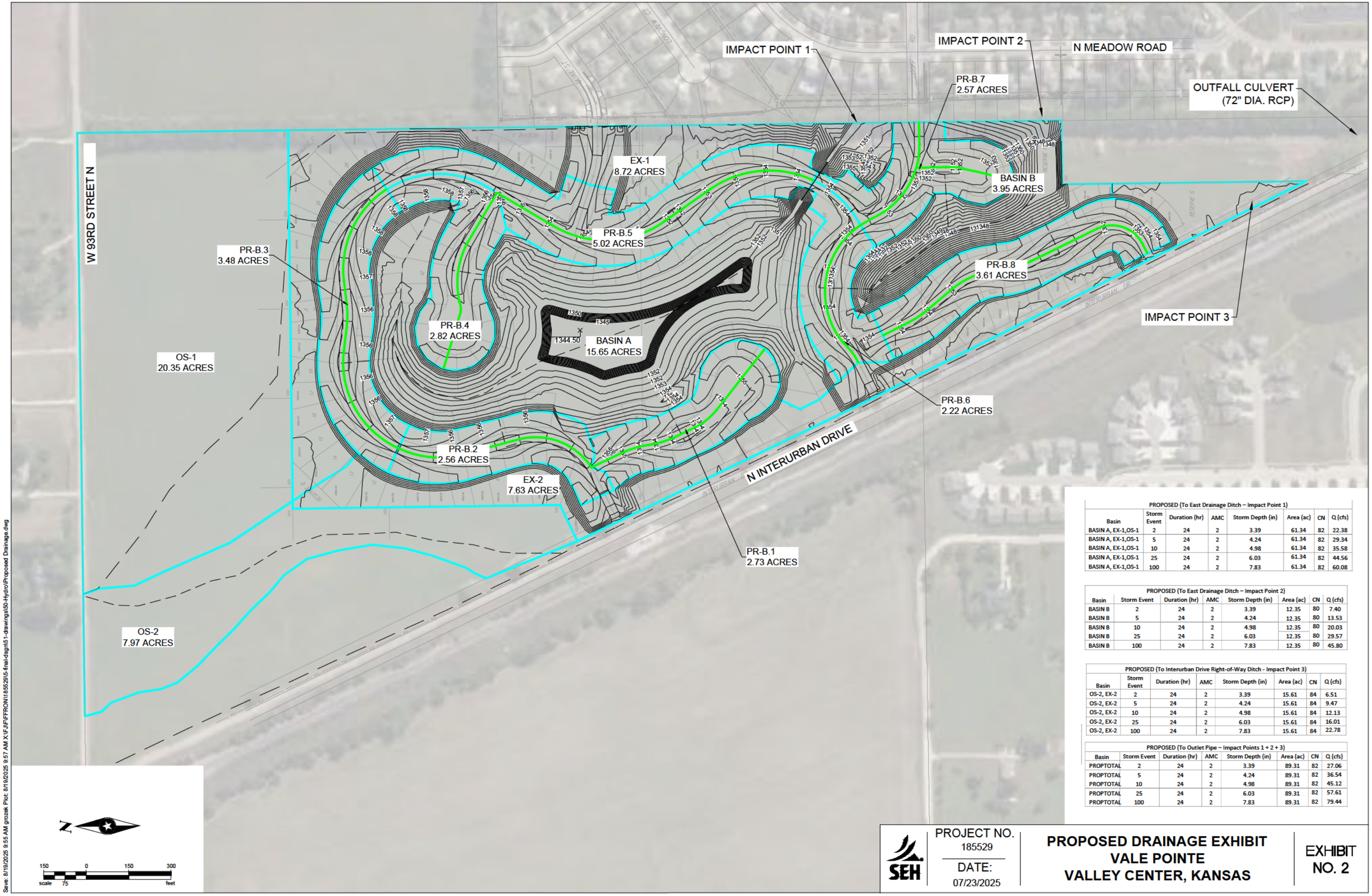

PROPOSED (To East Drainage Ditch – Impact Point 1)

Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
BASIN A, EX-1,OS-1	2	24	2	3.39	61.34	82	22.38
BASIN A, EX-1,OS-1	5	24	2	4.24	61.34	82	29.34
BASIN A, EX-1,OS-1	10	24	2	4.98	61.34	82	35.58
BASIN A, EX-1,OS-1	25	24	2	6.03	61.34	82	44.56
BASIN A, EX-1,OS-1	100	24	2	7.83	61.34	82	60.08

PROPOSED (To East Drainage Ditch – Impact Point 2)

Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
BASIN B	2	24	2	3.39	12.35	80	7.40
BASIN B	5	24	2	4.24	12.35	80	13.53
BASIN B	10	24	2	4.98	12.35	80	20.03
BASIN B	25	24	2	6.03	12.35	80	29.57
BASIN B	100	24	2	7.83	12.35	80	45.80

PROPOSED (To Interurban Drive Right-of-Way Ditch - Impact Point 3)

Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
OS-2, EX-2	2	24	2	3.39	15.61	84	6.51
OS-2, EX-2	5	24	2	4.24	15.61	84	9.47
OS-2, EX-2	10	24	2	4.98	15.61	84	12.13
OS-2, EX-2	25	24	2	6.03	15.61	84	16.01
OS-2, EX-2	100	24	2	7.83	15.61	84	22.78

PROPOSED (To Outlet Pipe – Impact Points 1 + 2 + 3)

Basin	Storm Event	Duration (hr)	AMC	Storm Depth (in)	Area (ac)	CN	Q (cfs)
PROPTOTAL	2	24	2	3.39	89.31	82	27.06
PROPTOTAL	5	24	2	4.24	89.31	82	36.54
PROPTOTAL	10	24	2	4.98	89.31	82	45.12
PROPTOTAL	25	24	2	6.03	89.31	82	57.61
PROPTOTAL	100	24	2	7.83	89.31	82	79.44

SEH

PROJECT NO. 185529

DATE: 07/23/2025

PROPOSED DRAINAGE EXHIBIT
VALE POINTE
VALLEY CENTER, KANSAS

EXHIBIT NO. 2

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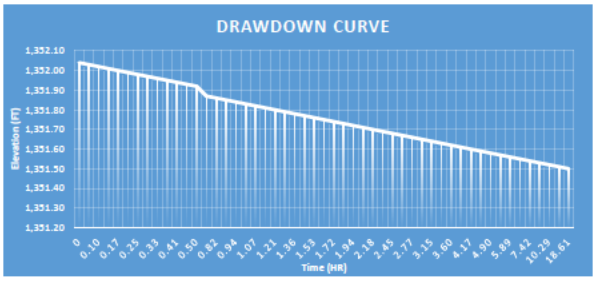
2-Year Storm Event Water Drawdown Calculation

Project Name: Vale Pointe Development
City of Valley Center, KS
Basin ID: *A*
Volume of Water Quality Event in CF: ***66,124***
Basin Elevation at the water Quality Event: ***1352.04***

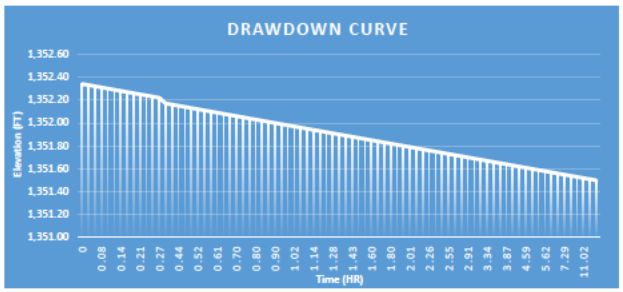
STAGE/ELEV, ft (use pond summary data)	VOLUME, cuft (use pond summary data)	Incremental Δ VOLUME, CFS (STAGE HI TO LOW)	DISCHARGE Q, CFS (use the stage-discharge table)	AVE Q, cfs (STAGE HI TO LOW)	time, sec = ΔV, cuft/AVG Q, cfs	t (Hours)	Cumulative Time in Hours
1,352.04	66124.08				0.00	0	0
1,352.03	64555.92	1568.16	12.74	6.37	246.18	0.07	0.07
1,352.02	63031.32	1524.6	12.30	12.52	121.77	0.03	0.10
1,352.01	61506.72	1524.6	11.87	12.09	126.16	0.04	0.14
1,352.00	59982.12	1524.6	11.45	11.66	130.75	0.04	0.17
1,351.99	58457.52	1524.6	11.03	11.24	135.64	0.04	0.21
1,351.98	56976.48	1481.04	10.62	10.83	136.82	0.04	0.25
1,351.97	55495.44	1481.04	10.23	10.43	142.07	0.04	0.29
1,351.96	54014.4	1481.04	9.84	10.04	147.59	0.04	0.33
1,351.95	52576.92	1437.48	9.46	9.65	148.96	0.04	0.37
1,351.94	51139.44	1437.48	9.08	9.27	155.07	0.04	0.41
1,351.93	49701.96	1437.48	8.72	8.90	161.51	0.04	0.46
1,351.92	48308.04	1393.92	8.36	8.54	163.22	0.05	0.50
1,351.91	46870.56	1437.48	8.01	8.19	175.62	0.05	0.55
1,351.90	45520.2	1350.36	7.67	7.84	172.24	0.05	0.60
1,351.89	44126.28	1393.92	7.34	7.51	185.73	0.05	0.65
1,351.88	42775.92	1350.36	7.02	7.18	188.07	0.05	0.70
1,351.87	41425.56	1350.36	6.70	6.86	196.85	0.05	0.76
1,351.86	40075.2	1350.36	6.40	6.55	206.16	0.06	0.82
1,351.85	38768.4	1306.8	6.10	6.25	209.09	0.06	0.87
1,351.84	37461.6	1306.8	5.81	5.96	219.45	0.06	0.94
1,351.83	36154.8	1306.8	5.52	5.67	230.68	0.06	1.00
1,351.82	34848	1306.8	5.24	5.38	242.90	0.07	1.07
1,351.81	33584.76	1263.24	4.97	5.11	247.45	0.07	1.14
1,351.80	32321.52	1263.24	4.71	4.84	261.00	0.07	1.21
1,351.79	31101.84	1219.68	4.45	4.58	266.31	0.07	1.28
1,351.78	29838.6	1263.24	4.20	4.33	292.08	0.08	1.36
1,351.77	28618.92	1219.68	3.96	4.08	298.94	0.08	1.45
1,351.76	27399.24	1219.68	3.72	3.84	317.63	0.09	1.53
1,351.75	26223.12	1176.12	3.50	3.61	325.80	0.09	1.63
1,351.74	25047	1176.12	3.27	3.39	347.45	0.10	1.72
1,351.73	23870.88	1176.12	3.06	3.17	371.60	0.10	1.83
1,351.72	22694.76	1176.12	2.85	2.96	398.01	0.11	1.94
1,351.71	21518.64	1176.12	2.65	2.75	427.68	0.12	2.05
1,351.70	20386.08	1132.56	2.45	2.55	444.14	0.12	2.18
1,351.69	19253.52	1132.56	2.26	2.36	480.92	0.13	2.31
1,351.68	18164.52	1089	2.09	2.18	500.69	0.14	2.45
1,351.67	17031.96	1132.56	1.92	2.01	564.87	0.16	2.61
1,351.66	15942.96	1089	1.75	1.84	593.46	0.16	2.77
1,351.65	14897.52	1045.44	1.59	1.67	626.01	0.17	2.95
1,351.64	13808.52	1089	1.44	1.52	718.81	0.20	3.15
1,351.63	12763.08	1045.44	1.29	1.37	765.89	0.21	3.36
1,351.62	11717.64	1045.44	1.15	1.22	856.92	0.24	3.60
1,351.61	10672.2	1045.44	1.02	1.09	963.54	0.27	3.86
1,351.60	9626.76	1045.44	0.89	0.96	1094.70	0.30	4.17
1,351.59	8624.88	1001.88	0.77	0.83	1207.08	0.34	4.50
1,351.58	7623	1001.88	0.65	0.71	1411.10	0.39	4.90
1,351.57	6621.12	1001.88	0.55	0.60	1669.80	0.46	5.36
1,351.56	5662.8	958.32	0.45	0.50	1916.64	0.53	5.89
1,351.55	4704.48	958.32	0.35	0.40	2395.80	0.67	6.56
1,351.54	3746.16	958.32	0.27	0.31	3091.35	0.86	7.42
1,351.53	2787.84	958.32	0.19	0.23	4166.61	1.16	8.57
1,351.52	1829.52	958.32	0.12	0.16	6182.71	1.72	10.29
1,351.51	914.76	914.76	0.07	0.10	9629.05	2.67	12.97
1,351.50	0	914.76	0.02	0.05	20328.00	5.65	18.61



10-Year Storm Event Water Drawdown Calculation

Project Name: Vale Pointe Development
City of Valley Center, KS
Basin ID: *A*
Volume of Water Quality Event in CF: ***118,875***
Basin Elevation at the water Quality Event: ***1352.34***

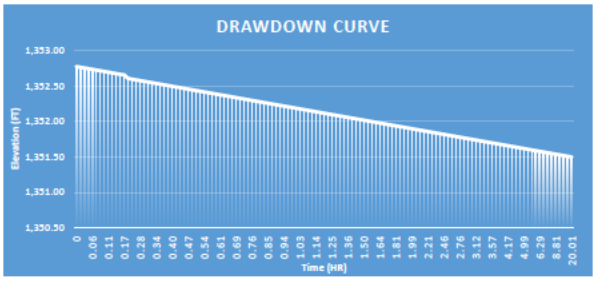
STAGE/ELEV, ft (use pond summary data)	VOLUME, cuft (use pond summary data)	Incremental Δ VOLUME, CFS (STAGE HI TO LOW)	DISCHARGE Q, CFS (use the stage-discharge table)	AVE Q, cfs (STAGE HI TO LOW)	time, sec = ΔV, cuft/AVG Q, cfs	t (Hours)	Cumulative Time in Hours
1,352.34	118,875.24				0.00	0	0
1,352.33	116,915.04	1960.2	27.57	13.79	142.20	0.04	0.04
1,352.32	114,998.40	1916.64	26.99	27.28	70.26	0.02	0.06
1,352.31	113,081.76	1916.64	26.43	26.71	71.76	0.02	0.08
1,352.30	111,165.12	1916.64	25.87	26.15	73.29	0.02	0.10
1,352.29	109,248.48	1916.64	25.31	25.59	74.90	0.02	0.12
1,352.28	107,375.40	1873.08	24.77	25.04	74.80	0.02	0.14
1,352.27	105,502.32	1873.08	24.24	24.51	76.44	0.02	0.16
1,352.26	103,629.24	1873.08	23.71	23.98	78.13	0.02	0.18
1,352.25	101,799.72	1829.52	23.19	23.45	78.02	0.02	0.21
1,352.24	99,970.20	1829.52	22.67	22.93	79.79	0.02	0.23
1,352.23	98,140.68	1829.52	22.16	22.42	81.62	0.02	0.25
1,352.22	96,354.72	1785.96	21.65	21.91	81.53	0.02	0.27
1,352.21	94,568.76	1785.96	21.15	21.40	83.46	0.02	0.30
1,352.20	92,782.80	1785.96	20.66	20.91	85.43	0.02	0.32
1,352.19	90,996.84	1785.96	20.17	20.42	87.48	0.02	0.34
1,352.18	89,254.44	1742.4	19.68	19.93	87.45	0.02	0.37
1,352.17	87,512.04	1742.4	19.20	19.44	89.63	0.02	0.39
1,352.16	85,813.20	1698.84	18.73	18.97	89.58	0.02	0.42
1,352.15	84,070.80	1742.4	18.26	18.50	94.21	0.03	0.44
1,352.14	82,371.96	1698.84	17.80	18.03	94.22	0.03	0.47
1,352.13	80,716.68	1655.28	17.34	17.57	94.21	0.03	0.50
1,352.12	79,017.84	1698.84	16.88	17.11	99.29	0.03	0.52
1,352.11	77,362.56	1655.28	16.44	16.66	99.36	0.03	0.55
1,352.10	75,707.28	1655.28	16.00	16.22	102.05	0.03	0.58
1,352.09	74,095.56	1611.72	15.56	15.78	102.14	0.03	0.61
1,352.08	72,483.84	1611.72	15.07	15.32	105.24	0.03	0.64
1,352.07	70,872.12	1611.72	14.58	14.83	108.72	0.03	0.67
1,352.06	69,260.40	1611.72	14.11	14.35	112.35	0.03	0.70
1,352.05	67,692.24	1568.16	13.64	13.88	113.02	0.03	0.73
1,352.04	66,124.08	1568.16	13.19	13.42	116.90	0.03	0.76
1,352.03	64,555.92	1568.16	12.74	12.97	120.95	0.03	0.80
1,352.02	63,031.32	1524.6	12.30	12.52	121.77	0.03	0.83
1,352.01	61,506.72	1524.6	11.87	12.09	126.16	0.04	0.87
1,352.00	59,982.12	1524.6	11.45	11.66	130.75	0.04	0.90
1,351.99	58,457.52	1524.6	11.03	11.24	135.64	0.04	0.94
1,351.98	56,976.48	1481.04	10.62	10.83	136.82	0.04	0.98
1,351.97	55,495.44	1481.04	10.23	10.43	142.07	0.04	1.02
1,351.96	54,014.40	1481.04	9.84	10.04	147.59	0.04	1.06
1,351.95	52,576.92	1437.48	9.46	9.65	148.96	0.04	1.10
1,351.94	51,139.44	1437.48	9.08	9.27	155.07	0.04	1.14
1,351.93	49,701.96	1437.48	8.72	8.90	161.51	0.04	1.19
1,351.92	48,308.04	1393.92	8.36	8.54	163.22	0.05	1.23
1,351.91	46,870.56	1437.48	8.01	8.19	175.62	0.05	1.28
1,351.90	45,520.20	1350.36	7.67	7.84	172.24	0.05	1.33
1,351.89	44,126.28	1393.92	7.34	7.51	185.73	0.05	1.38
1,351.88	42,775.92	1350.36	7.02	7.18	188.07	0.05	1.43
1,351.87	41,425.56	1350.36	6.70	6.86	196.85	0.05	1.49
1,351.86	40,075.20	1350.36	6.40	6.55	206.16	0.06	1.55
1,351.85	38,768.40	1306.8	6.10	6.25	209.09	0.06	1.60
1,351.84	37,461.60	1306.8	5.81	5.96	219.45	0.06	1.66
1,351.83	36,154.80	1306.8	5.52	5.67	230.68	0.06	1.73
1,351.82	34,848.00	1306.8	5.24	5.38	242.90	0.07	1.80
1,351.81	33,584.76	1263.24	4.97	5.11	247.45	0.07	1.86
1,351.80	32,321.52	1263.24	4.71	4.84	261.00	0.07	1.94
1,351.79	31,101.84	1219.68	4.45	4.58	266.31	0.07	2.01
1,351.78	29,838.60	1263.24	4.20	4.33	292.08	0.08	2.09
1,351.77	28,618.92	1219.68	3.96	4.08	298.94	0.08	2.18
1,351.76	27,399.24	1219.68	3.72	3.84	317.63	0.09	2.26
1,351.75	26,223.12	1176.12	3.50	3.61	325.80	0.09	2.35
1,351.74	25,047.00	1176.12	3.27	3.39	347.45	0.10	2.45
1,351.73	23,870.88	1176.12	3.06	3.17	371.60	0.10	2.55
1,351.72	22,694.76	1176.12	2.85	2.96	398.01	0.11	2.66
1,351.71	21,518.64	1176.12	2.65	2.75	427.68	0.12	2.78
1,351.70	20,386.08	1132.56	2.45	2.55	444.14	0.12	2.91
1,351.69	19,253.52	1132.56	2.26	2.36	480.92	0.13	3.04
1,351.68	18,164.52	1089	2.09	2.18	500.69	0.14	3.18
1,351.67	17,031.96	1132.56	1.92	2.01	564.87	0.16	3.34
1,351.66	15,942.96	1089	1.75	1.84	593.46	0.16	3.50
1,351.65	14,897.52	1045.44	1.59	1.67	626.01	0.17	3.67
1,351.64	13,808.52	1089	1.44	1.52	718.81	0.20	3.87
1,351.63	12,763.08	1045.44	1.29	1.37	765.89	0.21	4.09
1,351.62	11,717.64	1045.44	1.15	1.22	856.92	0.24	4.33
1,351.61	10,672.20	1045.44	1.02	1.09	963.54	0.27	4.59
1,351.60	9,626.76	1045.44	0.89	0.96	1094.70	0.30	4.90
1,351.59	8,624.88	1001.88	0.77	0.83	1207.08	0.34	5.23
1,351.58	7,623.00	1001.88	0.65	0.71	1411.10	0.39	5.62
1,351.57	6,621.12	1001.88	0.55	0.60	1669.80	0.46	6.09
1,351.56	5,662.80	958.32	0.45	0.50	1916.64	0.53	6.62
1,351.55	4,704.48	958.32	0.35	0.40	2395.80	0.67	7.29
1,351.54	3,746.16	958.32	0.27	0.31	3091.35	0.86	8.14
1,351.53	2,787.84	958.32	0.19	0.23	4166.61	1.16	9.30
1,351.52	1,829.52	958.32	0.12	0.16	6182.71	1.72	11.02
1,351.51	914.76	914.76	0.07	0.10	9629.05	2.67	13.69
1,351.50	-	914.76	0.02	0.05	20328.00	5.65	19.34



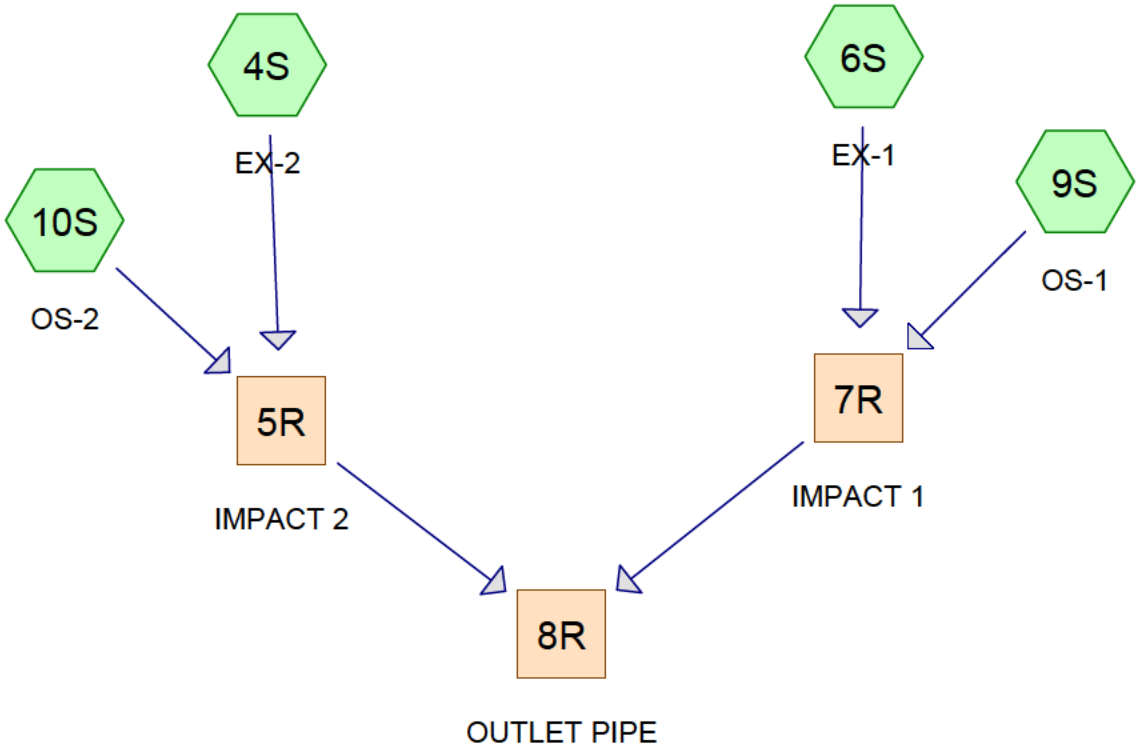
100-Year Storm Event Water Drawdown Calculation

Project Name: Vale Pointe Development
City of Valley Center, KS
Basin ID: *A*
Volume of Water Quality Event in CF: ***219,499***
Basin Elevation at the water Quality Event: ***1252.78***

STAGE/ELEV, ft (use pond summary data)	VOLUME, cuft (use pond summary data)	Incremental Δ VOLUME, CFS (STAGE HI TO LOW)	DISCHARGE Q, CFS (use the stage-discharge table)	AVE Q, cfs (STAGE HI TO LOW)	time, sec = ΔV, cuft/AVG Q, cfs	t (Hours)	Cumulative Time in Hours
1,352.78	219,498.84				0.00	0	0
1,352.77	216,885.24	2613.6	58.16	29.08	89.88	0.02	0.02
1,352.76	214,271.64	2613.6	57.33	57.75	45.26	0.01	0.04
1,352.75	211,701.60	2570.04	56.52	56.93	45.15	0.01	0.05
1,352.74	209,131.56	2570.04	55.71	56.12	45.80	0.01	0.06
1,352.73	206,561.52	2570.04	54.91	55.31	46.47	0.01	0.08
1,352.72	204,035.04	2526.48	54.11	54.51	46.35	0.01	0.09
1,352.71	201,508.56	2526.48	53.32	53.72	47.03	0.01	0.10
1,352.70	198,982.08	2526.48	52.53	52.93	47.74	0.01	0.11
1,352.69	196,499.16	2482.92	51.75	52.14	47.62	0.01	0.13
1,352.68	194,016.24	2482.92	50.99	51.37	48.33	0.01	0.14
1,352.67	191,576.88	2439.36	50.23	50.61	48.20	0.01	0.15
1,352.66	189,137.52	2439.36	49.47	49.85	48.93	0.01	0.17
1,352.65	186,698.16	2439.36	48.73	49.10	49.68	0.01	0.18
1,352.64	184,258.80	2439.36	47.98	48.36	50.45	0.01	0.20
1,352.63	181,863.00	2395.8	47.25	47.62	50.32	0.01	0.21
1,352.62	179,510.76	2352.24	46.52	46.89	50.17	0.01	0.22
1,352.61	177,114.96	2395.8	45.79	46.16	51.91	0.01	0.24
1,352.60	174,762.72	2352.24	45.07	45.43	51.78	0.01	0.25
1,352.59	172,454.04	2308.68	44.36	44.72	51.63	0.01	0.27
1,352.58	170,101.80	2352.24	43.65	44.01	53.45	0.01	0.28
1,352.57	167,836.68	2265.12	42.95	43.30	52.31	0.01	0.30
1,352.56	165,528.00	2308.68	42.25	42.60	54.19	0.02	0.31
1,352.55	163,262.88	2265.12	41.56	41.91	54.05	0.02	0.33
1,352.54	160,997.76	2265.12	40.87	41.22	54.96	0.02	0.34
1,352.53	158,732.64	2265.12	40.19	40.53	55.89	0.02	0.36
1,352.52	156,511.08	2221.56	39.51	39.85	55.75	0.02	0.37
1,352.51	154,289.52	2221.56	38.84	39.18	56.71	0.02	0.39
1,352.50	152,111.52	2178	38.18	38.51	56.56	0.02	0.40
1,352.49	149,933.52	2178	37.52	37.85	57.54	0.02	0.42
1,352.48	147,755.52	2178	36.85	37.19	58.57	0.02	0.44
1,352.47	145,577.52	2178	36.19	36.52	59.64	0.02	0.45
1,352.46	143,443.08	2134.44	35.54	35.87	59.51	0.02	0.47
1,352.45	141,308.64	2134.44	34.89	35.22	60.61	0.02	0.49
1,352.44	139,217.76	2090.88	34.25	34.57	60.48	0.02	0.50
1,352.43	137,126.88	2090.88	33.61	33.93	61.62	0.02	0.52
1,352.42	135,036.00	2090.88	32.98	33.30	62.80	0.02	0.54
1,352.41	132,945.12	2090.88	32.35	32.67	64.01	0.02	0.56
1,352.40	130,897.80	2047.32	31.73	32.04	63.90	0.02	0.57
1,352.39	128,850.48	2047.32	31.12	31.43	65.15	0.02	0.59
1,352.38	126,846.72	2003.76	30.51	30.82	65.03	0.02	0.61
1,352.37	124,842.96	2003.76	29.91	30.21	66.33	0.02	0.63
1,352.36	122,839.20	2003.76	29.32	29.62	67.66	0.02	0.65
1,352.35	120,835.44	2003.76	28.73	29.03	69.04	0.02	0.67
1,352.34	118,875.24	1960.2	28.14	28.44	68.94	0.02	0.69
1,352.33	116,915.04	1960.2	27.57	27.86	70.37	0.02	0.70
1,352.32	114,998.40	1916.64	26.99	27.28	70.26	0.02	0.72
1,352.31	113,081.76	1916.64	26.43	26.71	71.76	0.02	0.74
1,352.30	111,165.12	1916.64	25.87	26.15	73.29	0.02	0.76
1,352.29	109,248.48	1916.64	25.31	25.59	74.90	0.02	0.79
1,352.28	107,375.40	1873.08	24.77	25.04	74.80	0.02	0.81
1,352.27	105,502.32	1873.08	24.24	24.51	76.44	0.02	0.83
1,352.26	103,629.24	1873.08	23.71	23.98	78.13	0.02	0.85
1,352.25	101,799.72	1829.52	23.19	23.45	78.02	0.02	0.87
1,352.24	99,970.20	1829.52	22.67	22.93	79.79	0.02	0.89
1,352.23	98,140.68	1829.52	22.16	22.42	81.62	0.02	0.92
1,352.22	96,354.72	1785.96	21.65	21.91	81.53	0.02	0.94
1,352.21	94,568.76	1785.96	21.15	21.40	83.46	0.02	0.96
1,352.20	92,782.80	1785.96	20.66	20.91	85.43	0.02	0.99
1,352.19	90,996.84	1785.96	20.17	20.42	87.48	0.02	1.01
1,352.18	89,254.44	1742.4	19.68	19.93	87.45	0.02	1.03
1,352.17	87,512.04	1742.4	19.20	19.44	89.63	0.02	1.06
1,352.16	85,813.20	1698.84	18.73	18.97	89.58	0.02	1.08
1,352.15	84,070.80	1742.4	18.26	18.50	94.21	0.03	1.11
1,352.14	82,371.96	1698.84	17.80	18.03	94.22	0.03	1.14
1,352.13	80,716.68	1655.28	17.34	17.57	94.21	0.03	1.16
1,352.12	79,017.84	1698.84	16.88	17.11	99.29	0.03	1.19
1,352.11	77,362.56	1655.28	16.44	16.66	99.36	0.03	1.22
1,352.10	75,707.28	1655.28	16.00	16.22	102.05	0.03	1.25
1,352.09	74,095.56	1611.72	15.56	15.78	102.14	0.03	1.27
1,352.08	72,483.84	1611.72	15.07	15.32	105.24	0.03	1.30
1,352.07	70,872.12	1611.72	14.58	14.83	108.72	0.03	1.33
1,352.06	69,260.40	1611.72	14.11	14.35	112.35	0.03	1.36
1,352.05	67,692.24	1568.16	13.64	13.88	113.02	0.03	1.40
1,352.04	66,124.08	1568.16	13.19	13.42	116.90	0.03	1.43
1,352.03	64,555.92	1568.16	12.74	12.97	120.95	0.03	1.46
1,352.02	63,031.32	1524.6	12.30	12.52	121.77	0.03	1.50
1,352.01	61,506.72	1524.6	11.87	12.09	126.16	0.04	1.53
1,352.00	59,982.12	1524.6	11.45	11.66	130.75	0.04	1.57
1,351.99	58,457.52	1524.6	11.03	11.24	135.64	0.04	1.61
1,351.98	56,976.48	1481.04	10.62	10.83	136.82	0.04	1.64
1,351.97	55,495.44	1481.04	10.23	10.43	142.07	0.04	1.68



1,351.96	54,014.40	1481.04	9.84	10.04	147.59	0.04	1.72
1,351.95	52,576.92	1437.48	9.46	9.65	148.96	0.04	1.76
1,351.94	51,139.44	1437.48	9.08	9.27	155.07	0.04	1.81
1,351.93	49,701.96	1437.48	8.72	8.90	161.51	0.04	1.85
1,351.92	48,308.04	1393.92	8.36	8.54	163.22	0.05	1.90
1,351.91	46,870.56	1437.48	8.01	8.19	175.62	0.05	1.95
1,351.90	45,520.20	1350.36	7.67	7.84	172.24	0.05	1.99
1,351.89	44,126.28	1393.92	7.34	7.51	185.73	0.05	2.05
1,351.88	42,775.92	1350.36	7.02	7.18	188.07	0.05	2.10
1,351.87	41,425.56	1350.36	6.70	6.86	196.85	0.05	2.15
1,351.86	40,075.20	1350.36	6.40	6.55	206.16	0.06	2.21
1,351.85	38,768.40	1306.8	6.10	6.25	209.09	0.06	2.27
1,351.84	37,461.60	1306.8	5.81	5.96	219.45	0.06	2.33
1,351.83	36,154.80	1306.8	5.52	5.67	230.68	0.06	2.39
1,351.82	34,848.00	1306.8	5.24	5.38	242.90	0.07	2.46
1,351.81	33,584.76	1263.24	4.97	5.11	247.45	0.07	2.53
1,351.80	32,321.52	1263.24	4.71	4.84	261.00	0.07	2.60
1,351.79	31,101.84	1219.68	4.45	4.58	266.31	0.07	2.68
1,351.78	29,838.60	1263.24	4.20	4.33	292.08	0.08	2.76
1,351.77	28,618.92	1219.68	3.96	4.08	298.94	0.08	2.84
1,351.76	27,399.24	1219.68	3.72	3.84	317.63	0.09	2.93
1,351.75	26,223.12	1176.12	3.50	3.61	325.80	0.09	3.02
1,351.74	25,047.00	1176.12	3.27	3.39	347.45	0.10	3.12
1,351.73	23,870.88	1176.12	3.06	3.17	371.60	0.10	3.22
1,351.72	22,694.76	1176.12	2.85	2.96	398.01	0.11	3.33
1,351.71	21,518.64	1176.12	2.65	2.75	427.68	0.12	3.45
1,351.70	20,386.08	1132.56	2.45	2.55	444.14	0.12	3.57
1,351.69	19,253.52	1132.56	2.26	2.36	480.92	0.13	3.71
1,351.68	18,164.52	1089	2.09	2.18	500.69	0.14	3.84
1,351.67	17,031.96	1132.56	1.92	2.01	564.87	0.16	4.00
1,351.66	15,942.96	1089	1.75	1.84	593.46	0.16	4.17
1,351.65	14,897.52	1045.44	1.59	1.67	626.01	0.17	4.34
1,351.64	13,808.52	1089	1.44	1.52	718.81	0.20	4.54
1,351.63	12,763.08	1045.44	1.29	1.37	765.89	0.21	4.75
1,351.62	11,717.64	1045.44	1.15	1.22	856.92	0.24	4.99
1,351.61	10,672.20	1045.44	1.02	1.09	963.54	0.27	5.26
1,351.60	9,626.76	1045.44	0.89	0.96	1094.70	0.30	5.56
1,351.59	8,624.88	1001.88	0.77	0.83	1207.08	0.34	5.90
1,351.58	7,623.00	1001.88	0.65	0.71	1411.10	0.39	6.29
1,351.57	6,621.12	1001.88	0.55	0.60	1669.80	0.46	6.75
1,351.56	5,662.80	958.32	0.45	0.50	1916.64	0.53	7.29
1,351.55	4,704.48	958.32	0.35	0.40	2395.80	0.67	7.95
1,351.54	3,746.16	958.32	0.27	0.31	3091.35	0.86	8.81
1,351.53	2,787.84	958.32	0.19	0.23	4166.61	1.16	9.97
1,351.52	1,829.52	958.32	0.12	0.16	6182.71	1.72	11.68
1,351.51	914.76	914.76	0.07	0.10	9629.05	2.67	14.36
1,351.50	-	914.76	0.02	0.05	20328.00	5.65	20.01



Subcat Reach Pond Link

Routing Diagram for 60 ACRE Existing
Prepared by Short Elliott Hendrickson Inc, Printed 7/28/2025

TABLE OF CONTENTS

Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 1986 KS Sedgwick_4

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	MSE 24-hr	4	Default	24.00	1	3.39	2
2	5-Year	MSE 24-hr	4	Default	24.00	1	4.24	2
3	10-Year	MSE 24-hr	4	Default	24.00	1	4.98	2
4	25-Year	MSE 24-hr	4	Default	24.00	1	6.03	2
5	100-Year	MSE 24-hr	4	Default	24.00	1	7.83	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.160	96	Gravel surface, HSG D (9S, 10S)
85.050	84	Small grain, SR + CR, Good, HSG D (4S, 6S, 9S, 10S)
4.090	79	Woods, Fair, HSG D (6S, 9S)
89.300	**84**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
89.300	HSG D	4S, 6S, 9S, 10S
0.000	Other	
89.300		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.160	0.000	0.160	Gravel surface	9S, 10S
0.000	0.000	0.000	85.050	0.000	85.050	Small grain, SR + CR, Good	4S, 6S, 9S, 10S
0.000	0.000	0.000	4.090	0.000	4.090	Woods, Fair	6S, 9S
0.000	**0.000**	**0.000**	**89.300**	**0.000**	**89.300**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	8R	1,346.00	1,344.00	200.0	0.0100	0.025	0.0	72.0	0.0	

Time span=5.00-40.00 hrs, dt=0.07 hrs, 501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 4S: EX-2 Runoff Area=30.050 ac 0.00% Impervious Runoff Depth=1.84"
Flow Length=4,175' Slope=0.0014 '/' Tc=206.6 min CN=84 Runoff=12.16 cfs 4.614 af

Subcatchment 6S: EX-1 Runoff Area=30.930 ac 0.00% Impervious Runoff Depth=1.84"
Flow Length=3,550' Slope=0.0013 '/' Tc=182.3 min CN=84 Runoff=13.72 cfs 4.749 af

Subcatchment 9S: OS-1 Runoff Area=20.350 ac 0.00% Impervious Runoff Depth=1.84"
Flow Length=3,550' Slope=0.0013 '/' Tc=182.3 min CN=84 Runoff=9.03 cfs 3.125 af

Subcatchment 10S: OS-2 Runoff Area=7.970 ac 0.00% Impervious Runoff Depth=1.84"
Flow Length=4,175' Slope=0.0014 '/' Tc=206.6 min CN=84 Runoff=3.23 cfs 1.224 af

Reach 5R: IMPACT 2 Avg. Flow Depth=0.90' Max Vel=1.90 fps Inflow=15.39 cfs 5.838 af
n=0.025 L=4,770.0' S=0.0019 '/' Capacity=73.10 cfs Outflow=14.29 cfs 5.830 af

Reach 7R: IMPACT 1 Avg. Flow Depth=0.85' Max Vel=1.75 fps Inflow=22.74 cfs 7.874 af
n=0.025 L=1,550.0' S=0.0016 '/' Capacity=297.44 cfs Outflow=22.41 cfs 7.874 af

Reach 8R: OUTLET PIPE Avg. Flow Depth=1.58' Max Vel=5.61 fps Inflow=33.23 cfs 13.705 af
72.0" Round Pipe n=0.025 L=200.0' S=0.0100 '/' Capacity=220.22 cfs Outflow=33.23 cfs 13.704 af

Total Runoff Area = 89.300 ac Runoff Volume = 13.712 af Average Runoff Depth = 1.84"
100.00% Pervious = 89.300 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 4S: EX-2

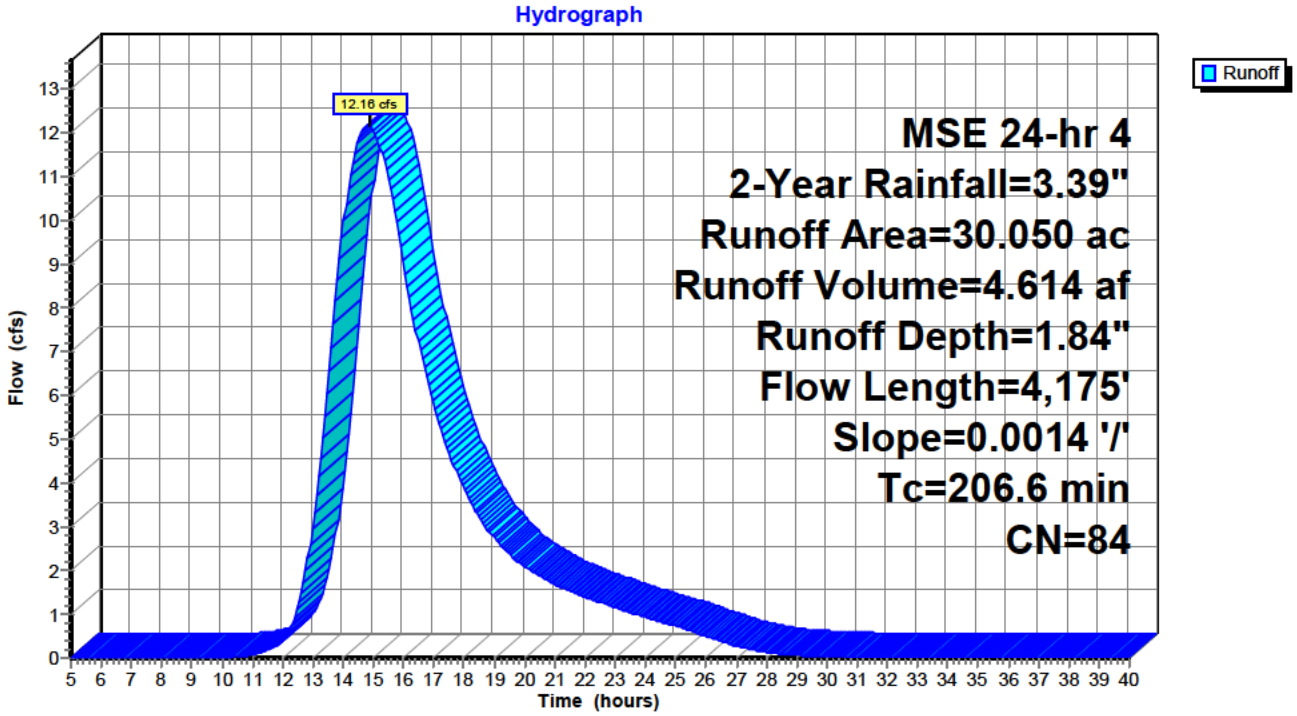
Runoff = 12.16 cfs @ 14.88 hrs, Volume= 4.614 af, Depth= 1.84"
Routed to Reach 5R : IMPACT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
30.050	84	Small grain, SR + CR, Good, HSG D
30.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
206.6	4,175	0.0014	0.34		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 4S: EX-2



Summary for Subcatchment 6S: EX-1

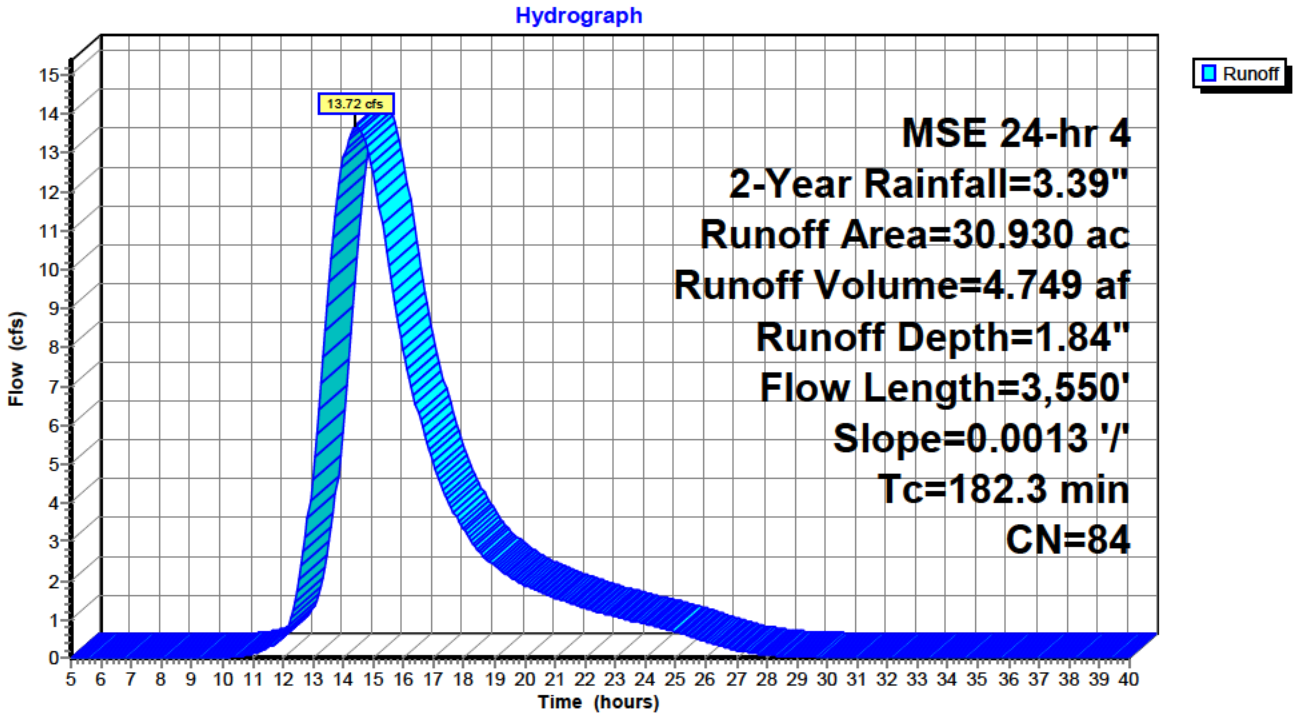
Runoff = 13.72 cfs @ 14.40 hrs, Volume= 4.749 af, Depth= 1.84"
Routed to Reach 7R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
2.550	79	Woods, Fair, HSG D
28.380	84	Small grain, SR + CR, Good, HSG D
30.930	84	Weighted Average
30.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
182.3	3,550	0.0013	0.32		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 6S: EX-1



Summary for Subcatchment 9S: OS-1

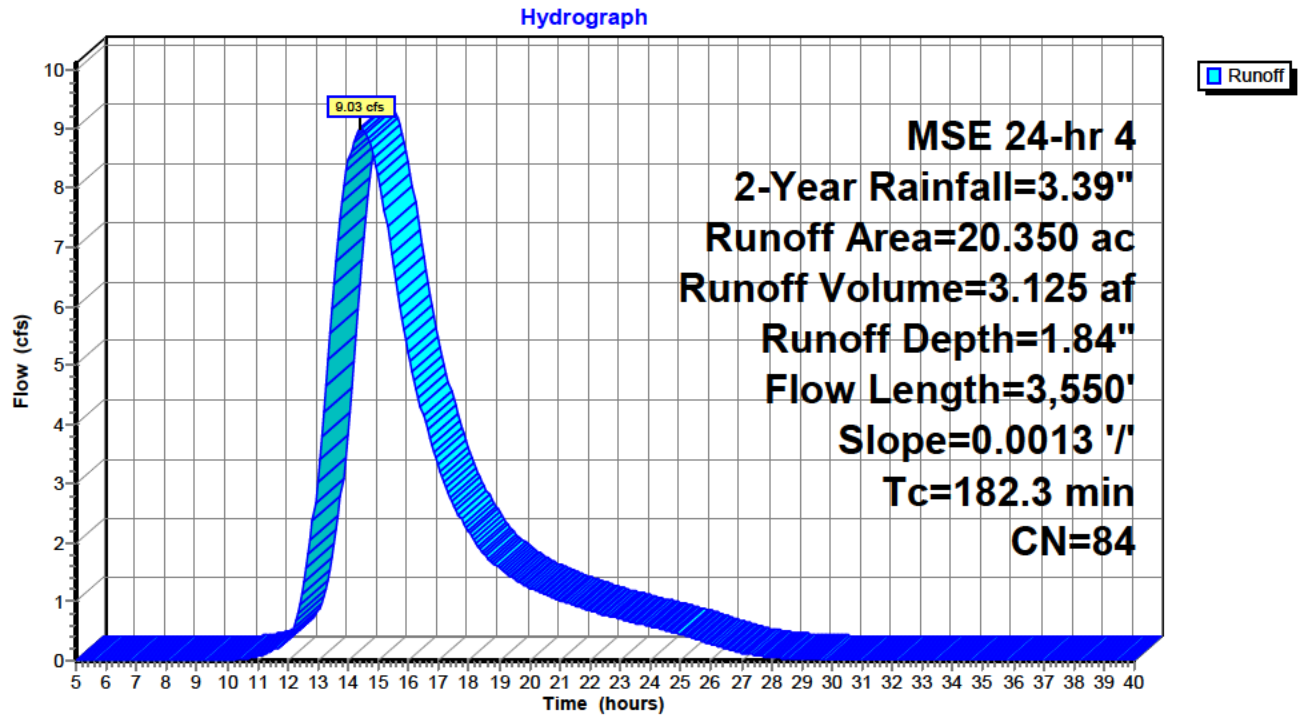
Runoff = 9.03 cfs @ 14.40 hrs, Volume= 3.125 af, Depth= 1.84"
Routed to Reach 7R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
1.540	79	Woods, Fair, HSG D
18.710	84	Small grain, SR + CR, Good, HSG D
0.100	96	Gravel surface, HSG D
20.350	84	Weighted Average
20.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
182.3	3,550	0.0013	0.32		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 9S: OS-1



Summary for Subcatchment 10S: OS-2

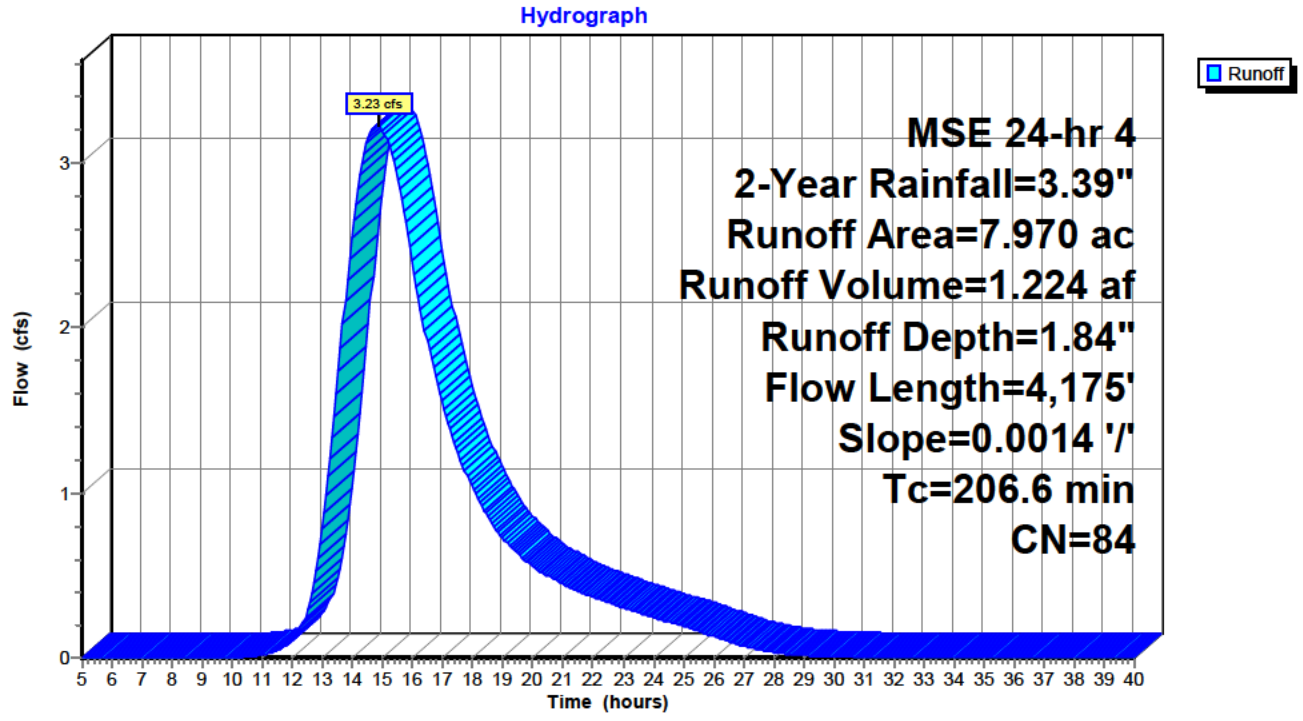
Runoff = 3.23 cfs @ 14.88 hrs, Volume= 1.224 af, Depth= 1.84"
Routed to Reach 5R : IMPACT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
7.910	84	Small grain, SR + CR, Good, HSG D
0.060	96	Gravel surface, HSG D
7.970	84	Weighted Average
7.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
206.6	4,175	0.0014	0.34		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 10S: OS-2



Summary for Reach 5R: IMPACT 2

Inflow Area = 38.020 ac, 0.00% Impervious, Inflow Depth = 1.84" for 2-Year event
Inflow = 15.39 cfs @ 14.88 hrs, Volume= 5.838 af
Outflow = 14.29 cfs @ 16.08 hrs, Volume= 5.830 af, Atten= 7%, Lag= 71.9 min
Routed to Reach 8R : OUTLET PIPE

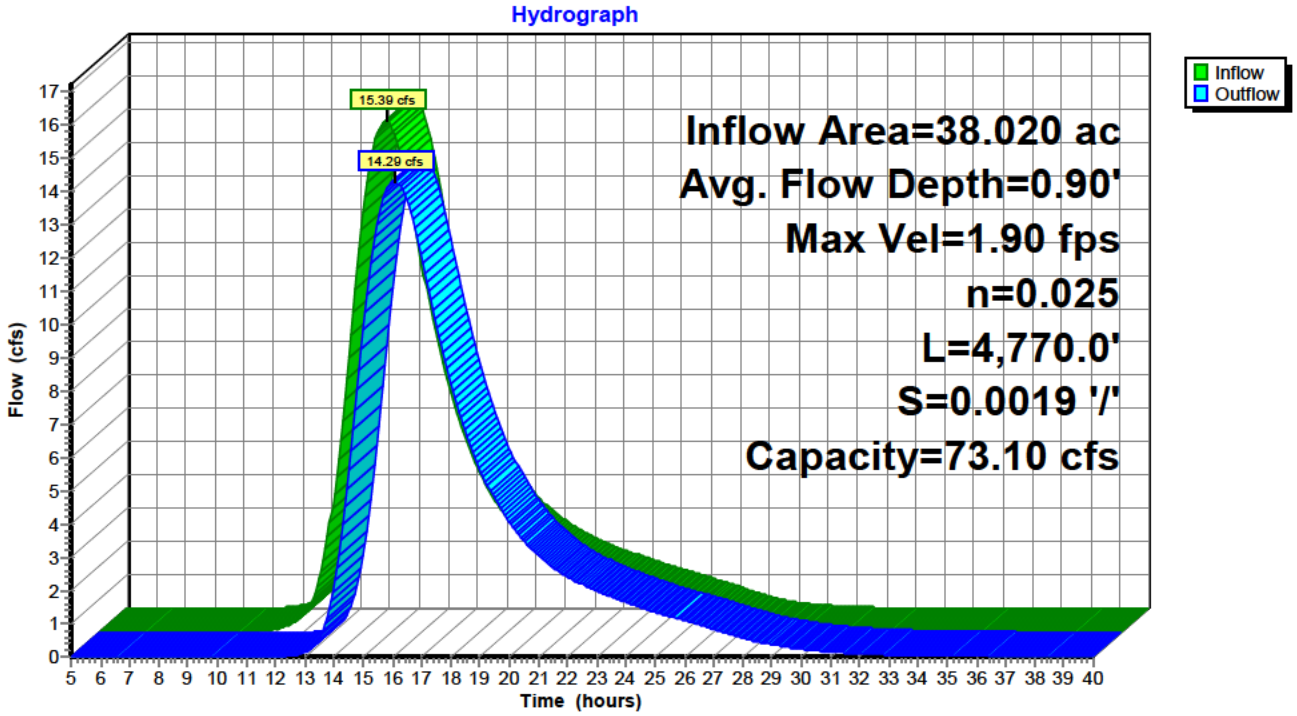
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 1.90 fps, Min. Travel Time= 41.8 min
Avg. Velocity = 0.76 fps, Avg. Travel Time= 104.9 min

Peak Storage= 35,869 cf @ 15.38 hrs
Average Depth at Peak Storage= 0.90' , Surface Width= 11.67'
Bank-Full Depth= 2.00' Flow Area= 24.8 sf, Capacity= 73.10 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 3.7 '/' Top Width= 19.80'
Length= 4,770.0' Slope= 0.0019 '/'
Inlet Invert= 1,355.00', Outlet Invert= 1,346.00'

‡

Reach 5R: IMPACT 2



Summary for Reach 7R: IMPACT 1

Inflow Area = 51.280 ac, 0.00% Impervious, Inflow Depth = 1.84" for 2-Year event
Inflow = 22.74 cfs @ 14.40 hrs, Volume= 7.874 af
Outflow = 22.41 cfs @ 14.86 hrs, Volume= 7.874 af, Atten= 1%, Lag= 27.6 min
Routed to Reach 8R : OUTLET PIPE

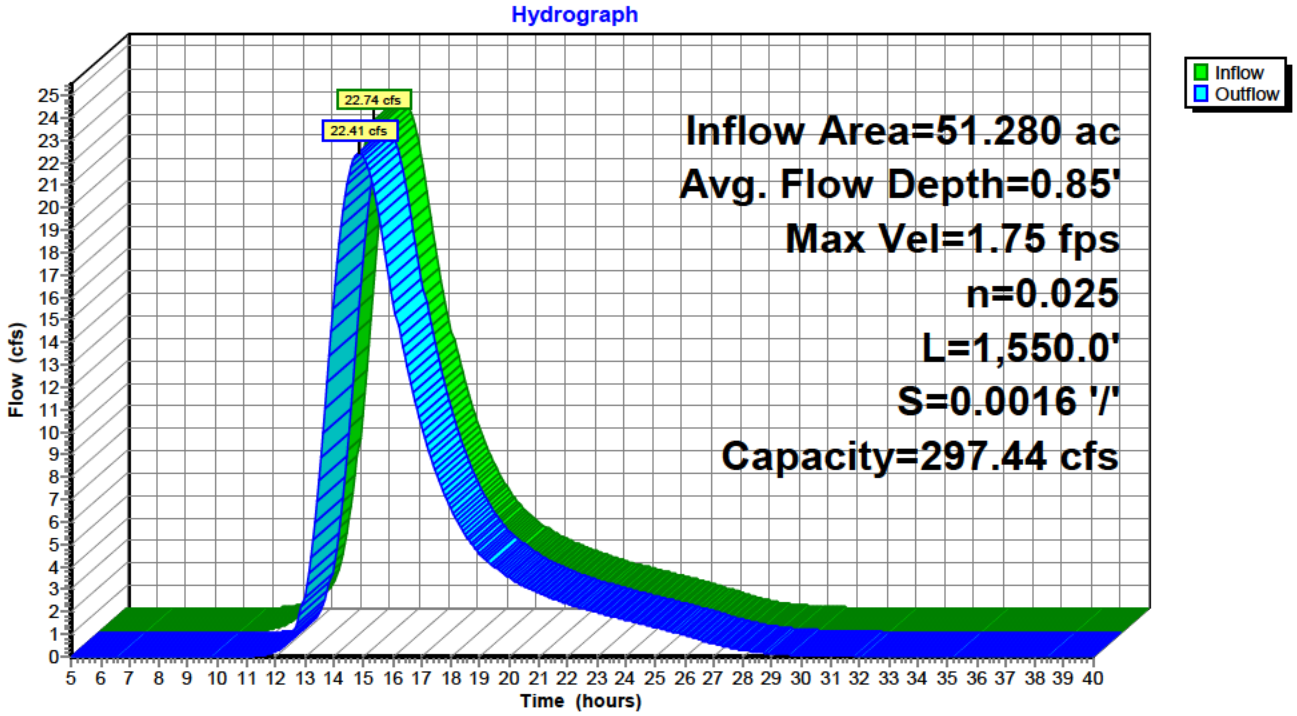
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 1.75 fps, Min. Travel Time= 14.7 min
Avg. Velocity = 0.64 fps, Avg. Travel Time= 40.4 min

Peak Storage= 19,819 cf @ 14.61 hrs
Average Depth at Peak Storage= 0.85' , Surface Width= 20.17'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 297.44 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 6.0 '/' Top Width= 46.00'
Length= 1,550.0' Slope= 0.0016 '/'
Inlet Invert= 1,348.50', Outlet Invert= 1,346.00'

‡

Reach 7R: IMPACT 1



Summary for Reach 8R: OUTLET PIPE

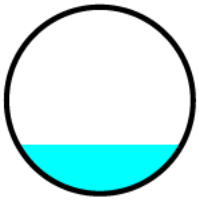
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 5R OUTLET depth by 0.67' @ 15.36 hrs
[62] Hint: Exceeded Reach 7R OUTLET depth by 0.84' @ 15.99 hrs

Inflow Area = 89.300 ac, 0.00% Impervious, Inflow Depth > 1.84" for 2-Year event
Inflow = 33.23 cfs @ 15.37 hrs, Volume= 13.705 af
Outflow = 33.23 cfs @ 15.39 hrs, Volume= 13.704 af, Atten= 0%, Lag= 1.0 min

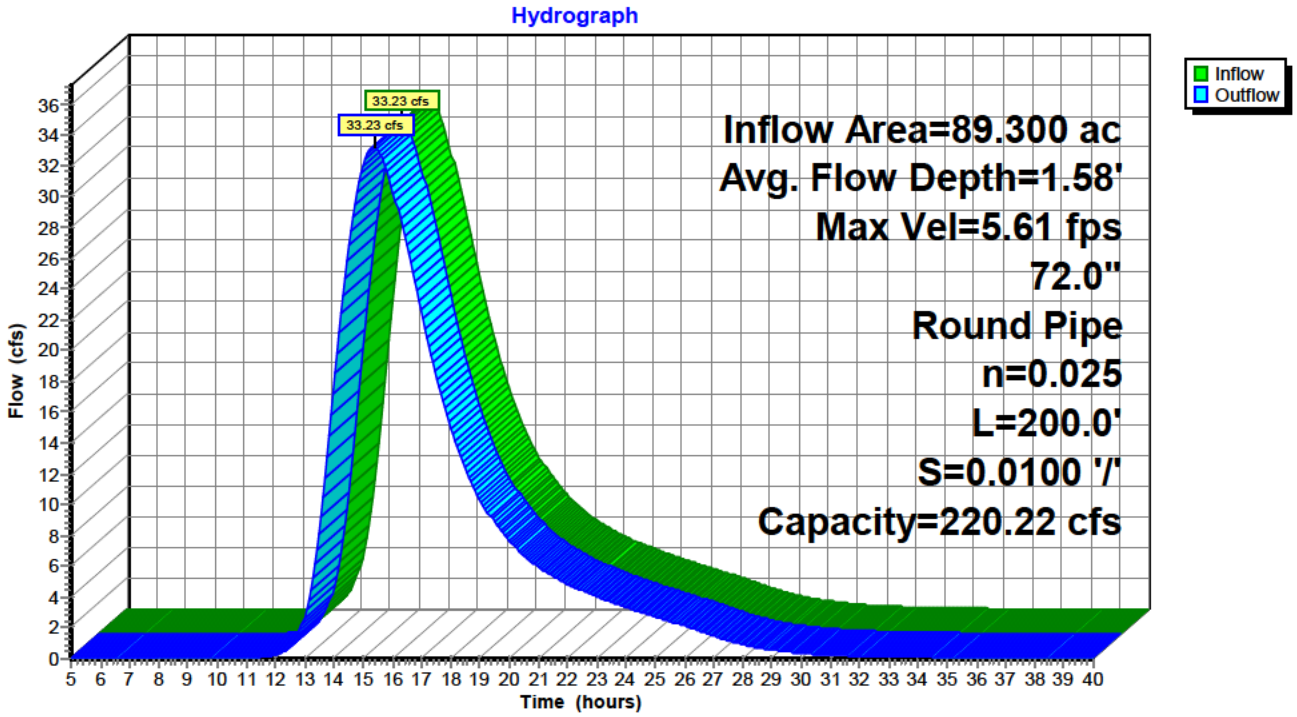
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 5.61 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.34 fps, Avg. Travel Time= 1.4 min

Peak Storage= 1,184 cf @ 15.38 hrs
Average Depth at Peak Storage= 1.58' , Surface Width= 5.28'
Bank-Full Depth= 6.00' Flow Area= 28.3 sf, Capacity= 220.22 cfs

72.0" Round Pipe
n= 0.025 Corrugated metal
Length= 200.0' Slope= 0.0100 '/'
Inlet Invert= 1,346.00', Outlet Invert= 1,344.00'



Reach 8R: OUTLET PIPE



Time span=5.00-40.00 hrs, dt=0.07 hrs, 501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 4S: EX-2 Runoff Area=30.050 ac 0.00% Impervious Runoff Depth=2.58"
Flow Length=4,175' Slope=0.0014 '/' Tc=206.6 min CN=84 Runoff=17.12 cfs 6.470 af

Subcatchment 6S: EX-1 Runoff Area=30.930 ac 0.00% Impervious Runoff Depth=2.58"
Flow Length=3,550' Slope=0.0013 '/' Tc=182.3 min CN=84 Runoff=19.37 cfs 6.660 af

Subcatchment 9S: OS-1 Runoff Area=20.350 ac 0.00% Impervious Runoff Depth=2.58"
Flow Length=3,550' Slope=0.0013 '/' Tc=182.3 min CN=84 Runoff=12.74 cfs 4.382 af

Subcatchment 10S: OS-2 Runoff Area=7.970 ac 0.00% Impervious Runoff Depth=2.58"
Flow Length=4,175' Slope=0.0014 '/' Tc=206.6 min CN=84 Runoff=4.54 cfs 1.716 af

Reach 5R: IMPACT 2 Avg. Flow Depth=1.08' Max Vel=2.10 fps Inflow=21.66 cfs 8.186 af
n=0.025 L=4,770.0' S=0.0019 '/' Capacity=73.10 cfs Outflow=20.39 cfs 8.178 af

Reach 7R: IMPACT 1 Avg. Flow Depth=1.02' Max Vel=1.94 fps Inflow=32.11 cfs 11.041 af
n=0.025 L=1,550.0' S=0.0016 '/' Capacity=297.44 cfs Outflow=31.70 cfs 11.041 af

Reach 8R: OUTLET PIPE Avg. Flow Depth=1.90' Max Vel=6.22 fps Inflow=47.74 cfs 19.219 af
72.0" Round Pipe n=0.025 L=200.0' S=0.0100 '/' Capacity=220.22 cfs Outflow=47.74 cfs 19.219 af

Total Runoff Area = 89.300 ac Runoff Volume = 19.227 af Average Runoff Depth = 2.58"
100.00% Pervious = 89.300 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 4S: EX-2

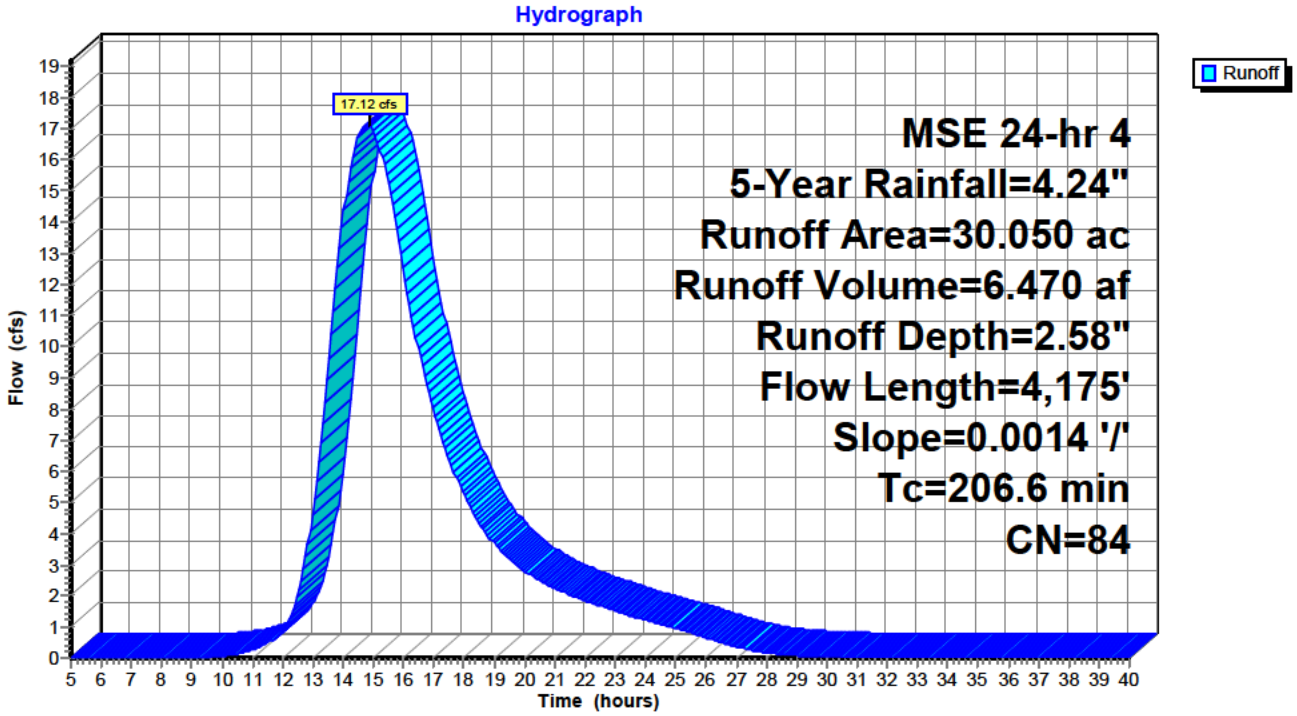
Runoff = 17.12 cfs @ 14.85 hrs, Volume= 6.470 af, Depth= 2.58"
Routed to Reach 5R : IMPACT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
30.050	84	Small grain, SR + CR, Good, HSG D
30.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
206.6	4,175	0.0014	0.34		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 4S: EX-2



Summary for Subcatchment 6S: EX-1

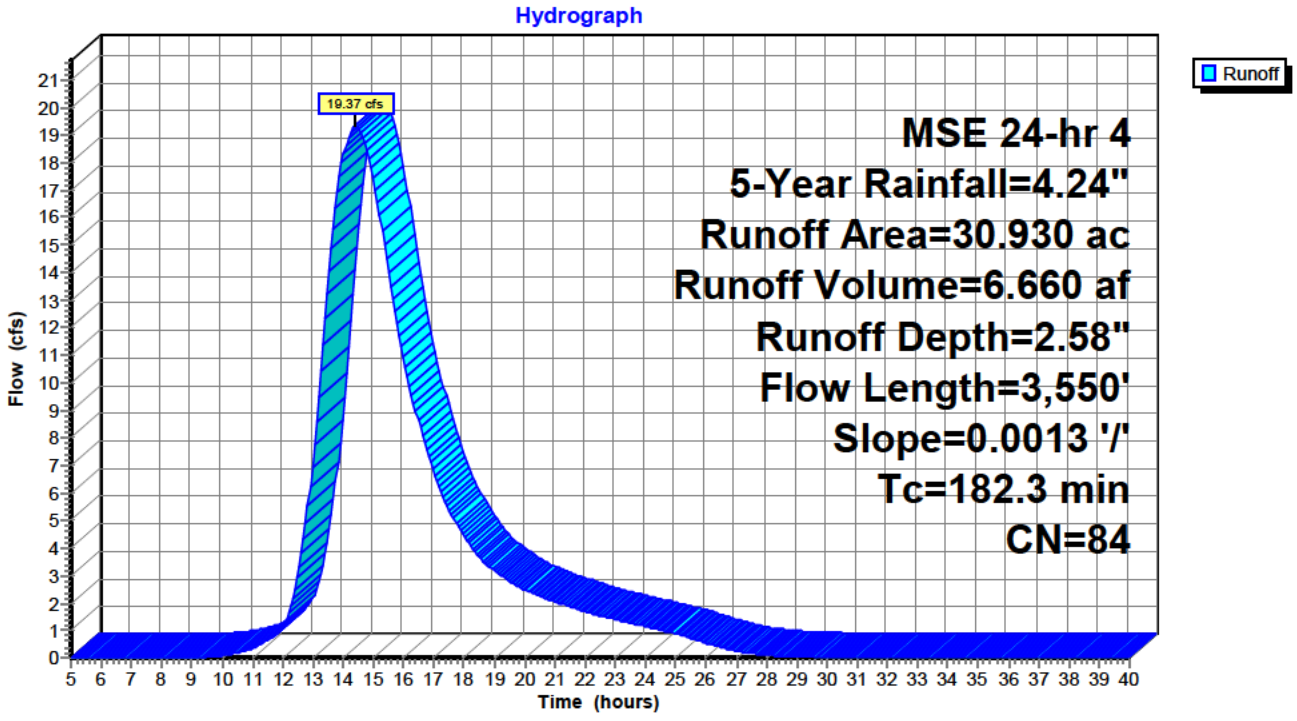
Runoff = 19.37 cfs @ 14.39 hrs, Volume= 6.660 af, Depth= 2.58"
Routed to Reach 7R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
2.550	79	Woods, Fair, HSG D
28.380	84	Small grain, SR + CR, Good, HSG D
30.930	84	Weighted Average
30.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
182.3	3,550	0.0013	0.32		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 6S: EX-1



Summary for Subcatchment 9S: OS-1

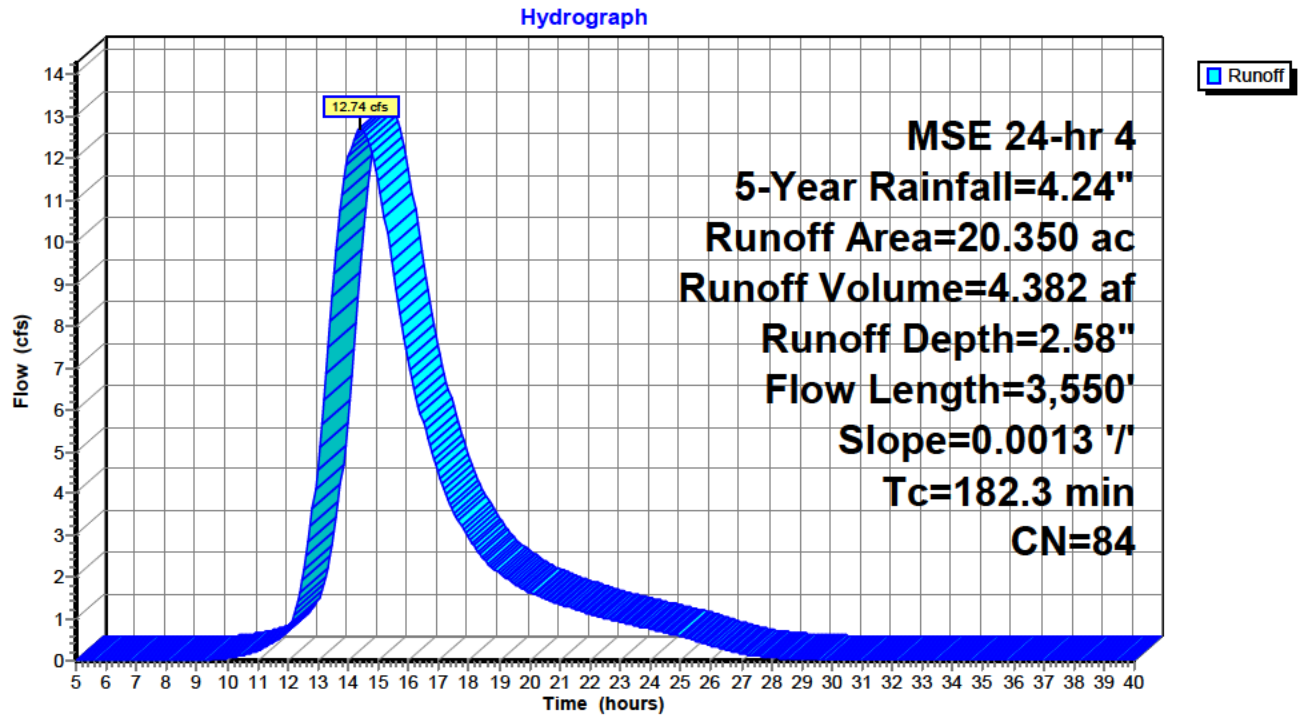
Runoff = 12.74 cfs @ 14.39 hrs, Volume= 4.382 af, Depth= 2.58"
Routed to Reach 7R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
1.540	79	Woods, Fair, HSG D
18.710	84	Small grain, SR + CR, Good, HSG D
0.100	96	Gravel surface, HSG D
20.350	84	Weighted Average
20.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
182.3	3,550	0.0013	0.32		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 9S: OS-1



Summary for Subcatchment 10S: OS-2

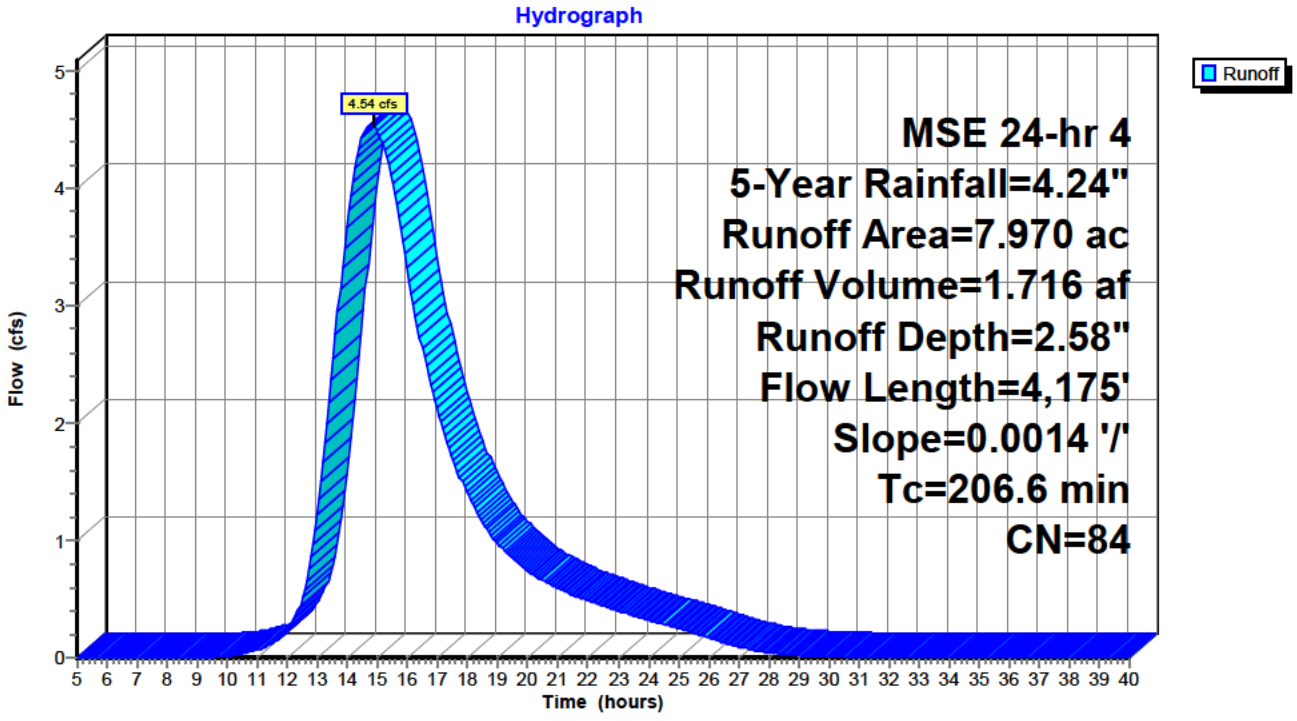
Runoff = 4.54 cfs @ 14.85 hrs, Volume= 1.716 af, Depth= 2.58"
Routed to Reach 5R : IMPACT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
7.910	84	Small grain, SR + CR, Good, HSG D
0.060	96	Gravel surface, HSG D
7.970	84	Weighted Average
7.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
206.6	4,175	0.0014	0.34		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 10S: OS-2



Summary for Reach 5R: IMPACT 2

Inflow Area = 38.020 ac, 0.00% Impervious, Inflow Depth = 2.58" for 5-Year event
Inflow = 21.66 cfs @ 14.85 hrs, Volume= 8.186 af
Outflow = 20.39 cfs @ 15.92 hrs, Volume= 8.178 af, Atten= 6%, Lag= 64.0 min
Routed to Reach 8R : OUTLET PIPE

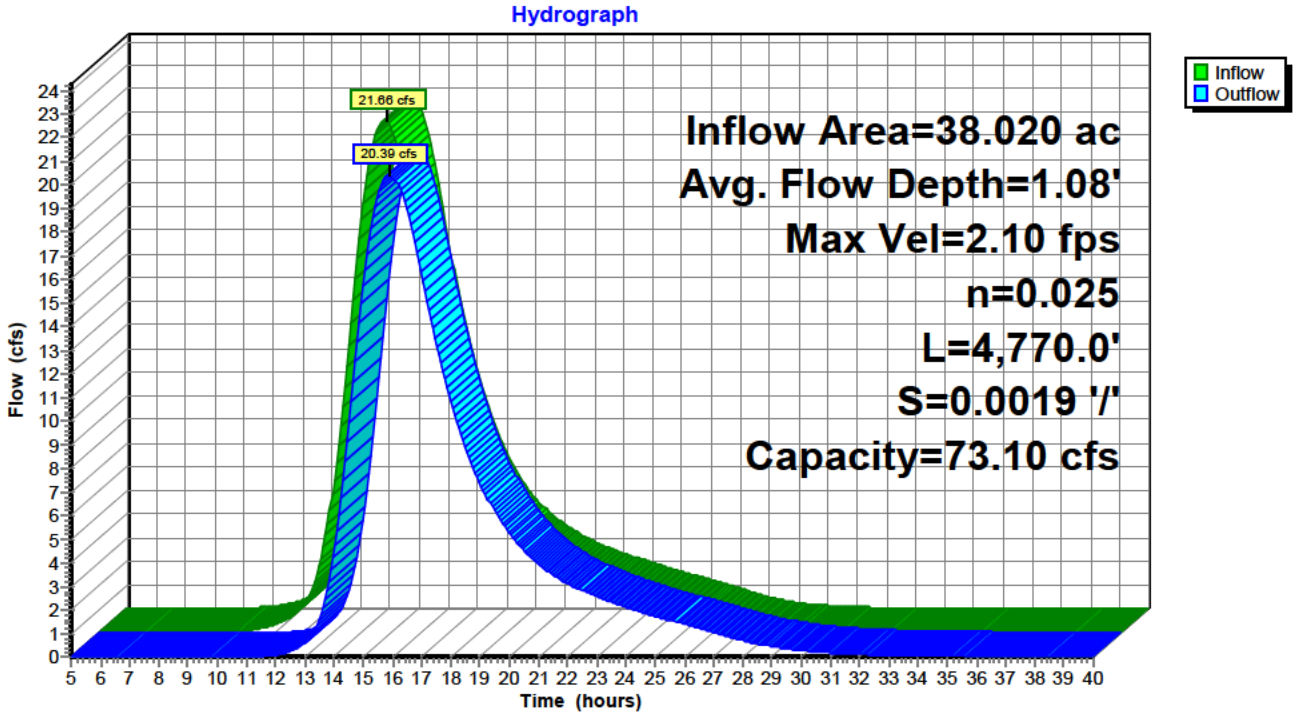
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 2.10 fps, Min. Travel Time= 37.9 min
Avg. Velocity = 0.82 fps, Avg. Travel Time= 97.4 min

Peak Storage= 46,373 cf @ 15.28 hrs
Average Depth at Peak Storage= 1.08' , Surface Width= 13.00'
Bank-Full Depth= 2.00' Flow Area= 24.8 sf, Capacity= 73.10 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 3.7 '/' Top Width= 19.80'
Length= 4,770.0' Slope= 0.0019 '/'
Inlet Invert= 1,355.00', Outlet Invert= 1,346.00'

‡

Reach 5R: IMPACT 2



Summary for Reach 7R: IMPACT 1

Inflow Area = 51.280 ac, 0.00% Impervious, Inflow Depth = 2.58" for 5-Year event
Inflow = 32.11 cfs @ 14.39 hrs, Volume= 11.041 af
Outflow = 31.70 cfs @ 14.78 hrs, Volume= 11.041 af, Atten= 1%, Lag= 23.6 min
Routed to Reach 8R : OUTLET PIPE

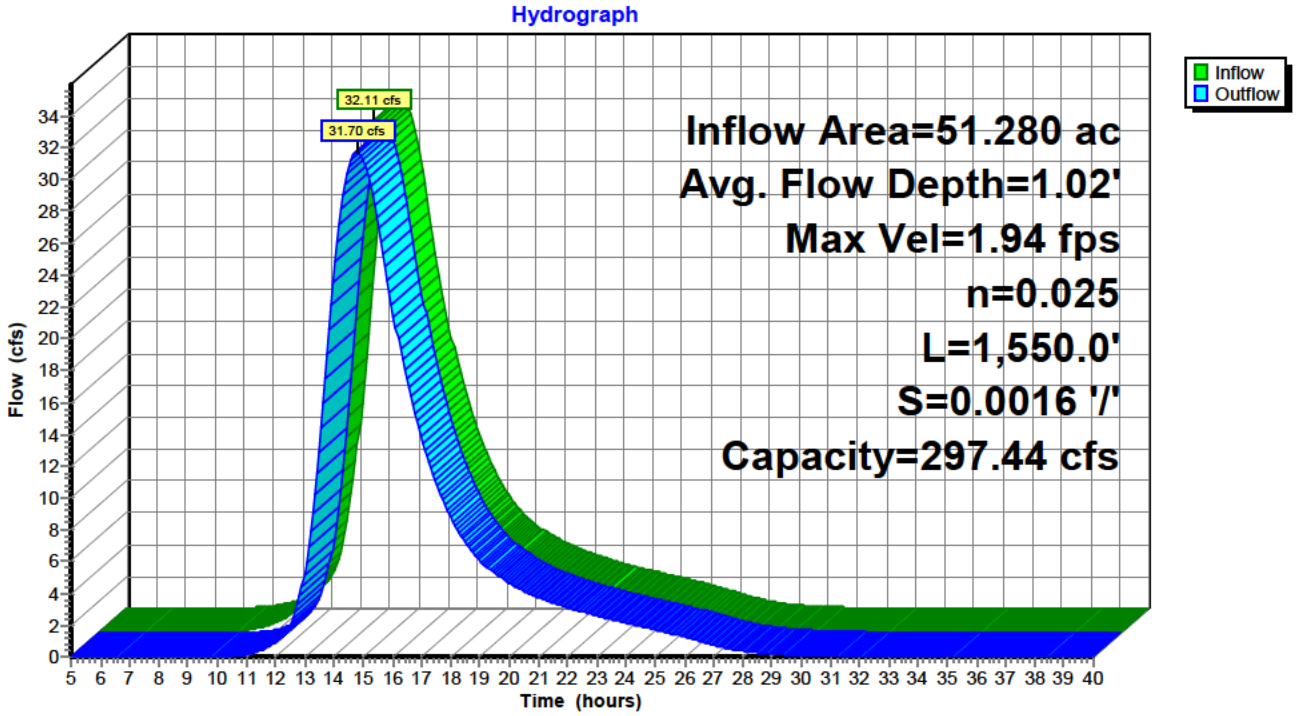
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 1.94 fps, Min. Travel Time= 13.3 min
Avg. Velocity = 0.69 fps, Avg. Travel Time= 37.3 min

Peak Storage= 25,358 cf @ 14.56 hrs
Average Depth at Peak Storage= 1.02' , Surface Width= 22.20'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 297.44 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 6.0 '/' Top Width= 46.00'
Length= 1,550.0' Slope= 0.0016 '/'
Inlet Invert= 1,348.50', Outlet Invert= 1,346.00'

‡

Reach 7R: IMPACT 1



Summary for Reach 8R: OUTLET PIPE

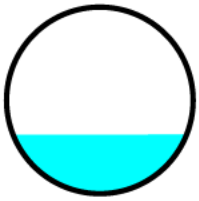
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 5R OUTLET depth by 0.82' @ 15.22 hrs
[62] Hint: Exceeded Reach 7R OUTLET depth by 1.00' @ 15.78 hrs

Inflow Area = 89.300 ac, 0.00% Impervious, Inflow Depth > 2.58" for 5-Year event
Inflow = 47.74 cfs @ 15.26 hrs, Volume= 19.219 af
Outflow = 47.74 cfs @ 15.28 hrs, Volume= 19.219 af, Atten= 0%, Lag= 0.9 min

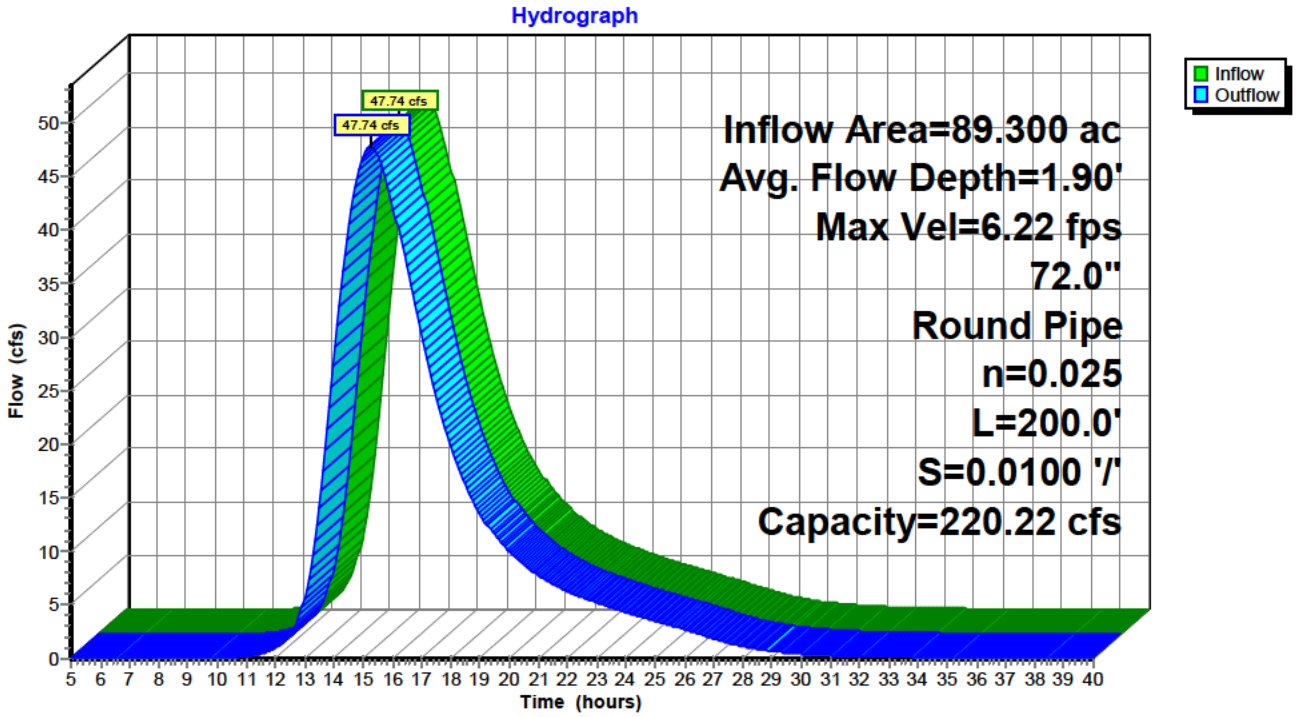
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 6.22 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.51 fps, Avg. Travel Time= 1.3 min

Peak Storage= 1,535 cf @ 15.27 hrs
Average Depth at Peak Storage= 1.90' , Surface Width= 5.58'
Bank-Full Depth= 6.00' Flow Area= 28.3 sf, Capacity= 220.22 cfs

72.0" Round Pipe
n= 0.025 Corrugated metal
Length= 200.0' Slope= 0.0100 '/'
Inlet Invert= 1,346.00', Outlet Invert= 1,344.00'



Reach 8R: OUTLET PIPE



Time span=5.00-40.00 hrs, dt=0.07 hrs, 501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 4S: EX-2 Runoff Area=30.050 ac 0.00% Impervious Runoff Depth=3.25"
Flow Length=4,175' Slope=0.0014 '/' Tc=206.6 min CN=84 Runoff=21.55 cfs 8.144 af

Subcatchment 6S: EX-1 Runoff Area=30.930 ac 0.00% Impervious Runoff Depth=3.25"
Flow Length=3,550' Slope=0.0013 '/' Tc=182.3 min CN=84 Runoff=24.42 cfs 8.382 af

Subcatchment 9S: OS-1 Runoff Area=20.350 ac 0.00% Impervious Runoff Depth=3.25"
Flow Length=3,550' Slope=0.0013 '/' Tc=182.3 min CN=84 Runoff=16.07 cfs 5.515 af

Subcatchment 10S: OS-2 Runoff Area=7.970 ac 0.00% Impervious Runoff Depth=3.25"
Flow Length=4,175' Slope=0.0014 '/' Tc=206.6 min CN=84 Runoff=5.72 cfs 2.160 af

Reach 5R: IMPACT 2 Avg. Flow Depth=1.22' Max Vel=2.24 fps Inflow=27.27 cfs 10.304 af
n=0.025 L=4,770.0' S=0.0019 '/' Capacity=73.10 cfs Outflow=25.86 cfs 10.296 af

Reach 7R: IMPACT 1 Avg. Flow Depth=1.15' Max Vel=2.07 fps Inflow=40.48 cfs 13.897 af
n=0.025 L=1,550.0' S=0.0016 '/' Capacity=297.44 cfs Outflow=40.03 cfs 13.897 af

Reach 8R: OUTLET PIPE Avg. Flow Depth=2.16' Max Vel=6.66 fps Inflow=60.81 cfs 24.193 af
72.0" Round Pipe n=0.025 L=200.0' S=0.0100 '/' Capacity=220.22 cfs Outflow=60.80 cfs 24.193 af

Total Runoff Area = 89.300 ac Runoff Volume = 24.201 af Average Runoff Depth = 3.25"
100.00% Pervious = 89.300 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 4S: EX-2

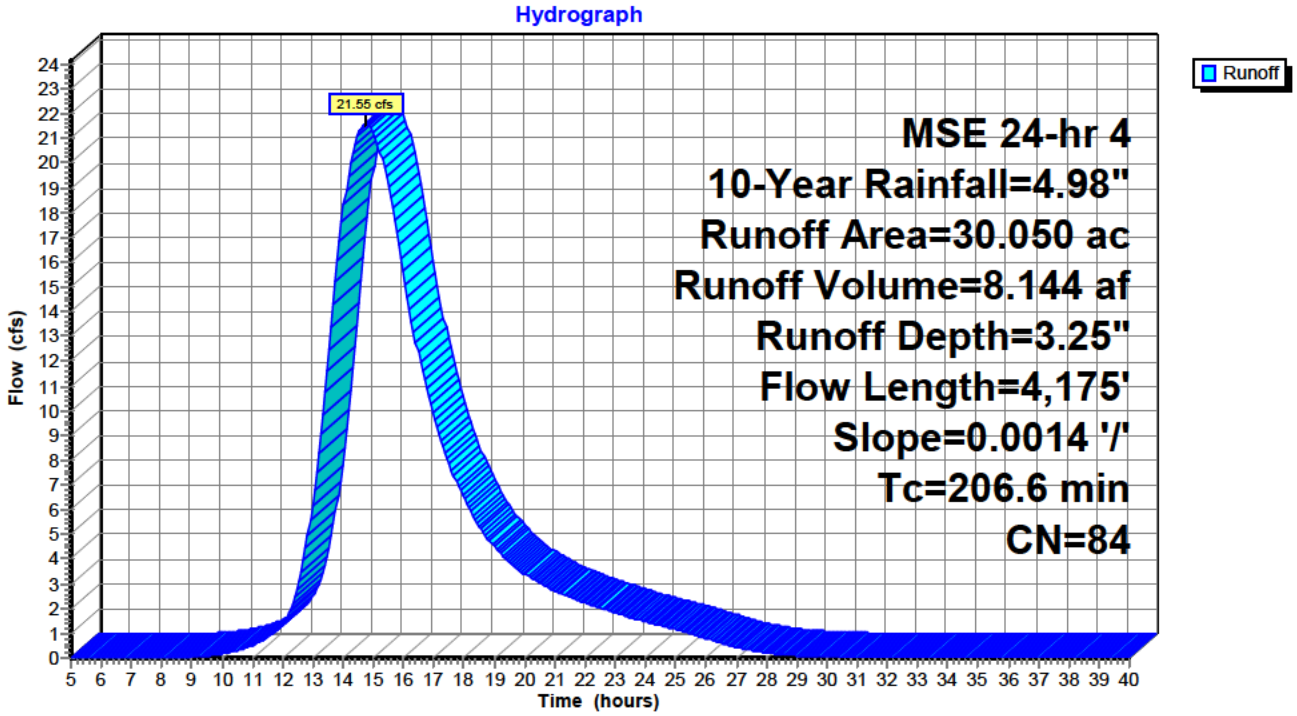
Runoff = 21.55 cfs @ 14.73 hrs, Volume= 8.144 af, Depth= 3.25"
Routed to Reach 5R : IMPACT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
30.050	84	Small grain, SR + CR, Good, HSG D
30.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
206.6	4,175	0.0014	0.34		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 4S: EX-2



Summary for Subcatchment 6S: EX-1

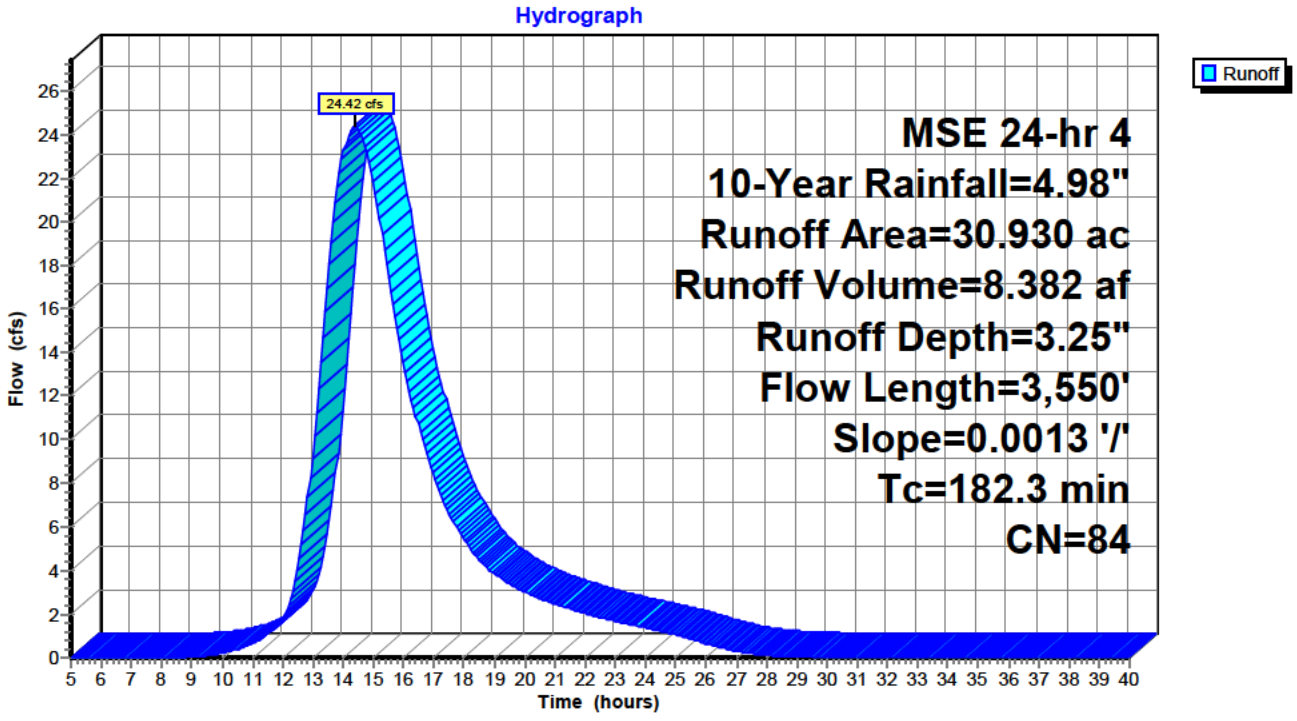
Runoff = 24.42 cfs @ 14.38 hrs, Volume= 8.382 af, Depth= 3.25"
Routed to Reach 7R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
2.550	79	Woods, Fair, HSG D
28.380	84	Small grain, SR + CR, Good, HSG D
30.930	84	Weighted Average
30.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
182.3	3,550	0.0013	0.32		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 6S: EX-1



Summary for Subcatchment 9S: OS-1

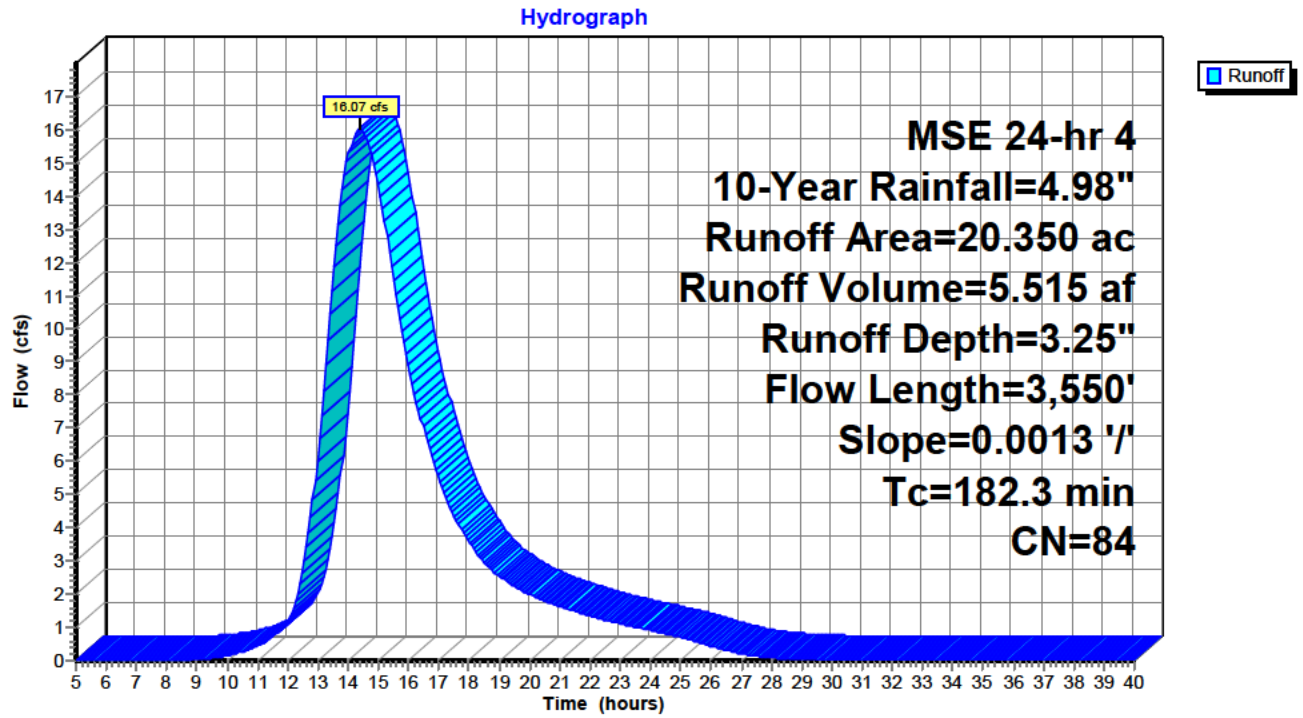
Runoff = 16.07 cfs @ 14.38 hrs, Volume= 5.515 af, Depth= 3.25"
Routed to Reach 7R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
1.540	79	Woods, Fair, HSG D
18.710	84	Small grain, SR + CR, Good, HSG D
0.100	96	Gravel surface, HSG D
20.350	84	Weighted Average
20.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
182.3	3,550	0.0013	0.32		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 9S: OS-1



Summary for Subcatchment 10S: OS-2

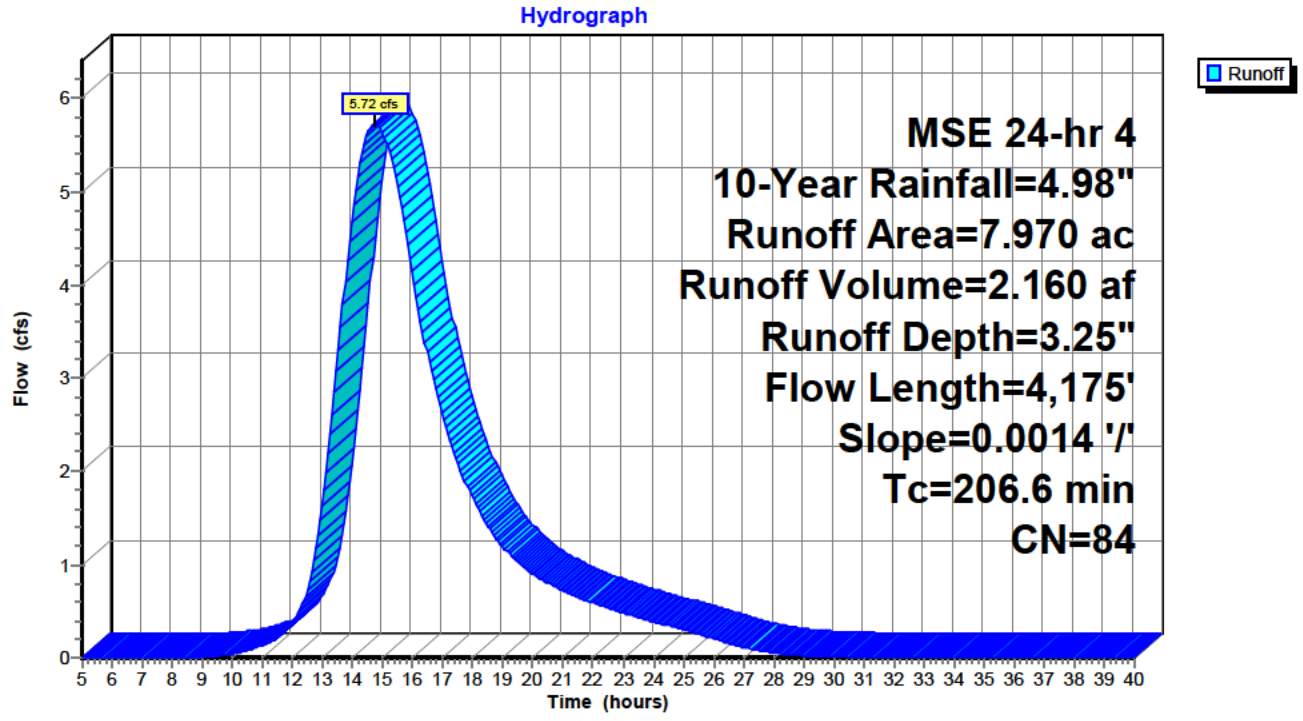
Runoff = 5.72 cfs @ 14.73 hrs, Volume= 2.160 af, Depth= 3.25"
Routed to Reach 5R : IMPACT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
7.910	84	Small grain, SR + CR, Good, HSG D
0.060	96	Gravel surface, HSG D
7.970	84	Weighted Average
7.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
206.6	4,175	0.0014	0.34		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 10S: OS-2



Summary for Reach 5R: IMPACT 2

Inflow Area = 38.020 ac, 0.00% Impervious, Inflow Depth = 3.25" for 10-Year event
Inflow = 27.27 cfs @ 14.73 hrs, Volume= 10.304 af
Outflow = 25.86 cfs @ 15.82 hrs, Volume= 10.296 af, Atten= 5%, Lag= 65.4 min
Routed to Reach 8R : OUTLET PIPE

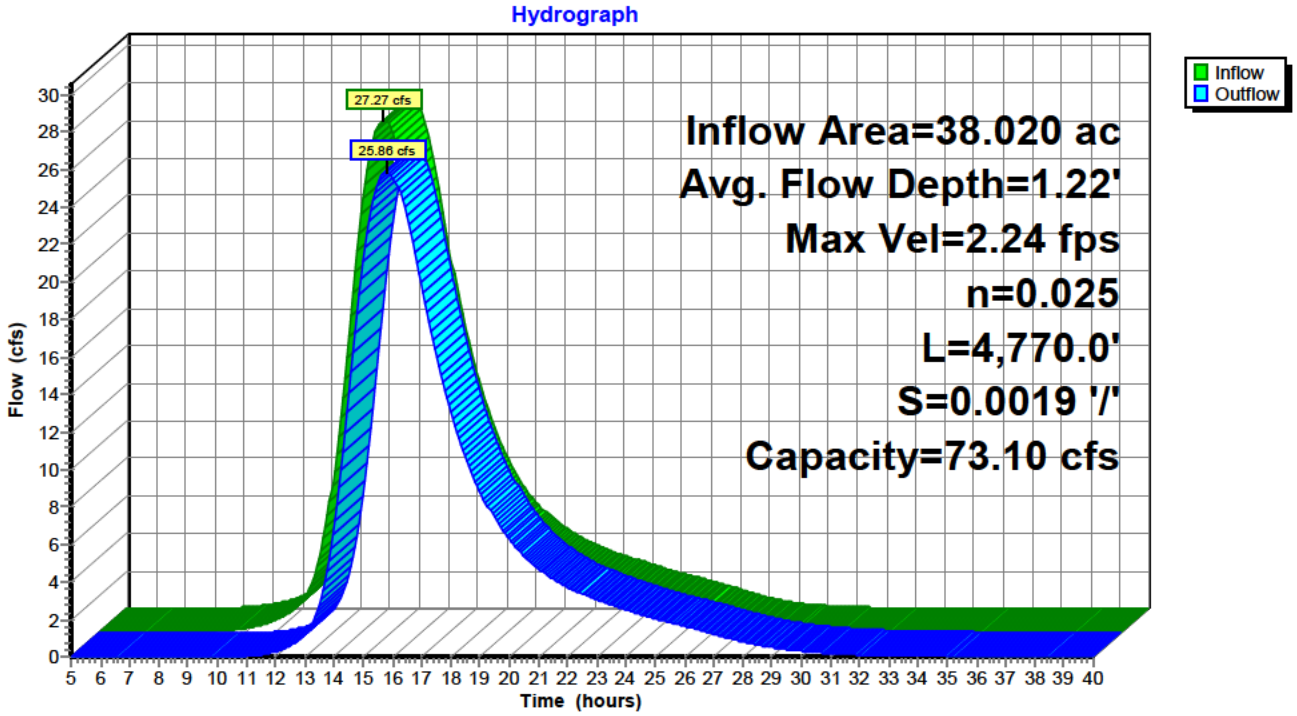
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 2.24 fps, Min. Travel Time= 35.5 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 92.2 min

Peak Storage= 55,145 cf @ 15.23 hrs
Average Depth at Peak Storage= 1.22' , Surface Width= 14.00'
Bank-Full Depth= 2.00' Flow Area= 24.8 sf, Capacity= 73.10 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 3.7 '/' Top Width= 19.80'
Length= 4,770.0' Slope= 0.0019 '/'
Inlet Invert= 1,355.00', Outlet Invert= 1,346.00'

‡

Reach 5R: IMPACT 2



Summary for Reach 7R: IMPACT 1

Inflow Area = 51.280 ac, 0.00% Impervious, Inflow Depth = 3.25" for 10-Year event
Inflow = 40.48 cfs @ 14.38 hrs, Volume= 13.897 af
Outflow = 40.03 cfs @ 14.74 hrs, Volume= 13.897 af, Atten= 1%, Lag= 21.3 min
Routed to Reach 8R : OUTLET PIPE

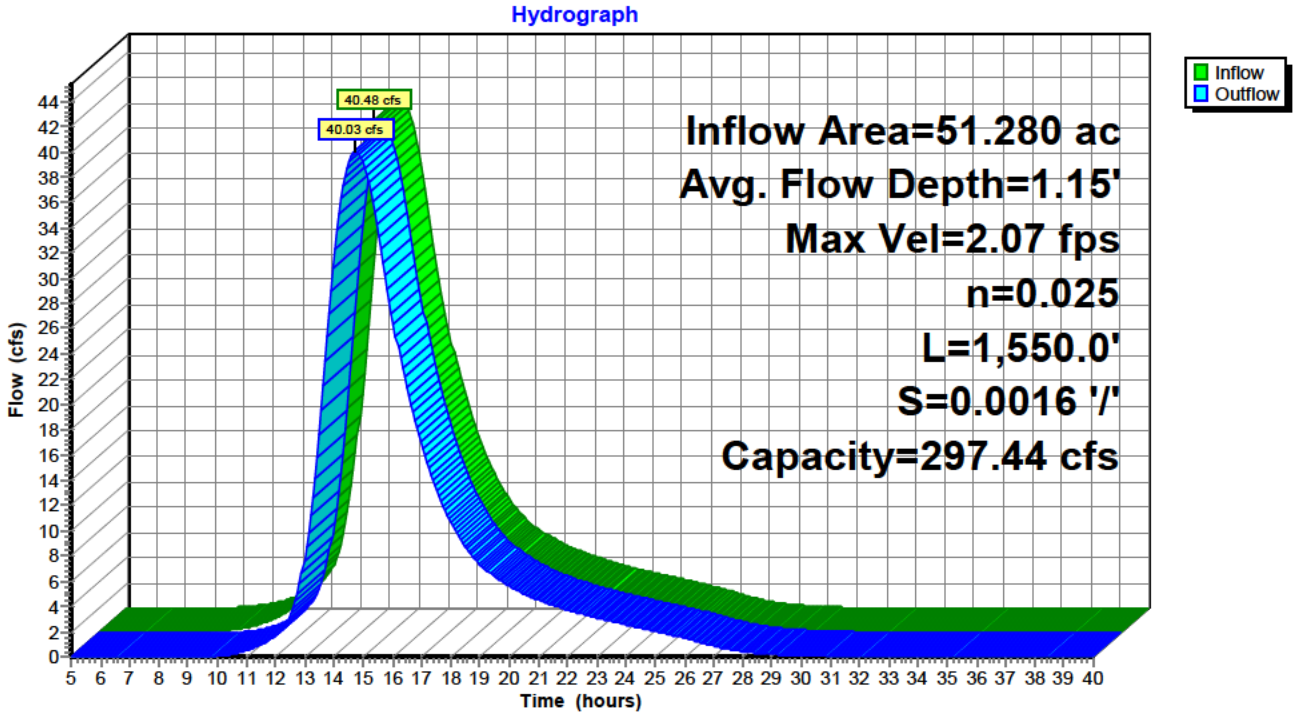
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 2.07 fps, Min. Travel Time= 12.5 min
Avg. Velocity = 0.73 fps, Avg. Travel Time= 35.2 min

Peak Storage= 29,968 cf @ 14.53 hrs
Average Depth at Peak Storage= 1.15' , Surface Width= 23.75'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 297.44 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 6.0 '/' Top Width= 46.00'
Length= 1,550.0' Slope= 0.0016 '/'
Inlet Invert= 1,348.50', Outlet Invert= 1,346.00'

‡

Reach 7R: IMPACT 1



Summary for Reach 8R: OUTLET PIPE

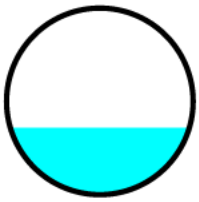
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 5R OUTLET depth by 0.94' @ 15.15 hrs
[64] Warning: Exceeded Reach 5R outlet bank by 0.16' @ 15.20 hrs
[62] Hint: Exceeded Reach 7R OUTLET depth by 1.13' @ 15.71 hrs

Inflow Area = 89.300 ac, 0.00% Impervious, Inflow Depth > 3.25" for 10-Year event
Inflow = 60.81 cfs @ 15.20 hrs, Volume= 24.193 af
Outflow = 60.80 cfs @ 15.21 hrs, Volume= 24.193 af, Atten= 0%, Lag= 0.9 min

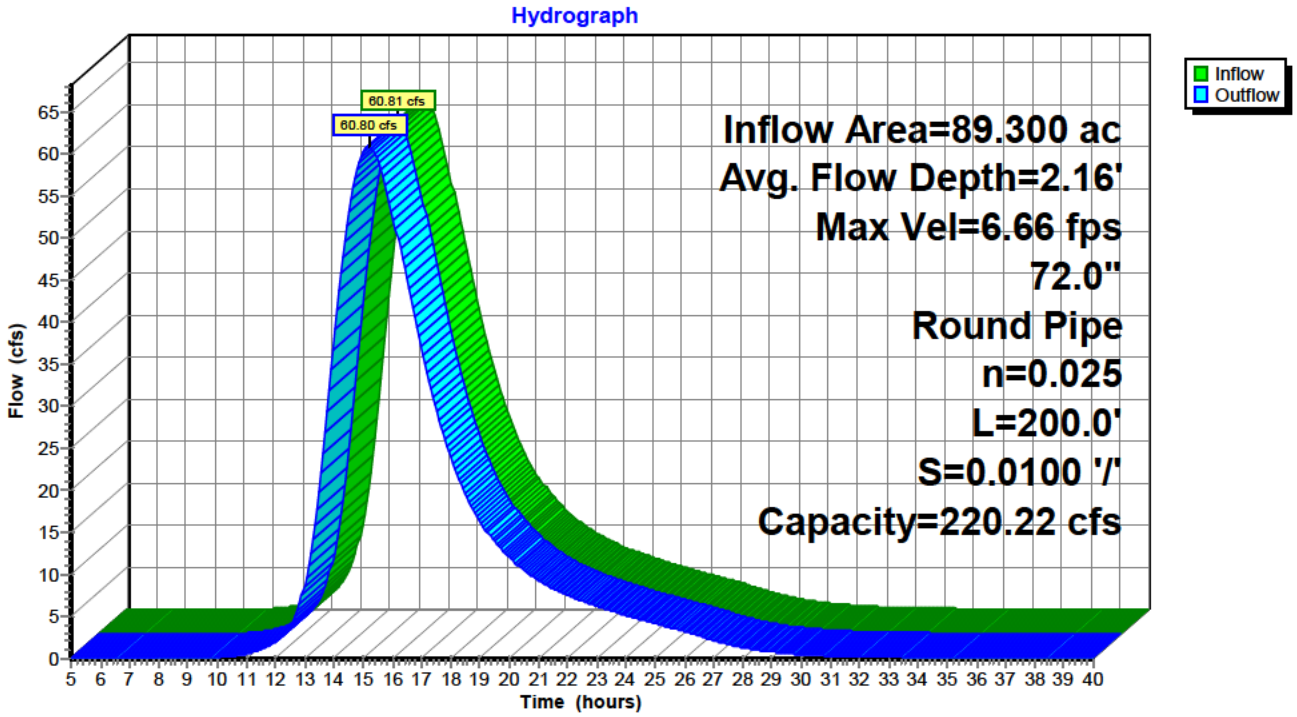
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 6.66 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.64 fps, Avg. Travel Time= 1.3 min

Peak Storage= 1,827 cf @ 15.20 hrs
Average Depth at Peak Storage= 2.16' , Surface Width= 5.76'
Bank-Full Depth= 6.00' Flow Area= 28.3 sf, Capacity= 220.22 cfs

72.0" Round Pipe
n= 0.025 Corrugated metal
Length= 200.0' Slope= 0.0100 '/'
Inlet Invert= 1,346.00', Outlet Invert= 1,344.00'



Reach 8R: OUTLET PIPE



Time span=5.00-40.00 hrs, dt=0.07 hrs, 501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 4S: EX-2 Runoff Area=30.050 ac 0.00% Impervious Runoff Depth=4.22"
Flow Length=4,175' Slope=0.0014 '/' Tc=206.6 min CN=84 Runoff=27.97 cfs 10.579 af

Subcatchment 6S: EX-1 Runoff Area=30.930 ac 0.00% Impervious Runoff Depth=4.22"
Flow Length=3,550' Slope=0.0013 '/' Tc=182.3 min CN=84 Runoff=31.69 cfs 10.889 af

Subcatchment 9S: OS-1 Runoff Area=20.350 ac 0.00% Impervious Runoff Depth=4.22"
Flow Length=3,550' Slope=0.0013 '/' Tc=182.3 min CN=84 Runoff=20.85 cfs 7.164 af

Subcatchment 10S: OS-2 Runoff Area=7.970 ac 0.00% Impervious Runoff Depth=4.22"
Flow Length=4,175' Slope=0.0014 '/' Tc=206.6 min CN=84 Runoff=7.42 cfs 2.806 af

Reach 5R: IMPACT 2 Avg. Flow Depth=1.39' Max Vel=2.41 fps Inflow=35.39 cfs 13.385 af
n=0.025 L=4,770.0' S=0.0019 '/' Capacity=73.10 cfs Outflow=33.80 cfs 13.376 af

Reach 7R: IMPACT 1 Avg. Flow Depth=1.31' Max Vel=2.23 fps Inflow=52.54 cfs 18.053 af
n=0.025 L=1,550.0' S=0.0016 '/' Capacity=297.44 cfs Outflow=52.02 cfs 18.053 af

Reach 8R: OUTLET PIPE Avg. Flow Depth=2.50' Max Vel=7.16 fps Inflow=79.76 cfs 31.429 af
72.0" Round Pipe n=0.025 L=200.0' S=0.0100 '/' Capacity=220.22 cfs Outflow=79.75 cfs 31.429 af

Total Runoff Area = 89.300 ac Runoff Volume = 31.438 af Average Runoff Depth = 4.22"
100.00% Pervious = 89.300 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 4S: EX-2

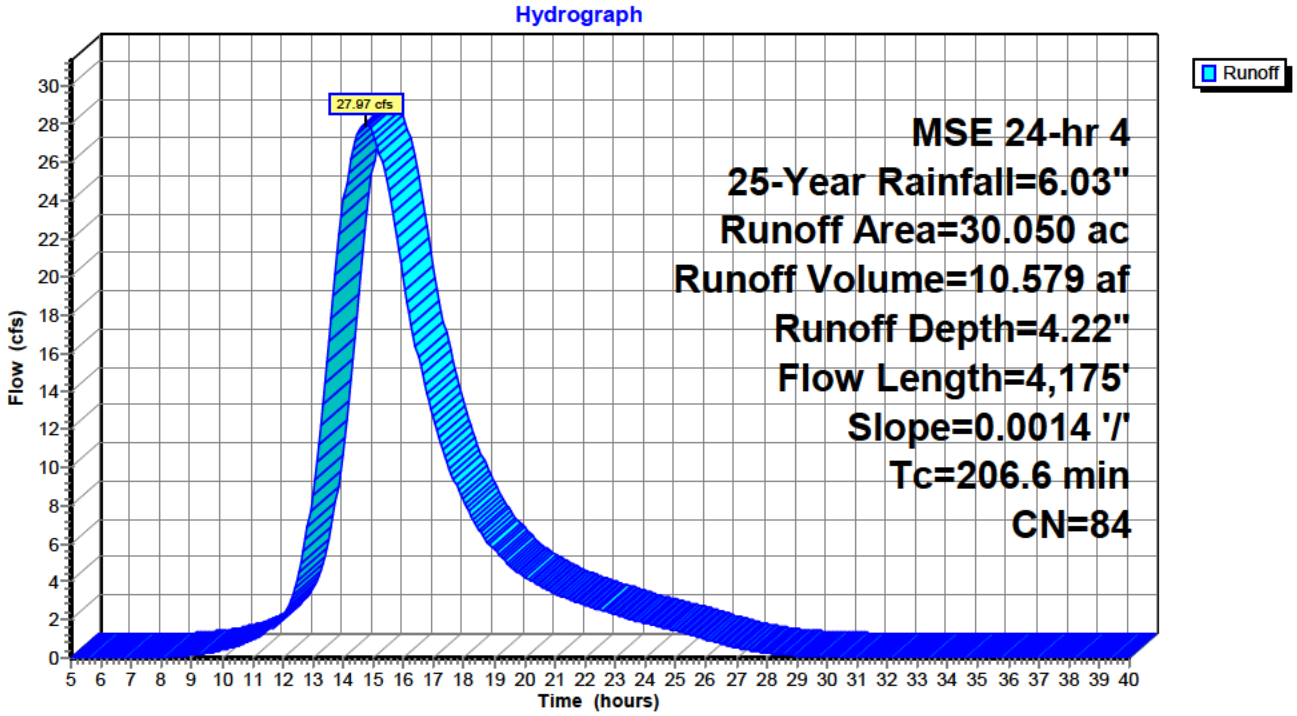
Runoff = 27.97 cfs @ 14.74 hrs, Volume= 10.579 af, Depth= 4.22"
Routed to Reach 5R : IMPACT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
30.050	84	Small grain, SR + CR, Good, HSG D
30.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
206.6	4,175	0.0014	0.34		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 4S: EX-2



Summary for Subcatchment 6S: EX-1

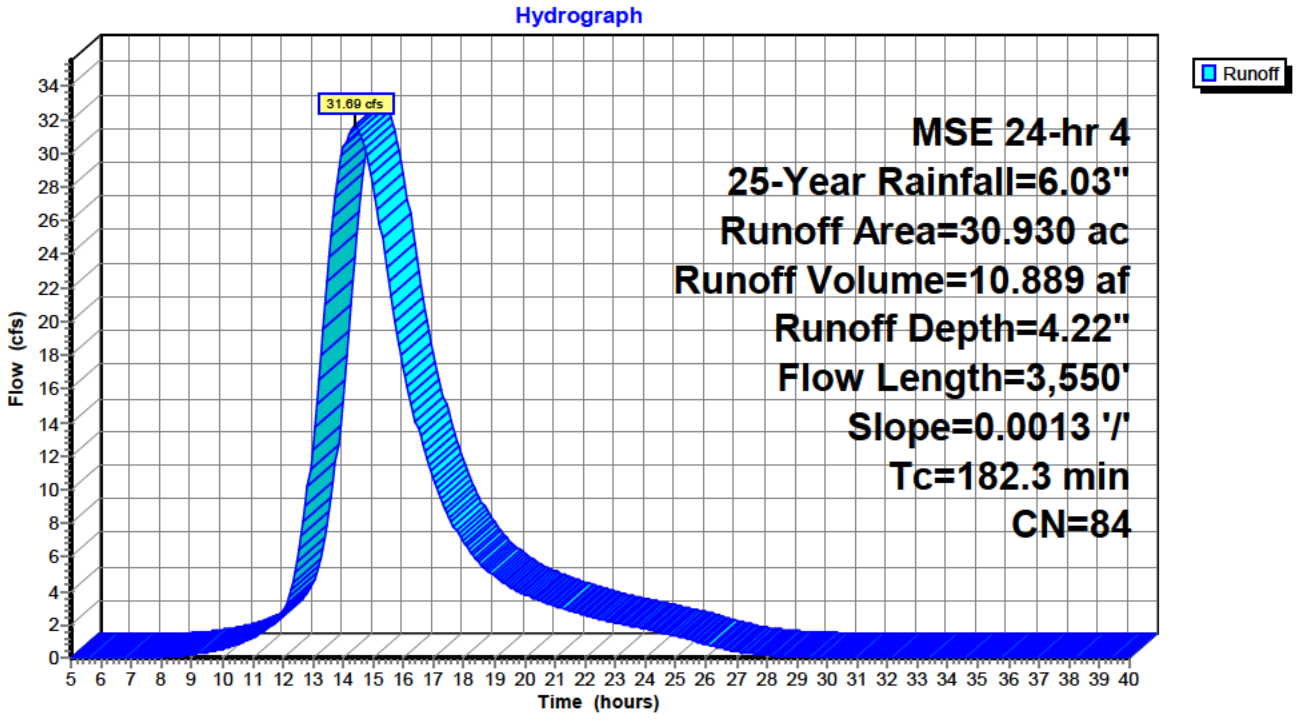
Runoff = 31.69 cfs @ 14.38 hrs, Volume= 10.889 af, Depth= 4.22"
Routed to Reach 7R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
2.550	79	Woods, Fair, HSG D
28.380	84	Small grain, SR + CR, Good, HSG D
30.930	84	Weighted Average
30.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
182.3	3,550	0.0013	0.32		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 6S: EX-1



Summary for Subcatchment 9S: OS-1

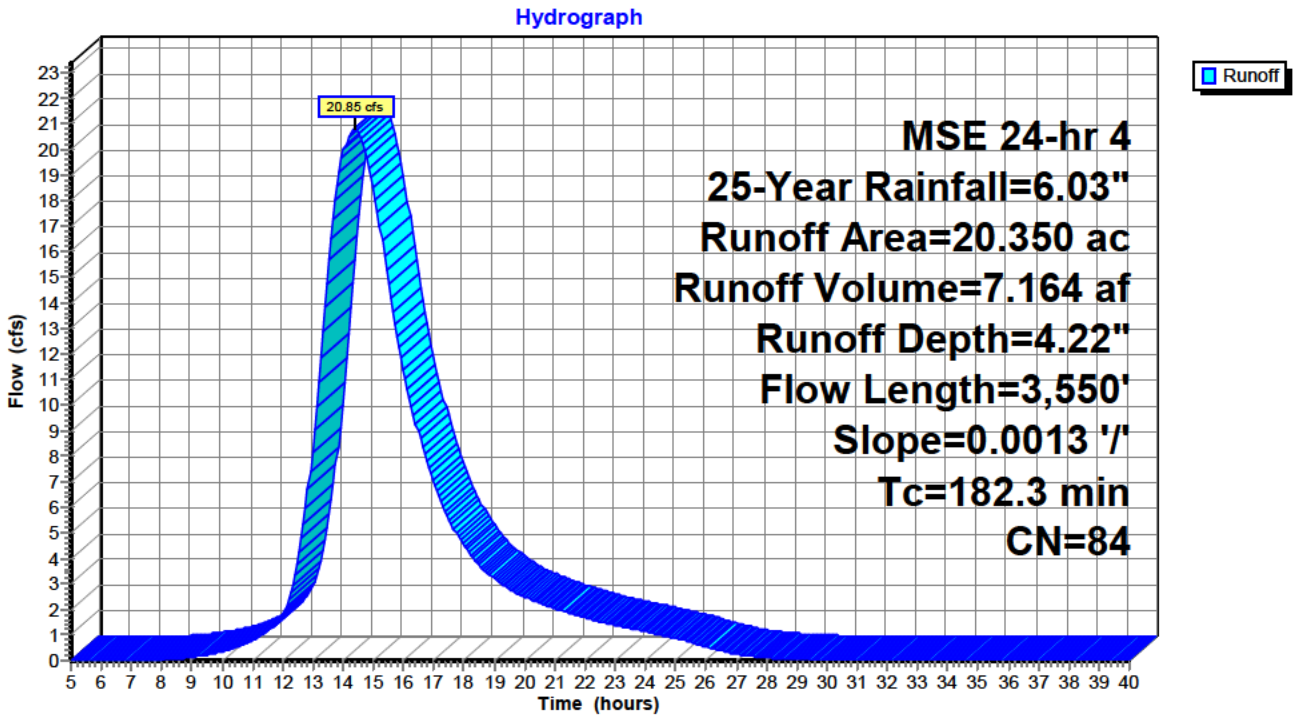
Runoff = 20.85 cfs @ 14.38 hrs, Volume= 7.164 af, Depth= 4.22"
Routed to Reach 7R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
1.540	79	Woods, Fair, HSG D
18.710	84	Small grain, SR + CR, Good, HSG D
0.100	96	Gravel surface, HSG D
20.350	84	Weighted Average
20.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
182.3	3,550	0.0013	0.32		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 9S: OS-1



Summary for Subcatchment 10S: OS-2

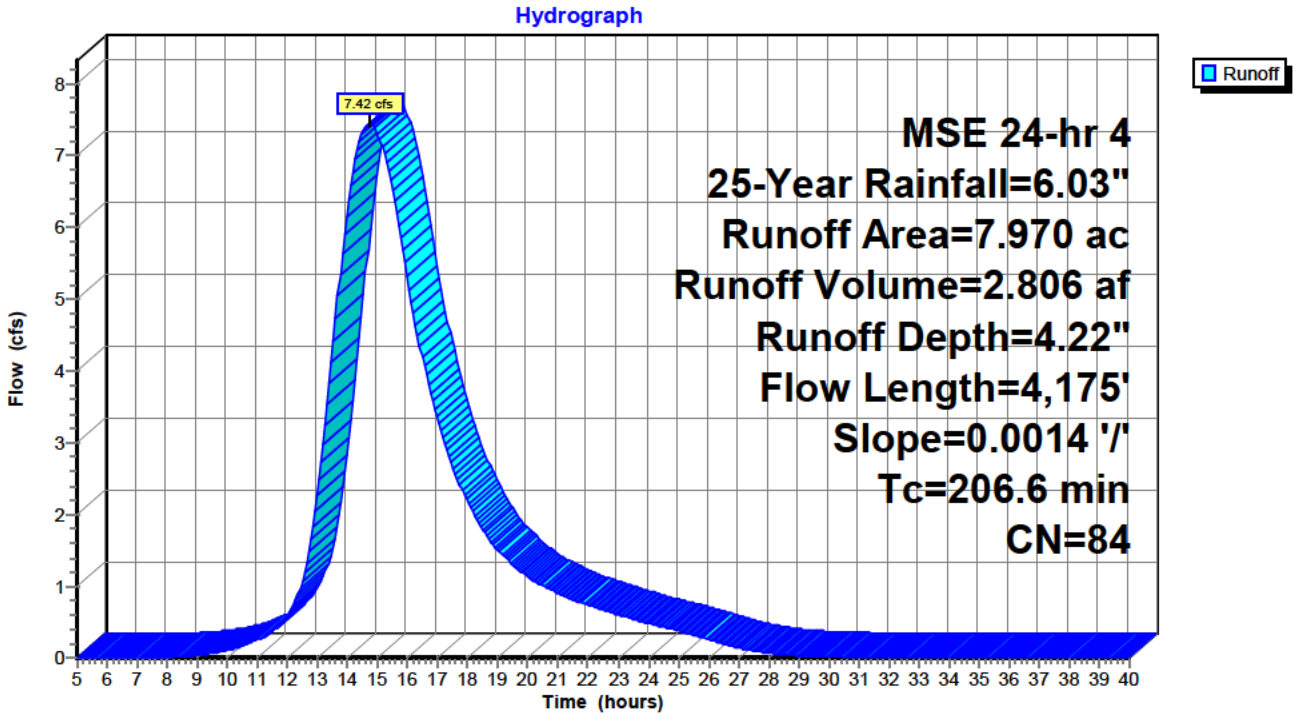
Runoff = 7.42 cfs @ 14.74 hrs, Volume= 2.806 af, Depth= 4.22"
Routed to Reach 5R : IMPACT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
7.910	84	Small grain, SR + CR, Good, HSG D
0.060	96	Gravel surface, HSG D
7.970	84	Weighted Average
7.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
206.6	4,175	0.0014	0.34		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 10S: OS-2



Summary for Reach 5R: IMPACT 2

Inflow Area = 38.020 ac, 0.00% Impervious, Inflow Depth = 4.22" for 25-Year event
Inflow = 35.39 cfs @ 14.74 hrs, Volume= 13.385 af
Outflow = 33.80 cfs @ 15.72 hrs, Volume= 13.376 af, Atten= 4%, Lag= 59.2 min
Routed to Reach 8R : OUTLET PIPE

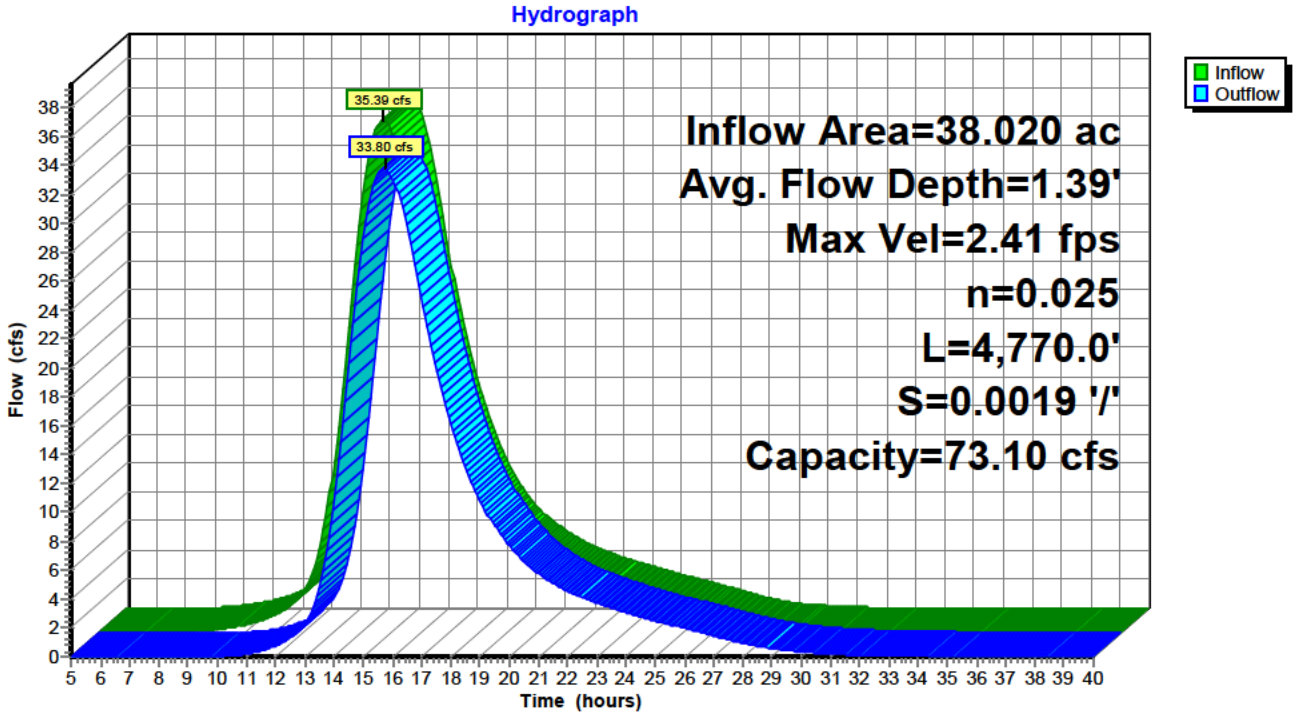
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 2.41 fps, Min. Travel Time= 33.1 min
Avg. Velocity = 0.92 fps, Avg. Travel Time= 86.5 min

Peak Storage= 67,049 cf @ 15.17 hrs
Average Depth at Peak Storage= 1.39' , Surface Width= 15.27'
Bank-Full Depth= 2.00' Flow Area= 24.8 sf, Capacity= 73.10 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 3.7 '/' Top Width= 19.80'
Length= 4,770.0' Slope= 0.0019 '/'
Inlet Invert= 1,355.00', Outlet Invert= 1,346.00'

‡

Reach 5R: IMPACT 2



Summary for Reach 7R: IMPACT 1

Inflow Area = 51.280 ac, 0.00% Impervious, Inflow Depth = 4.22" for 25-Year event
Inflow = 52.54 cfs @ 14.38 hrs, Volume= 18.053 af
Outflow = 52.02 cfs @ 14.69 hrs, Volume= 18.053 af, Atten= 1%, Lag= 18.9 min
Routed to Reach 8R : OUTLET PIPE

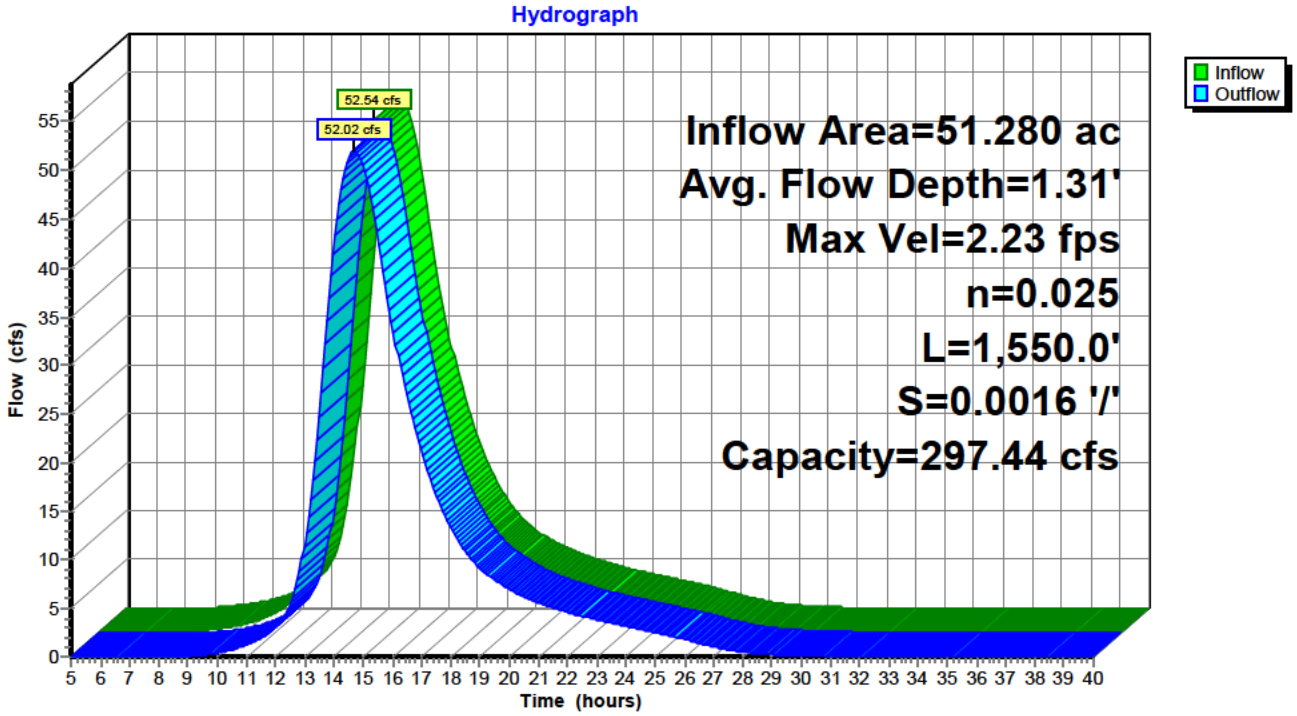
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 2.23 fps, Min. Travel Time= 11.6 min
Avg. Velocity = 0.78 fps, Avg. Travel Time= 33.0 min

Peak Storage= 36,206 cf @ 14.50 hrs
Average Depth at Peak Storage= 1.31' , Surface Width= 25.70'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 297.44 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 6.0 '/' Top Width= 46.00'
Length= 1,550.0' Slope= 0.0016 '/'
Inlet Invert= 1,348.50', Outlet Invert= 1,346.00'

‡

Reach 7R: IMPACT 1



Summary for Reach 8R: OUTLET PIPE

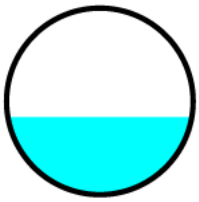
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 5R OUTLET depth by 1.11' @ 15.08 hrs
[64] Warning: Exceeded Reach 5R outlet bank by 0.50' @ 15.13 hrs
[62] Hint: Exceeded Reach 7R OUTLET depth by 1.31' @ 15.57 hrs

Inflow Area = 89.300 ac, 0.00% Impervious, Inflow Depth > 4.22" for 25-Year event
Inflow = 79.76 cfs @ 15.13 hrs, Volume= 31.429 af
Outflow = 79.75 cfs @ 15.14 hrs, Volume= 31.429 af, Atten= 0%, Lag= 0.9 min

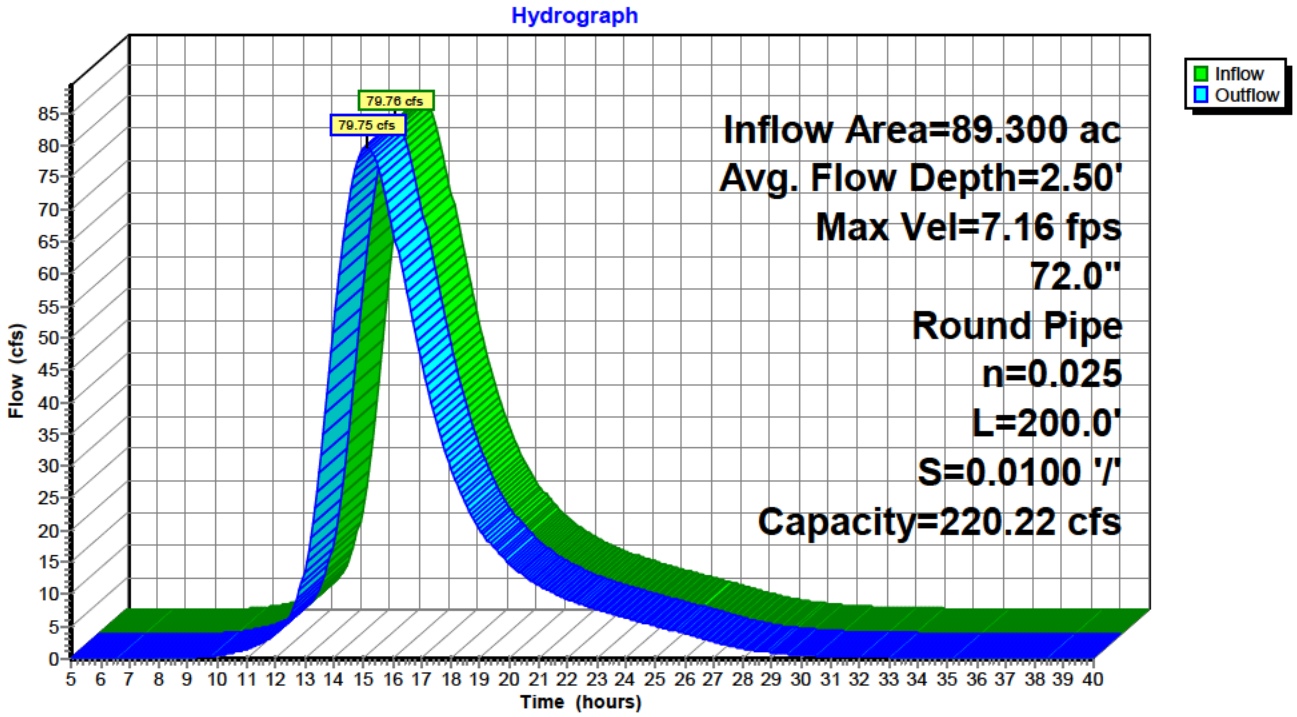
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 7.16 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.81 fps, Avg. Travel Time= 1.2 min

Peak Storage= 2,227 cf @ 15.13 hrs
Average Depth at Peak Storage= 2.50' , Surface Width= 5.92'
Bank-Full Depth= 6.00' Flow Area= 28.3 sf, Capacity= 220.22 cfs

72.0" Round Pipe
n= 0.025 Corrugated metal
Length= 200.0' Slope= 0.0100 '/'
Inlet Invert= 1,346.00', Outlet Invert= 1,344.00'



Reach 8R: OUTLET PIPE



Time span=5.00-40.00 hrs, dt=0.07 hrs, 501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 4S: EX-2 Runoff Area=30.050 ac 0.00% Impervious Runoff Depth=5.93"
Flow Length=4,175' Slope=0.0014 '/' Tc=206.6 min CN=84 Runoff=39.09 cfs 14.855 af

Subcatchment 6S: EX-1 Runoff Area=30.930 ac 0.00% Impervious Runoff Depth=5.93"
Flow Length=3,550' Slope=0.0013 '/' Tc=182.3 min CN=84 Runoff=44.29 cfs 15.290 af

Subcatchment 9S: OS-1 Runoff Area=20.350 ac 0.00% Impervious Runoff Depth=5.93"
Flow Length=3,550' Slope=0.0013 '/' Tc=182.3 min CN=84 Runoff=29.14 cfs 10.060 af

Subcatchment 10S: OS-2 Runoff Area=7.970 ac 0.00% Impervious Runoff Depth=5.93"
Flow Length=4,175' Slope=0.0014 '/' Tc=206.6 min CN=84 Runoff=10.37 cfs 3.940 af

Reach 5R: IMPACT 2 Avg. Flow Depth=1.64' Max Vel=2.63 fps Inflow=49.45 cfs 18.795 af
n=0.025 L=4,770.0' S=0.0019 '/' Capacity=73.10 cfs Outflow=47.61 cfs 18.786 af

Reach 7R: IMPACT 1 Avg. Flow Depth=1.55' Max Vel=2.44 fps Inflow=73.43 cfs 25.350 af
n=0.025 L=1,550.0' S=0.0016 '/' Capacity=297.44 cfs Outflow=72.80 cfs 25.350 af

Reach 8R: OUTLET PIPE Avg. Flow Depth=3.04' Max Vel=7.84 fps Inflow=112.78 cfs 44.136 af
72.0" Round Pipe n=0.025 L=200.0' S=0.0100 '/' Capacity=220.22 cfs Outflow=112.76 cfs 44.136 af

Total Runoff Area = 89.300 ac Runoff Volume = 44.145 af Average Runoff Depth = 5.93"
100.00% Pervious = 89.300 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 4S: EX-2

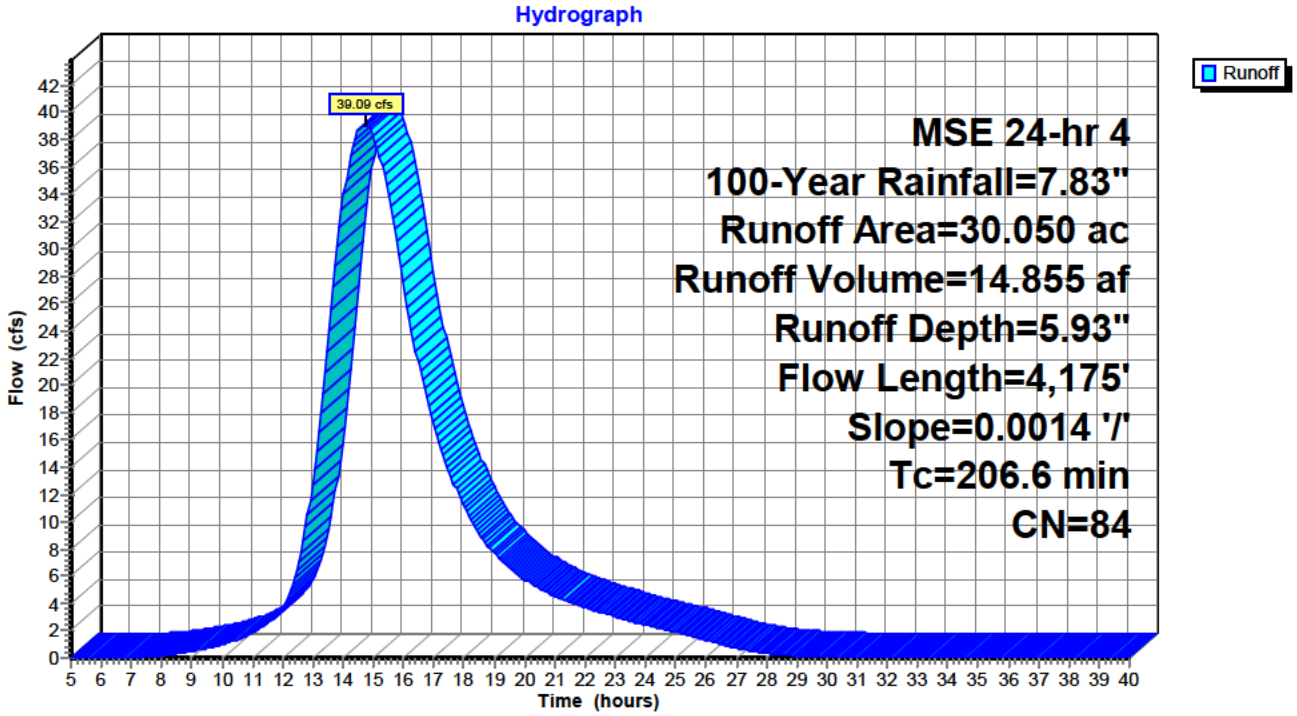
Runoff = 39.09 cfs @ 14.71 hrs, Volume= 14.855 af, Depth= 5.93"
Routed to Reach 5R : IMPACT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
30.050	84	Small grain, SR + CR, Good, HSG D
30.050		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
206.6	4,175	0.0014	0.34		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 4S: EX-2



Summary for Subcatchment 6S: EX-1

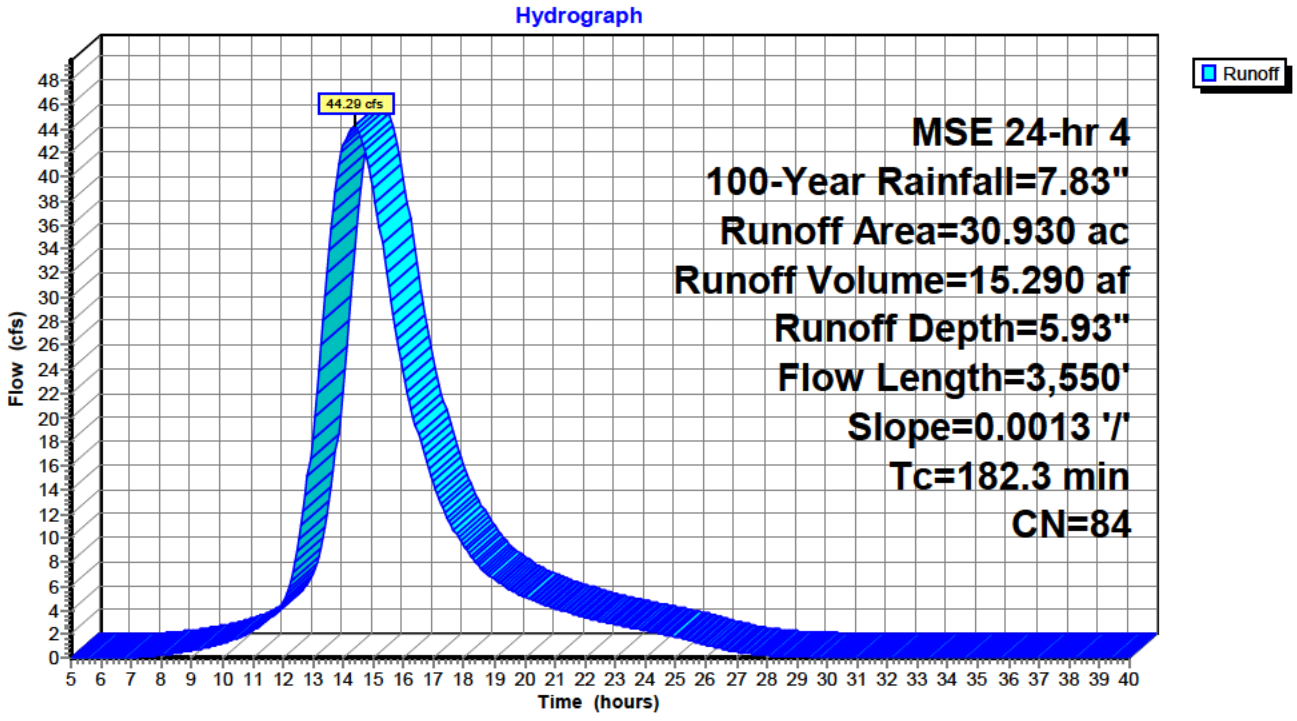
Runoff = 44.29 cfs @ 14.37 hrs, Volume= 15.290 af, Depth= 5.93"
Routed to Reach 7R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
2.550	79	Woods, Fair, HSG D
28.380	84	Small grain, SR + CR, Good, HSG D
30.930	84	Weighted Average
30.930		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
182.3	3,550	0.0013	0.32		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 6S: EX-1



Summary for Subcatchment 9S: OS-1

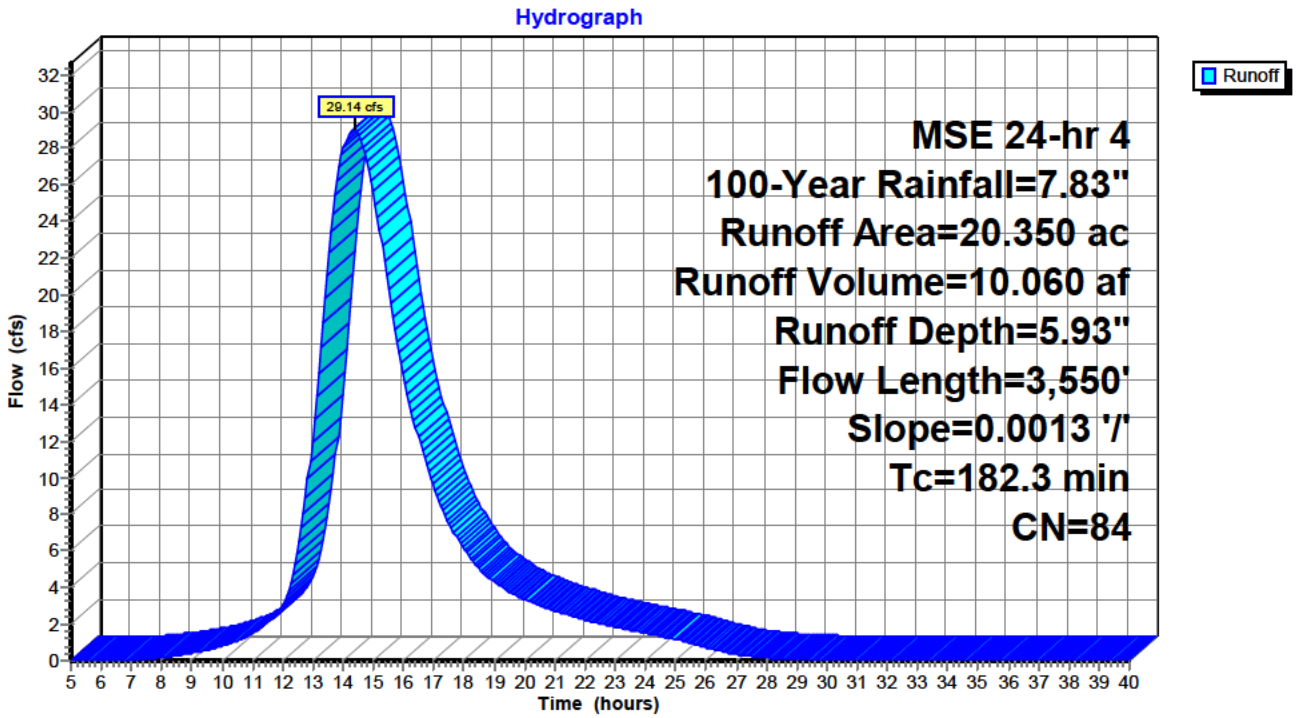
Runoff = 29.14 cfs @ 14.37 hrs, Volume= 10.060 af, Depth= 5.93"
Routed to Reach 7R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
1.540	79	Woods, Fair, HSG D
18.710	84	Small grain, SR + CR, Good, HSG D
0.100	96	Gravel surface, HSG D
20.350	84	Weighted Average
20.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
182.3	3,550	0.0013	0.32		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 9S: OS-1



Summary for Subcatchment 10S: OS-2

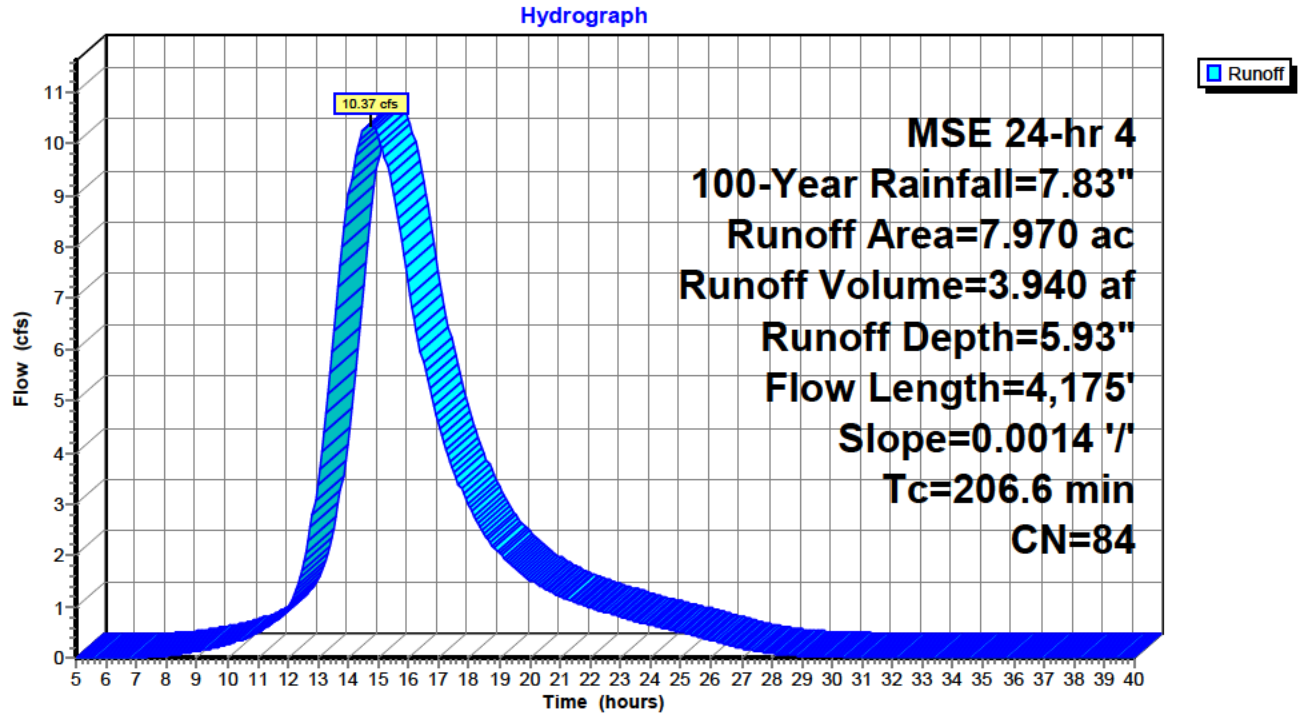
Runoff = 10.37 cfs @ 14.71 hrs, Volume= 3.940 af, Depth= 5.93"
Routed to Reach 5R : IMPACT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
7.910	84	Small grain, SR + CR, Good, HSG D
0.060	96	Gravel surface, HSG D
7.970	84	Weighted Average
7.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
206.6	4,175	0.0014	0.34		**Shallow Concentrated Flow, Crop Runoff** Cultivated Straight Rows Kv= 9.0 fps

Subcatchment 10S: OS-2



Summary for Reach 5R: IMPACT 2

Inflow Area = 38.020 ac, 0.00% Impervious, Inflow Depth = 5.93" for 100-Year event
Inflow = 49.45 cfs @ 14.71 hrs, Volume= 18.795 af
Outflow = 47.61 cfs @ 15.61 hrs, Volume= 18.786 af, Atten= 4%, Lag= 54.1 min
Routed to Reach 8R : OUTLET PIPE

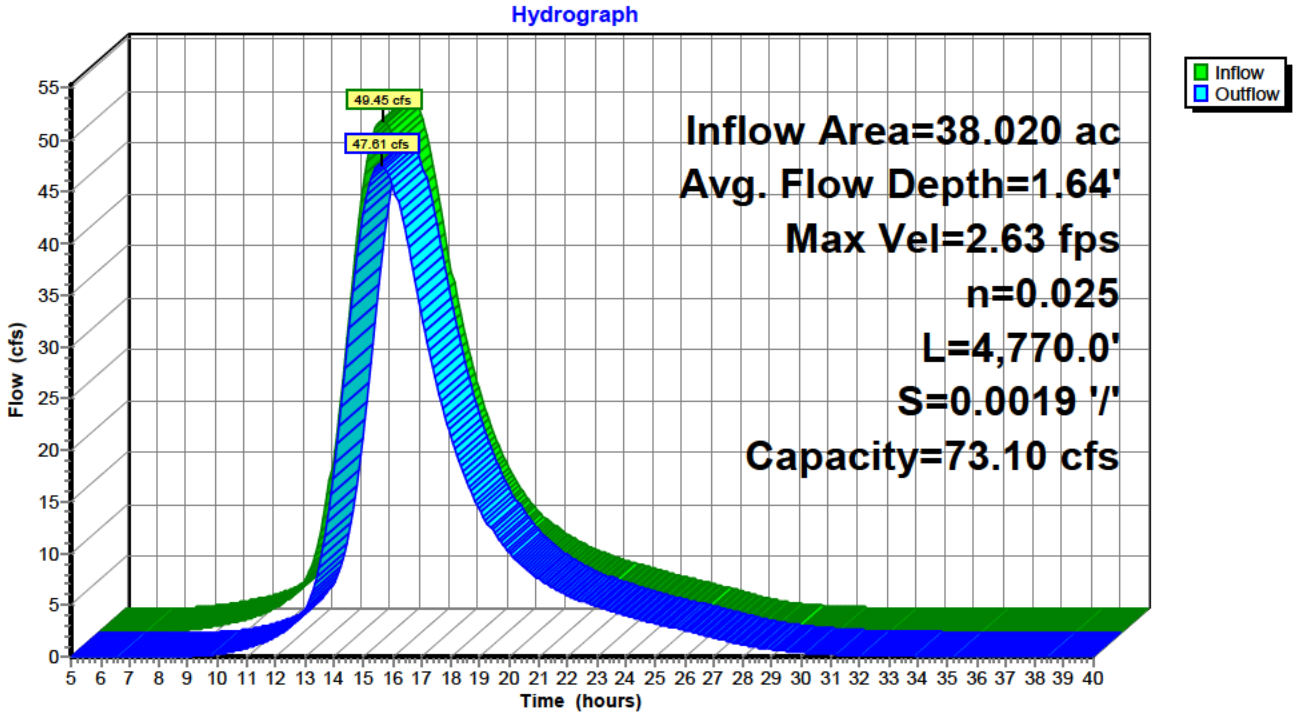
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 2.63 fps, Min. Travel Time= 30.2 min
Avg. Velocity = 1.01 fps, Avg. Travel Time= 79.0 min

Peak Storage= 86,214 cf @ 15.11 hrs
Average Depth at Peak Storage= 1.64' , Surface Width= 17.10'
Bank-Full Depth= 2.00' Flow Area= 24.8 sf, Capacity= 73.10 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 3.7 '/' Top Width= 19.80'
Length= 4,770.0' Slope= 0.0019 '/'
Inlet Invert= 1,355.00', Outlet Invert= 1,346.00'

‡

Reach 5R: IMPACT 2



Summary for Reach 7R: IMPACT 1

Inflow Area = 51.280 ac, 0.00% Impervious, Inflow Depth = 5.93" for 100-Year event
Inflow = 73.43 cfs @ 14.37 hrs, Volume= 25.350 af
Outflow = 72.80 cfs @ 14.65 hrs, Volume= 25.350 af, Atten= 1%, Lag= 16.7 min
Routed to Reach 8R : OUTLET PIPE

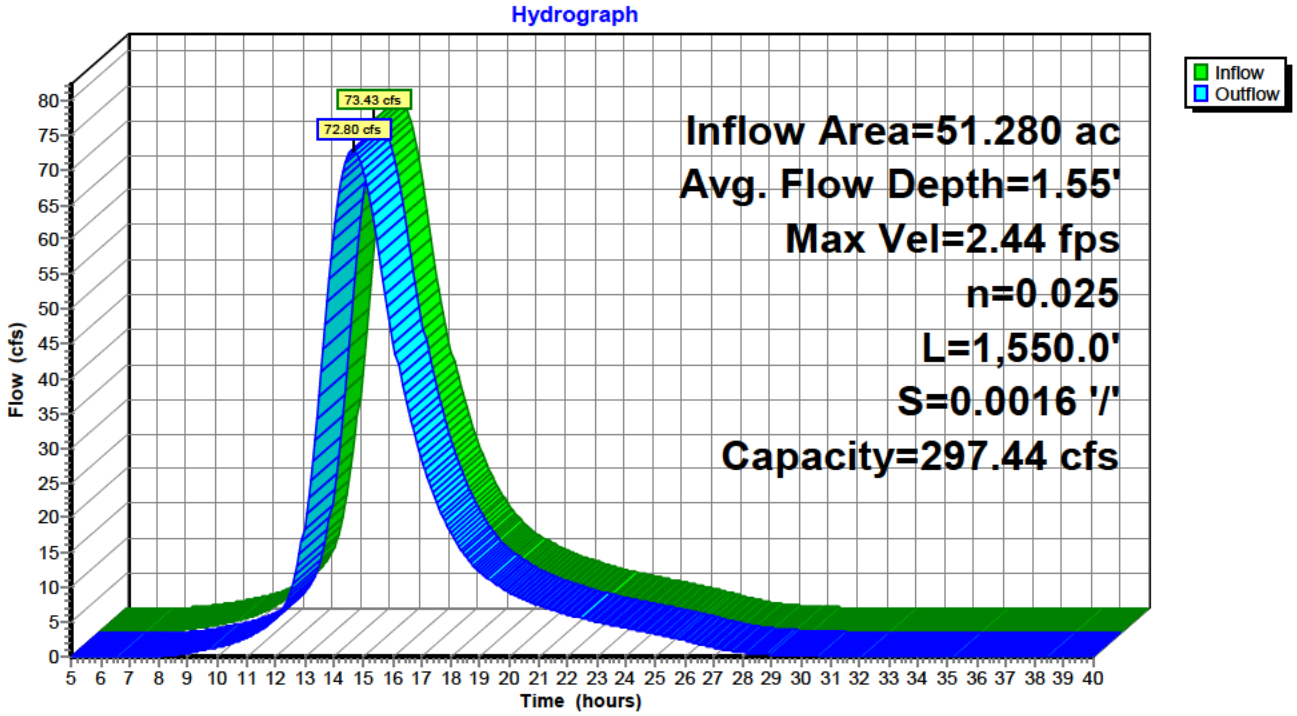
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 2.44 fps, Min. Travel Time= 10.6 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 30.1 min

Peak Storage= 46,228 cf @ 14.47 hrs
Average Depth at Peak Storage= 1.55' , Surface Width= 28.56'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 297.44 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 6.0 '/' Top Width= 46.00'
Length= 1,550.0' Slope= 0.0016 '/'
Inlet Invert= 1,348.50', Outlet Invert= 1,346.00'

‡

Reach 7R: IMPACT 1



Summary for Reach 8R: OUTLET PIPE

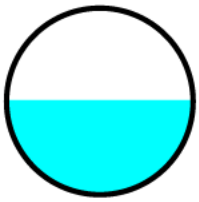
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 5R OUTLET depth by 1.41' @ 15.01 hrs
[64] Warning: Exceeded Reach 5R outlet bank by 1.04' @ 15.05 hrs
[62] Hint: Exceeded Reach 7R OUTLET depth by 1.61' @ 15.43 hrs
[64] Warning: Exceeded Reach 7R outlet bank by 0.04' @ 15.05 hrs

Inflow Area = 89.300 ac, 0.00% Impervious, Inflow Depth > 5.93" for 100-Year event
Inflow = 112.78 cfs @ 15.05 hrs, Volume= 44.136 af
Outflow = 112.76 cfs @ 15.06 hrs, Volume= 44.136 af, Atten= 0%, Lag= 0.8 min

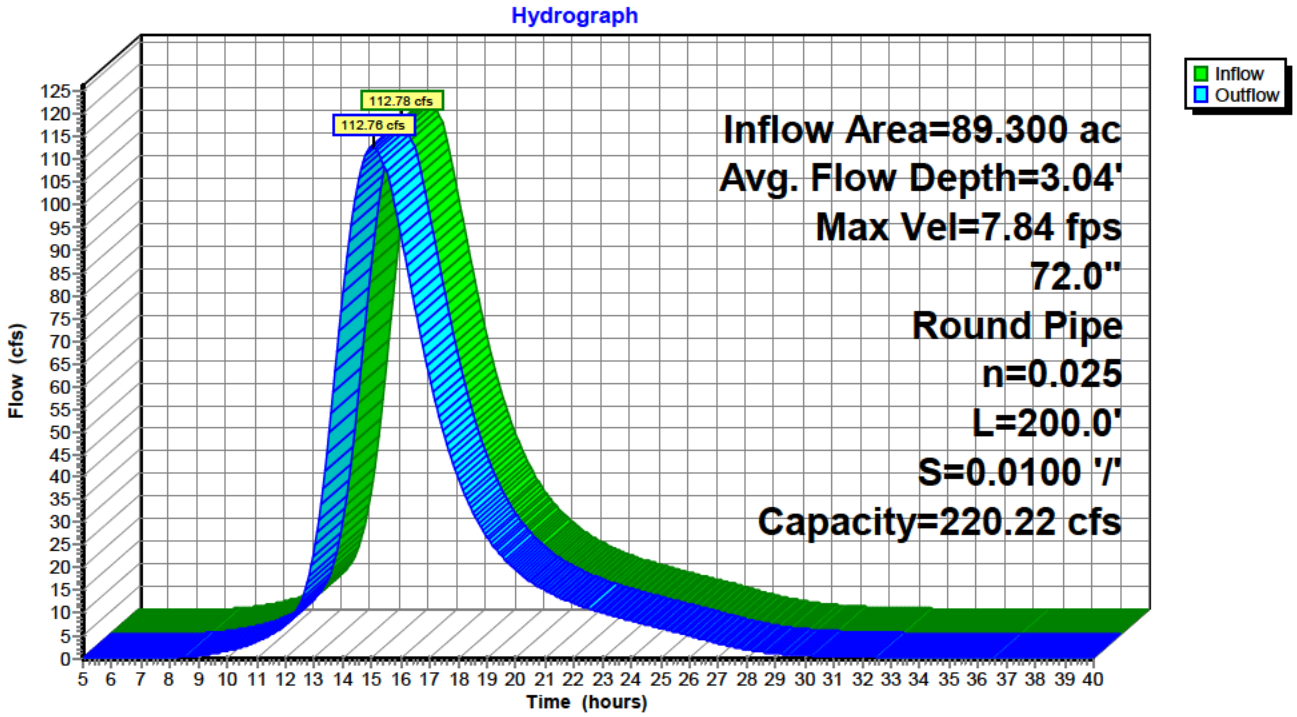
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 7.84 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 3.06 fps, Avg. Travel Time= 1.1 min

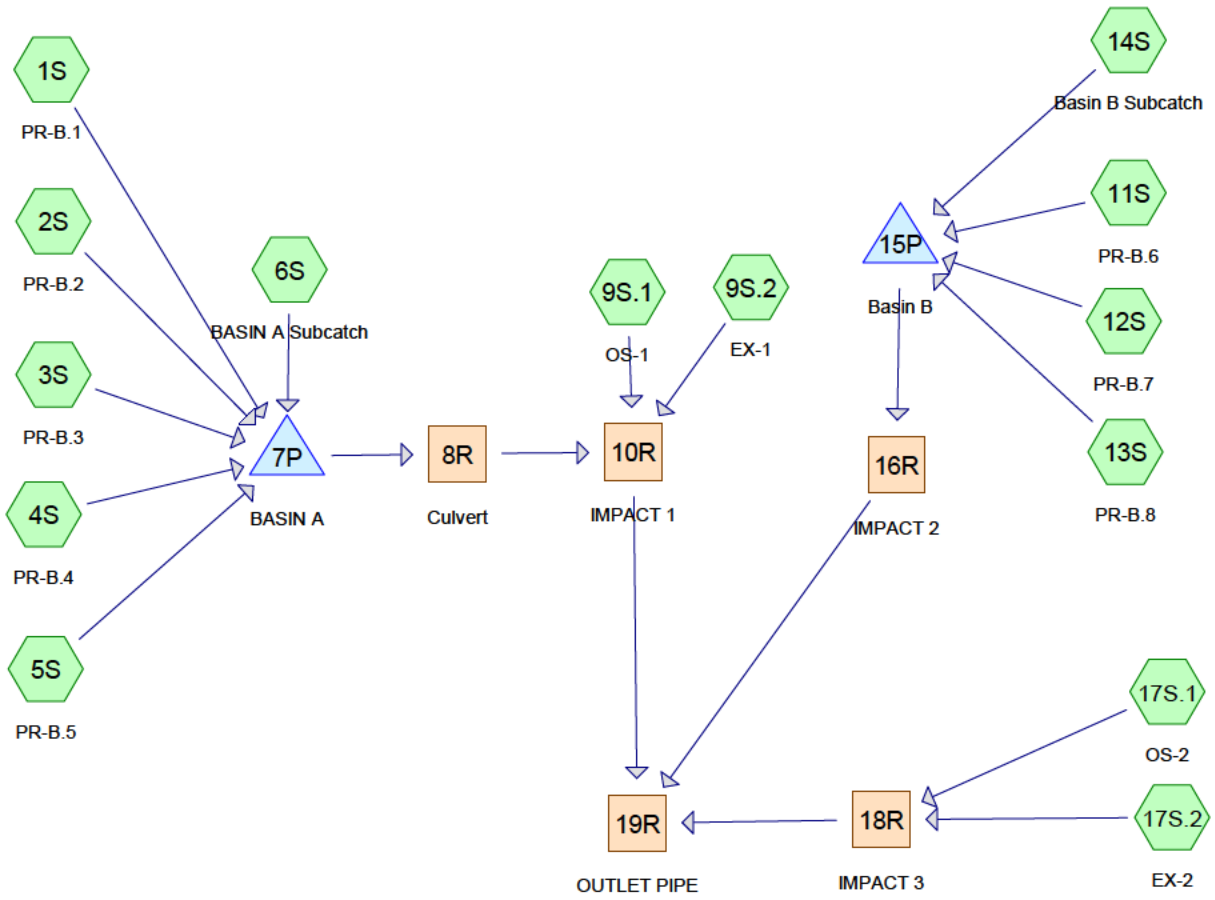
Peak Storage= 2,879 cf @ 15.05 hrs
Average Depth at Peak Storage= 3.04' , Surface Width= 6.00'
Bank-Full Depth= 6.00' Flow Area= 28.3 sf, Capacity= 220.22 cfs

72.0" Round Pipe
n= 0.025 Corrugated metal
Length= 200.0' Slope= 0.0100 '/'
Inlet Invert= 1,346.00', Outlet Invert= 1,344.00'



Reach 8R: OUTLET PIPE





Subcat Reach Pond Link

Routing Diagram for 60 ACRE Proposed

Prepared by Short Elliott Hendrickson Inc, Printed 8/19/2025

TABLE OF CONTENTS

Project Notes

Rainfall events imported from "NRCS-Rain.txt" for 1986 KS Sedgwick_4

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	MSE 24-hr	4	Default	24.00	1	3.39	2
2	5-Year	MSE 24-hr	4	Default	24.00	1	4.24	2
3	10-Year	MSE 24-hr	4	Default	24.00	1	4.98	2
4	25-Year	MSE 24-hr	4	Default	24.00	1	6.03	2
5	100-Year	MSE 24-hr	4	Default	24.00	1	7.83	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
41.360	83	1/4 acre lots, 38% imp, HSG C (1S, 2S, 3S, 4S, 5S, 9S.2, 11S, 12S, 13S, 17S.2)
19.600	74	>75% Grass cover, Good, HSG C (6S, 14S)
0.100	96	Gravel surface, HSG D (9S.1)
28.220	84	Small grain, SR + CR, Good, HSG D (9S.1, 17S.1)
89.280	**81**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
60.960	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 9S.2, 11S, 12S, 13S, 14S, 17S.2
28.320	HSG D	9S.1, 17S.1
0.000	Other	
89.280		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	41.360	0.000	0.000	41.360	1/4 acre lots, 38% imp	1S, 2S, 3S, 4S, 5S, 9S.2, 11S, 12S, 13S, 17S.2
0.000	0.000	19.600	0.000	0.000	19.600	>75% Grass cover, Good	6S, 14S
0.000	0.000	0.000	0.100	0.000	0.100	Gravel surface	9S.1
0.000	0.000	0.000	28.220	0.000	28.220	Small grain, SR + CR, Good	9S.1, 17S.1
0.000	**0.000**	**60.960**	**28.320**	**0.000**	**89.280**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	6S	0.00	0.00	200.0	0.0050	0.011	0.0	18.0	0.0	
2	8R	1,350.69	1,350.33	145.0	0.0025	0.012	0.0	18.0	0.0	
3	19R	1,346.00	1,344.00	200.0	0.0100	0.025	0.0	72.0	0.0	

Time span=5.00-40.00 hrs, dt=0.07 hrs, 501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PR-B.1 Runoff Area=2.730 ac 38.00% Impervious Runoff Depth=1.77"
Flow Length=480' Slope=0.0050 '/' Tc=15.9 min CN=83 Runoff=5.26 cfs 0.402 af

Subcatchment 2S: PR-B.2 Runoff Area=2.560 ac 38.00% Impervious Runoff Depth=1.77"
Flow Length=510' Slope=0.0050 '/' Tc=16.2 min CN=83 Runoff=4.91 cfs 0.377 af

Subcatchment 3S: PR-B.3 Runoff Area=3.480 ac 38.00% Impervious Runoff Depth=1.77"
Flow Length=760' Slope=0.0050 '/' Tc=19.1 min CN=83 Runoff=6.23 cfs 0.512 af

Subcatchment 4S: PR-B.4 Runoff Area=2.820 ac 38.00% Impervious Runoff Depth=1.77"
Flow Length=710' Slope=0.0050 '/' Tc=18.5 min CN=83 Runoff=5.12 cfs 0.415 af

Subcatchment 5S: PR-B.5 Runoff Area=5.020 ac 38.00% Impervious Runoff Depth=1.77"
Flow Length=1,110' Slope=0.0050 '/' Tc=23.2 min CN=83 Runoff=8.13 cfs 0.739 af

Subcatchment 6S: BASIN A Subcatch Runoff Area=15.650 ac 0.00% Impervious Runoff Depth=1.16"
Flow Length=2,250' Tc=37.9 min CN=74 Runoff=12.20 cfs 1.519 af

Subcatchment 9S.1: OS-1 Runoff Area=20.350 ac 0.00% Impervious Runoff Depth=1.84"
Flow Length=2,575' Slope=0.0020 '/' Tc=122.3 min CN=84 Runoff=12.14 cfs 3.125 af

Subcatchment 9S.2: EX-1 Runoff Area=8.720 ac 38.00% Impervious Runoff Depth=1.77"
Flow Length=2,575' Slope=0.0020 '/' Tc=122.3 min CN=83 Runoff=4.97 cfs 1.284 af

Subcatchment 11S: PR-B.6 Runoff Area=2.220 ac 38.00% Impervious Runoff Depth=1.77"
Flow Length=460' Slope=0.0050 '/' Tc=10.0 min CN=83 Runoff=5.09 cfs 0.327 af

Subcatchment 12S: PR-B.7 Runoff Area=2.570 ac 38.00% Impervious Runoff Depth=1.77"
Flow Length=735' Slope=0.0050 '/' Tc=18.8 min CN=83 Runoff=4.64 cfs 0.378 af

Subcatchment 13S: PR-B.8 Runoff Area=3.610 ac 38.00% Impervious Runoff Depth=1.77"
Flow Length=760' Slope=0.0050 '/' Tc=19.1 min CN=83 Runoff=6.47 cfs 0.531 af

Subcatchment 14S: Basin B Subcatch Runoff Area=3.950 ac 0.00% Impervious Runoff Depth=1.16"
Flow Length=950' Tc=27.9 min CN=74 Runoff=3.67 cfs 0.383 af

Subcatchment 17S.1: OS-2 Runoff Area=7.970 ac 0.00% Impervious Runoff Depth=1.84"
Flow Length=1,500' Slope=0.0010 '/' Tc=154.4 min CN=84 Runoff=4.00 cfs 1.224 af

Subcatchment 17S.2: EX-2 Runoff Area=7.630 ac 38.00% Impervious Runoff Depth=1.77"
Flow Length=1,500' Slope=0.0010 '/' Tc=154.4 min CN=83 Runoff=3.66 cfs 1.123 af

Reach 8R: Culvert Avg. Flow Depth=1.50' Max Vel=3.65 fps Inflow=12.74 cfs 3.951 af
18.0" Round Pipe n=0.012 L=145.0' S=0.0025 '/' Capacity=5.67 cfs Outflow=5.67 cfs 3.951 af

Reach 10R: IMPACT 1 Avg. Flow Depth=0.85' Max Vel=1.75 fps Inflow=22.78 cfs 8.359 af
n=0.025 L=1,550.0' S=0.0016 '/' Capacity=297.44 cfs Outflow=22.38 cfs 8.353 af

Reach 16R: IMPACT 2 Avg. Flow Depth=0.46' Max Vel=1.25 fps Inflow=10.02 cfs 0.987 af
n=0.025 L=1,550.0' S=0.0016 '/' Capacity=297.44 cfs Outflow=7.40 cfs 0.987 af

Reach 18R: IMPACT 3 Avg. Flow Depth=0.60' Max Vel=1.51 fps Inflow=7.66 cfs 2.347 af
n=0.025 L=4,770.0' S=0.0019 '/' Capacity=73.10 cfs Outflow=6.51 cfs 2.342 af

Reach 19R: OUTLET PIPE Avg. Flow Depth=1.42' Max Vel=5.29 fps Inflow=27.06 cfs 11.681 af
72.0" Round Pipe n=0.025 L=200.0' S=0.0100 '/' Capacity=220.22 cfs Outflow=27.05 cfs 11.681 af

Pond 7P: BASIN A Peak Elev=1,352.04' Storage=1.518 af Inflow=35.89 cfs 3.964 af
Outflow=12.74 cfs 3.951 af

Pond 15P: Basin B Peak Elev=1,348.94' Storage=0.472 af Inflow=17.43 cfs 1.620 af
Discarded=0.67 cfs 0.633 af Primary=10.02 cfs 0.987 af Outflow=10.69 cfs 1.620 af

Total Runoff Area = 89.280 ac Runoff Volume = 12.339 af Average Runoff Depth = 1.66"
82.40% Pervious = 73.563 ac 17.60% Impervious = 15.717 ac

Summary for Subcatchment 1S: PR-B.1

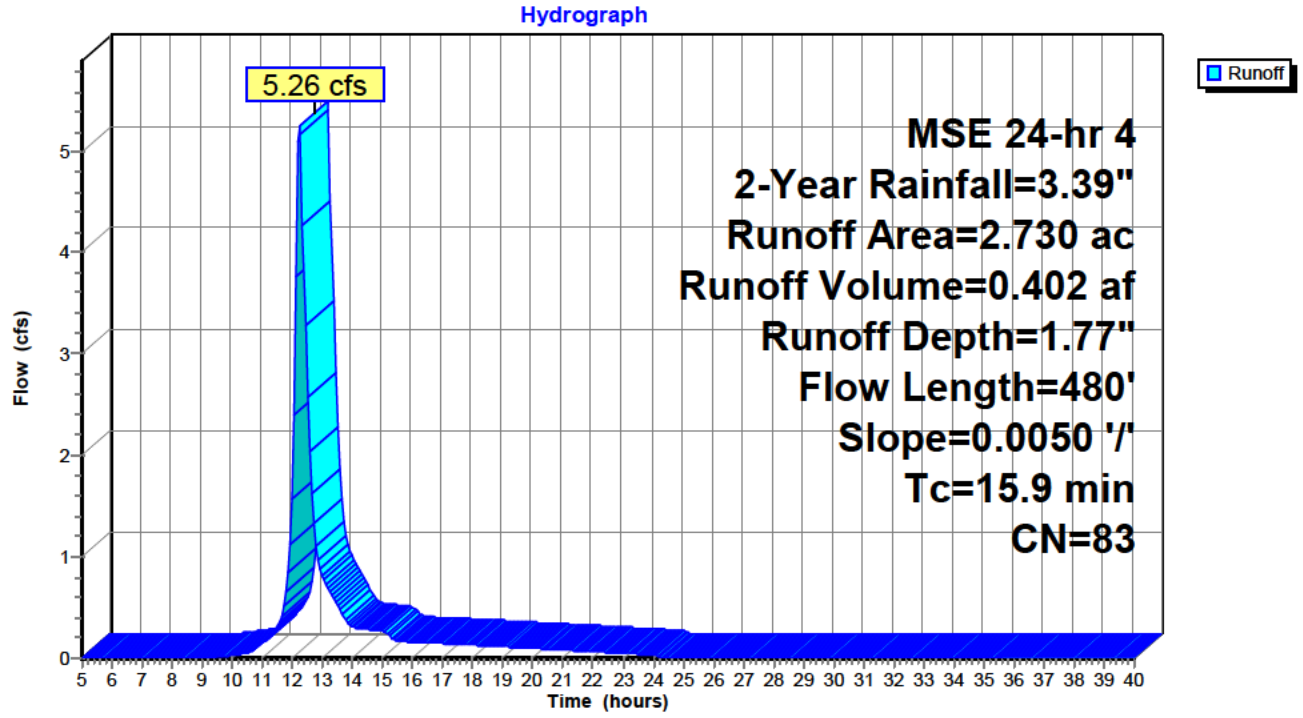
Runoff = 5.26 cfs @ 12.25 hrs, Volume= 0.402 af, Depth= 1.77"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
2.730	83	1/4 acre lots, 38% imp, HSG C
1.693		62.00% Pervious Area
1.037		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
4.9	420	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
15.9	480	Total			

Subcatchment 1S: PR-B.1



Summary for Subcatchment 2S: PR-B.2

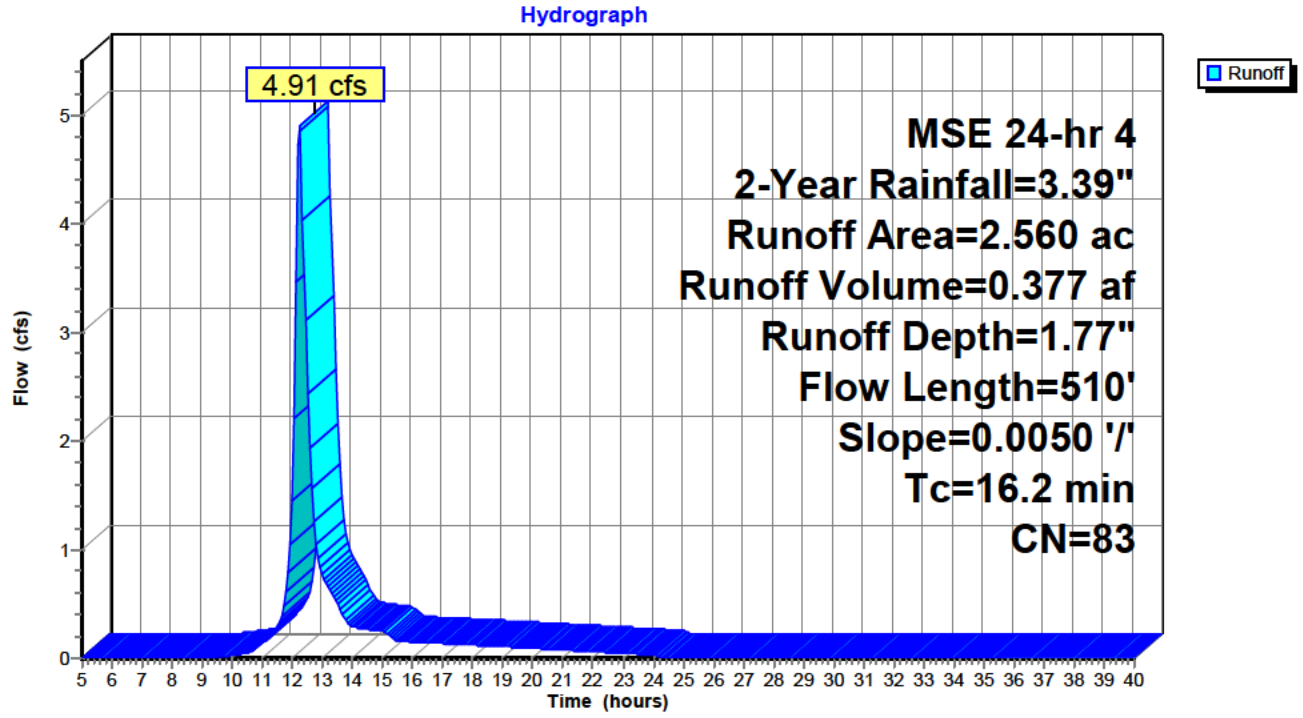
Runoff = 4.91 cfs @ 12.25 hrs, Volume= 0.377 af, Depth= 1.77"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
2.560	83	1/4 acre lots, 38% imp, HSG C
1.587		62.00% Pervious Area
0.973		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
5.2	450	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
16.2	510	Total			

Subcatchment 2S: PR-B.2



Summary for Subcatchment 3S: PR-B.3

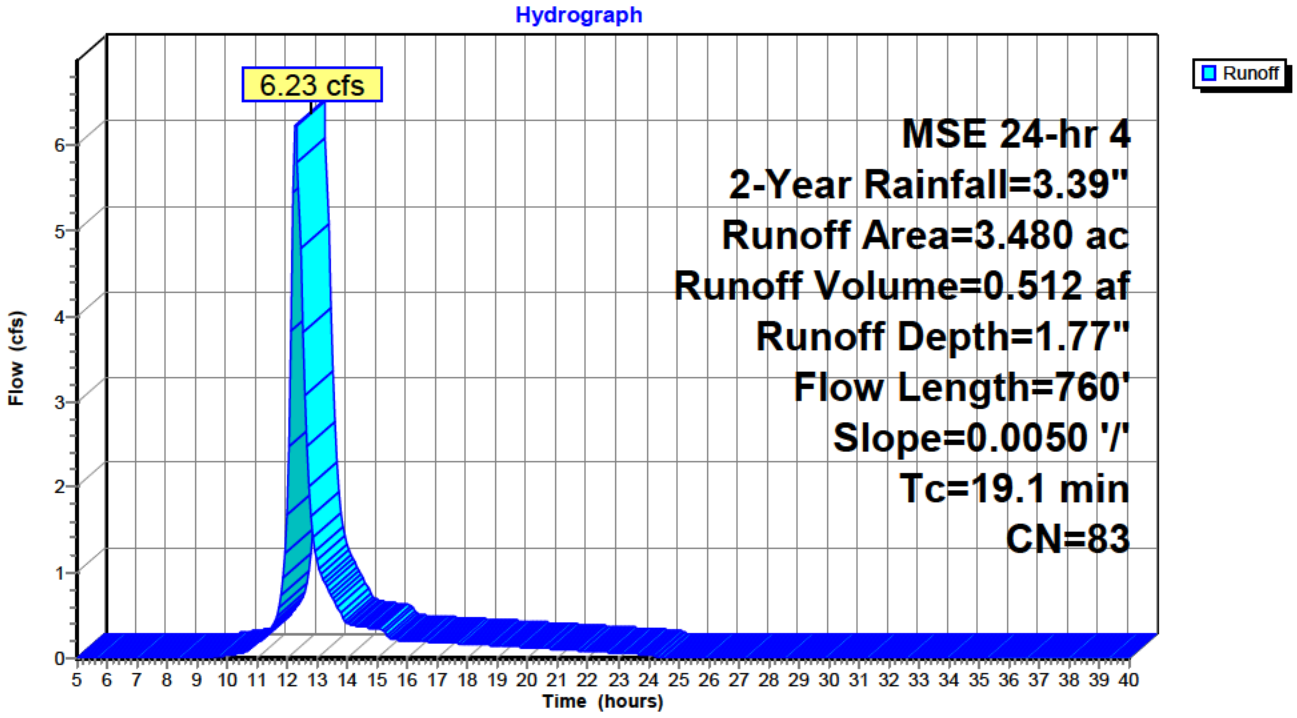
Runoff = 6.23 cfs @ 12.29 hrs, Volume= 0.512 af, Depth= 1.77"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
3.480	83	1/4 acre lots, 38% imp, HSG C
2.158		62.00% Pervious Area
1.322		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
8.1	700	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
19.1	760	Total			

Subcatchment 3S: PR-B.3



Summary for Subcatchment 4S: PR-B.4

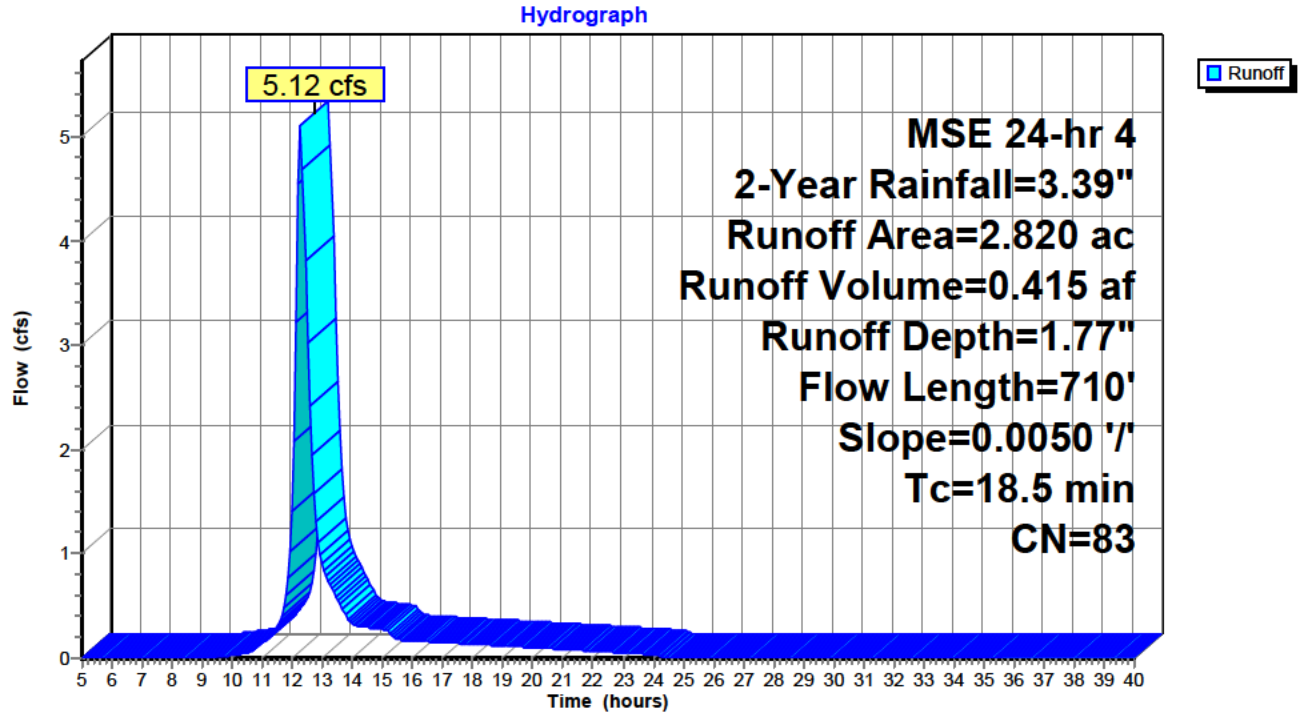
Runoff = 5.12 cfs @ 12.28 hrs, Volume= 0.415 af, Depth= 1.77"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
2.820	83	1/4 acre lots, 38% imp, HSG C
1.748		62.00% Pervious Area
1.072		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
7.5	650	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
18.5	710	Total			

Subcatchment 4S: PR-B.4



Summary for Subcatchment 5S: PR-B.5

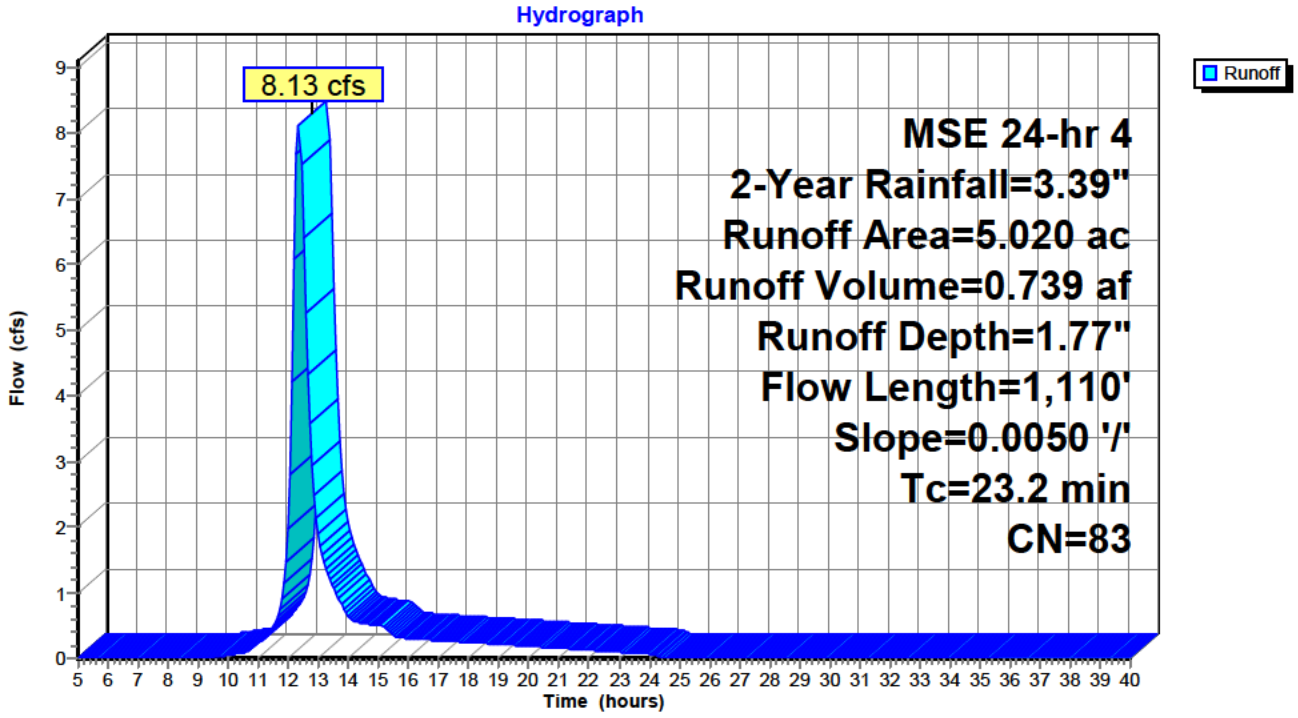
Runoff = 8.13 cfs @ 12.35 hrs, Volume= 0.739 af, Depth= 1.77"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
5.020	83	1/4 acre lots, 38% imp, HSG C
3.112		62.00% Pervious Area
1.908		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
12.2	1,050	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
23.2	1,110	Total			

Subcatchment 5S: PR-B.5



Summary for Subcatchment 6S: BASIN A Subcatch

[47] Hint: Peak is 139% of capacity of segment #4

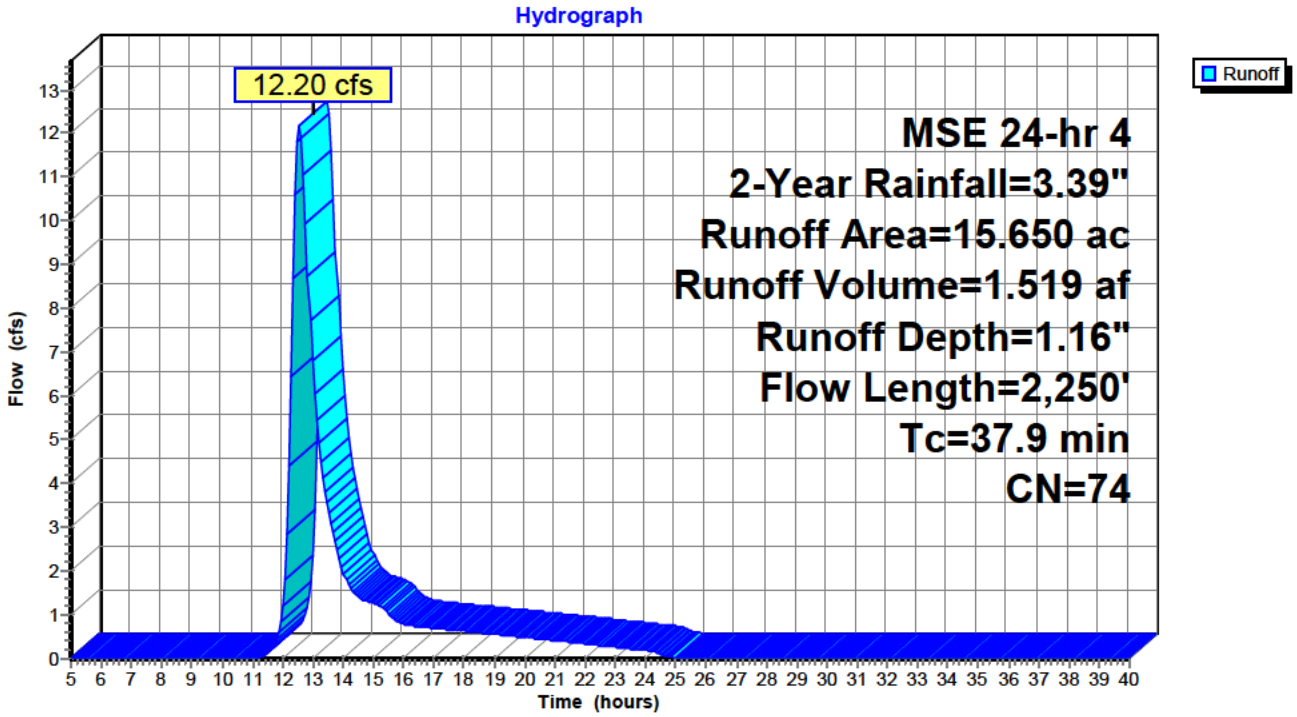
Runoff = 12.20 cfs @ 12.56 hrs, Volume= 1.519 af, Depth= 1.16"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
15.650	74	>75% Grass cover, Good, HSG C
15.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0050	0.10		**Sheet Flow, SHEETING (BACKYARDS)** Grass: Short n= 0.150 P2= 3.38"
19.3	1,100	0.0040	0.95		**Shallow Concentrated Flow, SHALLOW DITCH** Grassed Waterway Kv= 15.0 fps
0.8	750		15.01		**Lake or Reservoir, BASIN AREA** Mean Depth= 7.00'
0.7	200	0.0050	4.97	8.78	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
0.5	100	0.0010	3.09	139.23	**Channel Flow, LINED CHANNEL** Area= 45.0 sf Perim= 38.0' r= 1.18' n= 0.017 Concrete, unfinished
37.9	2,250	Total			

Subcatchment 6S: BASIN A Subcatch



Summary for Subcatchment 9S.1: OS-1

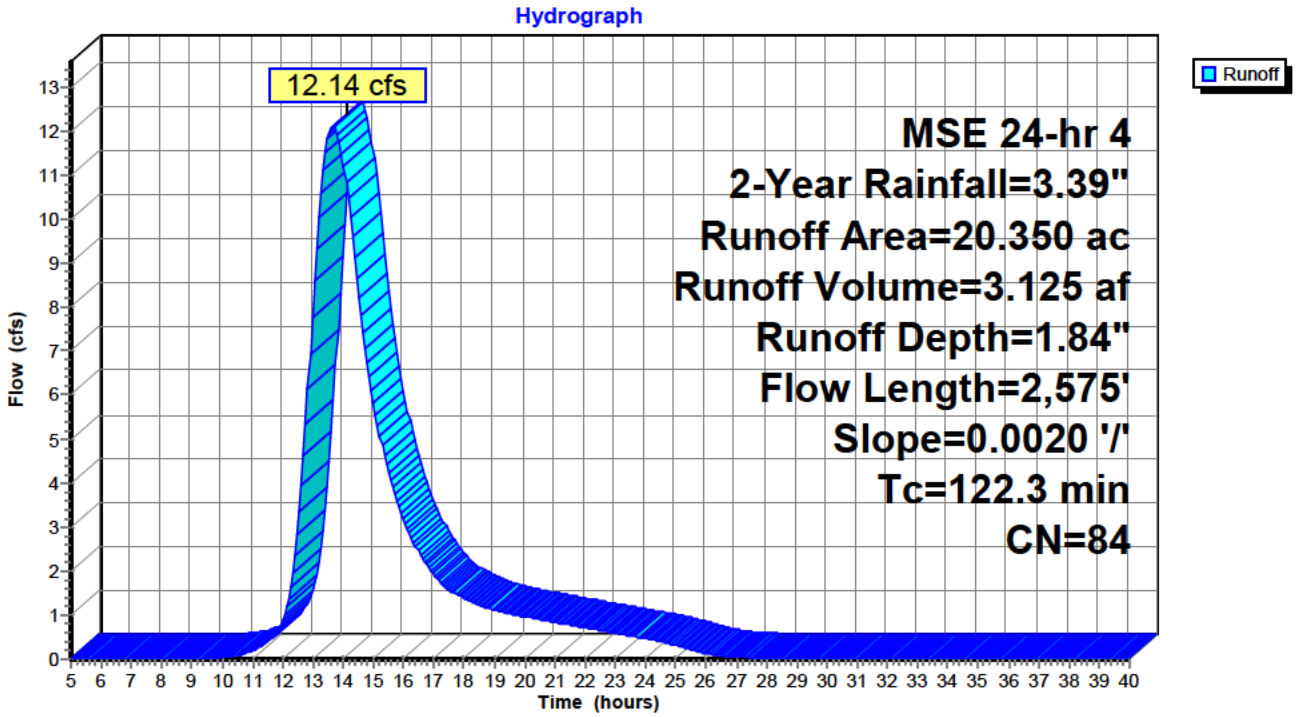
Runoff = 12.14 cfs @ 13.68 hrs, Volume= 3.125 af, Depth= 1.84"
Routed to Reach 10R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
20.250	84	Small grain, SR + CR, Good, HSG D
0.100	96	Gravel surface, HSG D
20.350	84	Weighted Average
20.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.8	1,250	0.0020	0.40		**Shallow Concentrated Flow, Backyard and Open Space Flow** Cultivated Straight Rows Kv= 9.0 fps
70.5	1,325	0.0020	0.31		**Shallow Concentrated Flow, Backyard Flow** Short Grass Pasture Kv= 7.0 fps
122.3	2,575	Total			

Subcatchment 9S.1: OS-1



Summary for Subcatchment 9S.2: EX-1

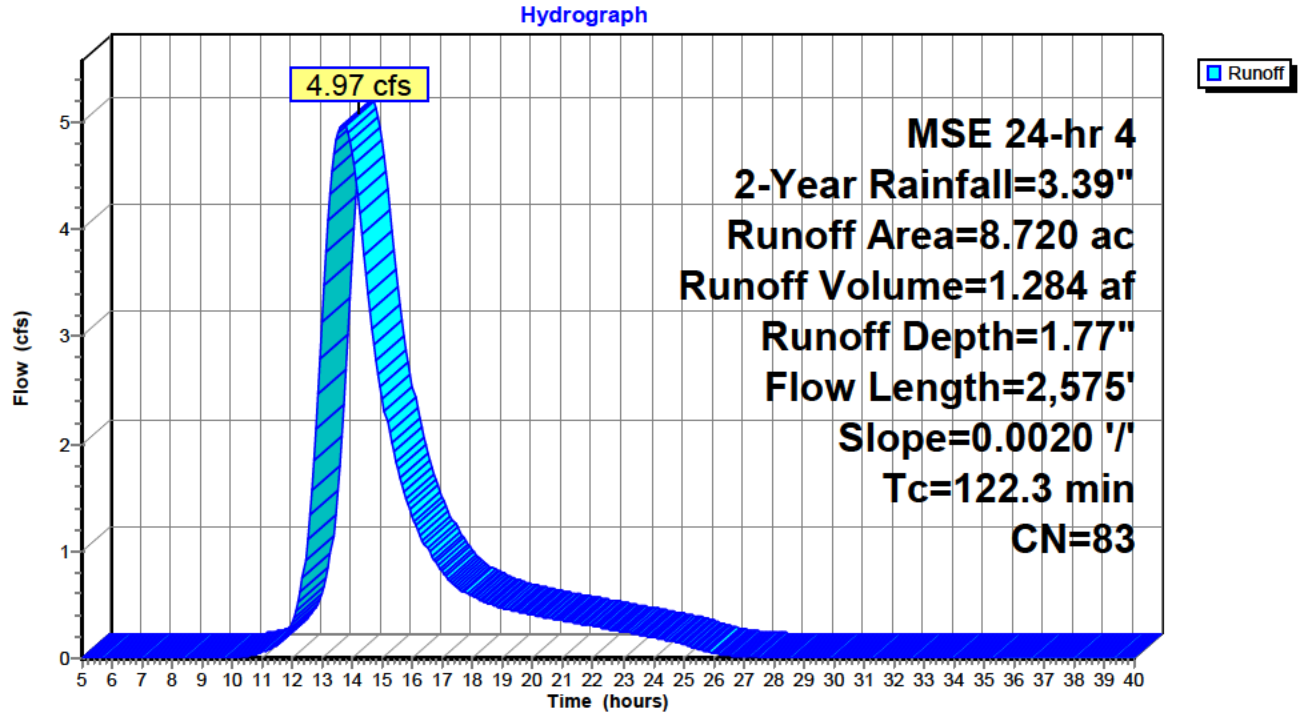
Runoff = 4.97 cfs @ 13.69 hrs, Volume= 1.284 af, Depth= 1.77"
Routed to Reach 10R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
8.720	83	1/4 acre lots, 38% imp, HSG C
5.406		62.00% Pervious Area
3.314		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.8	1,250	0.0020	0.40		**Shallow Concentrated Flow, Backyard and Open Space Flow** Cultivated Straight Rows Kv= 9.0 fps
70.5	1,325	0.0020	0.31		**Shallow Concentrated Flow, Backyard Flow** Short Grass Pasture Kv= 7.0 fps
122.3	2,575	Total			

Subcatchment 9S.2: EX-1



Summary for Subcatchment 11S: PR-B.6

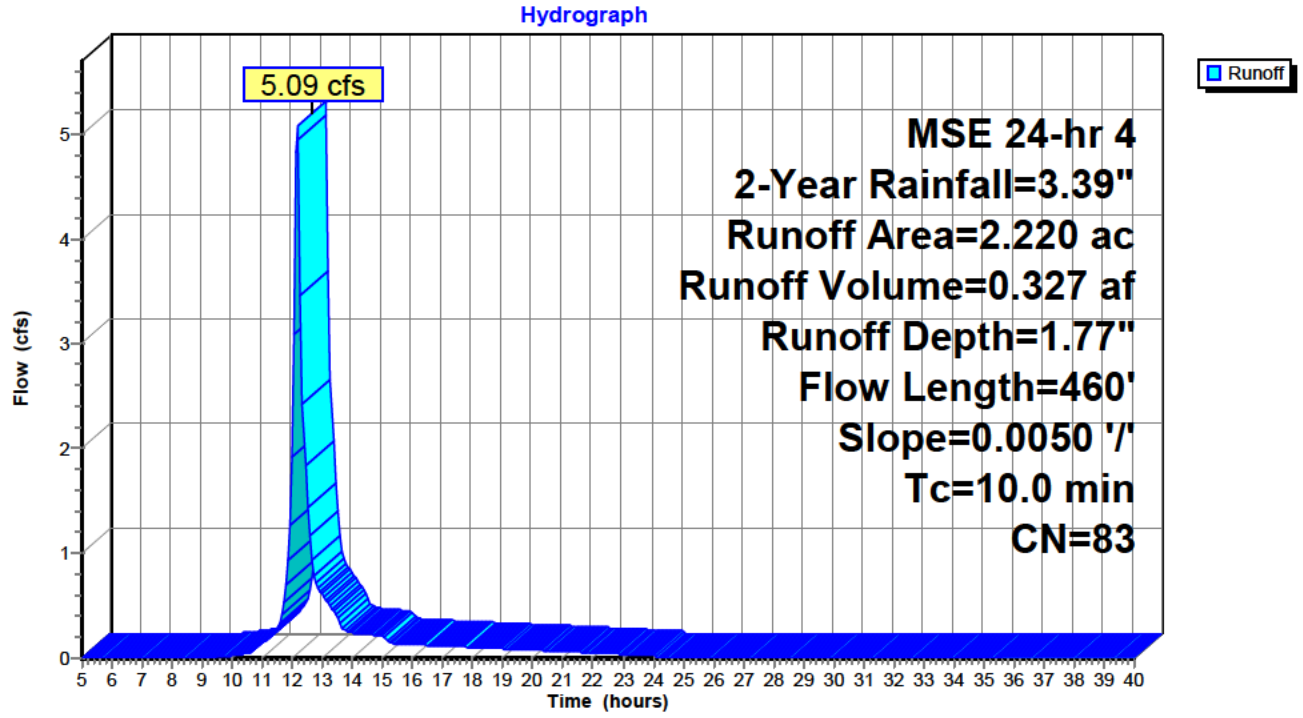
Runoff = 5.09 cfs @ 12.18 hrs, Volume= 0.327 af, Depth= 1.77"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
2.220	83	1/4 acre lots, 38% imp, HSG C
1.376		62.00% Pervious Area
0.844		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	10	0.0050	0.06		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
5.2	450	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
7.8	460	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 11S: PR-B.6



Summary for Subcatchment 12S: PR-B.7

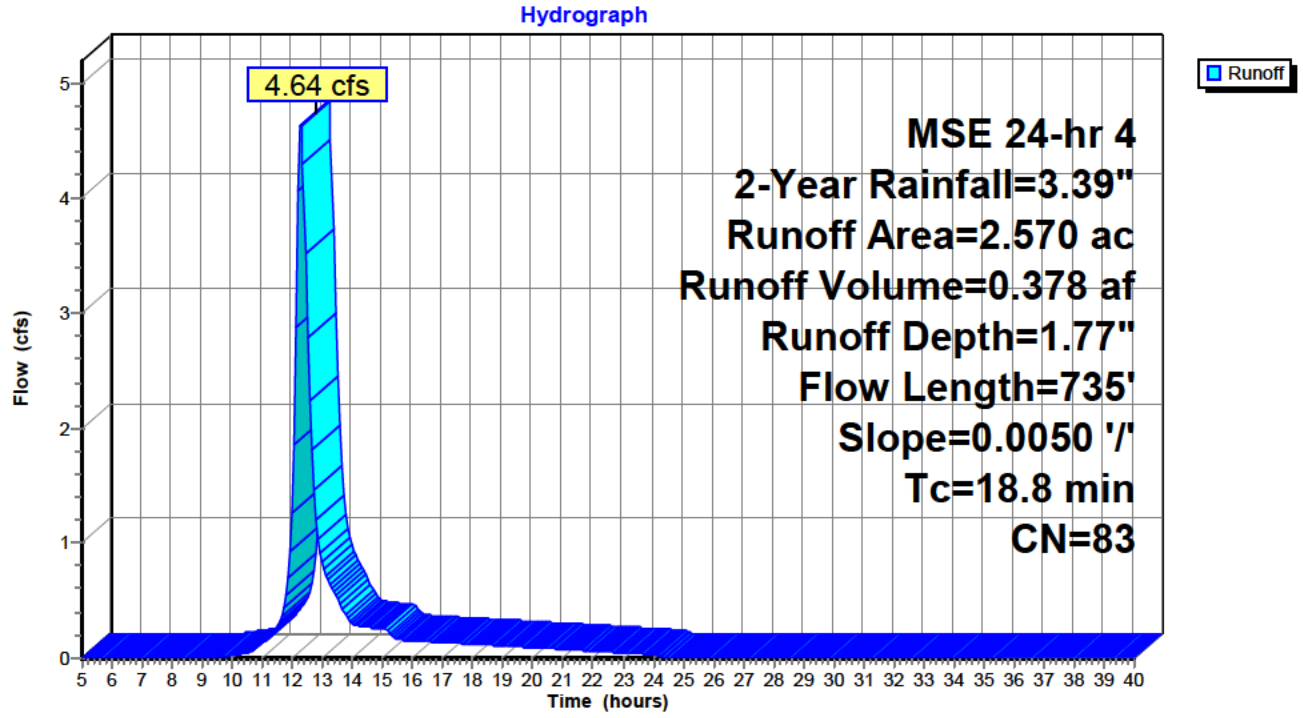
Runoff = 4.64 cfs @ 12.29 hrs, Volume= 0.378 af, Depth= 1.77"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
2.570	83	1/4 acre lots, 38% imp, HSG C
1.593		62.00% Pervious Area
0.977		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
7.8	675	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
18.8	735	Total			

Subcatchment 12S: PR-B.7



Summary for Subcatchment 13S: PR-B.8

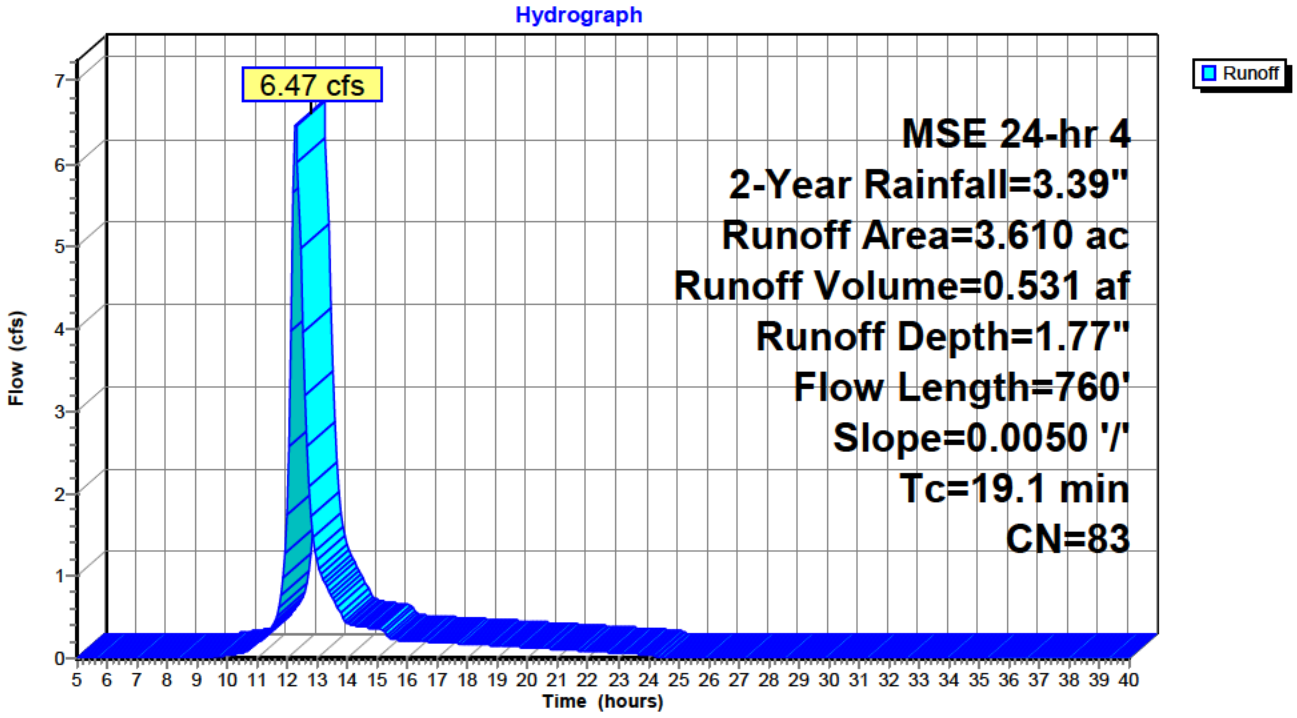
Runoff = 6.47 cfs @ 12.29 hrs, Volume= 0.531 af, Depth= 1.77"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
3.610	83	1/4 acre lots, 38% imp, HSG C
2.238		62.00% Pervious Area
1.372		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
8.1	700	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
19.1	760	Total			

Subcatchment 13S: PR-B.8



Summary for Subcatchment 14S: Basin B Subcatch

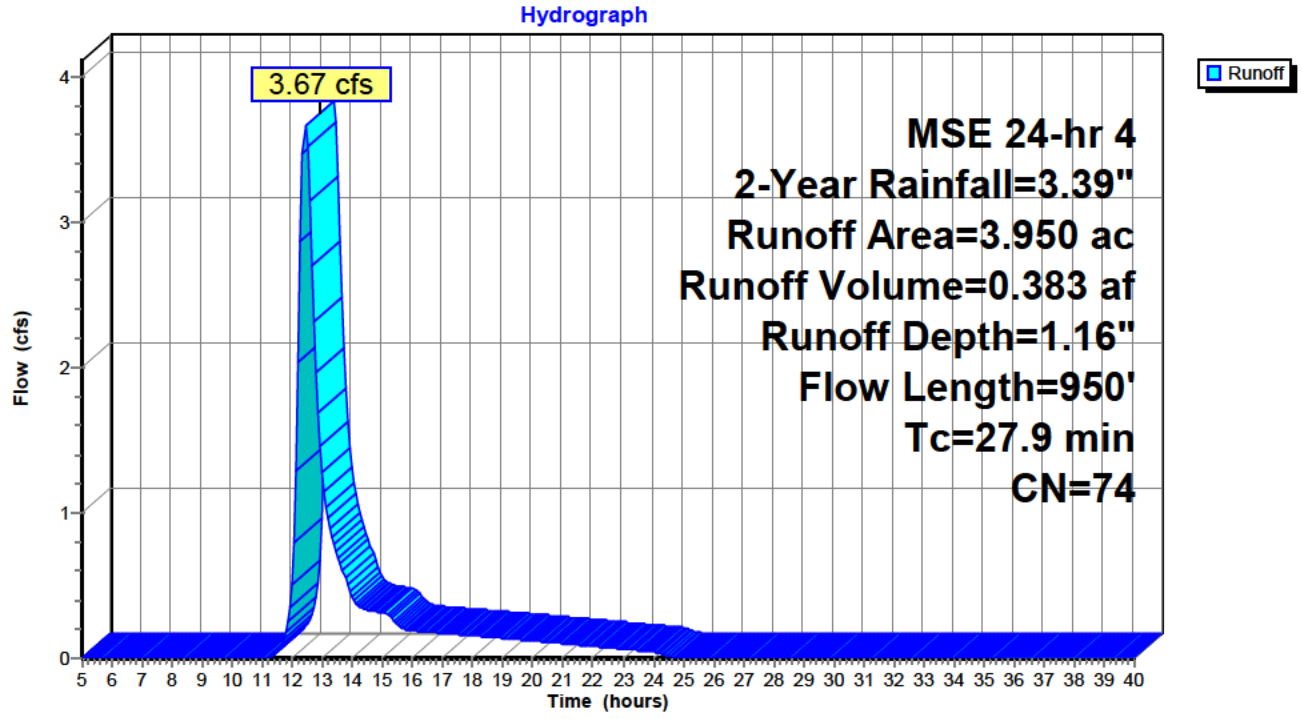
Runoff = 3.67 cfs @ 12.42 hrs, Volume= 0.383 af, Depth= 1.16"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
3.950	74	>75% Grass cover, Good, HSG C
3.950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0050	0.10		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
9.4	600	0.0050	1.06		**Shallow Concentrated Flow, DITCH FLOW** Grassed Waterway Kv= 15.0 fps
0.4	200		8.02		**Lake or Reservoir, Basin Area** Mean Depth= 2.00'
1.5	50	0.0020	0.56	11.24	**Channel Flow, CHANNEL OUTFALL** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.150 Sheet flow over Short Grass
27.9	950	Total			

Subcatchment 14S: Basin B Subcatch



Summary for Subcatchment 17S.1: OS-2

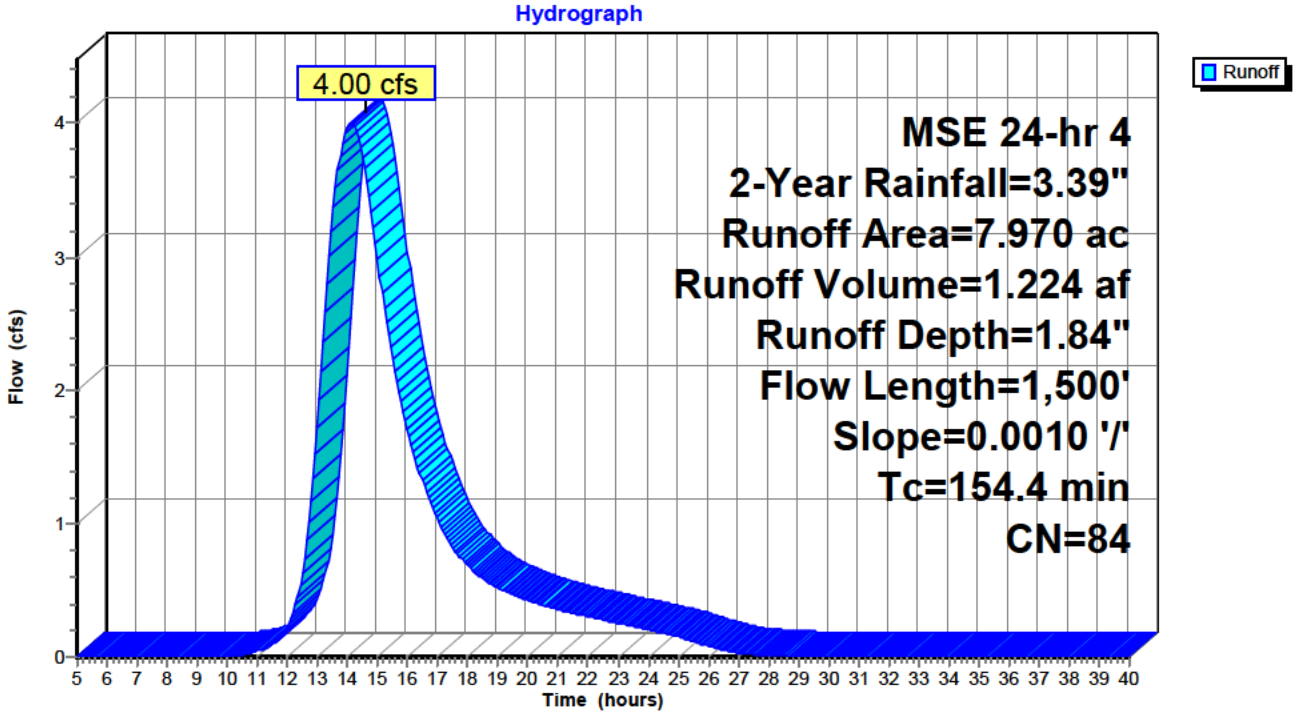
Runoff = 4.00 cfs @ 14.12 hrs, Volume= 1.224 af, Depth= 1.84"
Routed to Reach 18R : IMPACT 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
7.970	84	Small grain, SR + CR, Good, HSG D
7.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
84.1	300	0.0010	0.06		**Sheet Flow, Crop Sheeting** Cultivated: Residue>20% n= 0.170 P2= 3.38"
70.3	1,200	0.0010	0.28		**Shallow Concentrated Flow, Crop Shallow Concentrated** Cultivated Straight Rows Kv= 9.0 fps
154.4	1,500	Total			

Subcatchment 17S.1: OS-2



Summary for Subcatchment 17S.2: EX-2

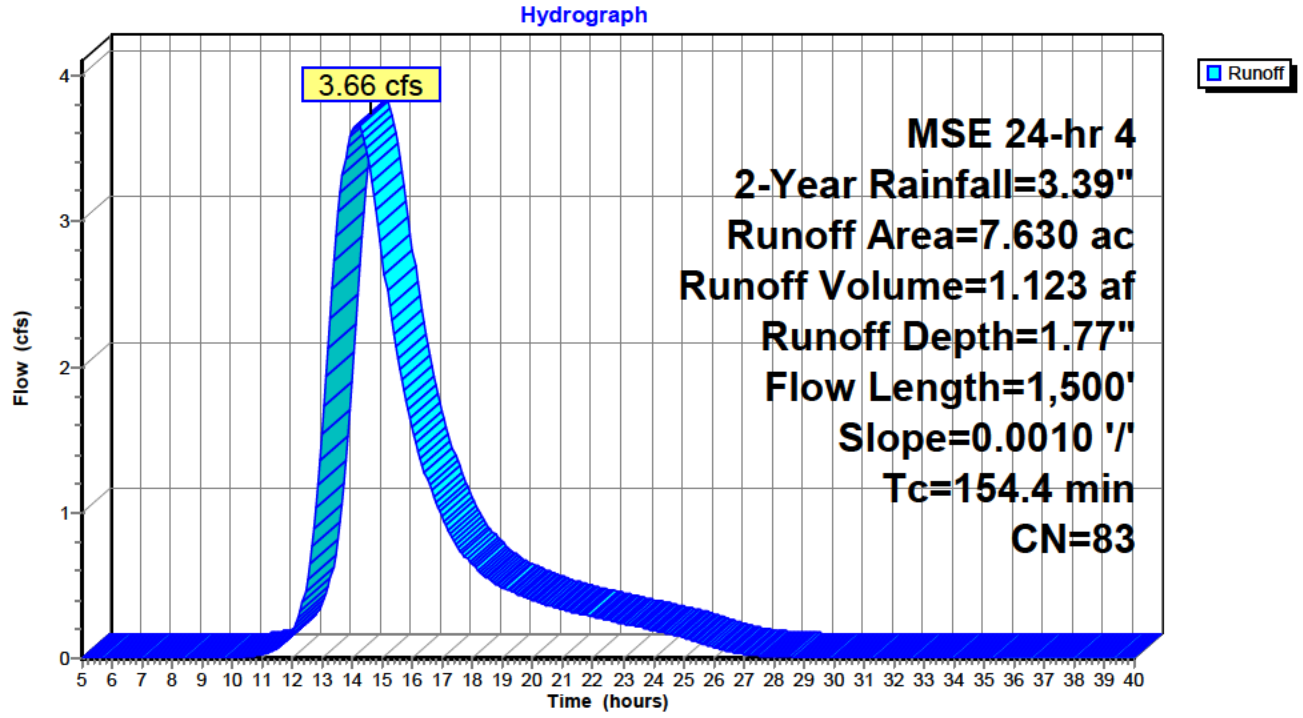
Runoff = 3.66 cfs @ 14.13 hrs, Volume= 1.123 af, Depth= 1.77"
Routed to Reach 18R : IMPACT 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 2-Year Rainfall=3.39"

Area (ac)	CN	Description
7.630	83	1/4 acre lots, 38% imp, HSG C
4.731		62.00% Pervious Area
2.899		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
84.1	300	0.0010	0.06		**Sheet Flow, Crop Sheeting** Cultivated: Residue>20% n= 0.170 P2= 3.38"
70.3	1,200	0.0010	0.28		**Shallow Concentrated Flow, Crop Shallow Concentrated** Cultivated Straight Rows Kv= 9.0 fps
154.4	1,500	Total			

Subcatchment 17S.2: EX-2



Summary for Reach 8R: Culvert

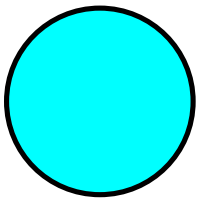
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 225% of Manning's capacity
[76] Warning: Detained 0.832 af (Pond w/culvert advised)
[81] Warning: Exceeded Pond 7P by 0.51' @ 18.86 hrs

Inflow Area = 32.260 ac, 19.57% Impervious, Inflow Depth > 1.47" for 2-Year event
Inflow = 12.74 cfs @ 12.96 hrs, Volume= 3.951 af
Outflow = 5.67 cfs @ 12.49 hrs, Volume= 3.951 af, Atten= 55%, Lag= 0.0 min
Routed to Reach 10R : IMPACT 1

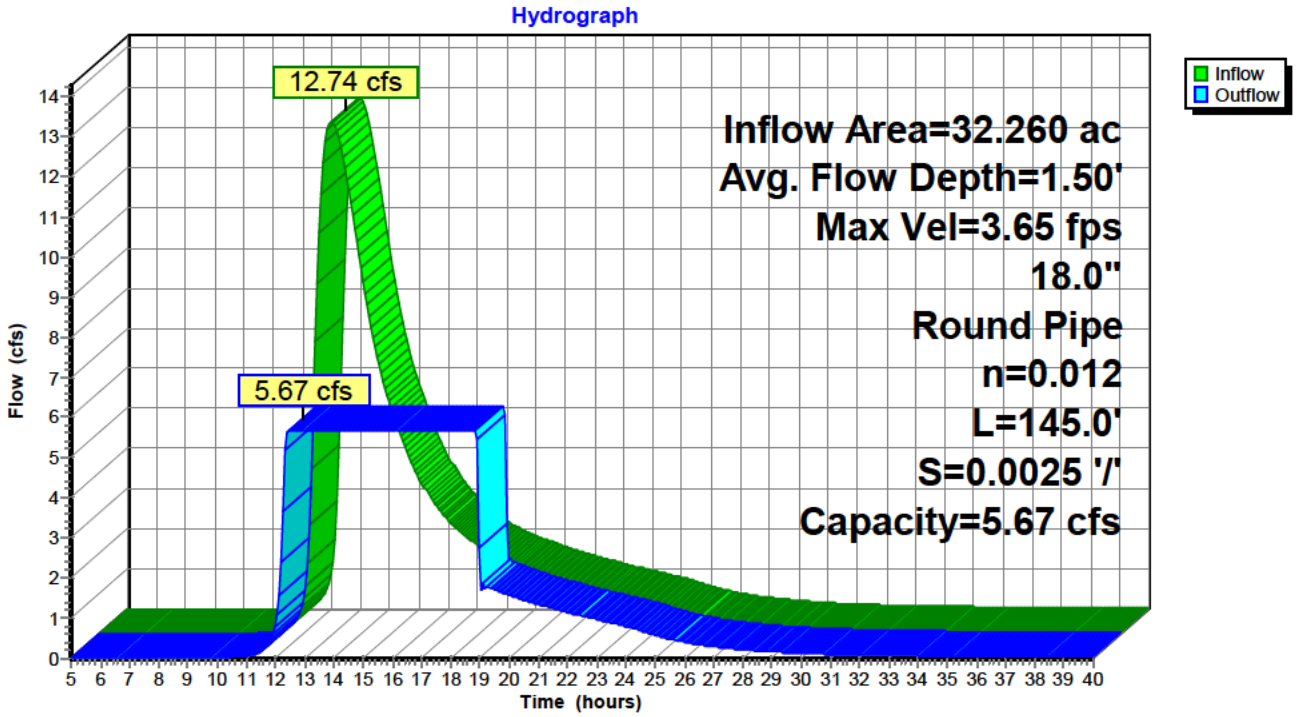
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 3.65 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.91 fps, Avg. Travel Time= 1.3 min

Peak Storage= 256 cf @ 12.42 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 5.67 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 145.0' Slope= 0.0025 '/'
Inlet Invert= 1,350.69', Outlet Invert= 1,350.33'



Reach 8R: Culvert



Summary for Reach 10R: IMPACT 1

Inflow Area = 61.330 ac, 15.69% Impervious, Inflow Depth > 1.64" for 2-Year event
Inflow = 22.78 cfs @ 13.69 hrs, Volume= 8.359 af
Outflow = 22.38 cfs @ 14.10 hrs, Volume= 8.353 af, Atten= 2%, Lag= 24.9 min
Routed to Reach 19R : OUTLET PIPE

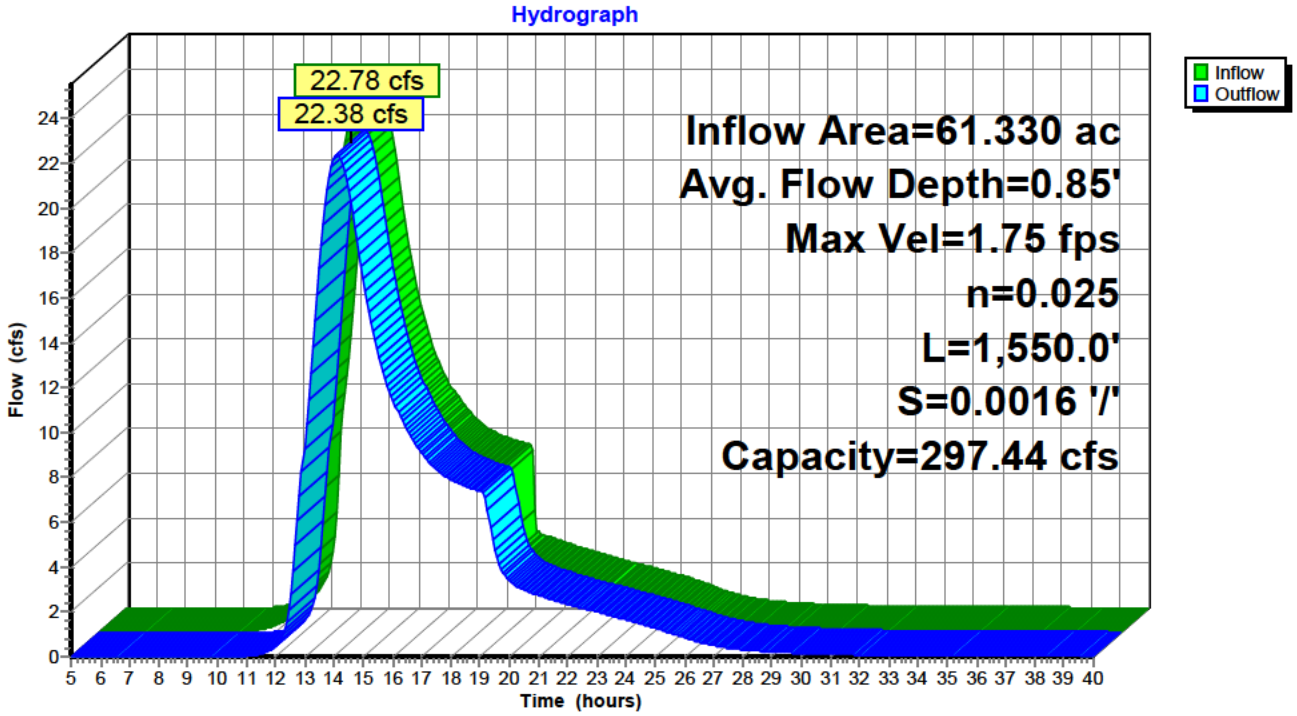
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 1.75 fps, Min. Travel Time= 14.7 min
Avg. Velocity = 0.67 fps, Avg. Travel Time= 38.7 min

Peak Storage= 19,802 cf @ 13.85 hrs
Average Depth at Peak Storage= 0.85' , Surface Width= 20.16'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 297.44 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 6.0 '/' Top Width= 46.00'
Length= 1,550.0' Slope= 0.0016 '/'
Inlet Invert= 1,348.50', Outlet Invert= 1,346.00'

‡

Reach 10R: IMPACT 1



Summary for Reach 16R: IMPACT 2

[81] Warning: Exceeded Pond 15P by 0.50' @ 32.37 hrs

Inflow Area = 12.350 ac, 25.85% Impervious, Inflow Depth = 0.96" for 2-Year event
Inflow = 10.02 cfs @ 12.53 hrs, Volume= 0.987 af
Outflow = 7.40 cfs @ 13.17 hrs, Volume= 0.987 af, Atten= 26%, Lag= 38.2 min
Routed to Reach 19R : OUTLET PIPE

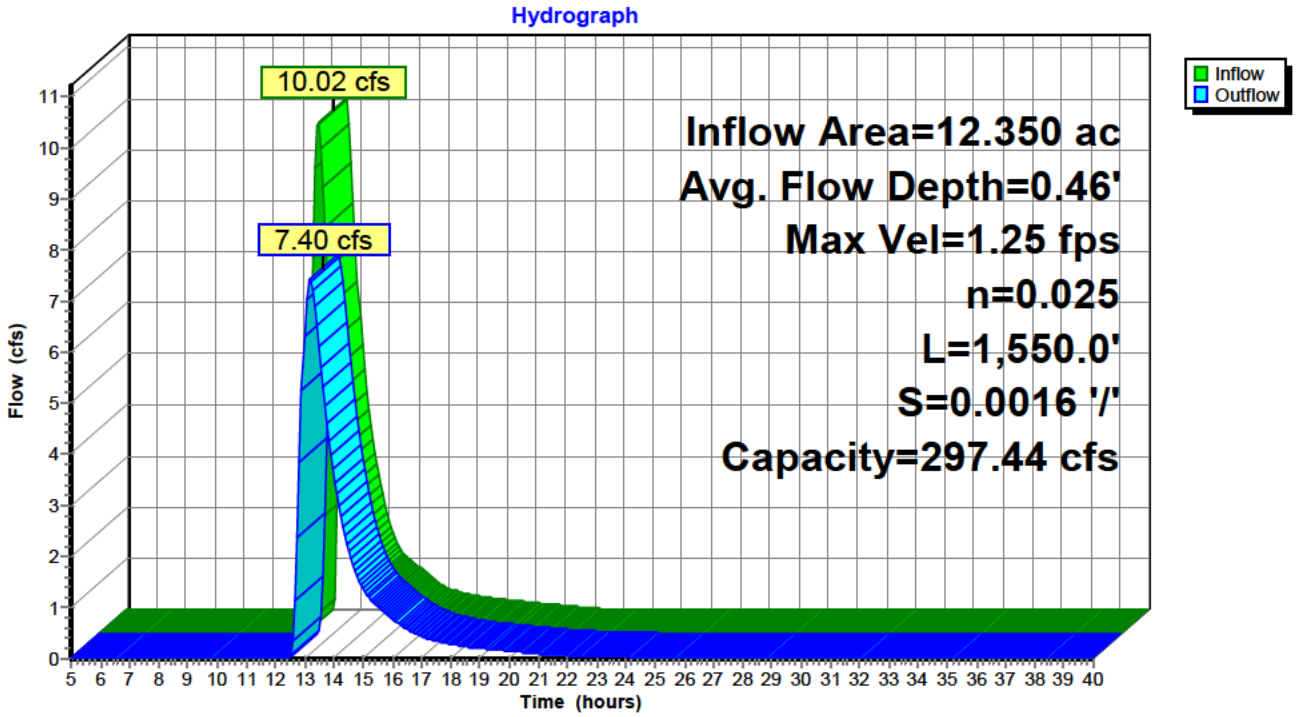
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 1.25 fps, Min. Travel Time= 20.7 min
Avg. Velocity = 0.35 fps, Avg. Travel Time= 73.6 min

Peak Storage= 9,183 cf @ 12.82 hrs
Average Depth at Peak Storage= 0.46' , Surface Width= 15.56'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 297.44 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 6.0 '/' Top Width= 46.00'
Length= 1,550.0' Slope= 0.0016 '/'
Inlet Invert= 1,348.50', Outlet Invert= 1,346.00'

‡

Reach 16R: IMPACT 2



Summary for Reach 18R: IMPACT 3

Inflow Area = 15.600 ac, 18.59% Impervious, Inflow Depth = 1.81" for 2-Year event
Inflow = 7.66 cfs @ 14.13 hrs, Volume= 2.347 af
Outflow = 6.51 cfs @ 15.64 hrs, Volume= 2.342 af, Atten= 15%, Lag= 90.9 min
Routed to Reach 19R : OUTLET PIPE

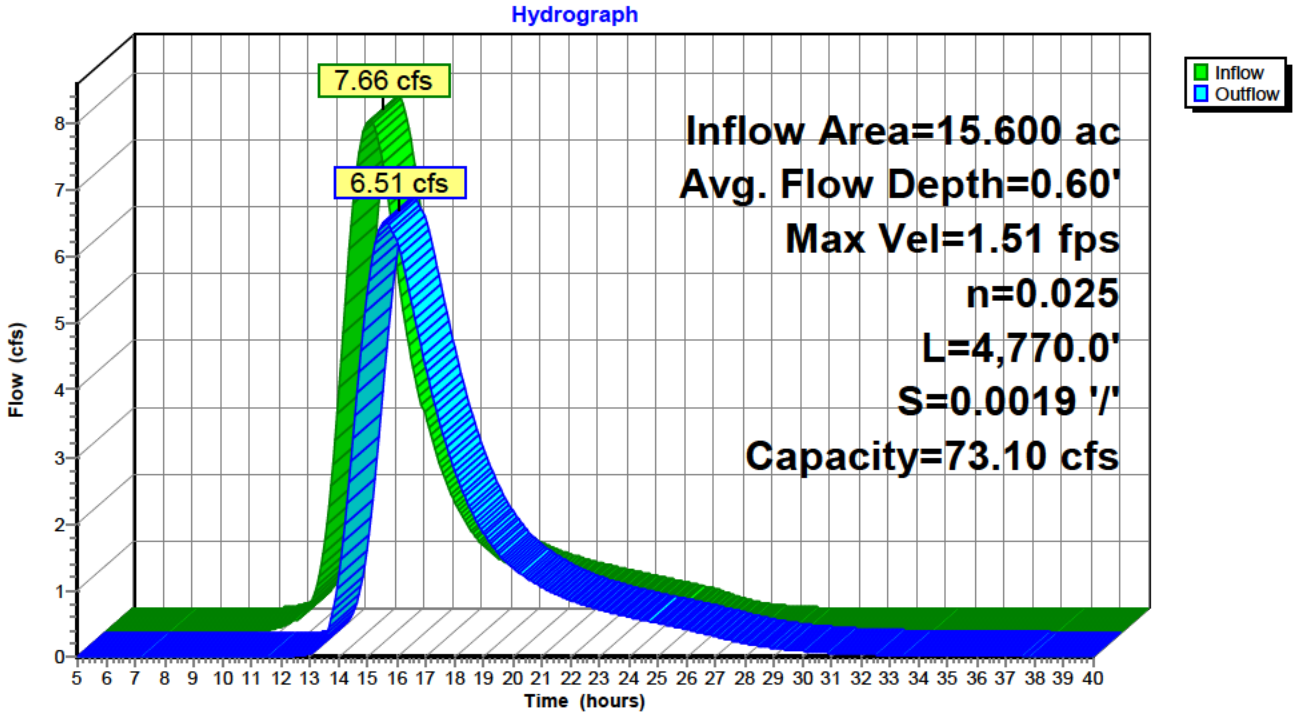
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 1.51 fps, Min. Travel Time= 52.5 min
Avg. Velocity = 0.57 fps, Avg. Travel Time= 140.1 min

Peak Storage= 20,516 cf @ 14.77 hrs
Average Depth at Peak Storage= 0.60' , Surface Width= 9.42'
Bank-Full Depth= 2.00' Flow Area= 24.8 sf, Capacity= 73.10 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.7 '/' Top Width= 19.80'
Length= 4,770.0' Slope= 0.0019 '/'
Inlet Invert= 1,355.00', Outlet Invert= 1,346.00'

‡

Reach 18R: IMPACT 3



Summary for Reach 19R: OUTLET PIPE

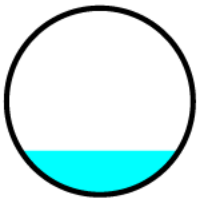
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 10R OUTLET depth by 0.64' @ 15.15 hrs
[62] Hint: Exceeded Reach 16R OUTLET depth by 1.21' @ 14.45 hrs
[62] Hint: Exceeded Reach 18R OUTLET depth by 0.98' @ 13.33 hrs

Inflow Area = 89.280 ac, 17.60% Impervious, Inflow Depth > 1.57" for 2-Year event
Inflow = 27.06 cfs @ 14.12 hrs, Volume= 11.681 af
Outflow = 27.05 cfs @ 14.14 hrs, Volume= 11.681 af, Atten= 0%, Lag= 1.1 min

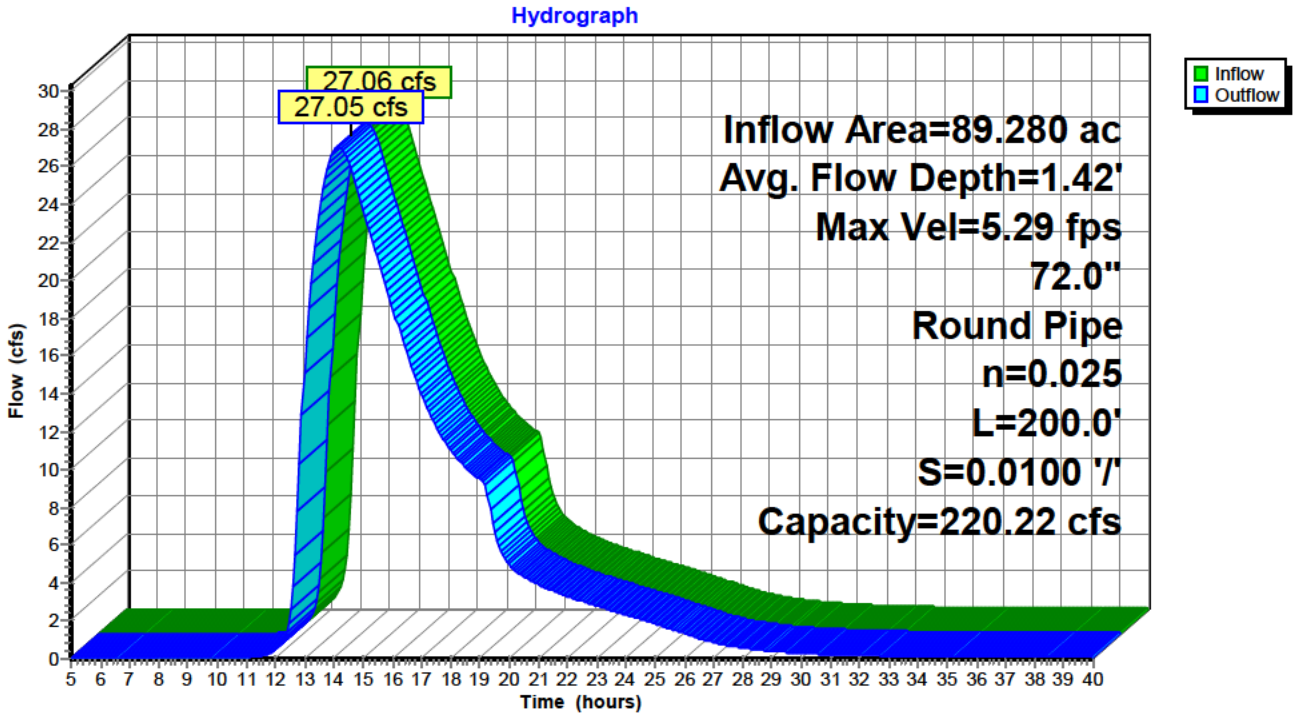
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 5.29 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1,023 cf @ 14.13 hrs
Average Depth at Peak Storage= 1.42' , Surface Width= 5.10'
Bank-Full Depth= 6.00' Flow Area= 28.3 sf, Capacity= 220.22 cfs

72.0" Round Pipe
n= 0.025 Corrugated metal
Length= 200.0' Slope= 0.0100 '/'
Inlet Invert= 1,346.00', Outlet Invert= 1,344.00'



Reach 19R: OUTLET PIPE



Summary for Pond 7P: BASIN A

Inflow Area = 32.260 ac, 19.57% Impervious, Inflow Depth = 1.47" for 2-Year event
Inflow = 35.89 cfs @ 12.32 hrs, Volume= 3.964 af
Outflow = 12.74 cfs @ 12.96 hrs, Volume= 3.951 af, Atten= 65%, Lag= 38.7 min
Primary = 12.74 cfs @ 12.96 hrs, Volume= 3.951 af
Routed to Reach 8R : Culvert

Routing by Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Peak Elev= 1,352.04' @ 12.96 hrs Surf.Area= 3.589 ac Storage= 1.518 af
Flood Elev= 1,354.50' Surf.Area= 10.869 ac Storage= 15.257 af

Plug-Flow detention time= 123.9 min calculated for 3.943 af (99% of inflow)
Center-of-Mass det. time= 123.5 min (967.9 - 844.4)

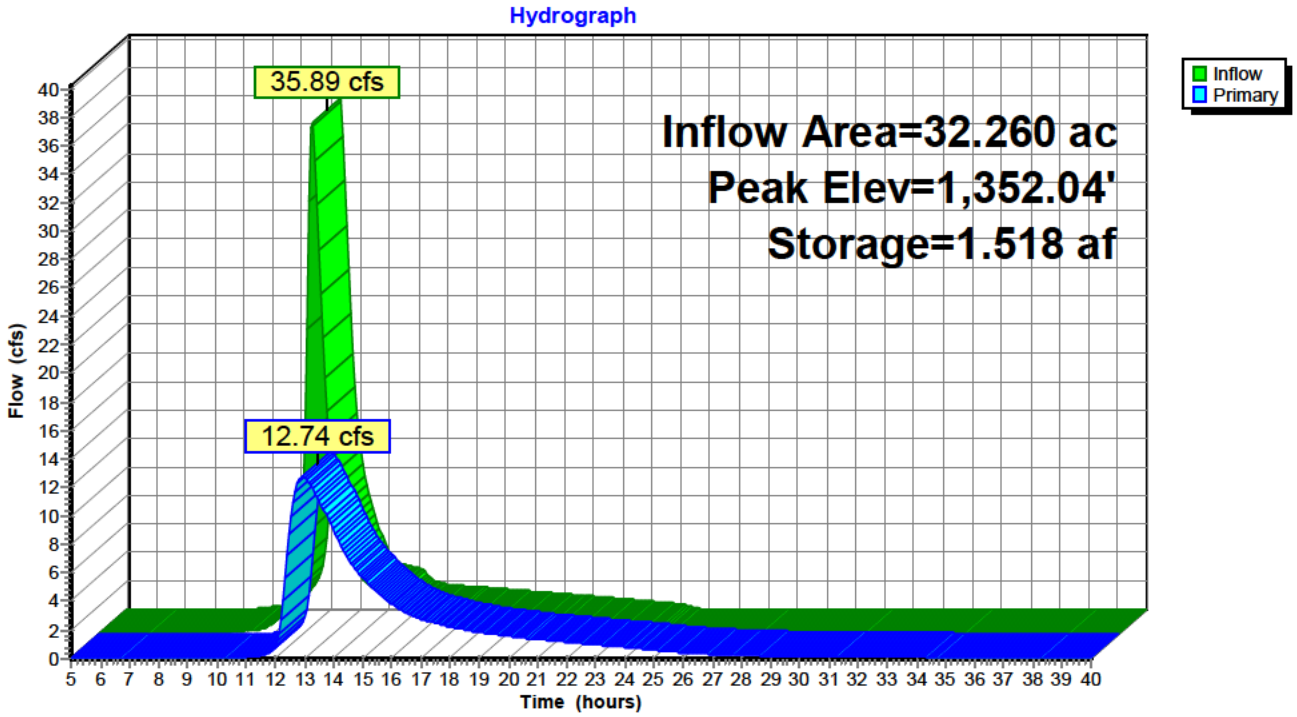
Volume	Invert	Avail.Storage	Storage Description
#1	1,351.50'	15.257 af	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
1,351.50	2.090	0.000	0.000	2.090
1,352.00	3.475	1.377	1.377	3.475
1,353.00	6.880	5.082	6.458	6.880
1,354.00	10.869	8.799	15.257	10.870

Device	Routing	Invert	Outlet Devices
#1	Primary	1,351.50'	**10.0' long + 5.0 '/' SideZ x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=12.73 cfs @ 12.96 hrs HW=1,352.04' TW=1,351.50' (Fixed TW Elev= 1,351.50')
1=Broad-Crested Rectangular Weir (Weir Controls 12.73 cfs @ 1.86 fps)

Pond 7P: BASIN A



Summary for Pond 15P: Basin B

Inflow Area = 12.350 ac, 25.85% Impervious, Inflow Depth = 1.57" for 2-Year event
Inflow = 17.43 cfs @ 12.27 hrs, Volume= 1.620 af
Outflow = 10.69 cfs @ 12.53 hrs, Volume= 1.620 af, Atten= 39%, Lag= 15.5 min
Discarded = 0.67 cfs @ 12.53 hrs, Volume= 0.633 af
Primary = 10.02 cfs @ 12.53 hrs, Volume= 0.987 af
Routed to Reach 16R : IMPACT 2

Routing by Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Peak Elev= 1,348.94' @ 12.53 hrs Surf.Area= 0.805 ac Storage= 0.472 af

Plug-Flow detention time= 120.3 min calculated for 1.617 af (100% of inflow)
Center-of-Mass det. time= 120.8 min (955.2 - 834.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,348.00'	1.012 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

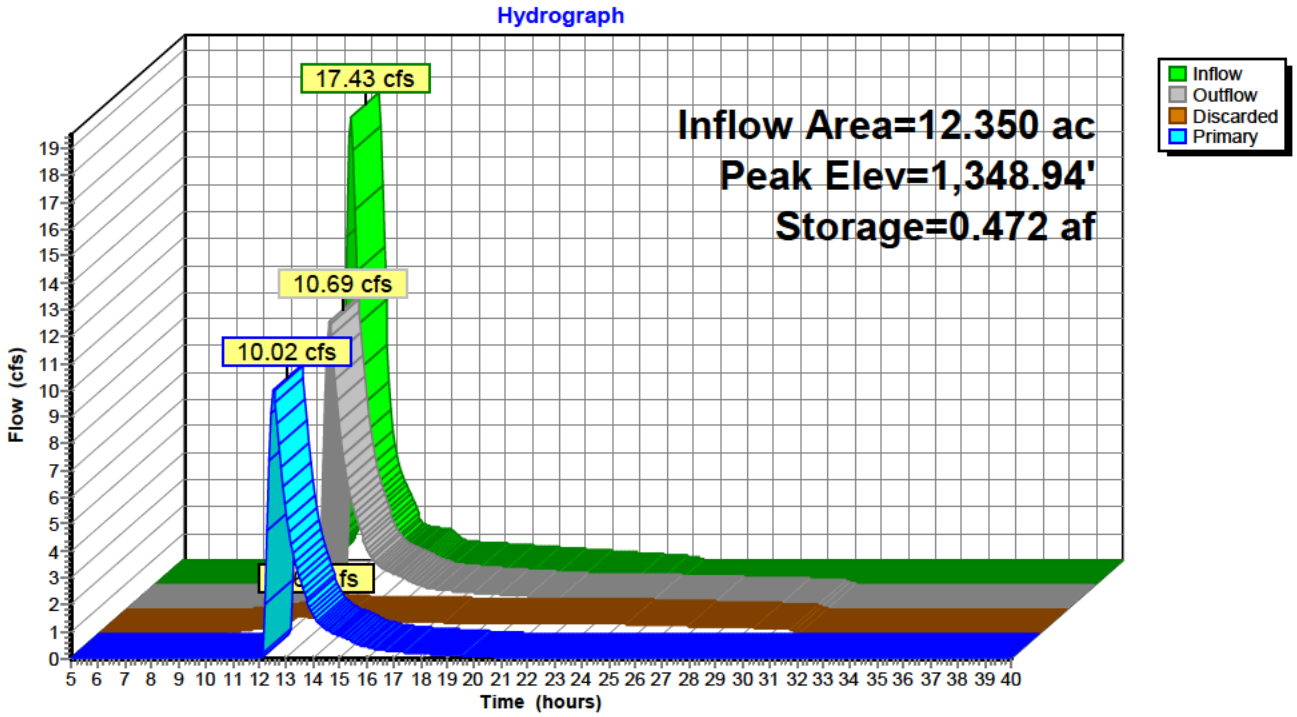
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,348.00	0.250	0.000	0.000
1,348.50	0.500	0.187	0.187
1,349.00	0.850	0.337	0.525
1,349.50	1.100	0.487	1.012

Device	Routing	Invert	Outlet Devices
#1	Primary	1,348.50'	**10.0' long + 10.0 '/' SideZ 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	Discarded	1,348.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 1,342.00'
#3	Primary	1,349.00'	**50.0' long + 10.0 '/' SideZ x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.67 cfs @ 12.53 hrs HW=1,348.93' (Free Discharge)
└**2=Exfiltration** (Controls 0.67 cfs)

Primary OutFlow Max=9.96 cfs @ 12.53 hrs HW=1,348.93' (Free Discharge)
├**1=Broad-Crested Rectangular Weir** (Weir Controls 9.96 cfs @ 1.60 fps)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 15P: Basin B



Time span=5.00-40.00 hrs, dt=0.07 hrs, 501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PR-B.1 Runoff Area=2.730 ac 38.00% Impervious Runoff Depth=2.50"
Flow Length=480' Slope=0.0050 '/' Tc=15.9 min CN=83 Runoff=7.41 cfs 0.568 af

Subcatchment 2S: PR-B.2 Runoff Area=2.560 ac 38.00% Impervious Runoff Depth=2.50"
Flow Length=510' Slope=0.0050 '/' Tc=16.2 min CN=83 Runoff=6.92 cfs 0.532 af

Subcatchment 3S: PR-B.3 Runoff Area=3.480 ac 38.00% Impervious Runoff Depth=2.50"
Flow Length=760' Slope=0.0050 '/' Tc=19.1 min CN=83 Runoff=8.80 cfs 0.724 af

Subcatchment 4S: PR-B.4 Runoff Area=2.820 ac 38.00% Impervious Runoff Depth=2.50"
Flow Length=710' Slope=0.0050 '/' Tc=18.5 min CN=83 Runoff=7.22 cfs 0.587 af

Subcatchment 5S: PR-B.5 Runoff Area=5.020 ac 38.00% Impervious Runoff Depth=2.50"
Flow Length=1,110' Slope=0.0050 '/' Tc=23.2 min CN=83 Runoff=11.48 cfs 1.044 af

Subcatchment 6S: BASIN A Subcatch Runoff Area=15.650 ac 0.00% Impervious Runoff Depth=1.77"
Flow Length=2,250' Tc=37.9 min CN=74 Runoff=19.12 cfs 2.314 af

Subcatchment 9S.1: OS-1 Runoff Area=20.350 ac 0.00% Impervious Runoff Depth=2.58"
Flow Length=2,575' Slope=0.0020 '/' Tc=122.3 min CN=84 Runoff=17.08 cfs 4.382 af

Subcatchment 9S.2: EX-1 Runoff Area=8.720 ac 38.00% Impervious Runoff Depth=2.50"
Flow Length=2,575' Slope=0.0020 '/' Tc=122.3 min CN=83 Runoff=7.07 cfs 1.814 af

Subcatchment 11S: PR-B.6 Runoff Area=2.220 ac 38.00% Impervious Runoff Depth=2.50"
Flow Length=460' Slope=0.0050 '/' Tc=10.0 min CN=83 Runoff=7.15 cfs 0.462 af

Subcatchment 12S: PR-B.7 Runoff Area=2.570 ac 38.00% Impervious Runoff Depth=2.50"
Flow Length=735' Slope=0.0050 '/' Tc=18.8 min CN=83 Runoff=6.54 cfs 0.535 af

Subcatchment 13S: PR-B.8 Runoff Area=3.610 ac 38.00% Impervious Runoff Depth=2.50"
Flow Length=760' Slope=0.0050 '/' Tc=19.1 min CN=83 Runoff=9.13 cfs 0.751 af

Subcatchment 14S: Basin B Subcatch Runoff Area=3.950 ac 0.00% Impervious Runoff Depth=1.77"
Flow Length=950' Tc=27.9 min CN=74 Runoff=5.74 cfs 0.584 af

Subcatchment 17S.1: OS-2 Runoff Area=7.970 ac 0.00% Impervious Runoff Depth=2.58"
Flow Length=1,500' Slope=0.0010 '/' Tc=154.4 min CN=84 Runoff=5.63 cfs 1.716 af

Subcatchment 17S.2: EX-2 Runoff Area=7.630 ac 38.00% Impervious Runoff Depth=2.50"
Flow Length=1,500' Slope=0.0010 '/' Tc=154.4 min CN=83 Runoff=5.20 cfs 1.587 af

Reach 8R: Culvert Avg. Flow Depth=1.50' Max Vel=3.64 fps Inflow=20.50 cfs 5.755 af
18.0" Round Pipe n=0.012 L=145.0' S=0.0025 '/' Capacity=5.67 cfs Outflow=5.67 cfs 5.755 af

Reach 10R: IMPACT 1 Avg. Flow Depth=0.98' Max Vel=1.90 fps Inflow=29.81 cfs 11.950 af
n=0.025 L=1,550.0' S=0.0016 '/' Capacity=297.44 cfs Outflow=29.34 cfs 11.943 af

Reach 16R: IMPACT 2 Avg. Flow Depth=0.65' Max Vel=1.51 fps Inflow=18.73 cfs 1.639 af
n=0.025 L=1,550.0' S=0.0016 '/' Capacity=297.44 cfs Outflow=13.53 cfs 1.639 af

Reach 18R: IMPACT 3 Avg. Flow Depth=0.73' Max Vel=1.69 fps Inflow=10.83 cfs 3.303 af
n=0.025 L=4,770.0' S=0.0019 '/' Capacity=73.10 cfs Outflow=9.47 cfs 3.297 af

Reach 19R: OUTLET PIPE Avg. Flow Depth=1.65' Max Vel=5.77 fps Inflow=36.54 cfs 16.879 af
72.0" Round Pipe n=0.025 L=200.0' S=0.0100 '/' Capacity=220.22 cfs Outflow=36.54 cfs 16.879 af

Pond 7P: BASIN A Peak Elev=1,352.21' Storage=2.157 af Inflow=52.46 cfs 5.769 af
Outflow=20.50 cfs 5.755 af

Pond 15P: Basin B Peak Elev=1,349.07' Storage=0.583 af Inflow=25.16 cfs 2.331 af
Discarded=0.74 cfs 0.693 af Primary=18.73 cfs 1.639 af Outflow=19.47 cfs 2.331 af

Total Runoff Area = 89.280 ac Runoff Volume = 17.598 af Average Runoff Depth = 2.37"
82.40% Pervious = 73.563 ac 17.60% Impervious = 15.717 ac

Summary for Subcatchment 1S: PR-B.1

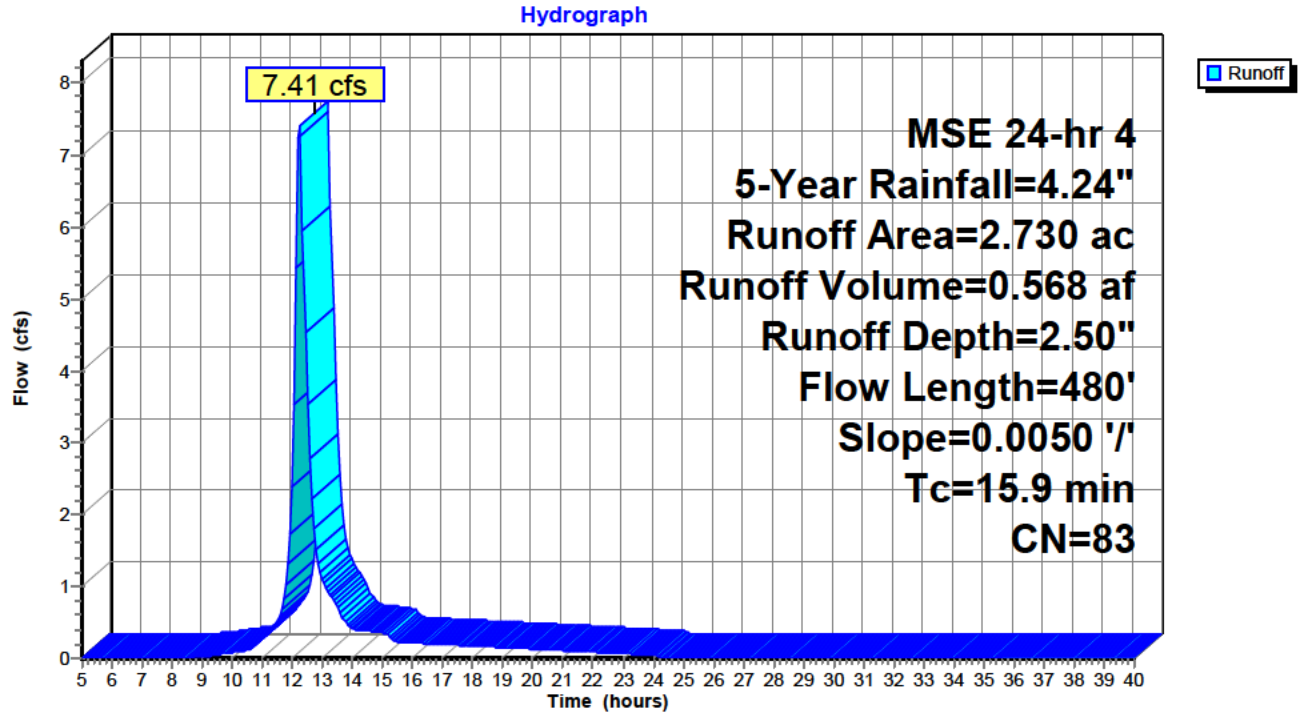
Runoff = 7.41 cfs @ 12.25 hrs, Volume= 0.568 af, Depth= 2.50"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
2.730	83	1/4 acre lots, 38% imp, HSG C
1.693		62.00% Pervious Area
1.037		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
4.9	420	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
15.9	480	Total			

Subcatchment 1S: PR-B.1



Summary for Subcatchment 2S: PR-B.2

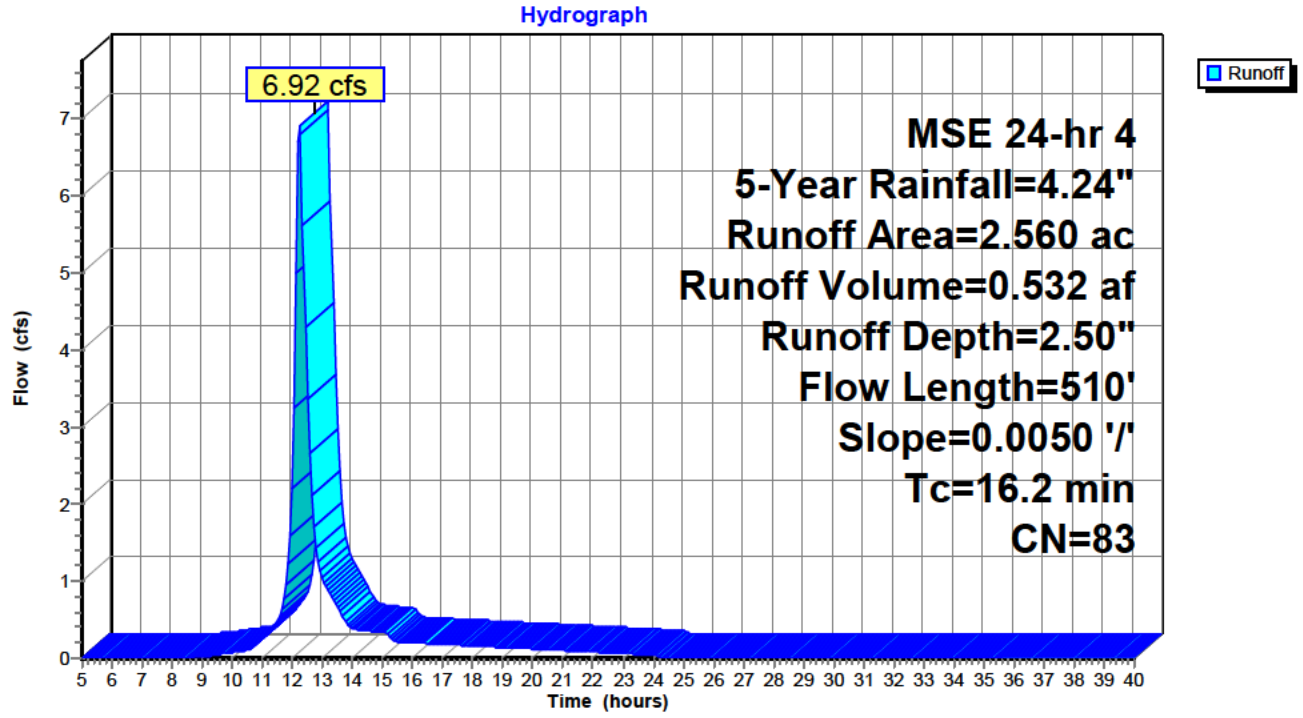
Runoff = 6.92 cfs @ 12.25 hrs, Volume= 0.532 af, Depth= 2.50"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
2.560	83	1/4 acre lots, 38% imp, HSG C
1.587		62.00% Pervious Area
0.973		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
5.2	450	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
16.2	510	Total			

Subcatchment 2S: PR-B.2



Summary for Subcatchment 3S: PR-B.3

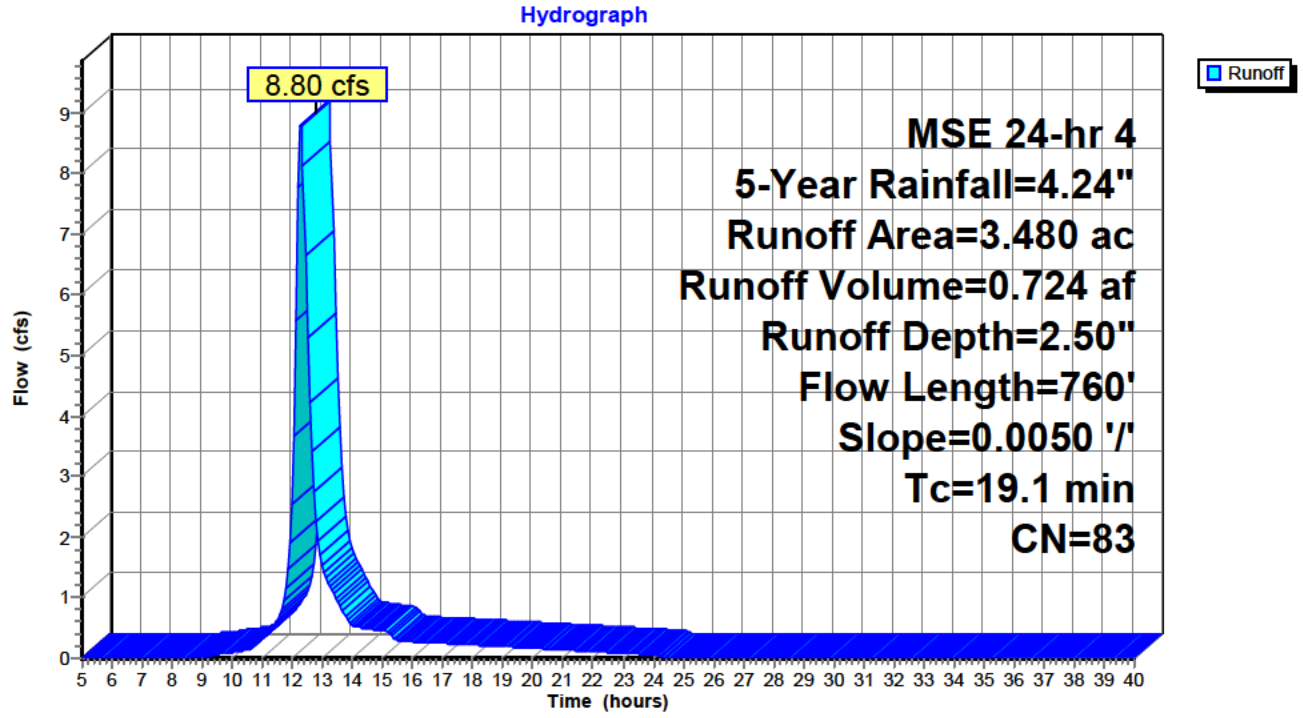
Runoff = 8.80 cfs @ 12.29 hrs, Volume= 0.724 af, Depth= 2.50"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
3.480	83	1/4 acre lots, 38% imp, HSG C
2.158		62.00% Pervious Area
1.322		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
8.1	700	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
19.1	760	Total			

Subcatchment 3S: PR-B.3



Summary for Subcatchment 4S: PR-B.4

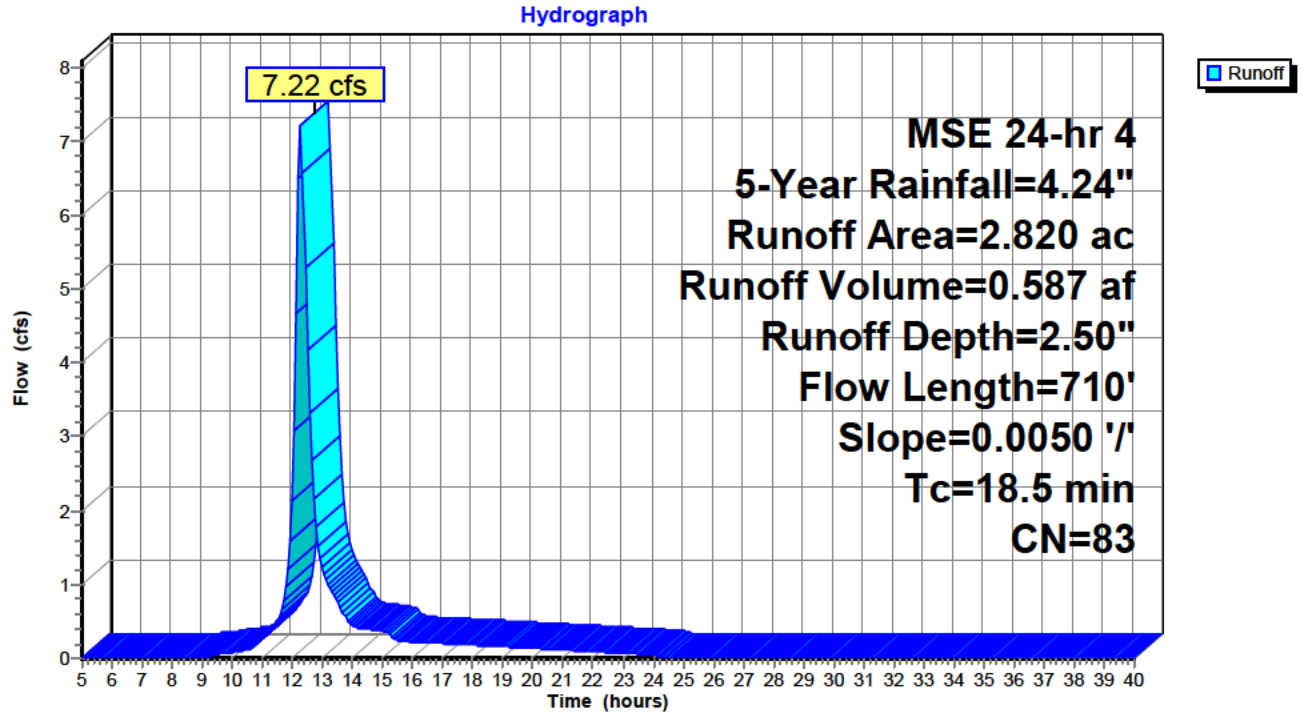
Runoff = 7.22 cfs @ 12.28 hrs, Volume= 0.587 af, Depth= 2.50"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
2.820	83	1/4 acre lots, 38% imp, HSG C
1.748		62.00% Pervious Area
1.072		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
7.5	650	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
18.5	710	Total			

Subcatchment 4S: PR-B.4



Summary for Subcatchment 5S: PR-B.5

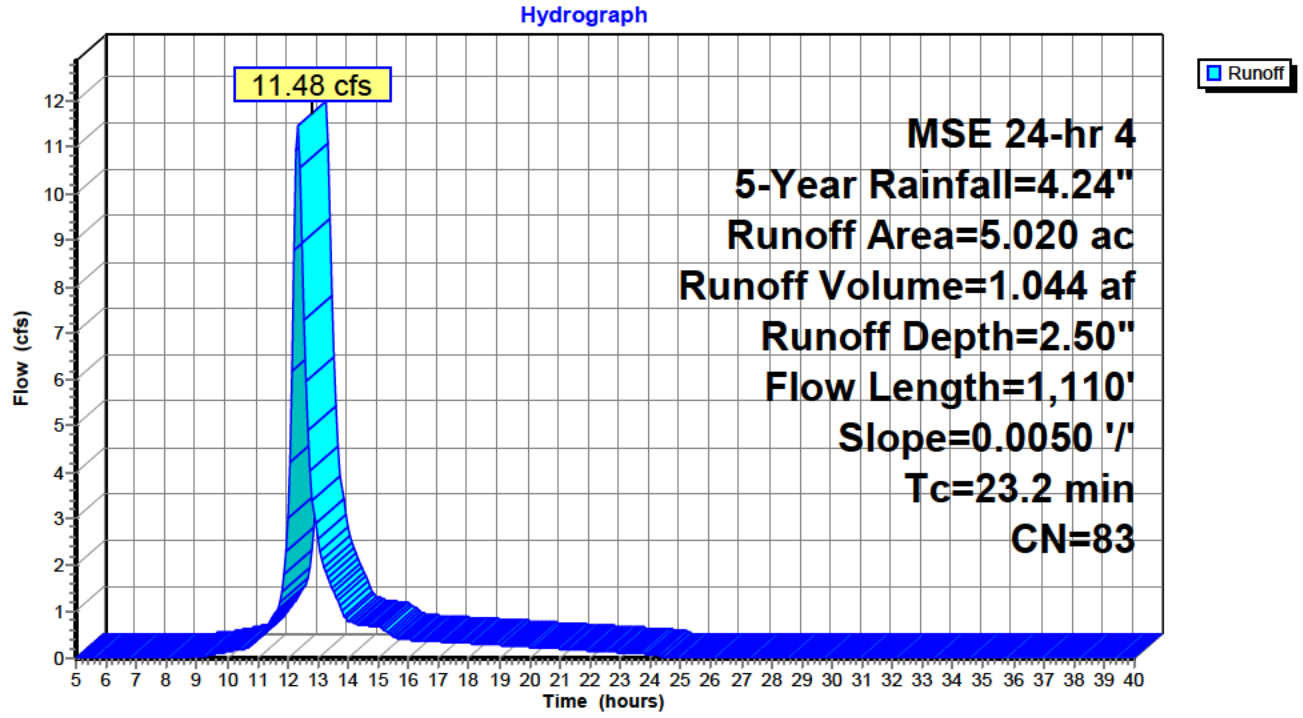
Runoff = 11.48 cfs @ 12.34 hrs, Volume= 1.044 af, Depth= 2.50"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
5.020	83	1/4 acre lots, 38% imp, HSG C
3.112		62.00% Pervious Area
1.908		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
12.2	1,050	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
23.2	1,110	Total			

Subcatchment 5S: PR-B.5



Summary for Subcatchment 6S: BASIN A Subcatch

[47] Hint: Peak is 218% of capacity of segment #4

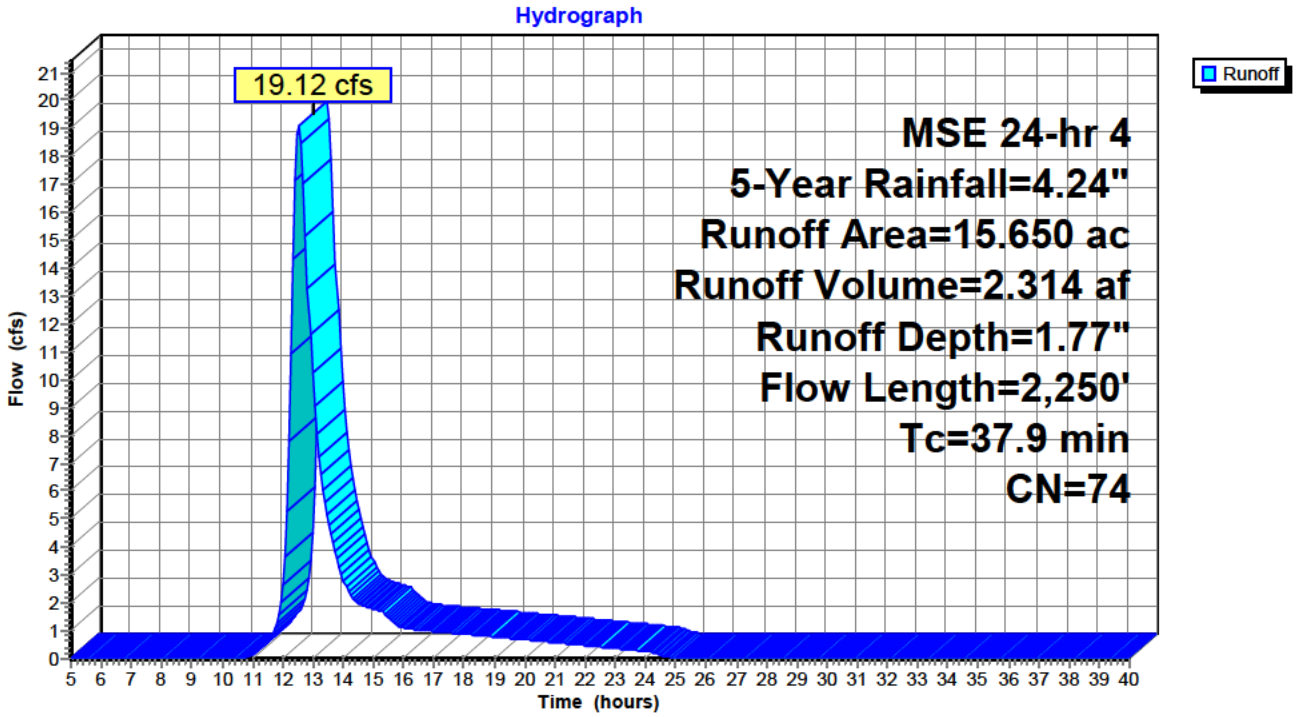
Runoff = 19.12 cfs @ 12.55 hrs, Volume= 2.314 af, Depth= 1.77"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
15.650	74	>75% Grass cover, Good, HSG C
15.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0050	0.10		**Sheet Flow, SHEETING (BACKYARDS)** Grass: Short n= 0.150 P2= 3.38"
19.3	1,100	0.0040	0.95		**Shallow Concentrated Flow, SHALLOW DITCH** Grassed Waterway Kv= 15.0 fps
0.8	750		15.01		**Lake or Reservoir, BASIN AREA** Mean Depth= 7.00'
0.7	200	0.0050	4.97	8.78	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
0.5	100	0.0010	3.09	139.23	**Channel Flow, LINED CHANNEL** Area= 45.0 sf Perim= 38.0' r= 1.18' n= 0.017 Concrete, unfinished
37.9	2,250	Total			

Subcatchment 6S: BASIN A Subcatch



Summary for Subcatchment 9S.1: OS-1

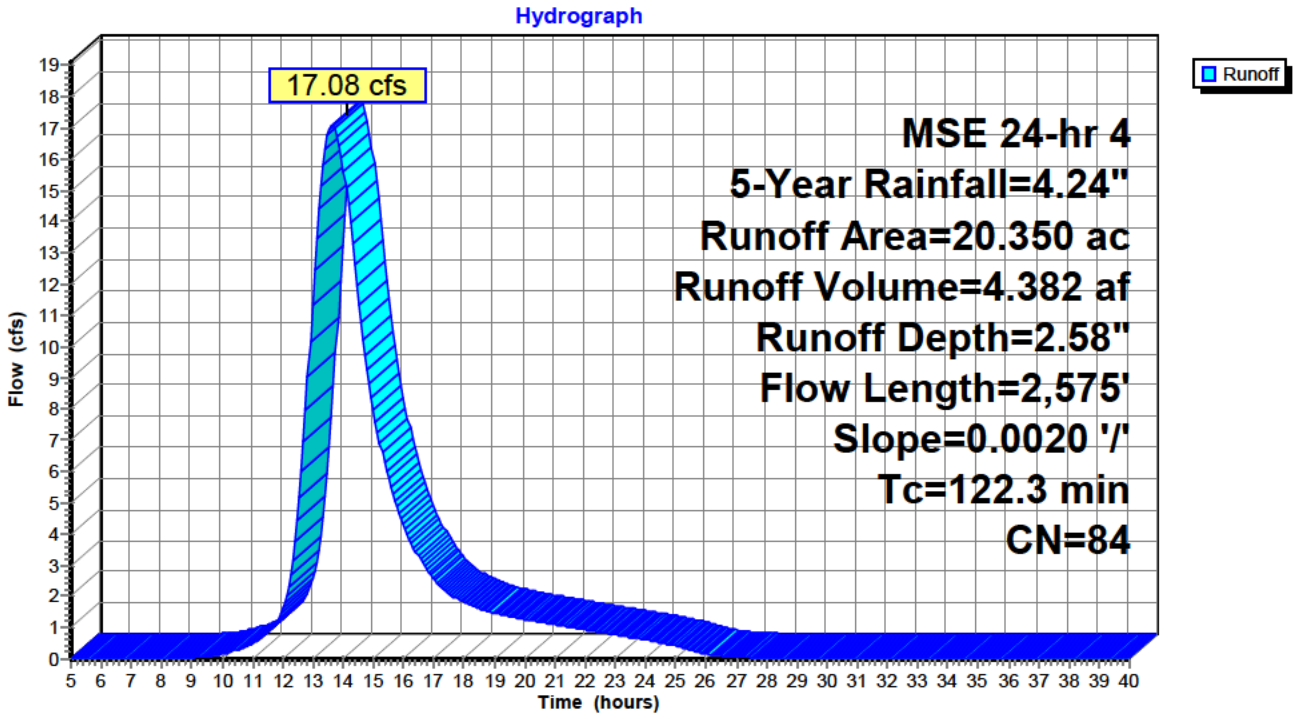
Runoff = 17.08 cfs @ 13.66 hrs, Volume= 4.382 af, Depth= 2.58"
Routed to Reach 10R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
20.250	84	Small grain, SR + CR, Good, HSG D
0.100	96	Gravel surface, HSG D
20.350	84	Weighted Average
20.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.8	1,250	0.0020	0.40		**Shallow Concentrated Flow, Backyard and Open Space Flow** Cultivated Straight Rows Kv= 9.0 fps
70.5	1,325	0.0020	0.31		**Shallow Concentrated Flow, Backyard Flow** Short Grass Pasture Kv= 7.0 fps
122.3	2,575	Total			

Subcatchment 9S.1: OS-1



Summary for Subcatchment 9S.2: EX-1

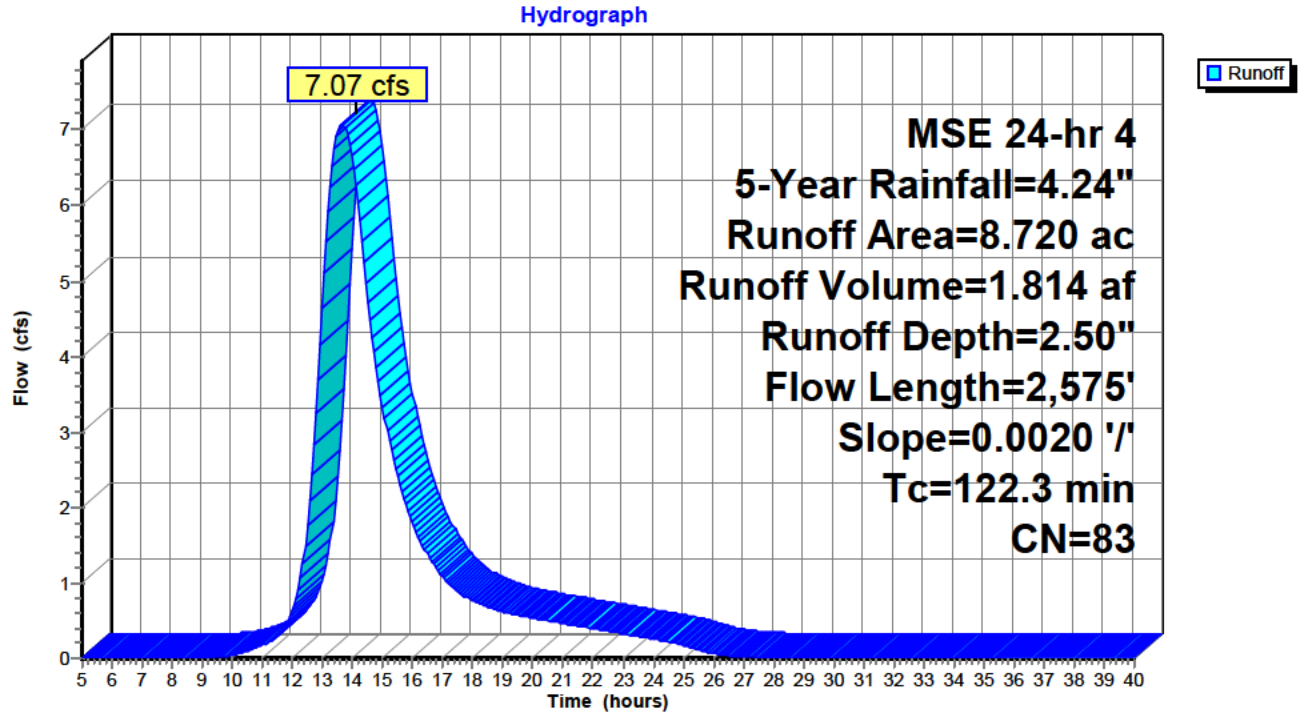
Runoff = 7.07 cfs @ 13.67 hrs, Volume= 1.814 af, Depth= 2.50"
Routed to Reach 10R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
8.720	83	1/4 acre lots, 38% imp, HSG C
5.406		62.00% Pervious Area
3.314		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.8	1,250	0.0020	0.40		**Shallow Concentrated Flow, Backyard and Open Space Flow** Cultivated Straight Rows Kv= 9.0 fps
70.5	1,325	0.0020	0.31		**Shallow Concentrated Flow, Backyard Flow** Short Grass Pasture Kv= 7.0 fps
122.3	2,575	Total			

Subcatchment 9S.2: EX-1



Summary for Subcatchment 11S: PR-B.6

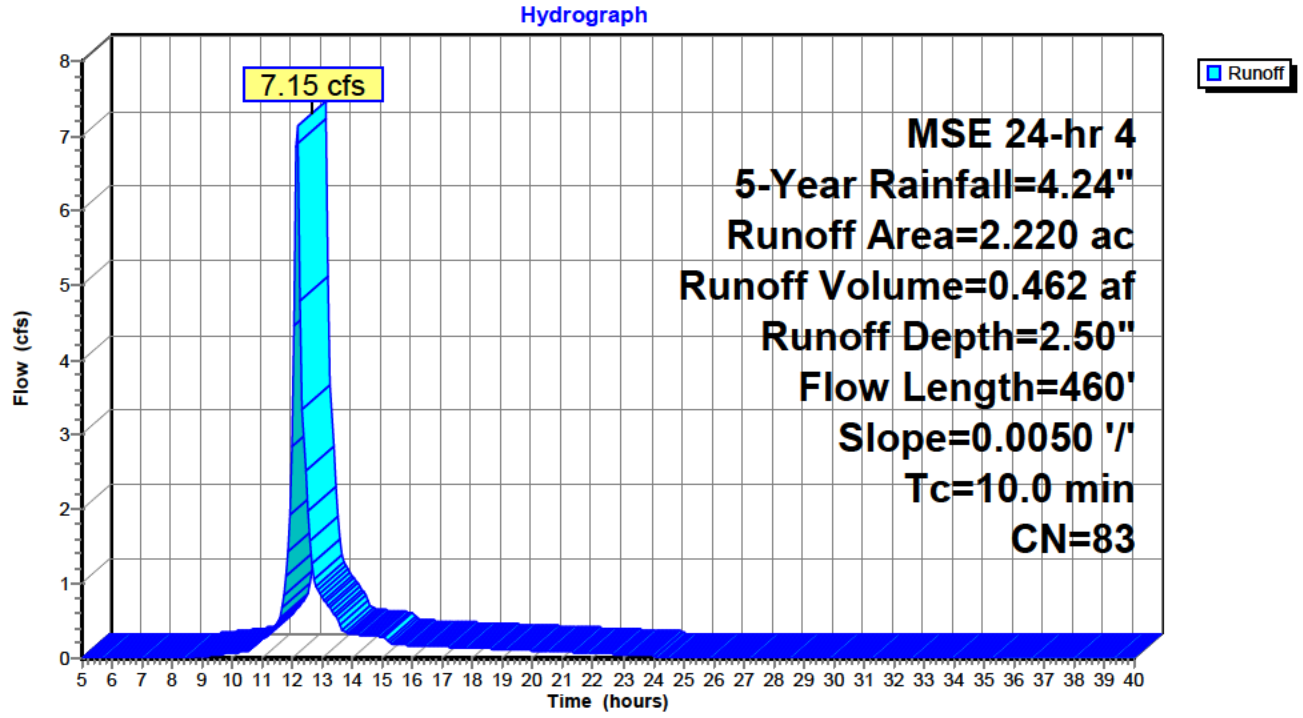
Runoff = 7.15 cfs @ 12.18 hrs, Volume= 0.462 af, Depth= 2.50"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
2.220	83	1/4 acre lots, 38% imp, HSG C
1.376		62.00% Pervious Area
0.844		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	10	0.0050	0.06		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
5.2	450	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
7.8	460	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 11S: PR-B.6



Summary for Subcatchment 12S: PR-B.7

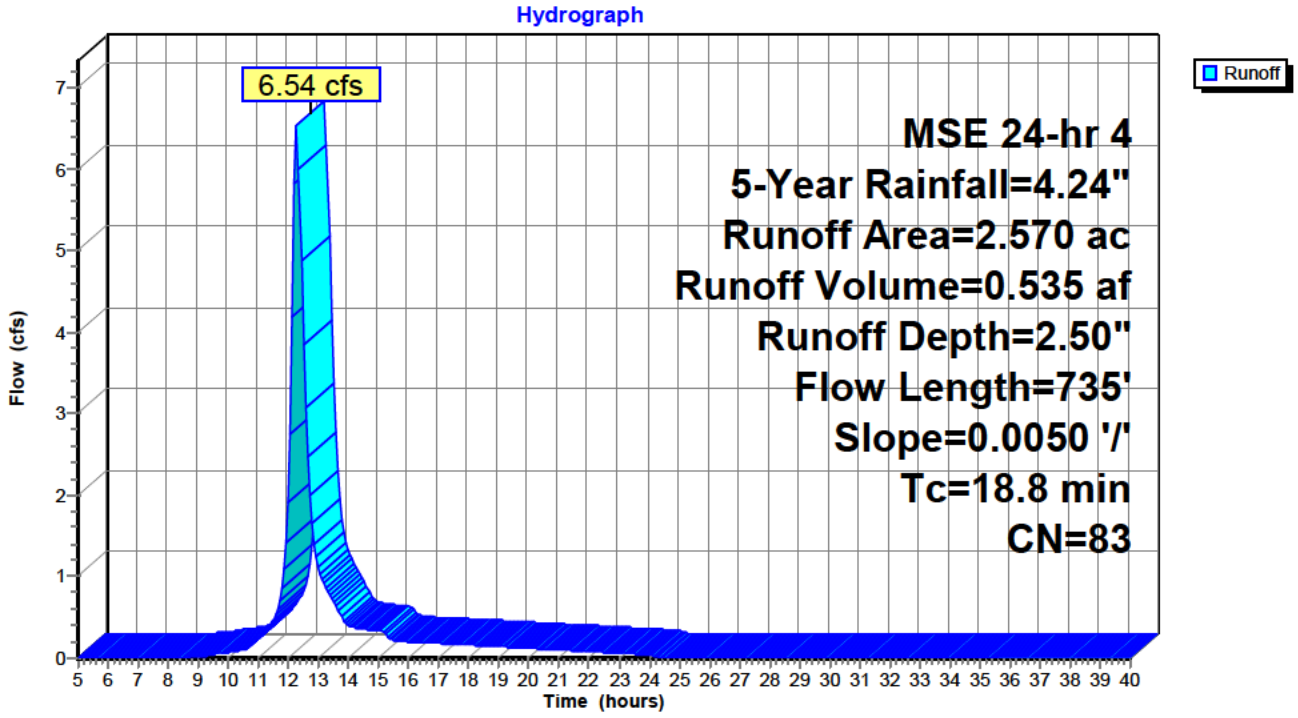
Runoff = 6.54 cfs @ 12.29 hrs, Volume= 0.535 af, Depth= 2.50"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
2.570	83	1/4 acre lots, 38% imp, HSG C
1.593		62.00% Pervious Area
0.977		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
7.8	675	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
18.8	735	Total			

Subcatchment 12S: PR-B.7



Summary for Subcatchment 13S: PR-B.8

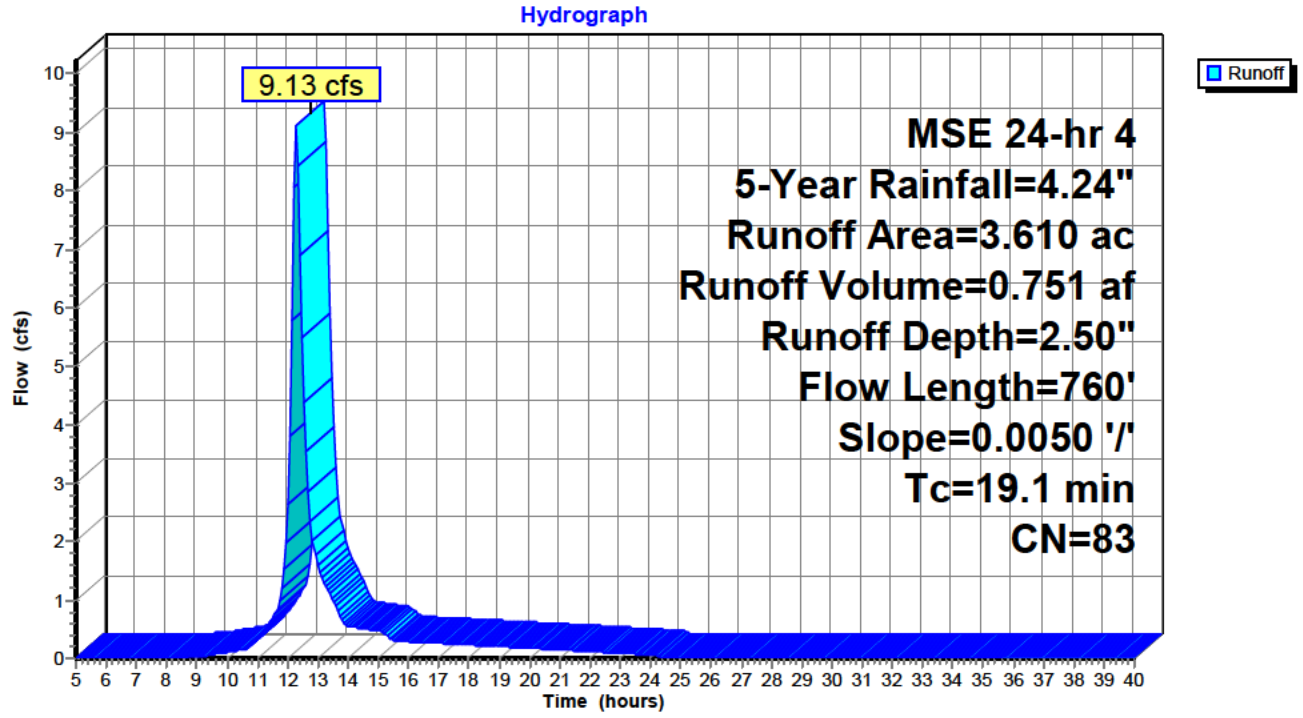
Runoff = 9.13 cfs @ 12.29 hrs, Volume= 0.751 af, Depth= 2.50"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
3.610	83	1/4 acre lots, 38% imp, HSG C
2.238		62.00% Pervious Area
1.372		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
8.1	700	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
19.1	760	Total			

Subcatchment 13S: PR-B.8



Summary for Subcatchment 14S: Basin B Subcatch

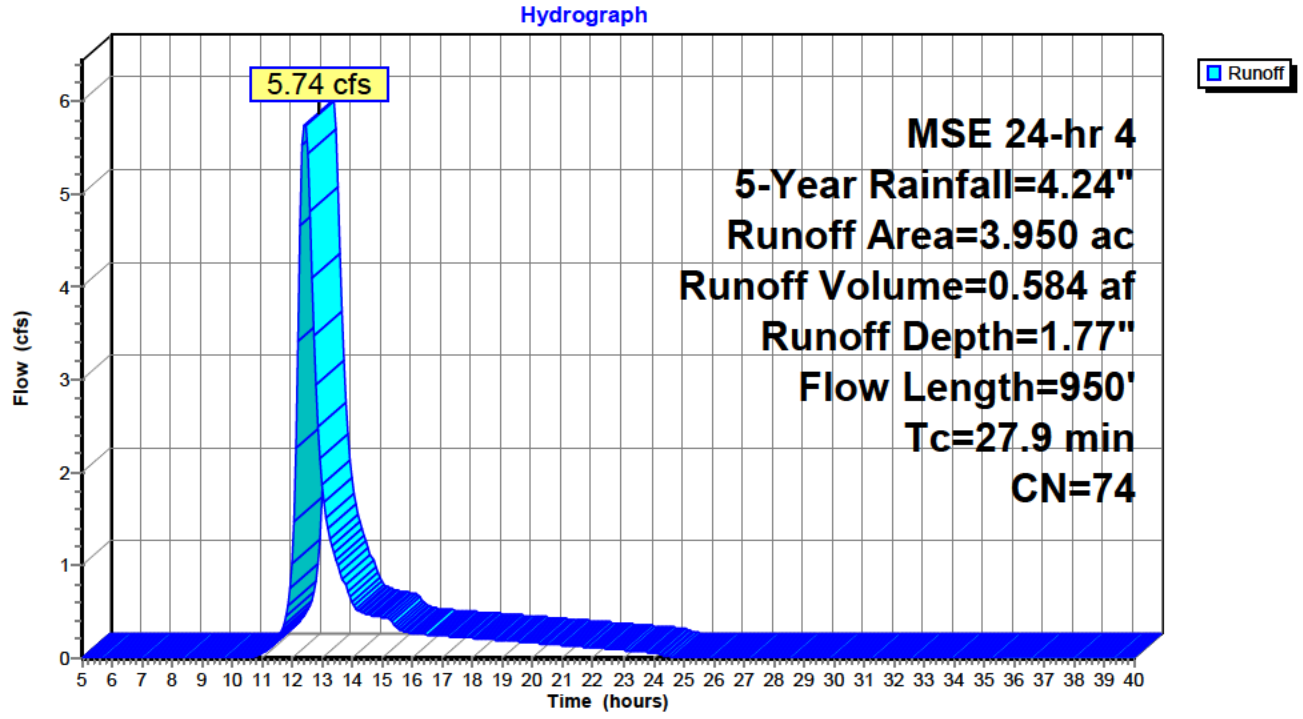
Runoff = 5.74 cfs @ 12.41 hrs, Volume= 0.584 af, Depth= 1.77"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
3.950	74	>75% Grass cover, Good, HSG C
3.950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0050	0.10		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
9.4	600	0.0050	1.06		**Shallow Concentrated Flow, DITCH FLOW** Grassed Waterway Kv= 15.0 fps
0.4	200		8.02		**Lake or Reservoir, Basin Area** Mean Depth= 2.00'
1.5	50	0.0020	0.56	11.24	**Channel Flow, CHANNEL OUTFALL** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.150 Sheet flow over Short Grass
27.9	950	Total			

Subcatchment 14S: Basin B Subcatch



Summary for Subcatchment 17S.1: OS-2

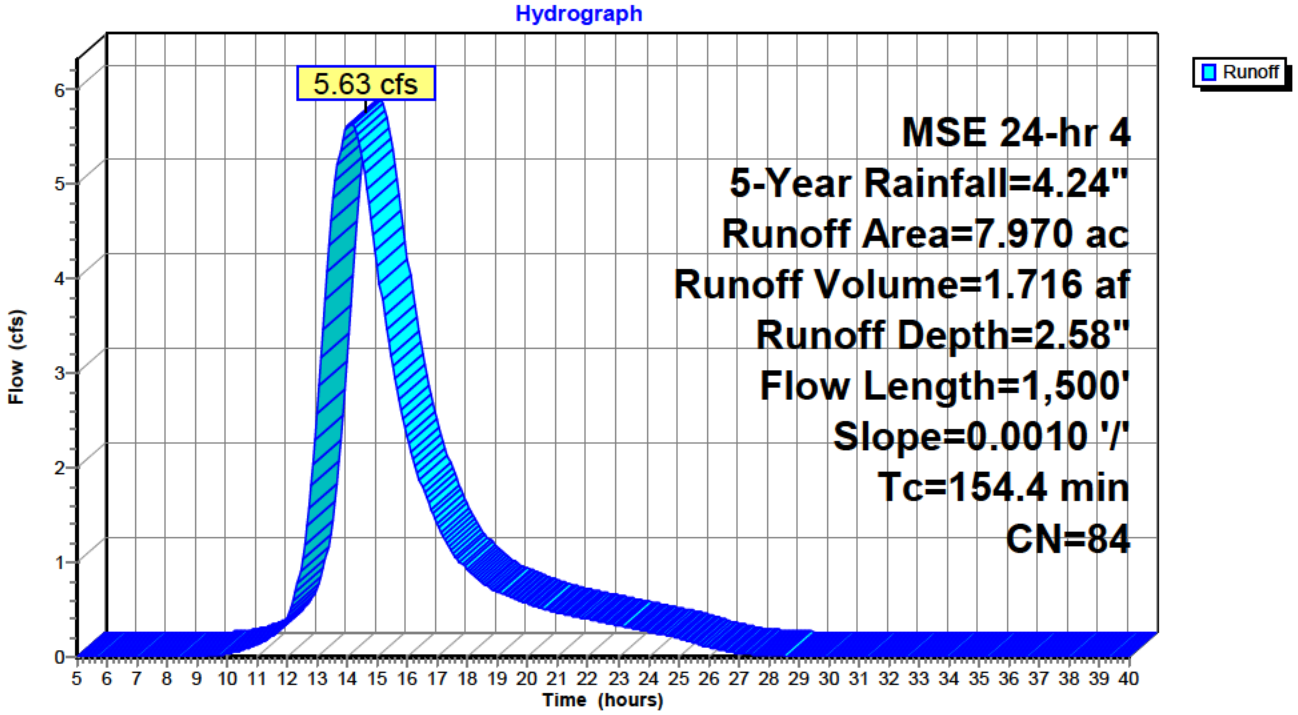
Runoff = 5.63 cfs @ 14.09 hrs, Volume= 1.716 af, Depth= 2.58"
Routed to Reach 18R : IMPACT 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
7.970	84	Small grain, SR + CR, Good, HSG D
7.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
84.1	300	0.0010	0.06		**Sheet Flow, Crop Sheeting** Cultivated: Residue>20% n= 0.170 P2= 3.38"
70.3	1,200	0.0010	0.28		**Shallow Concentrated Flow, Crop Shallow Concentrated** Cultivated Straight Rows Kv= 9.0 fps
154.4	1,500	Total			

Subcatchment 17S.1: OS-2



Summary for Subcatchment 17S.2: EX-2

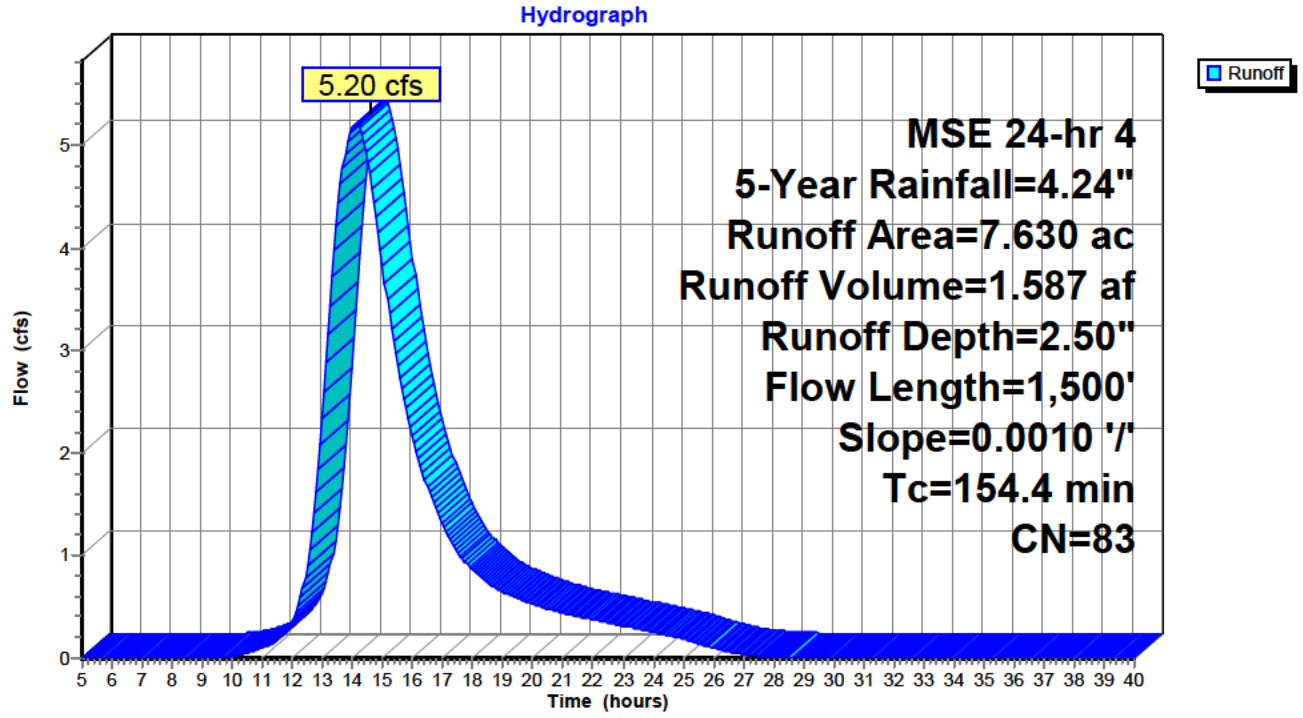
Runoff = 5.20 cfs @ 14.10 hrs, Volume= 1.587 af, Depth= 2.50"
Routed to Reach 18R : IMPACT 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 5-Year Rainfall=4.24"

Area (ac)	CN	Description
7.630	83	1/4 acre lots, 38% imp, HSG C
4.731		62.00% Pervious Area
2.899		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
84.1	300	0.0010	0.06		**Sheet Flow, Crop Sheeting** Cultivated: Residue>20% n= 0.170 P2= 3.38"
70.3	1,200	0.0010	0.28		**Shallow Concentrated Flow, Crop Shallow Concentrated** Cultivated Straight Rows Kv= 9.0 fps
154.4	1,500	Total			

Subcatchment 17S.2: EX-2



Summary for Reach 8R: Culvert

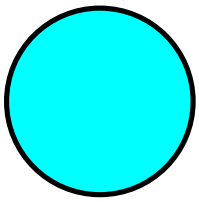
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 362% of Manning's capacity
[76] Warning: Detained 2.066 af (Pond w/culvert advised)
[81] Warning: Exceeded Pond 7P by 0.56' @ 23.48 hrs

Inflow Area = 32.260 ac, 19.57% Impervious, Inflow Depth > 2.14" for 5-Year event
Inflow = 20.50 cfs @ 12.90 hrs, Volume= 5.755 af
Outflow = 5.67 cfs @ 12.35 hrs, Volume= 5.755 af, Atten= 72%, Lag= 0.0 min
Routed to Reach 10R : IMPACT 1

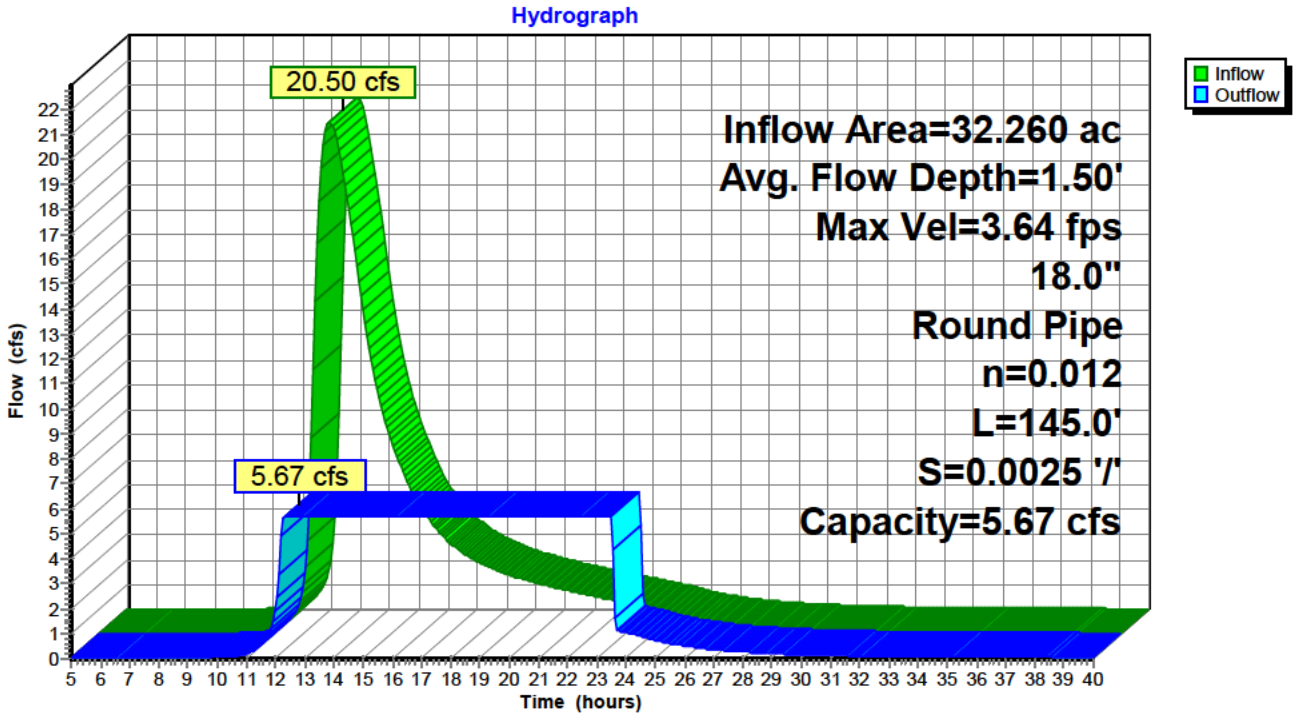
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 3.64 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.02 fps, Avg. Travel Time= 1.2 min

Peak Storage= 256 cf @ 12.28 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 5.67 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 145.0' Slope= 0.0025 '/'
Inlet Invert= 1,350.69', Outlet Invert= 1,350.33'



Reach 8R: Culvert



Summary for Reach 10R: IMPACT 1

Inflow Area = 61.330 ac, 15.69% Impervious, Inflow Depth > 2.34" for 5-Year event
Inflow = 29.81 cfs @ 13.66 hrs, Volume= 11.950 af
Outflow = 29.34 cfs @ 14.05 hrs, Volume= 11.943 af, Atten= 2%, Lag= 23.1 min
Routed to Reach 19R : OUTLET PIPE

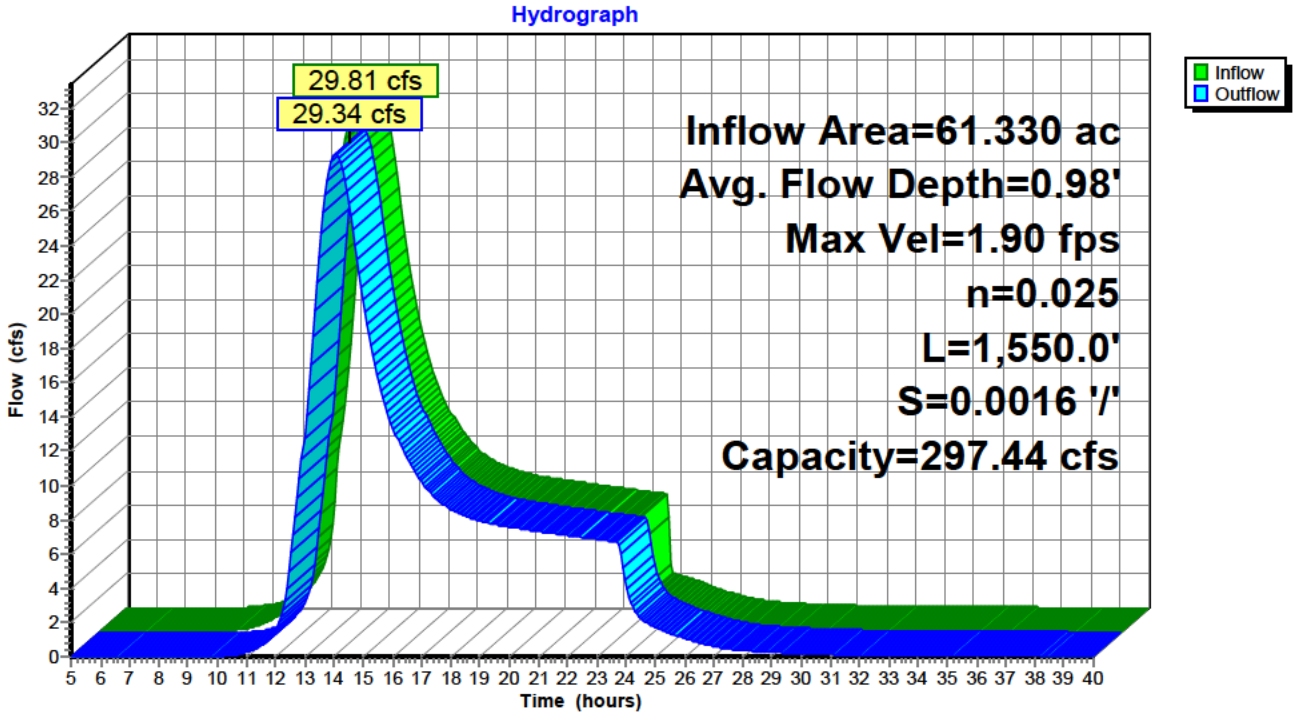
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 1.90 fps, Min. Travel Time= 13.6 min
Avg. Velocity = 0.75 fps, Avg. Travel Time= 34.5 min

Peak Storage= 24,000 cf @ 13.82 hrs
Average Depth at Peak Storage= 0.98' , Surface Width= 21.72'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 297.44 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 6.0 '/' Top Width= 46.00'
Length= 1,550.0' Slope= 0.0016 '/'
Inlet Invert= 1,348.50', Outlet Invert= 1,346.00'

‡

Reach 10R: IMPACT 1



Summary for Reach 16R: IMPACT 2

[81] Warning: Exceeded Pond 15P by 0.50' @ 32.86 hrs

Inflow Area = 12.350 ac, 25.85% Impervious, Inflow Depth = 1.59" for 5-Year event
Inflow = 18.73 cfs @ 12.44 hrs, Volume= 1.639 af
Outflow = 13.53 cfs @ 12.96 hrs, Volume= 1.639 af, Atten= 28%, Lag= 30.7 min
Routed to Reach 19R : OUTLET PIPE

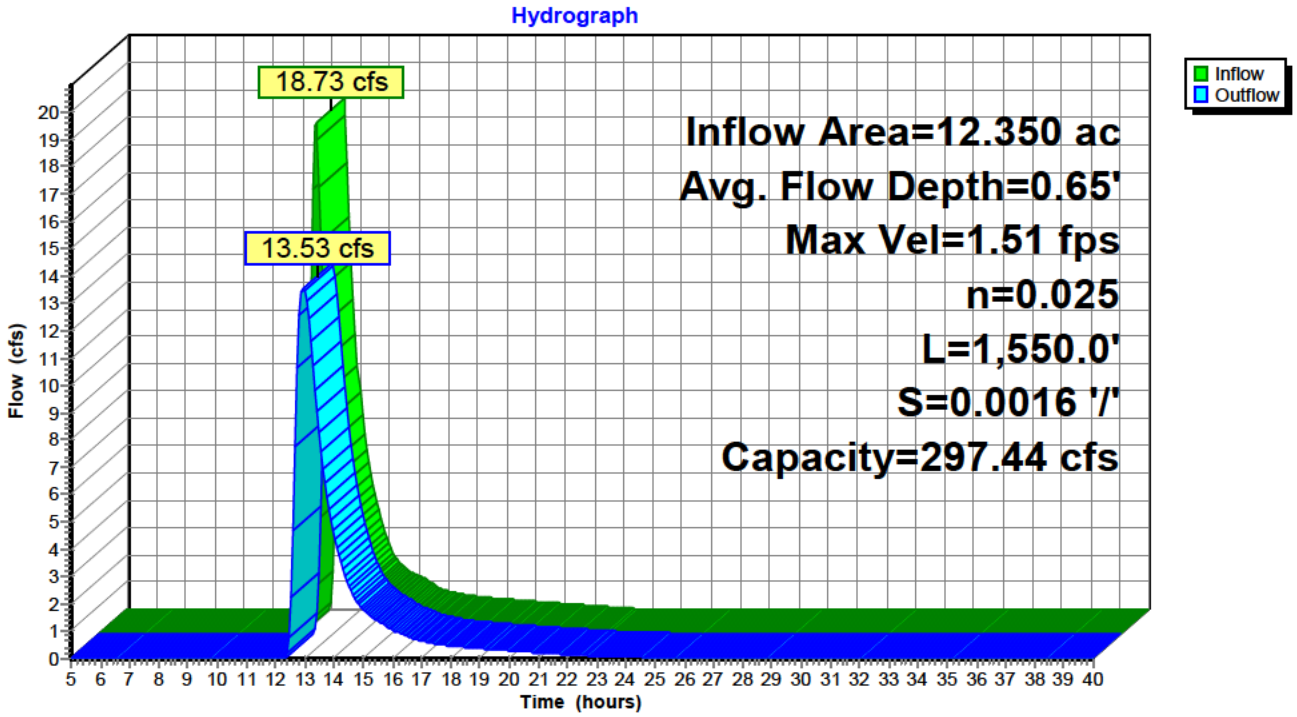
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 1.51 fps, Min. Travel Time= 17.1 min
Avg. Velocity = 0.39 fps, Avg. Travel Time= 67.1 min

Peak Storage= 13,920 cf @ 12.67 hrs
Average Depth at Peak Storage= 0.65' , Surface Width= 17.76'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 297.44 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 6.0 '/' Top Width= 46.00'
Length= 1,550.0' Slope= 0.0016 '/'
Inlet Invert= 1,348.50', Outlet Invert= 1,346.00'

‡

Reach 16R: IMPACT 2



Summary for Reach 18R: IMPACT 3

Inflow Area = 15.600 ac, 18.59% Impervious, Inflow Depth = 2.54" for 5-Year event
Inflow = 10.83 cfs @ 14.09 hrs, Volume= 3.303 af
Outflow = 9.47 cfs @ 15.46 hrs, Volume= 3.297 af, Atten= 13%, Lag= 82.2 min
Routed to Reach 19R : OUTLET PIPE

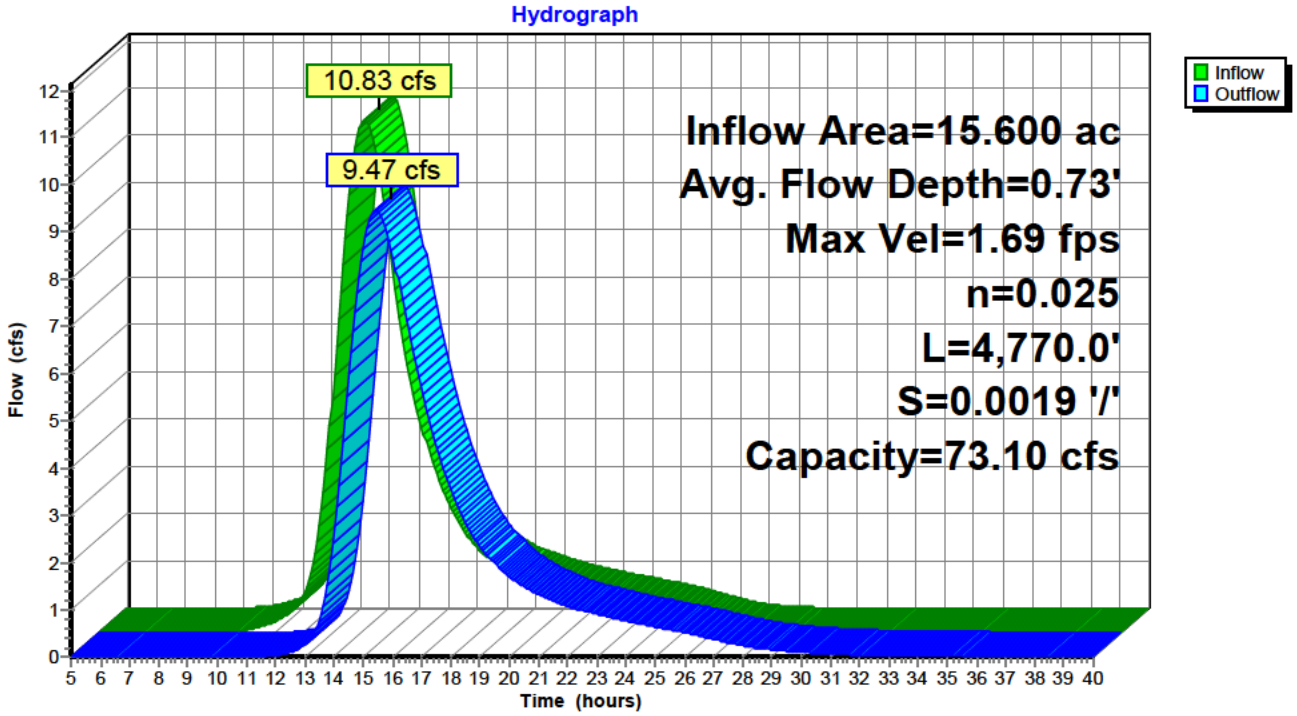
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 1.69 fps, Min. Travel Time= 47.0 min
Avg. Velocity = 0.61 fps, Avg. Travel Time= 130.0 min

Peak Storage= 26,727 cf @ 14.68 hrs
Average Depth at Peak Storage= 0.73' , Surface Width= 10.39'
Bank-Full Depth= 2.00' Flow Area= 24.8 sf, Capacity= 73.10 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.7 '/' Top Width= 19.80'
Length= 4,770.0' Slope= 0.0019 '/'
Inlet Invert= 1,355.00', Outlet Invert= 1,346.00'

‡

Reach 18R: IMPACT 3



Summary for Reach 19R: OUTLET PIPE

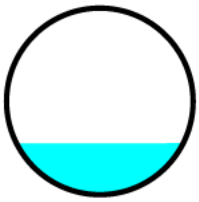
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 10R OUTLET depth by 0.76' @ 15.01 hrs
[62] Hint: Exceeded Reach 16R OUTLET depth by 1.40' @ 14.45 hrs
[62] Hint: Exceeded Reach 18R OUTLET depth by 1.13' @ 13.05 hrs

Inflow Area = 89.280 ac, 17.60% Impervious, Inflow Depth > 2.27" for 5-Year event
Inflow = 36.54 cfs @ 14.10 hrs, Volume= 16.879 af
Outflow = 36.54 cfs @ 14.12 hrs, Volume= 16.879 af, Atten= 0%, Lag= 1.0 min

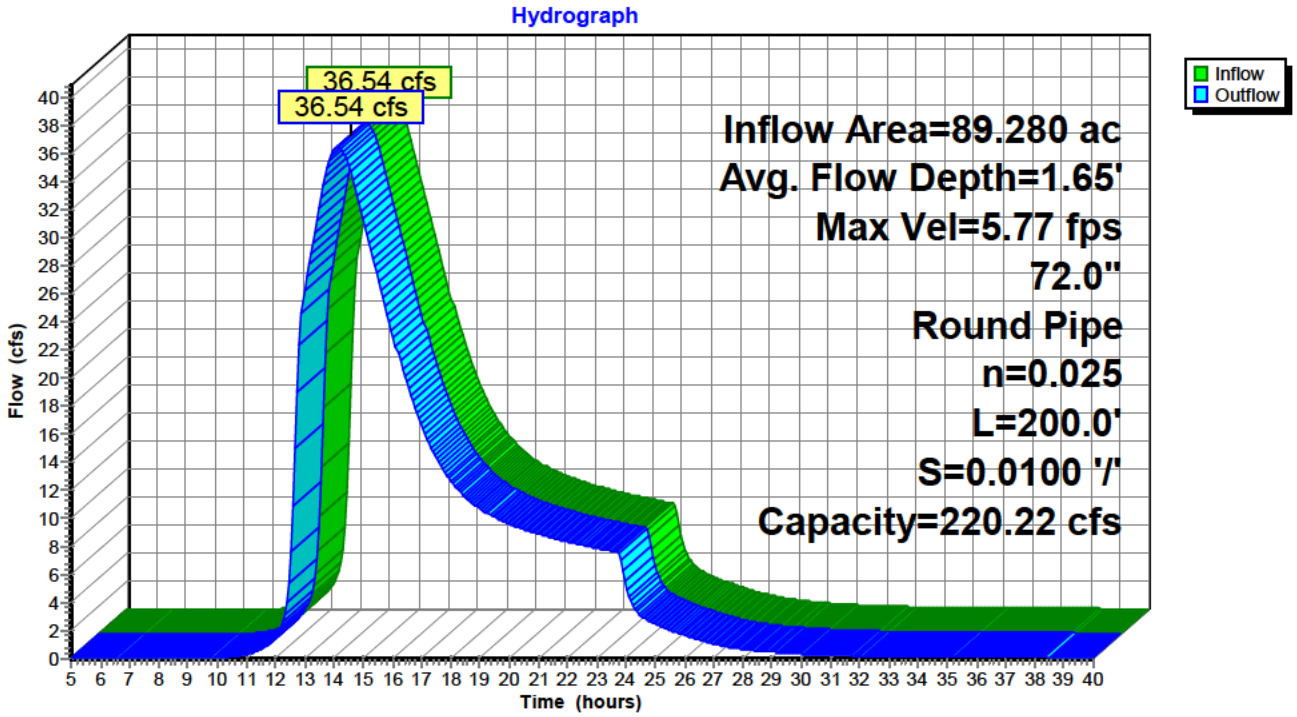
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 5.77 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.51 fps, Avg. Travel Time= 1.3 min

Peak Storage= 1,267 cf @ 14.11 hrs
Average Depth at Peak Storage= 1.65' , Surface Width= 5.36'
Bank-Full Depth= 6.00' Flow Area= 28.3 sf, Capacity= 220.22 cfs

72.0" Round Pipe
n= 0.025 Corrugated metal
Length= 200.0' Slope= 0.0100 '/'
Inlet Invert= 1,346.00', Outlet Invert= 1,344.00'



Reach 19R: OUTLET PIPE



Summary for Pond 7P: BASIN A

Inflow Area = 32.260 ac, 19.57% Impervious, Inflow Depth = 2.15" for 5-Year event
Inflow = 52.46 cfs @ 12.32 hrs, Volume= 5.769 af
Outflow = 20.50 cfs @ 12.90 hrs, Volume= 5.755 af, Atten= 61%, Lag= 34.8 min
Primary = 20.50 cfs @ 12.90 hrs, Volume= 5.755 af
Routed to Reach 8R : Culvert

Routing by Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Peak Elev= 1,352.21' @ 12.90 hrs Surf.Area= 4.085 ac Storage= 2.157 af
Flood Elev= 1,354.50' Surf.Area= 10.869 ac Storage= 15.257 af

Plug-Flow detention time= 109.2 min calculated for 5.743 af (100% of inflow)
Center-of-Mass det. time= 109.1 min (945.1 - 836.0)

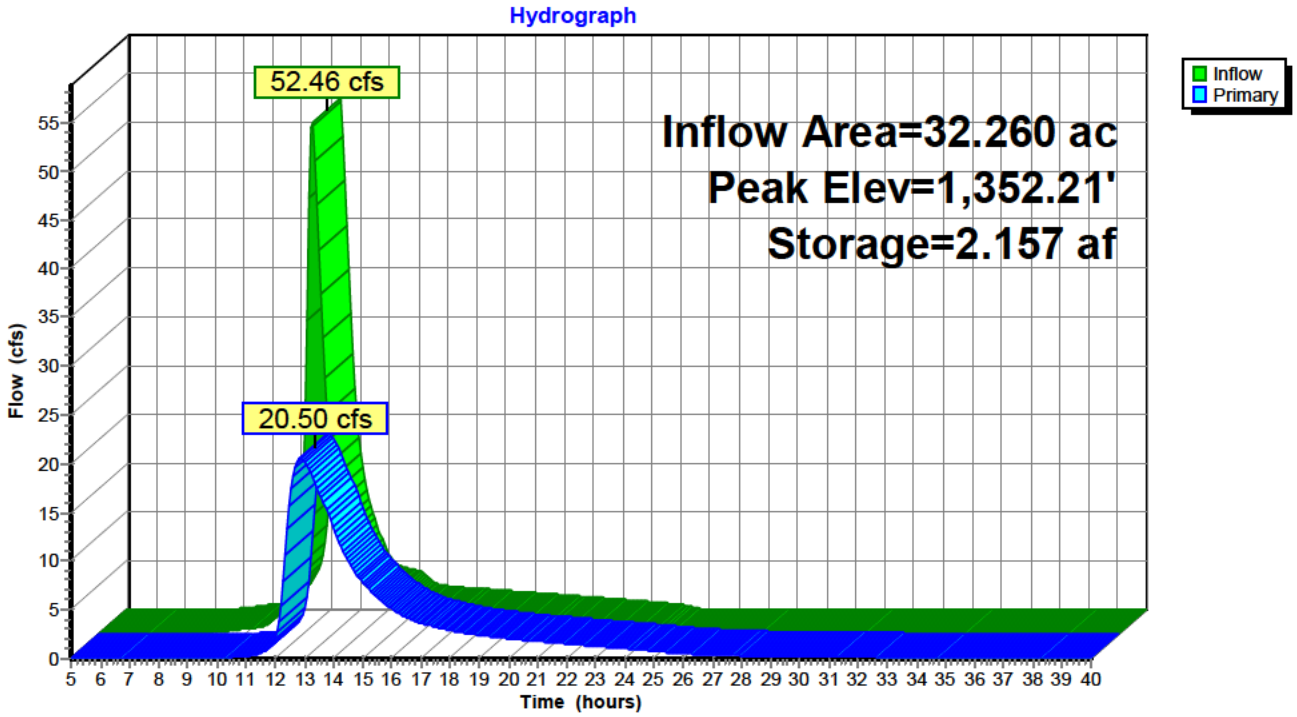
Volume	Invert	Avail.Storage	Storage Description
#1	1,351.50'	15.257 af	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
1,351.50	2.090	0.000	0.000	2.090
1,352.00	3.475	1.377	1.377	3.475
1,353.00	6.880	5.082	6.458	6.880
1,354.00	10.869	8.799	15.257	10.870

Device	Routing	Invert	Outlet Devices
#1	Primary	1,351.50'	**10.0' long + 5.0 '/' SideZ x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=20.48 cfs @ 12.90 hrs HW=1,352.21' TW=1,351.50' (Fixed TW Elev= 1,351.50')
1=Broad-Crested Rectangular Weir (Weir Controls 20.48 cfs @ 2.14 fps)

Pond 7P: BASIN A



Summary for Pond 15P: Basin B

Inflow Area = 12.350 ac, 25.85% Impervious, Inflow Depth = 2.27" for 5-Year event
Inflow = 25.16 cfs @ 12.27 hrs, Volume= 2.331 af
Outflow = 19.47 cfs @ 12.44 hrs, Volume= 2.331 af, Atten= 23%, Lag= 10.5 min
Discarded = 0.74 cfs @ 12.44 hrs, Volume= 0.693 af
Primary = 18.73 cfs @ 12.44 hrs, Volume= 1.639 af
Routed to Reach 16R : IMPACT 2

Routing by Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Peak Elev= 1,349.07' @ 12.44 hrs Surf.Area= 0.883 ac Storage= 0.583 af

Plug-Flow detention time= 94.1 min calculated for 2.327 af (100% of inflow)
Center-of-Mass det. time= 94.8 min (920.8 - 826.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,348.00'	1.012 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

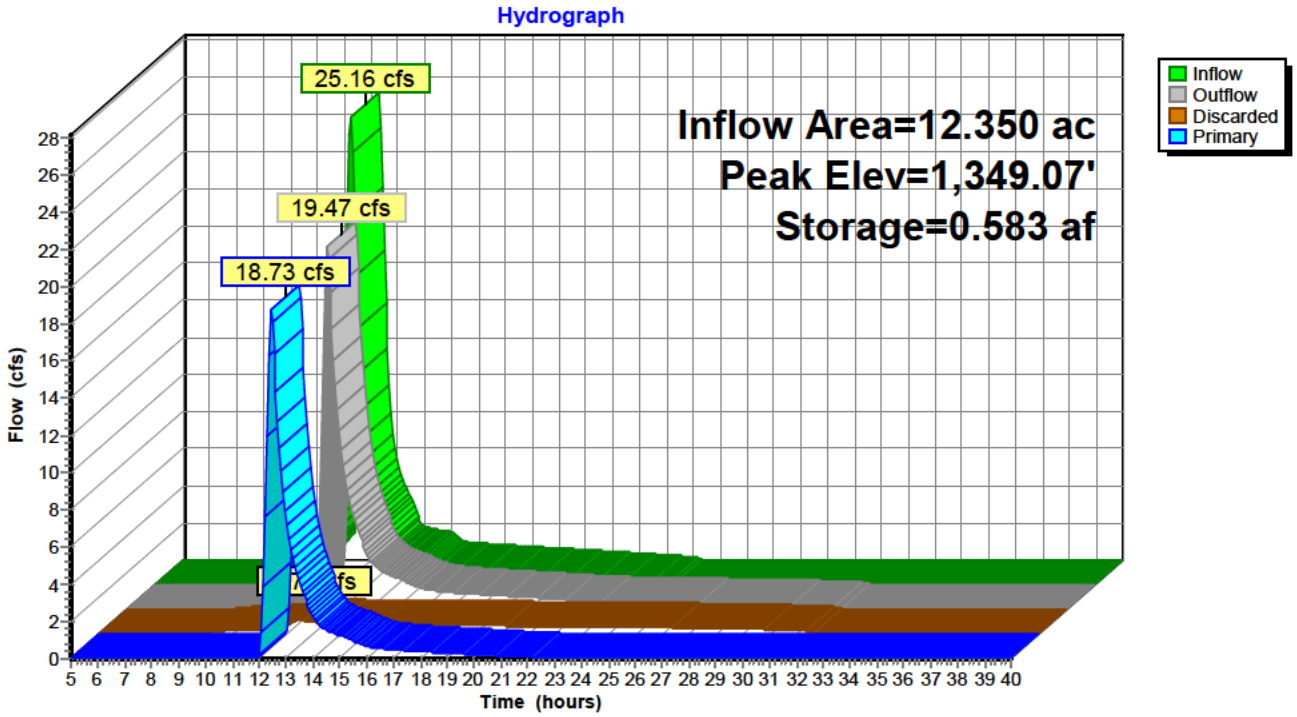
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,348.00	0.250	0.000	0.000
1,348.50	0.500	0.187	0.187
1,349.00	0.850	0.337	0.525
1,349.50	1.100	0.487	1.012

Device	Routing	Invert	Outlet Devices
#1	Primary	1,348.50'	**10.0' long + 10.0 '/' SideZ 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	Discarded	1,348.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 1,342.00'
#3	Primary	1,349.00'	**50.0' long + 10.0 '/' SideZ x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.74 cfs @ 12.44 hrs HW=1,349.06' (Free Discharge)
└**2=Exfiltration** (Controls 0.74 cfs)

Primary OutFlow Max=18.42 cfs @ 12.44 hrs HW=1,349.06' (Free Discharge)
├**1=Broad-Crested Rectangular Weir** (Weir Controls 16.41 cfs @ 1.86 fps)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 2.01 cfs @ 0.63 fps)

Pond 15P: Basin B



Time span=5.00-40.00 hrs, dt=0.07 hrs, 501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PR-B.1 Runoff Area=2.730 ac 38.00% Impervious Runoff Depth=3.16"
Flow Length=480' Slope=0.0050 '/' Tc=15.9 min CN=83 Runoff=9.40 cfs 0.718 af

Subcatchment 2S: PR-B.2 Runoff Area=2.560 ac 38.00% Impervious Runoff Depth=3.16"
Flow Length=510' Slope=0.0050 '/' Tc=16.2 min CN=83 Runoff=8.71 cfs 0.673 af

Subcatchment 3S: PR-B.3 Runoff Area=3.480 ac 38.00% Impervious Runoff Depth=3.16"
Flow Length=760' Slope=0.0050 '/' Tc=19.1 min CN=83 Runoff=11.08 cfs 0.915 af

Subcatchment 4S: PR-B.4 Runoff Area=2.820 ac 38.00% Impervious Runoff Depth=3.16"
Flow Length=710' Slope=0.0050 '/' Tc=18.5 min CN=83 Runoff=9.09 cfs 0.742 af

Subcatchment 5S: PR-B.5 Runoff Area=5.020 ac 38.00% Impervious Runoff Depth=3.16"
Flow Length=1,110' Slope=0.0050 '/' Tc=23.2 min CN=83 Runoff=14.47 cfs 1.320 af

Subcatchment 6S: BASIN A Subcatch Runoff Area=15.650 ac 0.00% Impervious Runoff Depth=2.35"
Flow Length=2,250' Tc=37.9 min CN=74 Runoff=25.58 cfs 3.063 af

Subcatchment 9S.1: OS-1 Runoff Area=20.350 ac 0.00% Impervious Runoff Depth=3.25"
Flow Length=2,575' Slope=0.0020 '/' Tc=122.3 min CN=84 Runoff=21.49 cfs 5.515 af

Subcatchment 9S.2: EX-1 Runoff Area=8.720 ac 38.00% Impervious Runoff Depth=3.16"
Flow Length=2,575' Slope=0.0020 '/' Tc=122.3 min CN=83 Runoff=8.94 cfs 2.293 af

Subcatchment 11S: PR-B.6 Runoff Area=2.220 ac 38.00% Impervious Runoff Depth=3.16"
Flow Length=460' Slope=0.0050 '/' Tc=10.0 min CN=83 Runoff=8.98 cfs 0.584 af

Subcatchment 12S: PR-B.7 Runoff Area=2.570 ac 38.00% Impervious Runoff Depth=3.16"
Flow Length=735' Slope=0.0050 '/' Tc=18.8 min CN=83 Runoff=8.23 cfs 0.676 af

Subcatchment 13S: PR-B.8 Runoff Area=3.610 ac 38.00% Impervious Runoff Depth=3.16"
Flow Length=760' Slope=0.0050 '/' Tc=19.1 min CN=83 Runoff=11.49 cfs 0.949 af

Subcatchment 14S: Basin B Subcatch Runoff Area=3.950 ac 0.00% Impervious Runoff Depth=2.35"
Flow Length=950' Tc=27.9 min CN=74 Runoff=7.67 cfs 0.773 af

Subcatchment 17S.1: OS-2 Runoff Area=7.970 ac 0.00% Impervious Runoff Depth=3.25"
Flow Length=1,500' Slope=0.0010 '/' Tc=154.4 min CN=84 Runoff=7.09 cfs 2.160 af

Subcatchment 17S.2: EX-2 Runoff Area=7.630 ac 38.00% Impervious Runoff Depth=3.16"
Flow Length=1,500' Slope=0.0010 '/' Tc=154.4 min CN=83 Runoff=6.59 cfs 2.007 af

Reach 8R: Culvert Avg. Flow Depth=1.50' Max Vel=3.66 fps Inflow=27.72 cfs 7.416 af
18.0" Round Pipe n=0.012 L=145.0' S=0.0025 '/' Capacity=5.67 cfs Outflow=5.68 cfs 7.416 af

Reach 10R: IMPACT 1 Avg. Flow Depth=1.08' Max Vel=2.00 fps Inflow=36.10 cfs 15.224 af
n=0.025 L=1,550.0' S=0.0016 '/' Capacity=297.44 cfs Outflow=35.58 cfs 15.217 af

Reach 16R: IMPACT 2 Avg. Flow Depth=0.80' Max Vel=1.70 fps Inflow=26.86 cfs 2.249 af
n=0.025 L=1,550.0' S=0.0016 '/' Capacity=297.44 cfs Outflow=20.03 cfs 2.249 af

Reach 18R: IMPACT 3 Avg. Flow Depth=0.83' Max Vel=1.81 fps Inflow=13.67 cfs 4.167 af
n=0.025 L=4,770.0' S=0.0019 '/' Capacity=73.10 cfs Outflow=12.13 cfs 4.161 af

Reach 19R: OUTLET PIPE Avg. Flow Depth=1.84' Max Vel=6.12 fps Inflow=45.12 cfs 21.627 af
72.0" Round Pipe n=0.025 L=200.0' S=0.0100 '/' Capacity=220.22 cfs Outflow=45.12 cfs 21.627 af

Pond 7P: BASIN A Peak Elev=1,352.34' Storage=2.741 af Inflow=67.48 cfs 7.431 af
Outflow=27.72 cfs 7.416 af

Pond 15P: Basin B Peak Elev=1,349.13' Storage=0.644 af Inflow=32.12 cfs 2.982 af
Discarded=0.77 cfs 0.733 af Primary=26.86 cfs 2.249 af Outflow=27.63 cfs 2.982 af

Total Runoff Area = 89.280 ac Runoff Volume = 22.388 af Average Runoff Depth = 3.01"
82.40% Pervious = 73.563 ac 17.60% Impervious = 15.717 ac

Summary for Subcatchment 1S: PR-B.1

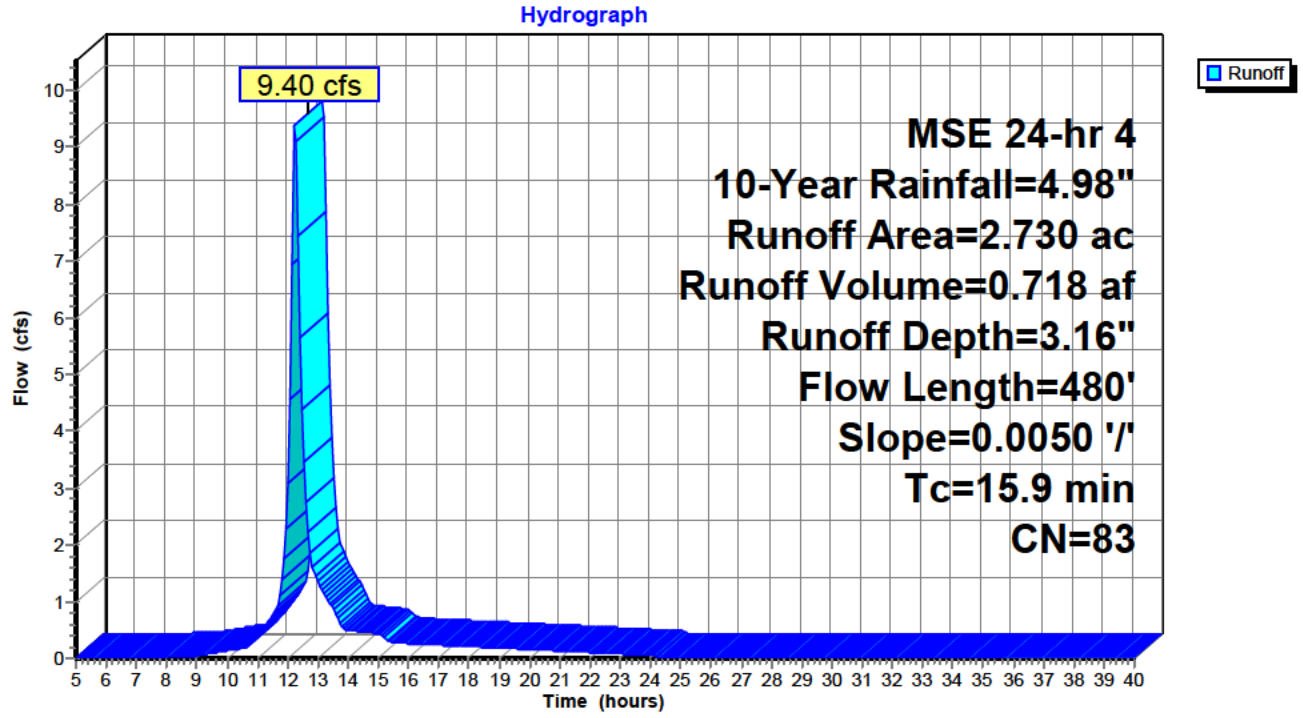
Runoff = 9.40 cfs @ 12.24 hrs, Volume= 0.718 af, Depth= 3.16"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
2.730	83	1/4 acre lots, 38% imp, HSG C
1.693		62.00% Pervious Area
1.037		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
4.9	420	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
15.9	480	Total			

Subcatchment 1S: PR-B.1



Summary for Subcatchment 2S: PR-B.2

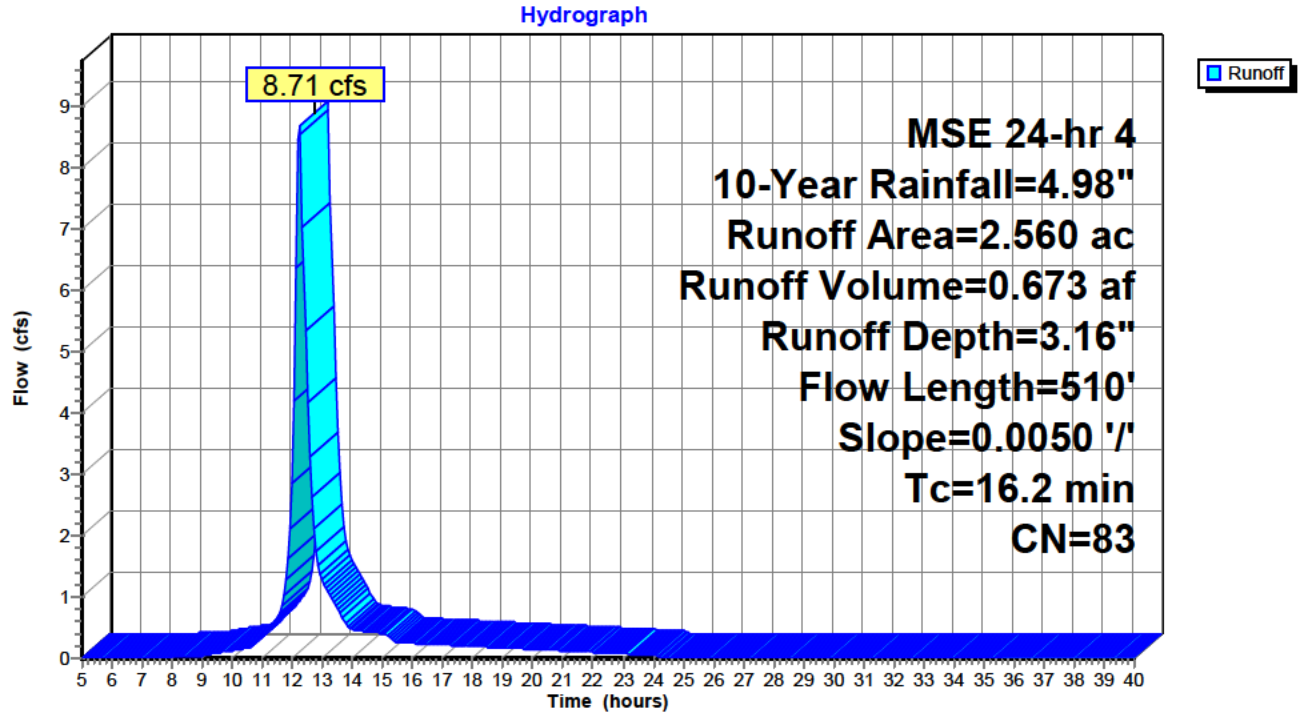
Runoff = 8.71 cfs @ 12.25 hrs, Volume= 0.673 af, Depth= 3.16"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
2.560	83	1/4 acre lots, 38% imp, HSG C
1.587		62.00% Pervious Area
0.973		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
5.2	450	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
16.2	510	Total			

Subcatchment 2S: PR-B.2



Summary for Subcatchment 3S: PR-B.3

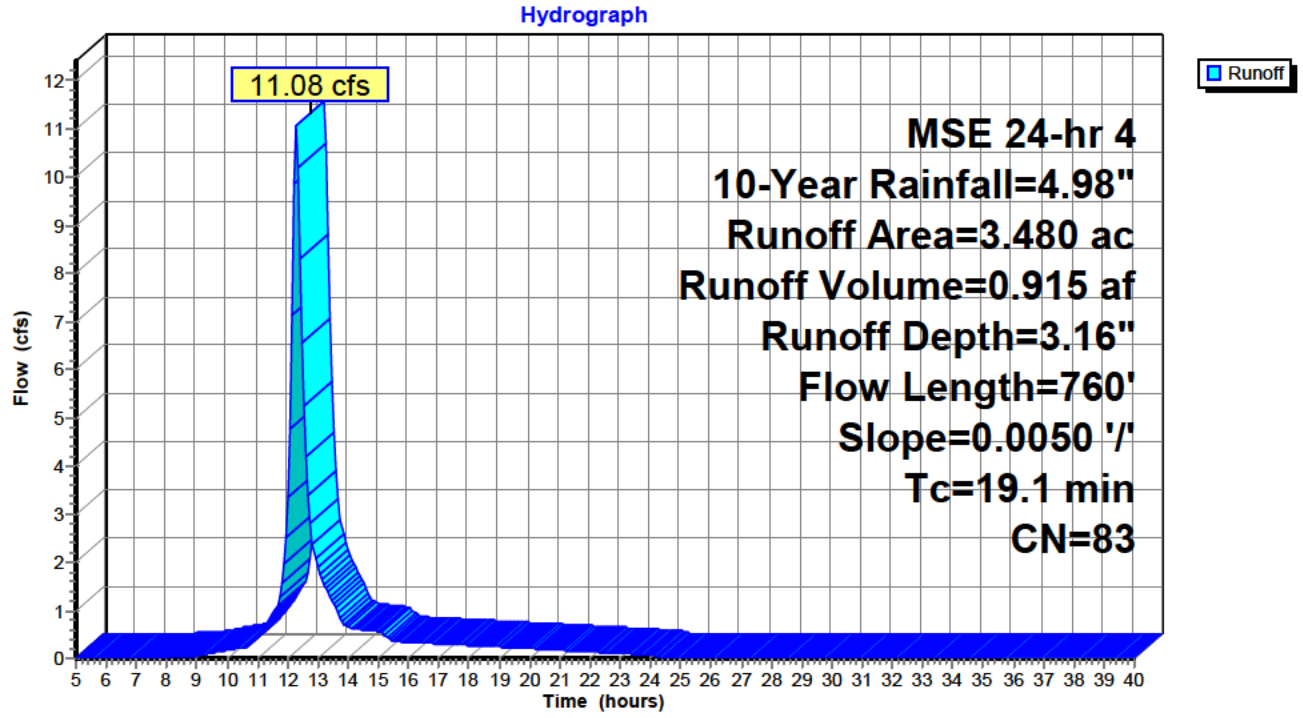
Runoff = 11.08 cfs @ 12.29 hrs, Volume= 0.915 af, Depth= 3.16"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
3.480	83	1/4 acre lots, 38% imp, HSG C
2.158		62.00% Pervious Area
1.322		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
8.1	700	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
19.1	760	Total			

Subcatchment 3S: PR-B.3



Summary for Subcatchment 4S: PR-B.4

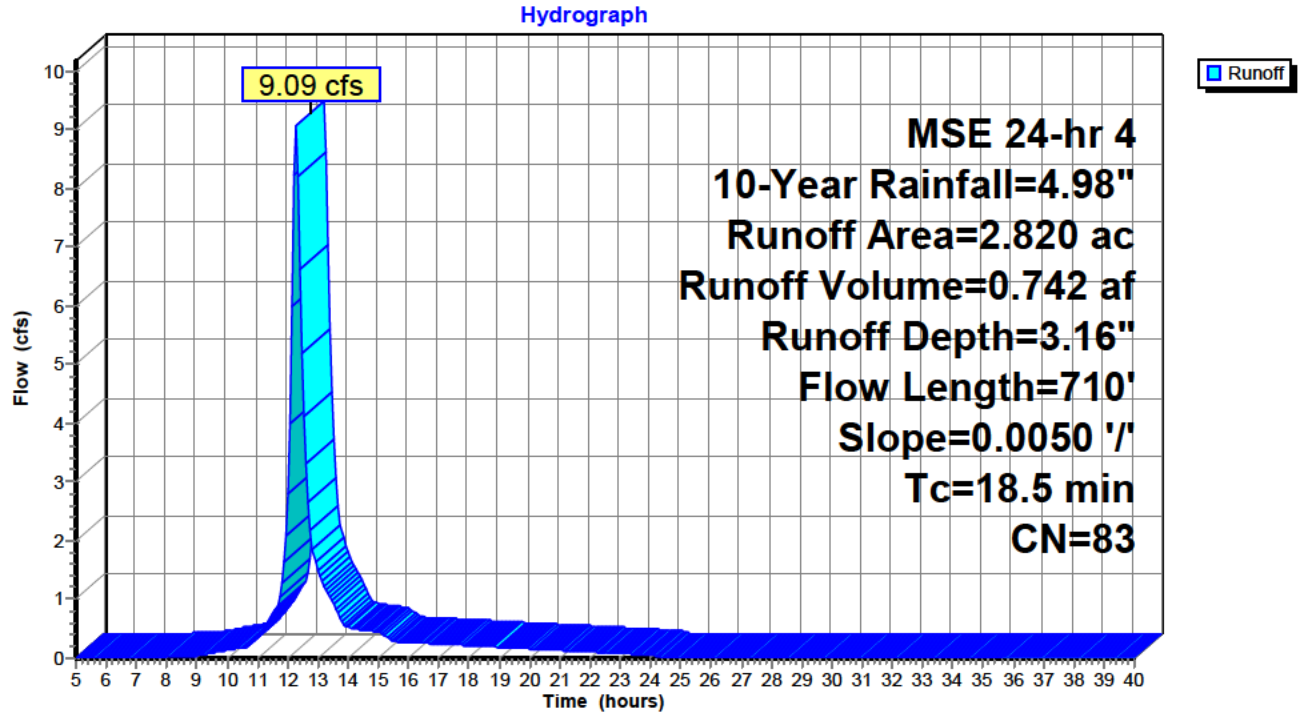
Runoff = 9.09 cfs @ 12.28 hrs, Volume= 0.742 af, Depth= 3.16"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
2.820	83	1/4 acre lots, 38% imp, HSG C
1.748		62.00% Pervious Area
1.072		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
7.5	650	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
18.5	710	Total			

Subcatchment 4S: PR-B.4



Summary for Subcatchment 5S: PR-B.5

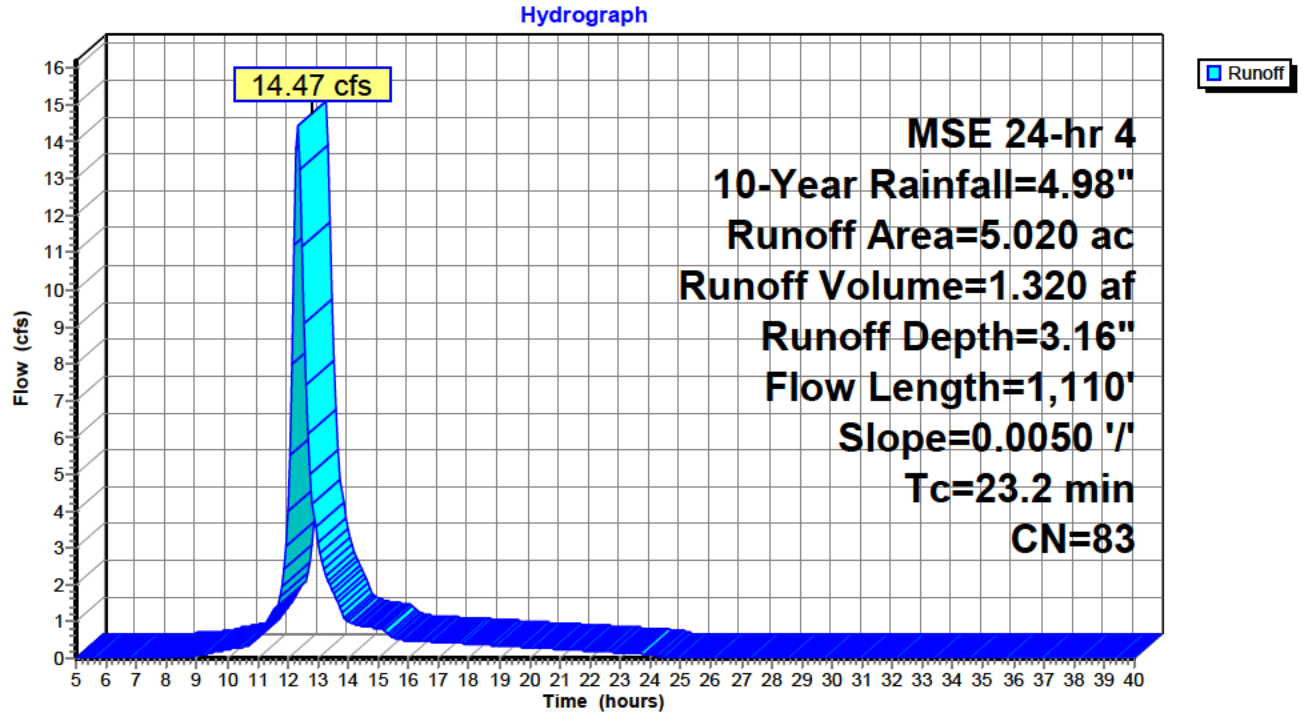
Runoff = 14.47 cfs @ 12.34 hrs, Volume= 1.320 af, Depth= 3.16"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
5.020	83	1/4 acre lots, 38% imp, HSG C
3.112		62.00% Pervious Area
1.908		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
12.2	1,050	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
23.2	1,110	Total			

Subcatchment 5S: PR-B.5



Summary for Subcatchment 6S: BASIN A Subcatch

[47] Hint: Peak is 291% of capacity of segment #4

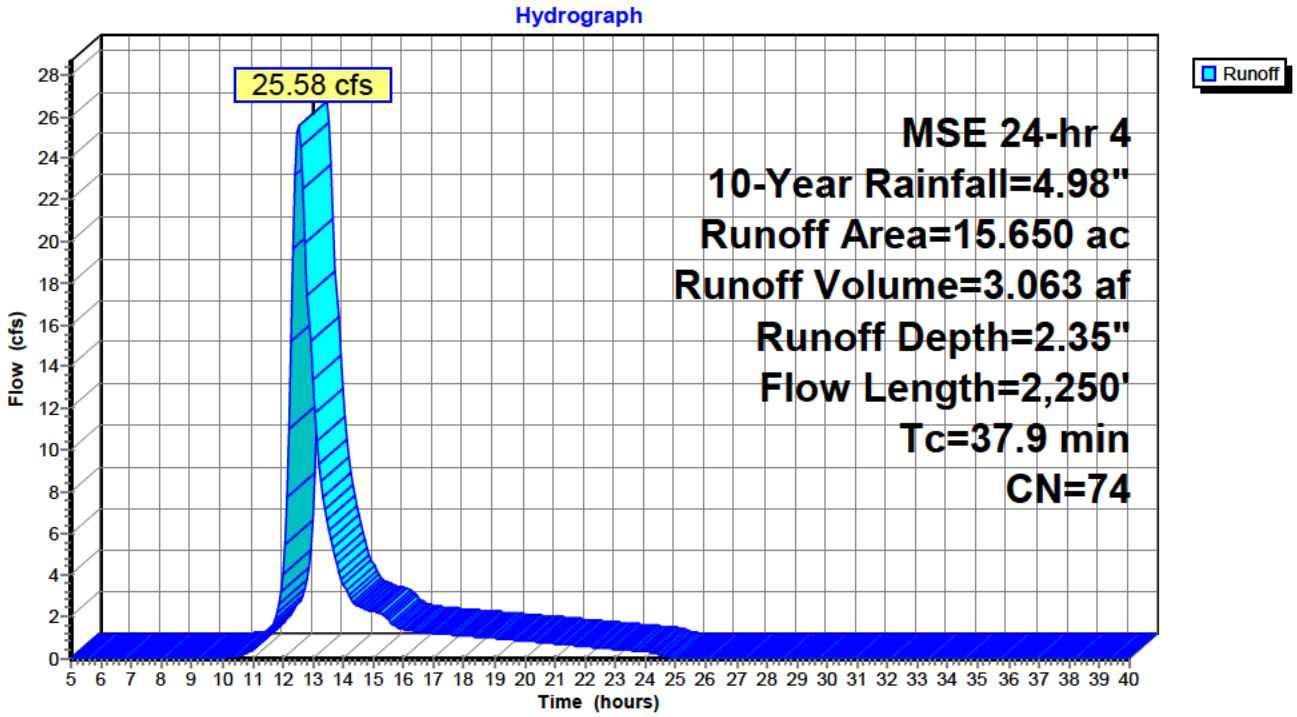
Runoff = 25.58 cfs @ 12.54 hrs, Volume= 3.063 af, Depth= 2.35"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
15.650	74	>75% Grass cover, Good, HSG C
15.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0050	0.10		**Sheet Flow, SHEETING (BACKYARDS)** Grass: Short n= 0.150 P2= 3.38"
19.3	1,100	0.0040	0.95		**Shallow Concentrated Flow, SHALLOW DITCH** Grassed Waterway Kv= 15.0 fps
0.8	750		15.01		**Lake or Reservoir, BASIN AREA** Mean Depth= 7.00'
0.7	200	0.0050	4.97	8.78	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
0.5	100	0.0010	3.09	139.23	**Channel Flow, LINED CHANNEL** Area= 45.0 sf Perim= 38.0' r= 1.18' n= 0.017 Concrete, unfinished
37.9	2,250	Total			

Subcatchment 6S: BASIN A Subcatch



Summary for Subcatchment 9S.1: OS-1

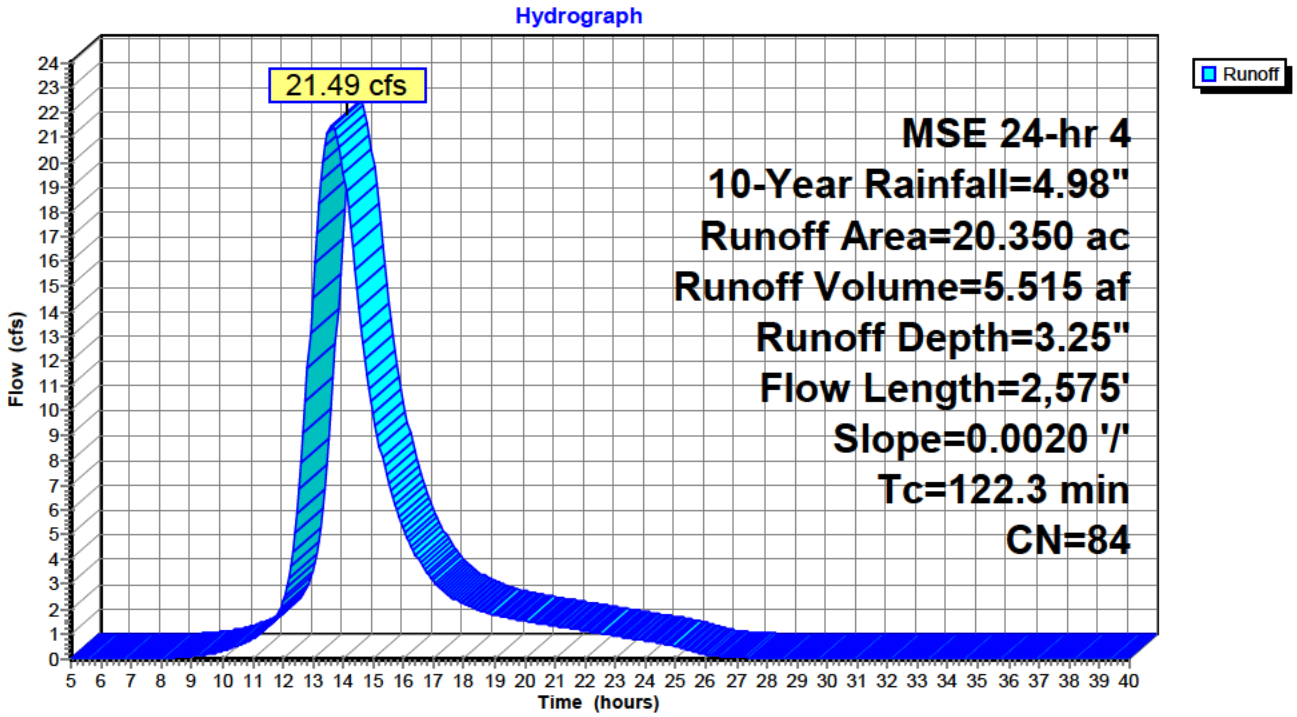
Runoff = 21.49 cfs @ 13.65 hrs, Volume= 5.515 af, Depth= 3.25"
Routed to Reach 10R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
20.250	84	Small grain, SR + CR, Good, HSG D
0.100	96	Gravel surface, HSG D
20.350	84	Weighted Average
20.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.8	1,250	0.0020	0.40		**Shallow Concentrated Flow, Backyard and Open Space Flow** Cultivated Straight Rows Kv= 9.0 fps
70.5	1,325	0.0020	0.31		**Shallow Concentrated Flow, Backyard Flow** Short Grass Pasture Kv= 7.0 fps
122.3	2,575	Total			

Subcatchment 9S.1: OS-1



Summary for Subcatchment 9S.2: EX-1

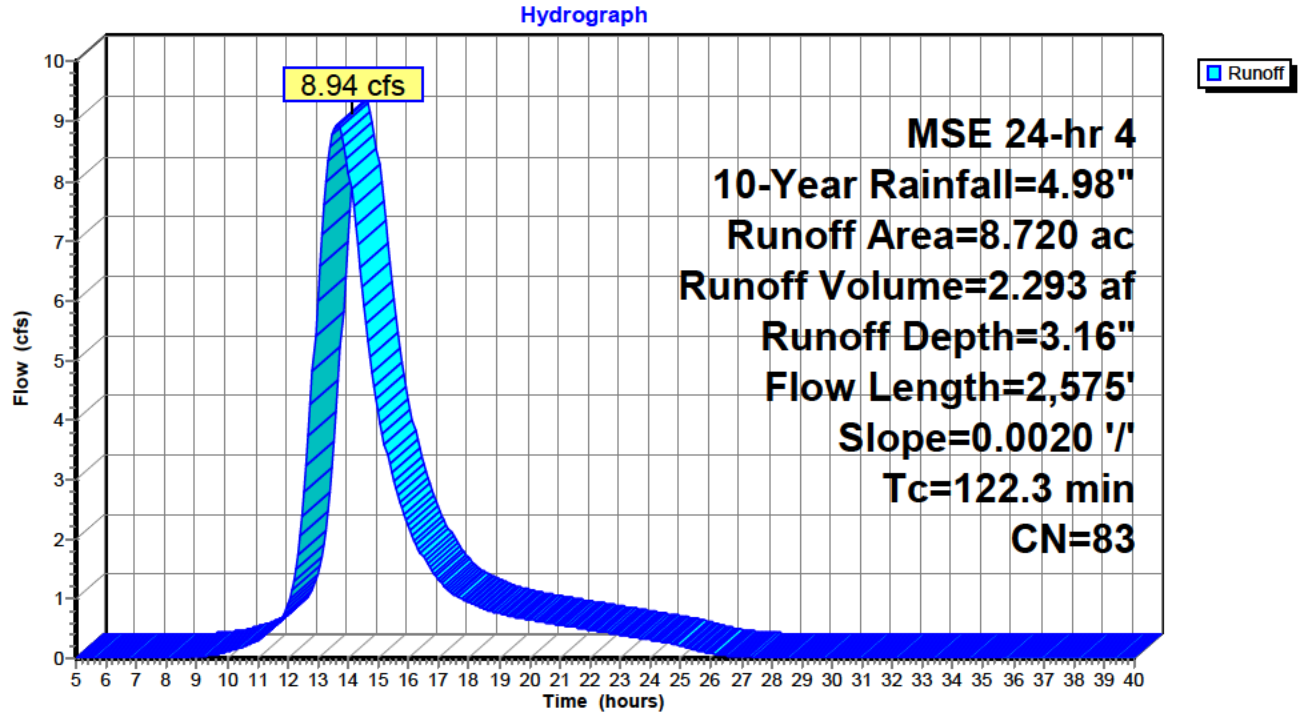
Runoff = 8.94 cfs @ 13.65 hrs, Volume= 2.293 af, Depth= 3.16"
Routed to Reach 10R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
8.720	83	1/4 acre lots, 38% imp, HSG C
5.406		62.00% Pervious Area
3.314		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.8	1,250	0.0020	0.40		**Shallow Concentrated Flow, Backyard and Open Space Flow** Cultivated Straight Rows Kv= 9.0 fps
70.5	1,325	0.0020	0.31		**Shallow Concentrated Flow, Backyard Flow** Short Grass Pasture Kv= 7.0 fps
122.3	2,575	Total			

Subcatchment 9S.2: EX-1



Summary for Subcatchment 11S: PR-B.6

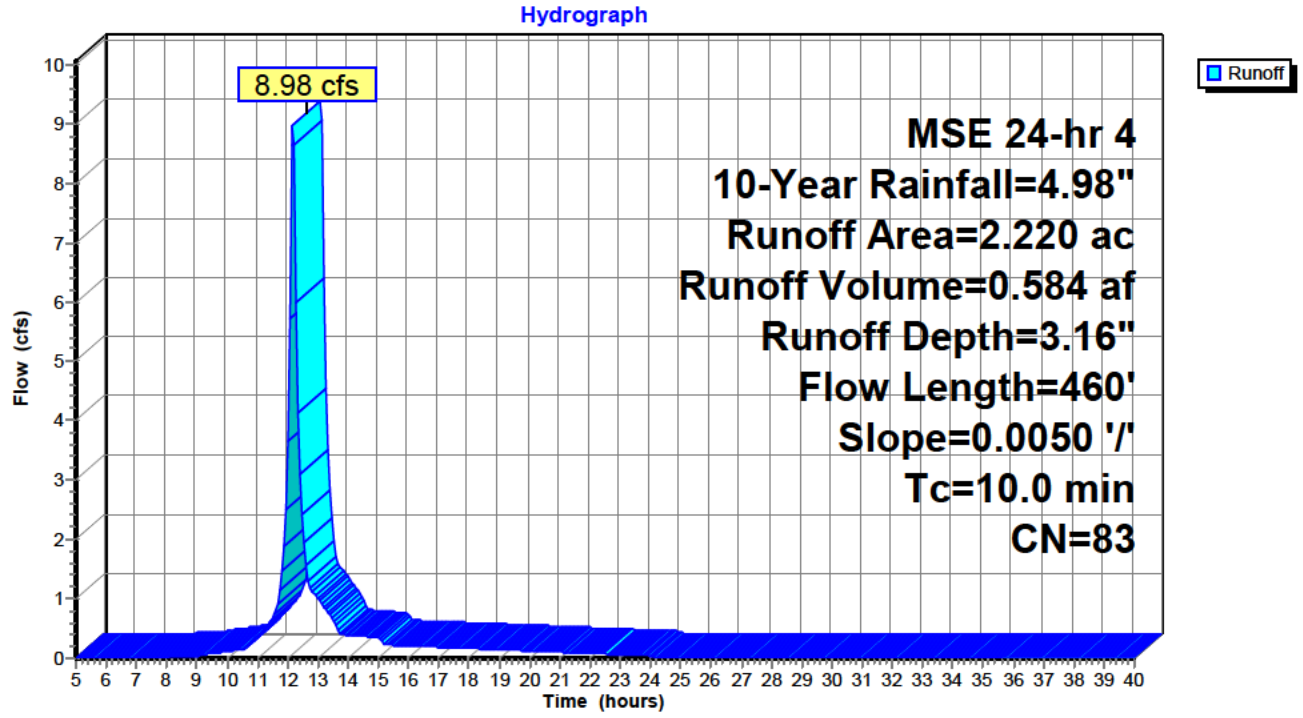
Runoff = 8.98 cfs @ 12.18 hrs, Volume= 0.584 af, Depth= 3.16"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
2.220	83	1/4 acre lots, 38% imp, HSG C
1.376		62.00% Pervious Area
0.844		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	10	0.0050	0.06		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
5.2	450	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
7.8	460	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 11S: PR-B.6



Summary for Subcatchment 12S: PR-B.7

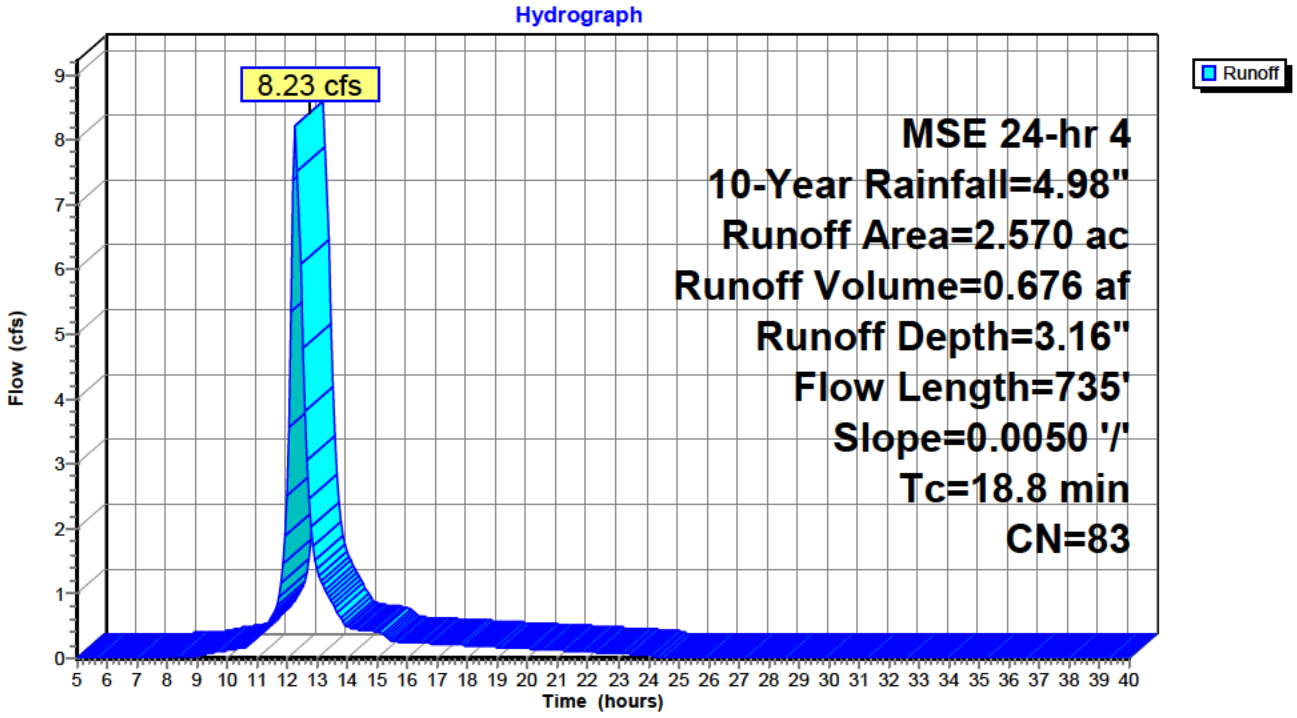
Runoff = 8.23 cfs @ 12.28 hrs, Volume= 0.676 af, Depth= 3.16"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
2.570	83	1/4 acre lots, 38% imp, HSG C
1.593		62.00% Pervious Area
0.977		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
7.8	675	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
18.8	735	Total			

Subcatchment 12S: PR-B.7



Summary for Subcatchment 13S: PR-B.8

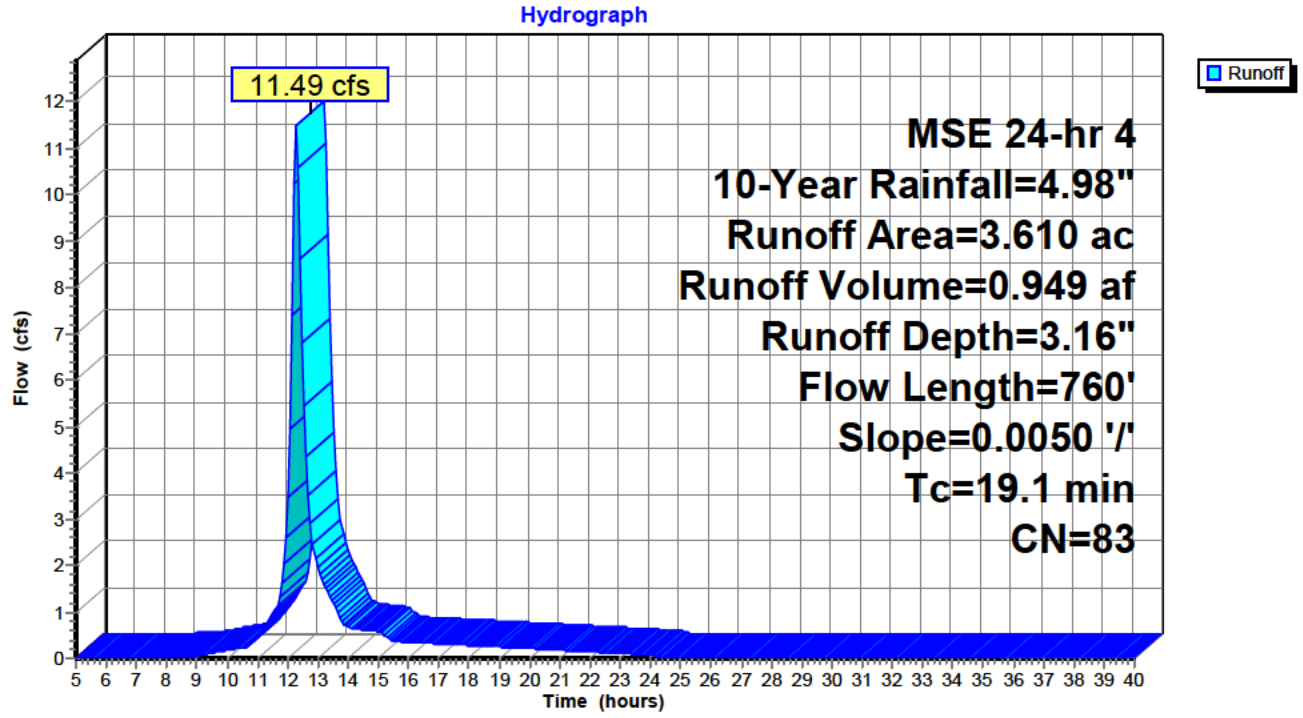
Runoff = 11.49 cfs @ 12.29 hrs, Volume= 0.949 af, Depth= 3.16"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
3.610	83	1/4 acre lots, 38% imp, HSG C
2.238		62.00% Pervious Area
1.372		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
8.1	700	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
19.1	760	Total			

Subcatchment 13S: PR-B.8



Summary for Subcatchment 14S: Basin B Subcatch

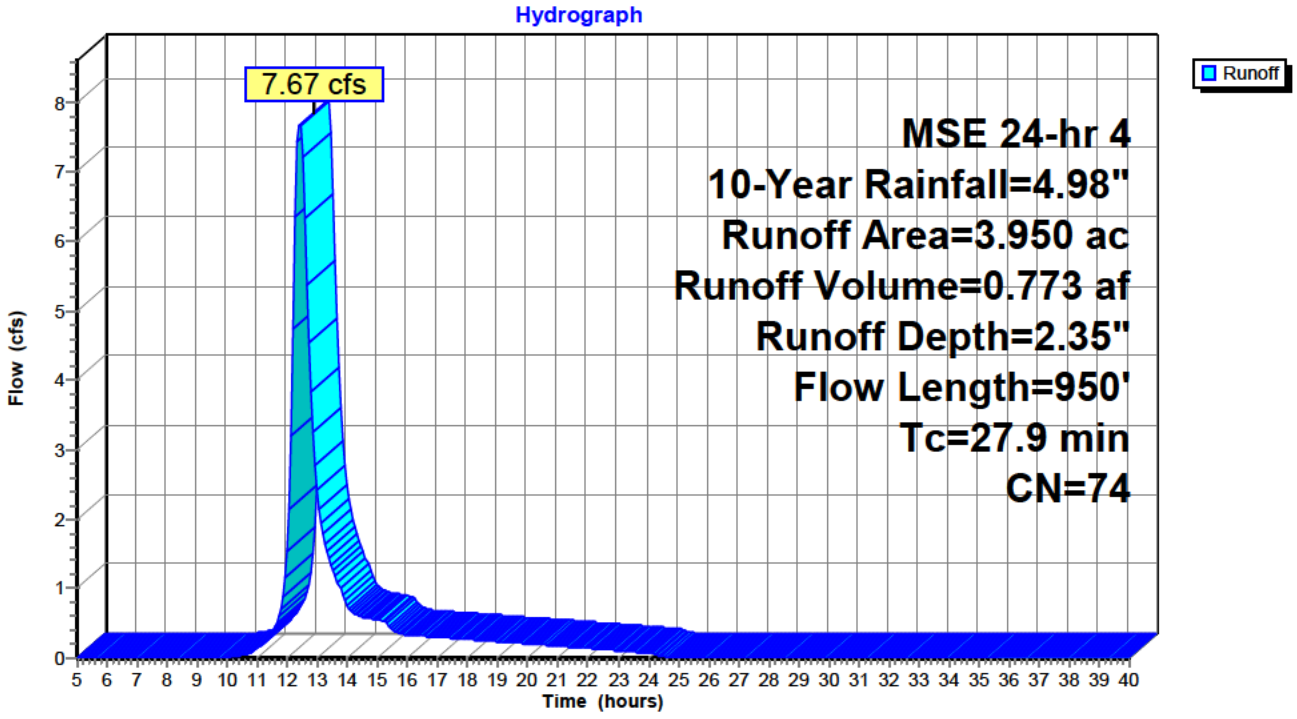
Runoff = 7.67 cfs @ 12.41 hrs, Volume= 0.773 af, Depth= 2.35"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
3.950	74	>75% Grass cover, Good, HSG C
3.950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0050	0.10		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
9.4	600	0.0050	1.06		**Shallow Concentrated Flow, DITCH FLOW** Grassed Waterway Kv= 15.0 fps
0.4	200		8.02		**Lake or Reservoir, Basin Area** Mean Depth= 2.00'
1.5	50	0.0020	0.56	11.24	**Channel Flow, CHANNEL OUTFALL** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.150 Sheet flow over Short Grass
27.9	950	Total			

Subcatchment 14S: Basin B Subcatch



Summary for Subcatchment 17S.1: OS-2

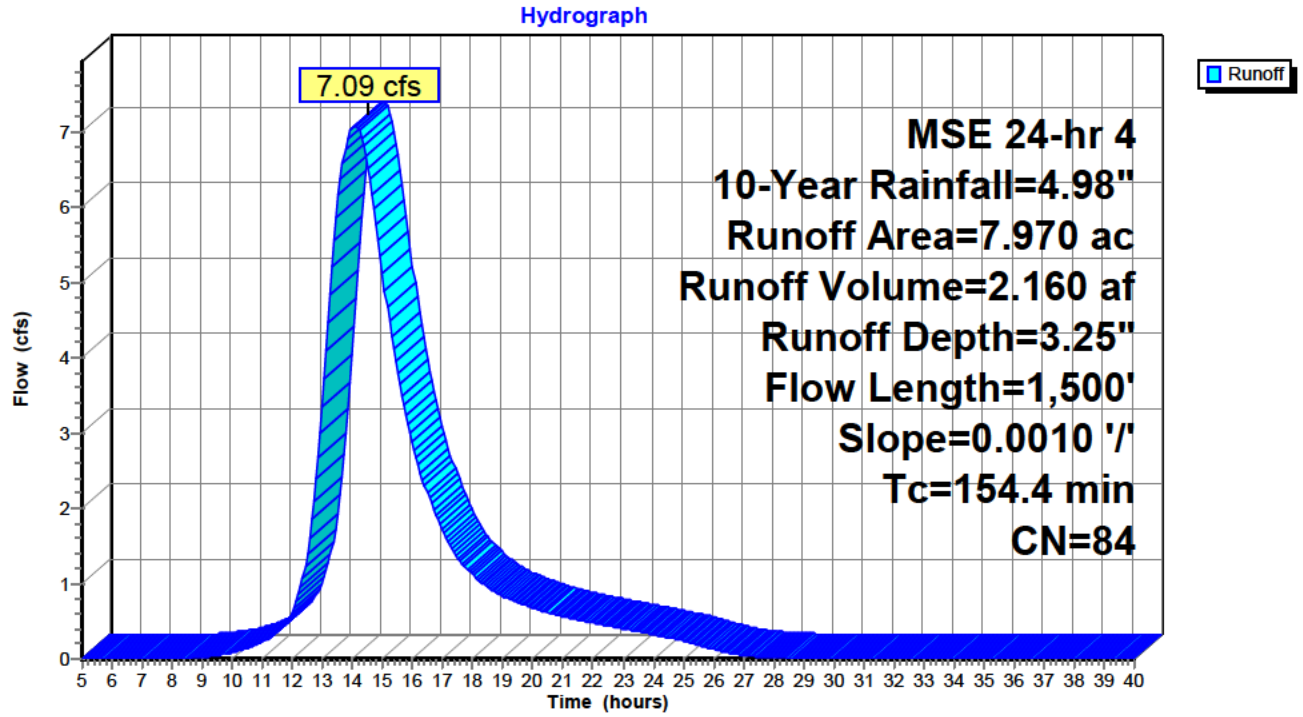
Runoff = 7.09 cfs @ 14.06 hrs, Volume= 2.160 af, Depth= 3.25"
Routed to Reach 18R : IMPACT 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
7.970	84	Small grain, SR + CR, Good, HSG D
7.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
84.1	300	0.0010	0.06		**Sheet Flow, Crop Sheeting** Cultivated: Residue>20% n= 0.170 P2= 3.38"
70.3	1,200	0.0010	0.28		**Shallow Concentrated Flow, Crop Shallow Concentrated** Cultivated Straight Rows Kv= 9.0 fps
154.4	1,500	Total			

Subcatchment 17S.1: OS-2



Summary for Subcatchment 17S.2: EX-2

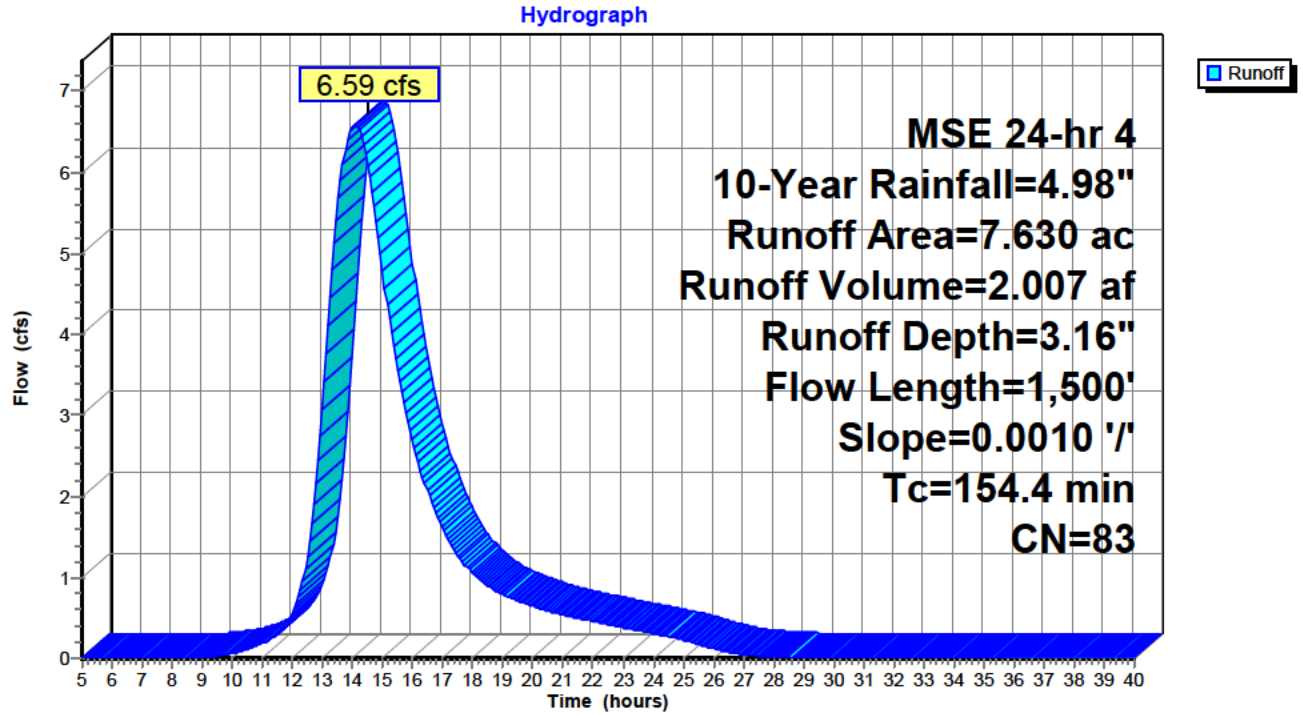
Runoff = 6.59 cfs @ 14.07 hrs, Volume= 2.007 af, Depth= 3.16"
Routed to Reach 18R : IMPACT 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 10-Year Rainfall=4.98"

Area (ac)	CN	Description
7.630	83	1/4 acre lots, 38% imp, HSG C
4.731		62.00% Pervious Area
2.899		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
84.1	300	0.0010	0.06		**Sheet Flow, Crop Sheeting** Cultivated: Residue>20% n= 0.170 P2= 3.38"
70.3	1,200	0.0010	0.28		**Shallow Concentrated Flow, Crop Shallow Concentrated** Cultivated Straight Rows Kv= 9.0 fps
154.4	1,500	Total			

Subcatchment 17S.2: EX-2



Summary for Reach 8R: Culvert

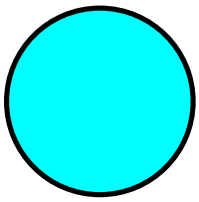
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 489% of Manning's capacity
[76] Warning: Detained 3.289 af (Pond w/culvert advised)
[81] Warning: Exceeded Pond 7P by 0.63' @ 27.26 hrs

Inflow Area = 32.260 ac, 19.57% Impervious, Inflow Depth > 2.76" for 10-Year event
Inflow = 27.72 cfs @ 12.87 hrs, Volume= 7.416 af
Outflow = 5.68 cfs @ 12.21 hrs, Volume= 7.416 af, Atten= 80%, Lag= 0.0 min
Routed to Reach 10R : IMPACT 1

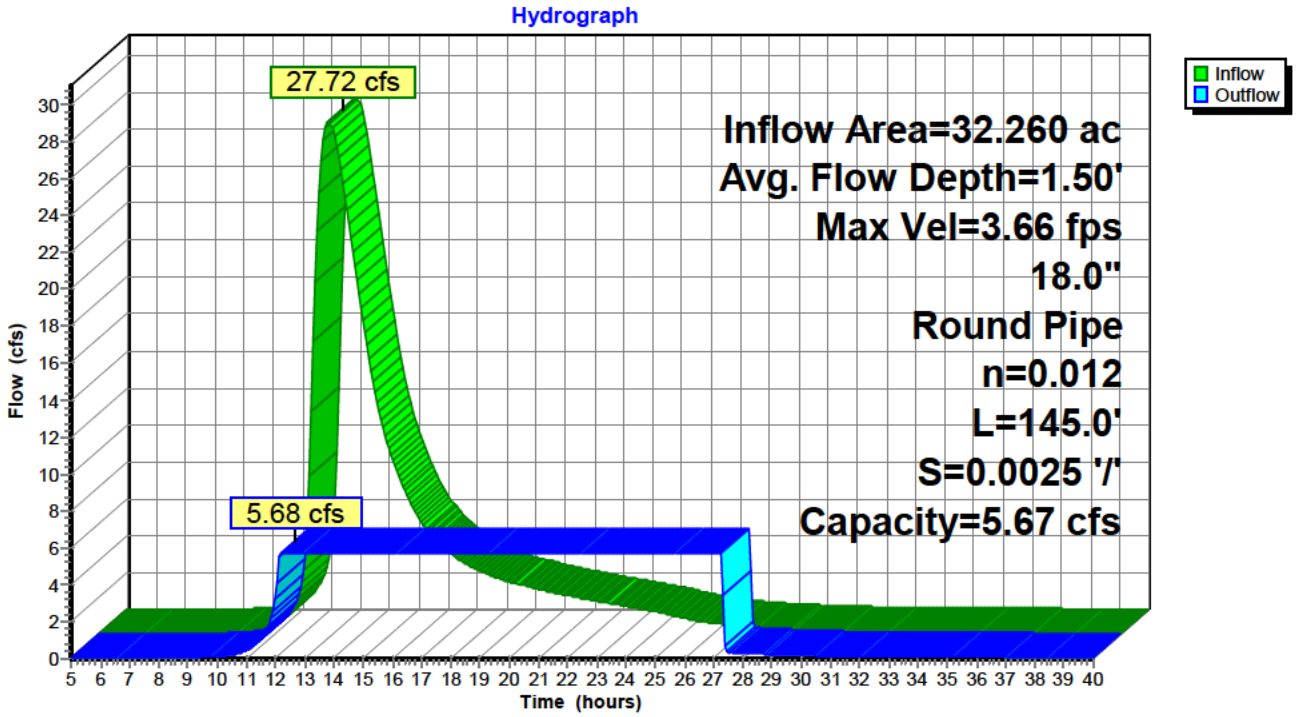
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 3.66 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.16 fps, Avg. Travel Time= 1.1 min

Peak Storage= 256 cf @ 12.21 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 5.67 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 145.0' Slope= 0.0025 '/'
Inlet Invert= 1,350.69', Outlet Invert= 1,350.33'



Reach 8R: Culvert



Summary for Reach 10R: IMPACT 1

Inflow Area = 61.330 ac, 15.69% Impervious, Inflow Depth > 2.98" for 10-Year event
Inflow = 36.10 cfs @ 13.65 hrs, Volume= 15.224 af
Outflow = 35.58 cfs @ 14.01 hrs, Volume= 15.217 af, Atten= 1%, Lag= 21.9 min
Routed to Reach 19R : OUTLET PIPE

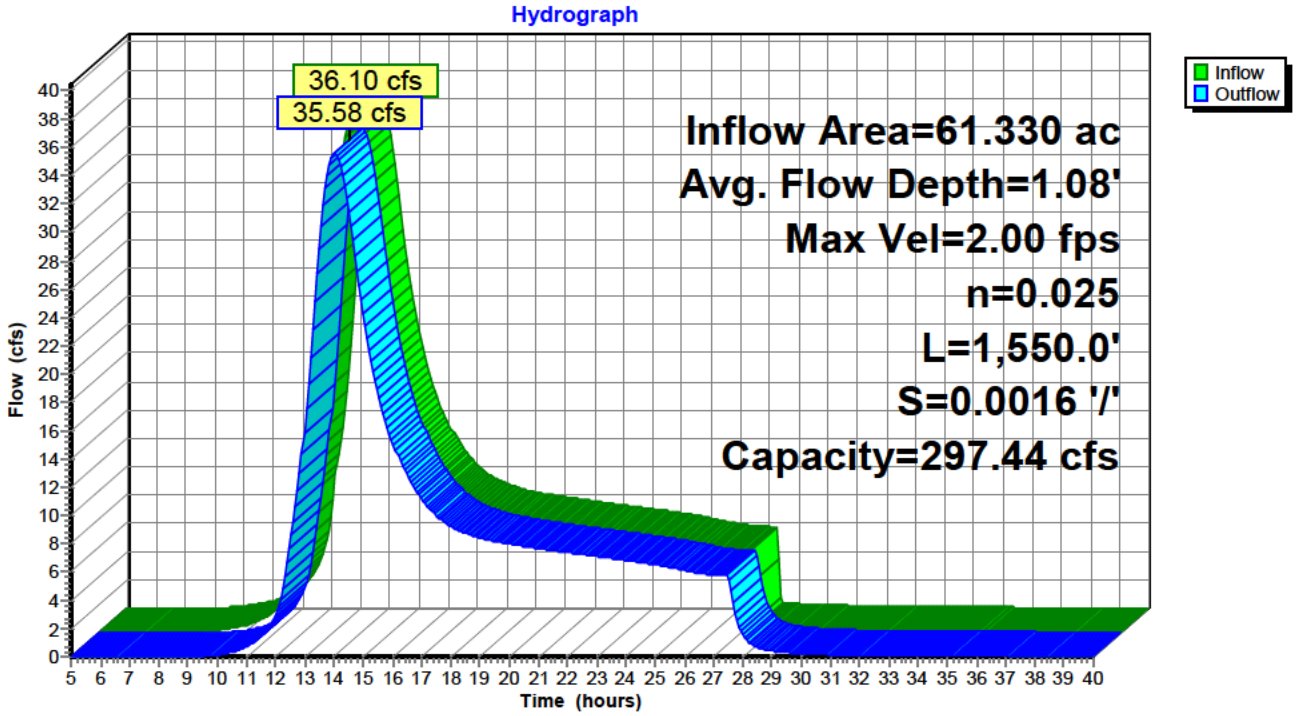
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 2.00 fps, Min. Travel Time= 12.9 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 31.0 min

Peak Storage= 27,541 cf @ 13.80 hrs
Average Depth at Peak Storage= 1.08' , Surface Width= 22.94'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 297.44 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 6.0 '/' Top Width= 46.00'
Length= 1,550.0' Slope= 0.0016 '/'
Inlet Invert= 1,348.50', Outlet Invert= 1,346.00'

‡

Reach 10R: IMPACT 1



Summary for Reach 16R: IMPACT 2

[81] Warning: Exceeded Pond 15P by 0.50' @ 33.14 hrs

Inflow Area = 12.350 ac, 25.85% Impervious, Inflow Depth = 2.19" for 10-Year event
Inflow = 26.86 cfs @ 12.39 hrs, Volume= 2.249 af
Outflow = 20.03 cfs @ 12.85 hrs, Volume= 2.249 af, Atten= 25%, Lag= 27.3 min
Routed to Reach 19R : OUTLET PIPE

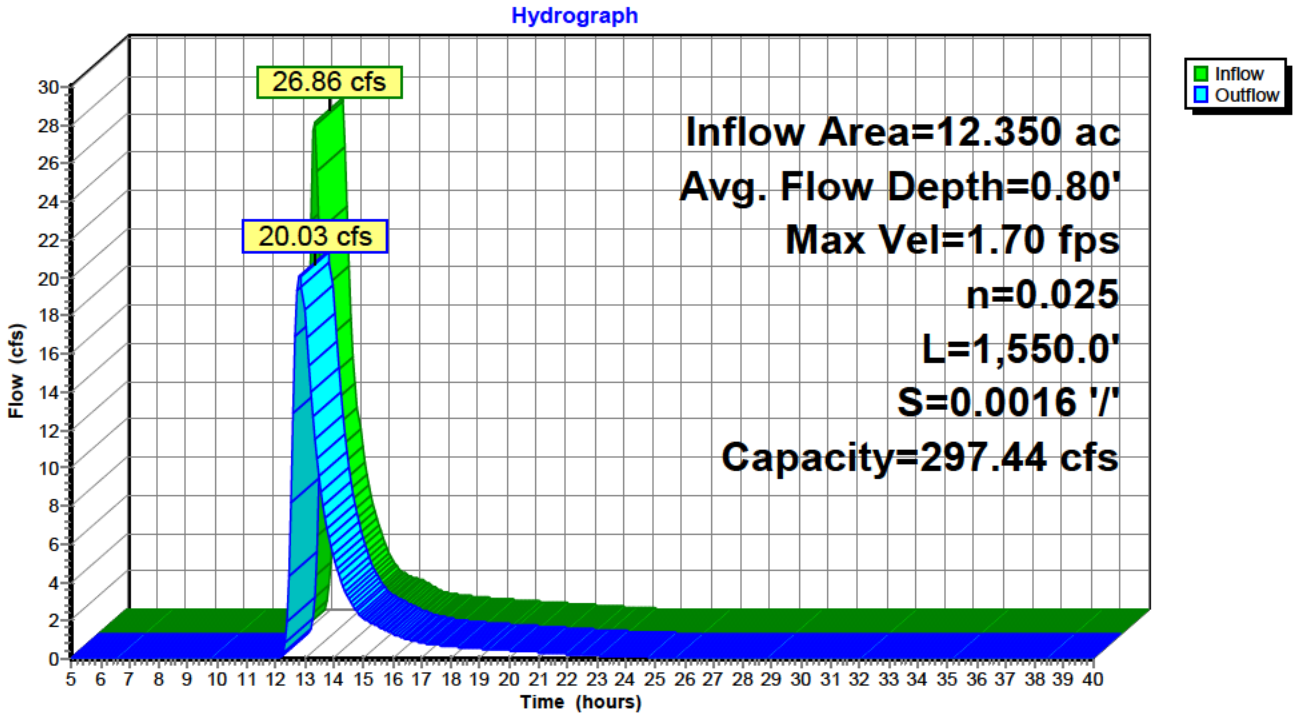
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 1.70 fps, Min. Travel Time= 15.2 min
Avg. Velocity = 0.41 fps, Avg. Travel Time= 62.9 min

Peak Storage= 18,409 cf @ 12.59 hrs
Average Depth at Peak Storage= 0.80' , Surface Width= 19.62'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 297.44 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 6.0 '/' Top Width= 46.00'
Length= 1,550.0' Slope= 0.0016 '/'
Inlet Invert= 1,348.50', Outlet Invert= 1,346.00'

‡

Reach 16R: IMPACT 2



Summary for Reach 18R: IMPACT 3

Inflow Area = 15.600 ac, 18.59% Impervious, Inflow Depth = 3.21" for 10-Year event
Inflow = 13.67 cfs @ 14.07 hrs, Volume= 4.167 af
Outflow = 12.13 cfs @ 15.35 hrs, Volume= 4.161 af, Atten= 11%, Lag= 77.1 min
Routed to Reach 19R : OUTLET PIPE

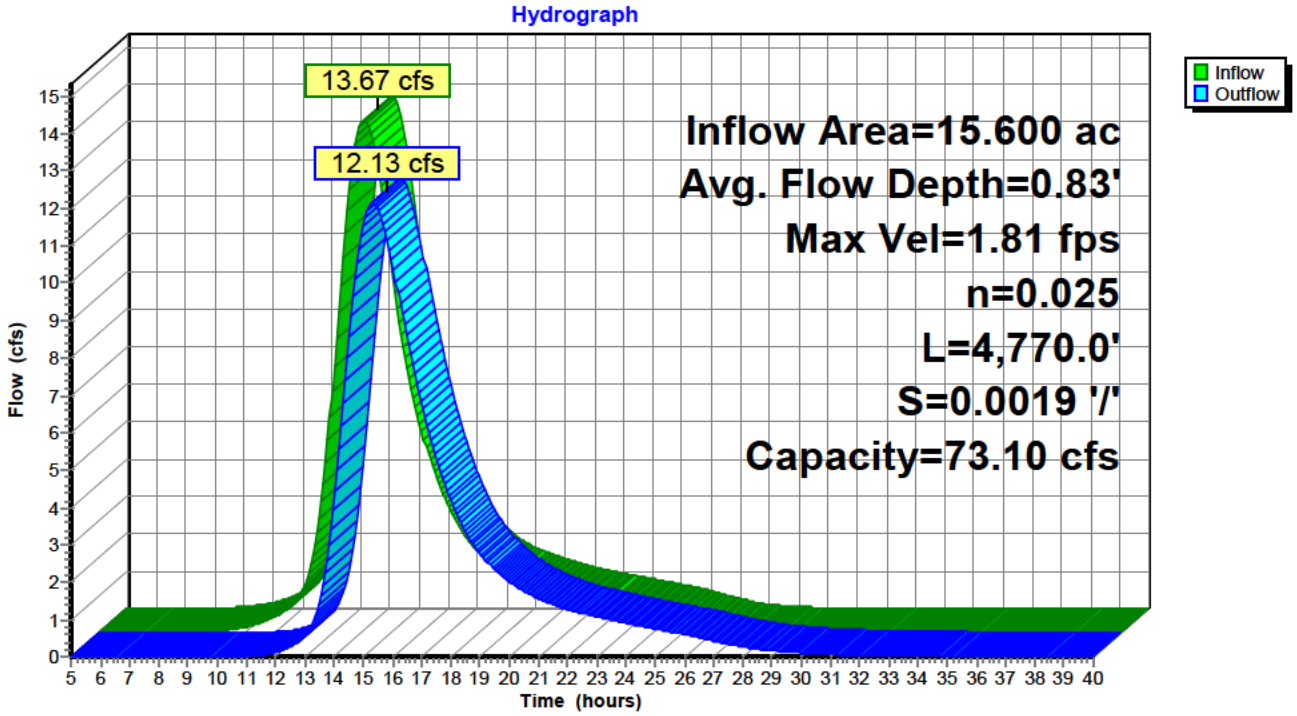
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 1.81 fps, Min. Travel Time= 43.8 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 123.0 min

Peak Storage= 31,912 cf @ 14.62 hrs
Average Depth at Peak Storage= 0.83' , Surface Width= 11.14'
Bank-Full Depth= 2.00' Flow Area= 24.8 sf, Capacity= 73.10 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.7 '/' Top Width= 19.80'
Length= 4,770.0' Slope= 0.0019 '/'
Inlet Invert= 1,355.00', Outlet Invert= 1,346.00'

‡

Reach 18R: IMPACT 3



Summary for Reach 19R: OUTLET PIPE

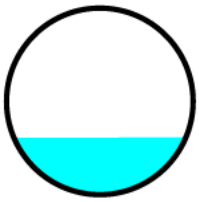
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 10R OUTLET depth by 0.86' @ 14.80 hrs
[62] Hint: Exceeded Reach 16R OUTLET depth by 1.56' @ 14.38 hrs
[62] Hint: Exceeded Reach 18R OUTLET depth by 1.29' @ 12.84 hrs

Inflow Area = 89.280 ac, 17.60% Impervious, Inflow Depth > 2.91" for 10-Year event
Inflow = 45.12 cfs @ 14.09 hrs, Volume= 21.627 af
Outflow = 45.12 cfs @ 14.11 hrs, Volume= 21.627 af, Atten= 0%, Lag= 1.0 min

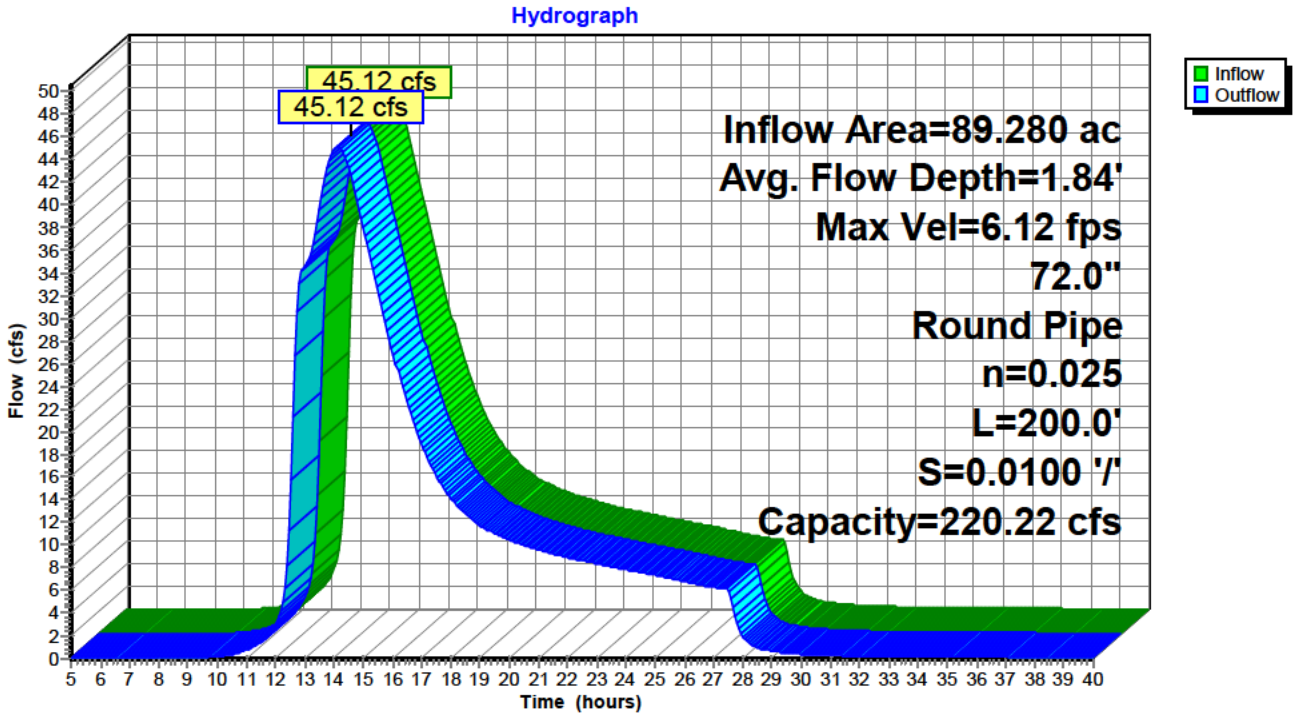
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 6.12 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.74 fps, Avg. Travel Time= 1.2 min

Peak Storage= 1,474 cf @ 14.10 hrs
Average Depth at Peak Storage= 1.84' , Surface Width= 5.54'
Bank-Full Depth= 6.00' Flow Area= 28.3 sf, Capacity= 220.22 cfs

72.0" Round Pipe
n= 0.025 Corrugated metal
Length= 200.0' Slope= 0.0100 '/'
Inlet Invert= 1,346.00', Outlet Invert= 1,344.00'



Reach 19R: OUTLET PIPE



Summary for Pond 7P: BASIN A

Inflow Area = 32.260 ac, 19.57% Impervious, Inflow Depth = 2.76" for 10-Year event
Inflow = 67.48 cfs @ 12.32 hrs, Volume= 7.431 af
Outflow = 27.72 cfs @ 12.87 hrs, Volume= 7.416 af, Atten= 59%, Lag= 33.0 min
Primary = 27.72 cfs @ 12.87 hrs, Volume= 7.416 af
Routed to Reach 8R : Culvert

Routing by Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Peak Elev= 1,352.34' @ 12.87 hrs Surf.Area= 4.512 ac Storage= 2.741 af
Flood Elev= 1,354.50' Surf.Area= 10.869 ac Storage= 15.257 af

Plug-Flow detention time= 102.6 min calculated for 7.416 af (100% of inflow)
Center-of-Mass det. time= 101.3 min (931.6 - 830.3)

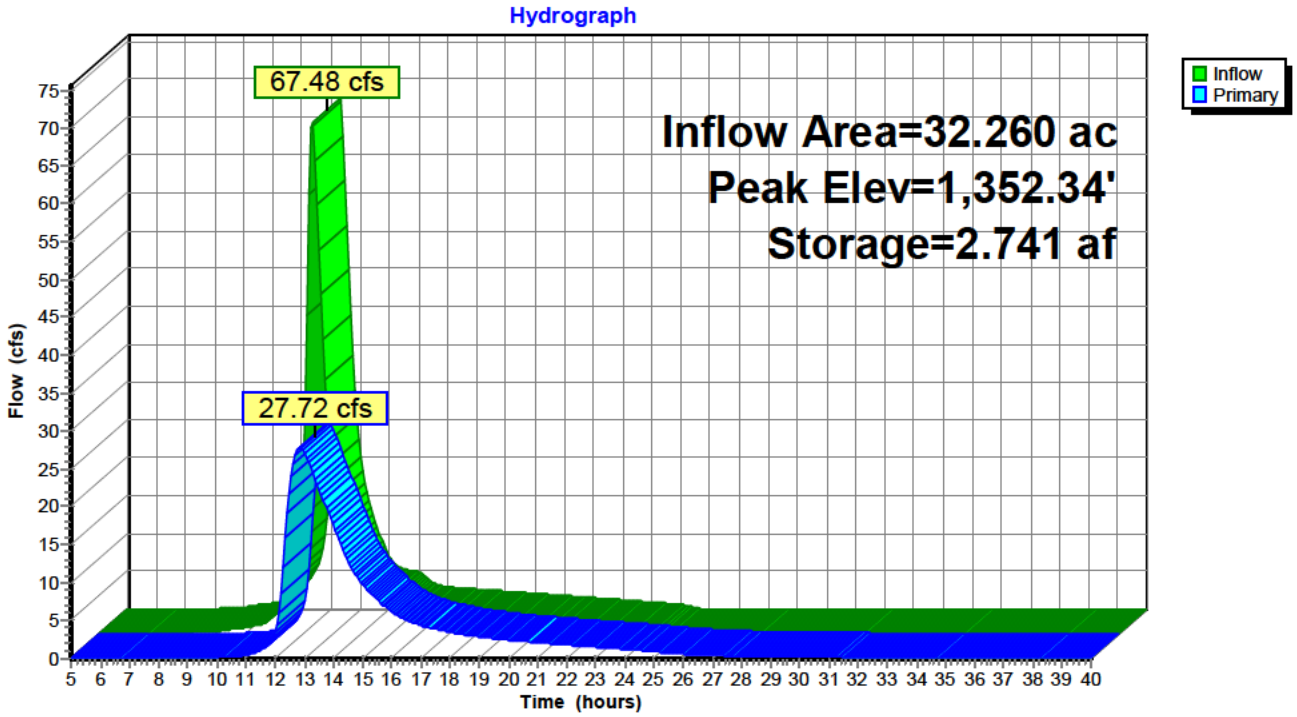
Volume	Invert	Avail.Storage	Storage Description
#1	1,351.50'	15.257 af	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
1,351.50	2.090	0.000	0.000	2.090
1,352.00	3.475	1.377	1.377	3.475
1,353.00	6.880	5.082	6.458	6.880
1,354.00	10.869	8.799	15.257	10.870

Device	Routing	Invert	Outlet Devices
#1	Primary	1,351.50'	**10.0' long + 5.0 '/' SideZ x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=27.69 cfs @ 12.87 hrs HW=1,352.34' TW=1,351.50' (Fixed TW Elev= 1,351.50')
1=Broad-Crested Rectangular Weir (Weir Controls 27.69 cfs @ 2.31 fps)

Pond 7P: BASIN A



Summary for Pond 15P: Basin B

Inflow Area = 12.350 ac, 25.85% Impervious, Inflow Depth = 2.90" for 10-Year event
Inflow = 32.12 cfs @ 12.27 hrs, Volume= 2.982 af
Outflow = 27.63 cfs @ 12.39 hrs, Volume= 2.982 af, Atten= 14%, Lag= 7.5 min
Discarded = 0.77 cfs @ 12.39 hrs, Volume= 0.733 af
Primary = 26.86 cfs @ 12.39 hrs, Volume= 2.249 af
Routed to Reach 16R : IMPACT 2

Routing by Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Peak Elev= 1,349.13' @ 12.39 hrs Surf.Area= 0.917 ac Storage= 0.644 af

Plug-Flow detention time= 79.4 min calculated for 2.976 af (100% of inflow)
Center-of-Mass det. time= 80.2 min (900.6 - 820.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,348.00'	1.012 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

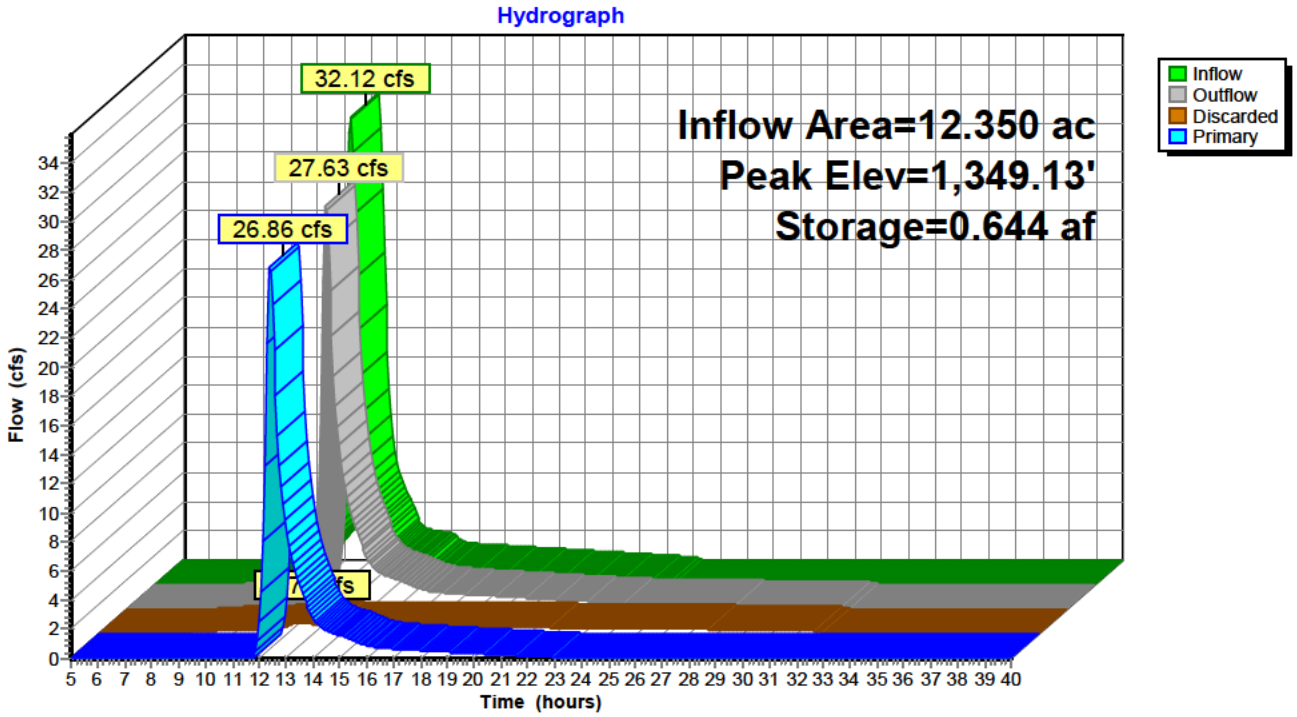
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,348.00	0.250	0.000	0.000
1,348.50	0.500	0.187	0.187
1,349.00	0.850	0.337	0.525
1,349.50	1.100	0.487	1.012

Device	Routing	Invert	Outlet Devices
#1	Primary	1,348.50'	**10.0' long + 10.0 '/' SideZ 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	Discarded	1,348.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 1,342.00'
#3	Primary	1,349.00'	**50.0' long + 10.0 '/' SideZ x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.77 cfs @ 12.39 hrs HW=1,349.13' (Free Discharge)
└**2=Exfiltration** (Controls 0.77 cfs)

Primary OutFlow Max=26.54 cfs @ 12.39 hrs HW=1,349.13' (Free Discharge)
├**1=Broad-Crested Rectangular Weir** (Weir Controls 20.43 cfs @ 1.98 fps)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 6.11 cfs @ 0.90 fps)

Pond 15P: Basin B



Time span=5.00-40.00 hrs, dt=0.07 hrs, 501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PR-B.1 Runoff Area=2.730 ac 38.00% Impervious Runoff Depth=4.12"
Flow Length=480' Slope=0.0050 '/' Tc=15.9 min CN=83 Runoff=12.17 cfs 0.937 af

Subcatchment 2S: PR-B.2 Runoff Area=2.560 ac 38.00% Impervious Runoff Depth=4.12"
Flow Length=510' Slope=0.0050 '/' Tc=16.2 min CN=83 Runoff=11.27 cfs 0.879 af

Subcatchment 3S: PR-B.3 Runoff Area=3.480 ac 38.00% Impervious Runoff Depth=4.12"
Flow Length=760' Slope=0.0050 '/' Tc=19.1 min CN=83 Runoff=14.35 cfs 1.195 af

Subcatchment 4S: PR-B.4 Runoff Area=2.820 ac 38.00% Impervious Runoff Depth=4.12"
Flow Length=710' Slope=0.0050 '/' Tc=18.5 min CN=83 Runoff=11.77 cfs 0.968 af

Subcatchment 5S: PR-B.5 Runoff Area=5.020 ac 38.00% Impervious Runoff Depth=4.12"
Flow Length=1,110' Slope=0.0050 '/' Tc=23.2 min CN=83 Runoff=18.75 cfs 1.723 af

Subcatchment 6S: BASIN A Subcatch Runoff Area=15.650 ac 0.00% Impervious Runoff Depth=3.21"
Flow Length=2,250' Tc=37.9 min CN=74 Runoff=35.19 cfs 4.187 af

Subcatchment 9S.1: OS-1 Runoff Area=20.350 ac 0.00% Impervious Runoff Depth=4.22"
Flow Length=2,575' Slope=0.0020 '/' Tc=122.3 min CN=84 Runoff=27.83 cfs 7.164 af

Subcatchment 9S.2: EX-1 Runoff Area=8.720 ac 38.00% Impervious Runoff Depth=4.12"
Flow Length=2,575' Slope=0.0020 '/' Tc=122.3 min CN=83 Runoff=11.64 cfs 2.993 af

Subcatchment 11S: PR-B.6 Runoff Area=2.220 ac 38.00% Impervious Runoff Depth=4.12"
Flow Length=460' Slope=0.0050 '/' Tc=10.0 min CN=83 Runoff=11.65 cfs 0.762 af

Subcatchment 12S: PR-B.7 Runoff Area=2.570 ac 38.00% Impervious Runoff Depth=4.12"
Flow Length=735' Slope=0.0050 '/' Tc=18.8 min CN=83 Runoff=10.66 cfs 0.882 af

Subcatchment 13S: PR-B.8 Runoff Area=3.610 ac 38.00% Impervious Runoff Depth=4.12"
Flow Length=760' Slope=0.0050 '/' Tc=19.1 min CN=83 Runoff=14.89 cfs 1.239 af

Subcatchment 14S: Basin B Subcatch Runoff Area=3.950 ac 0.00% Impervious Runoff Depth=3.21"
Flow Length=950' Tc=27.9 min CN=74 Runoff=10.55 cfs 1.057 af

Subcatchment 17S.1: OS-2 Runoff Area=7.970 ac 0.00% Impervious Runoff Depth=4.22"
Flow Length=1,500' Slope=0.0010 '/' Tc=154.4 min CN=84 Runoff=9.19 cfs 2.806 af

Subcatchment 17S.2: EX-2 Runoff Area=7.630 ac 38.00% Impervious Runoff Depth=4.12"
Flow Length=1,500' Slope=0.0010 '/' Tc=154.4 min CN=83 Runoff=8.59 cfs 2.619 af

Reach 8R: Culvert Avg. Flow Depth=1.50' Max Vel=3.66 fps Inflow=38.64 cfs 9.872 af
18.0" Round Pipe n=0.012 L=145.0' S=0.0025 '/' Capacity=5.67 cfs Outflow=5.68 cfs 9.873 af

Reach 10R: IMPACT 1 Avg. Flow Depth=1.21' Max Vel=2.13 fps Inflow=45.14 cfs 20.030 af
n=0.025 L=1,550.0' S=0.0016 '/' Capacity=297.44 cfs Outflow=44.56 cfs 20.023 af

Reach 16R: IMPACT 2 Avg. Flow Depth=0.98' Max Vel=1.90 fps Inflow=37.92 cfs 3.157 af
n=0.025 L=1,550.0' S=0.0016 '/' Capacity=297.44 cfs Outflow=29.57 cfs 3.157 af

Reach 18R: IMPACT 3 Avg. Flow Depth=0.96' Max Vel=1.96 fps Inflow=17.78 cfs 5.425 af
n=0.025 L=4,770.0' S=0.0019 '/' Capacity=73.10 cfs Outflow=16.01 cfs 5.419 af

Reach 19R: OUTLET PIPE Avg. Flow Depth=2.09' Max Vel=6.56 fps Inflow=57.61 cfs 28.599 af
72.0" Round Pipe n=0.025 L=200.0' S=0.0100 '/' Capacity=220.22 cfs Outflow=57.61 cfs 28.599 af

Pond 7P: BASIN A Peak Elev=1,352.52' Storage=3.577 af Inflow=90.06 cfs 9.888 af
Outflow=38.64 cfs 9.872 af

Pond 15P: Basin B Peak Elev=1,349.21' Storage=0.716 af Inflow=42.19 cfs 3.940 af
Discarded=0.81 cfs 0.783 af Primary=37.92 cfs 3.157 af Outflow=38.72 cfs 3.940 af

Total Runoff Area = 89.280 ac Runoff Volume = 29.411 af Average Runoff Depth = 3.95"
82.40% Pervious = 73.563 ac 17.60% Impervious = 15.717 ac

Summary for Subcatchment 1S: PR-B.1

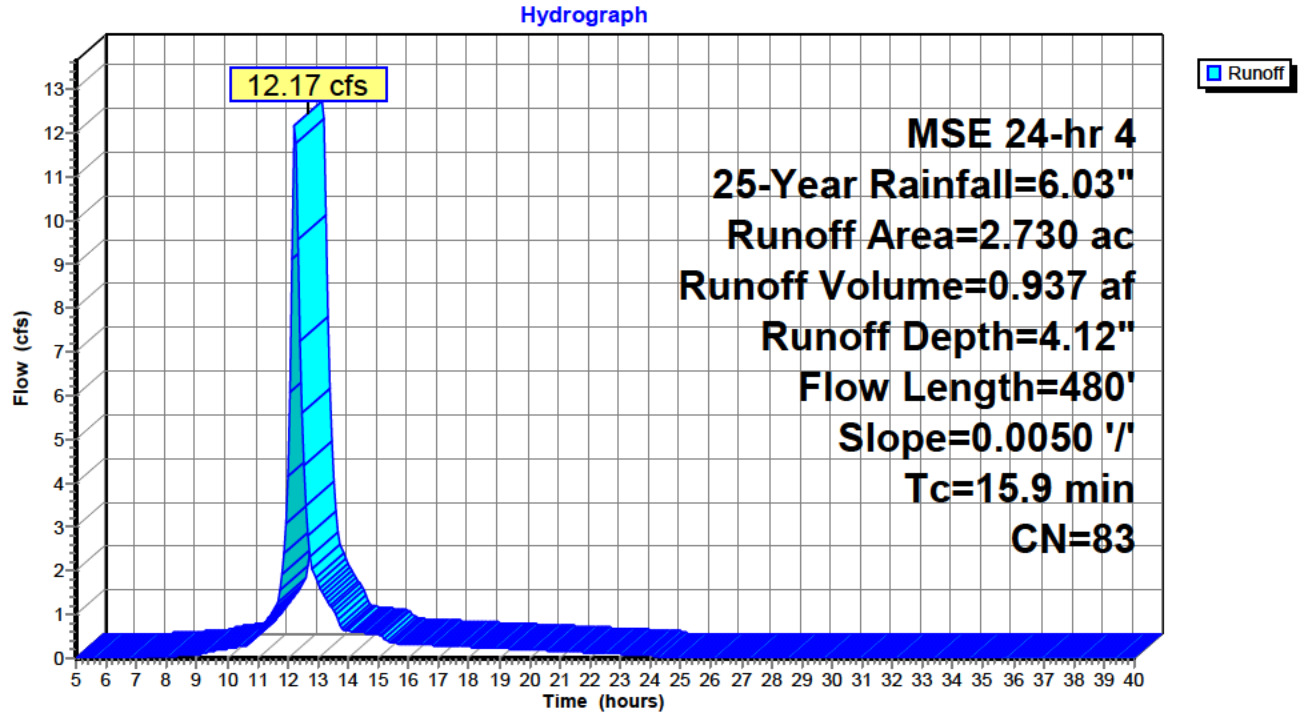
Runoff = 12.17 cfs @ 12.24 hrs, Volume= 0.937 af, Depth= 4.12"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
2.730	83	1/4 acre lots, 38% imp, HSG C
1.693		62.00% Pervious Area
1.037		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
4.9	420	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
15.9	480	Total			

Subcatchment 1S: PR-B.1



Summary for Subcatchment 2S: PR-B.2

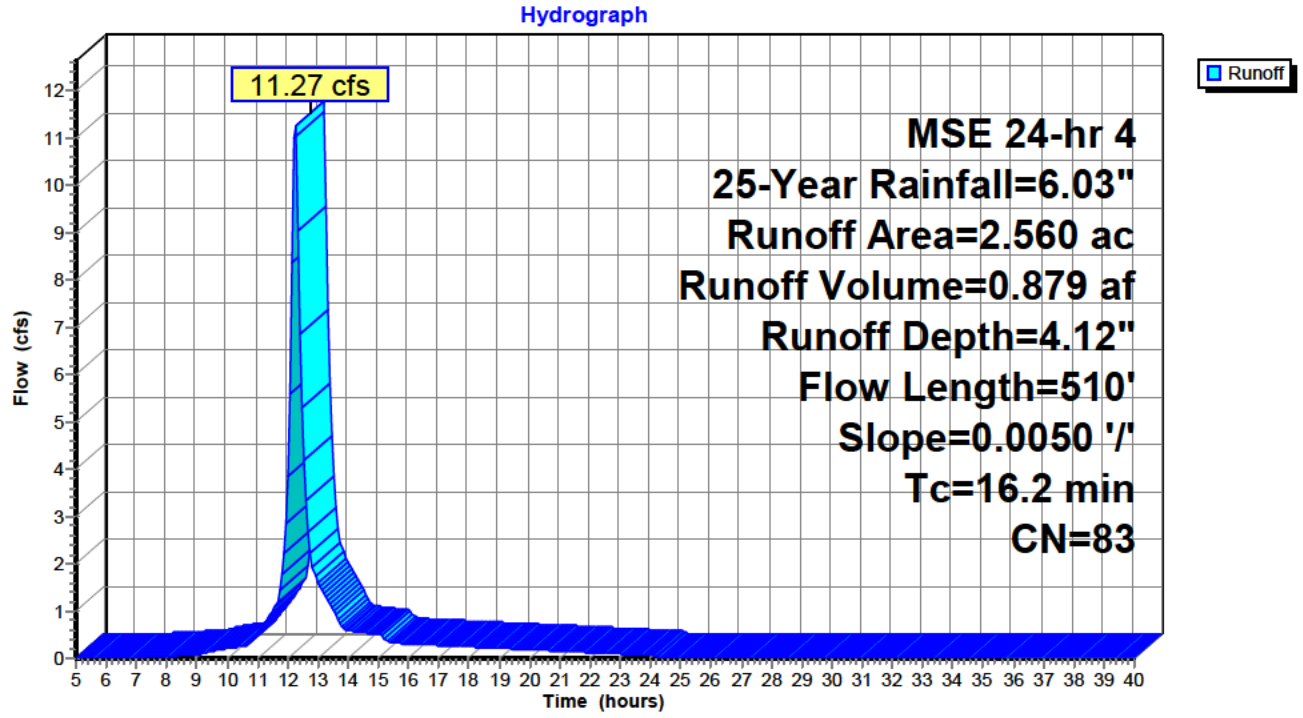
Runoff = 11.27 cfs @ 12.25 hrs, Volume= 0.879 af, Depth= 4.12"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
2.560	83	1/4 acre lots, 38% imp, HSG C
1.587		62.00% Pervious Area
0.973		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
5.2	450	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
16.2	510	Total			

Subcatchment 2S: PR-B.2



Summary for Subcatchment 3S: PR-B.3

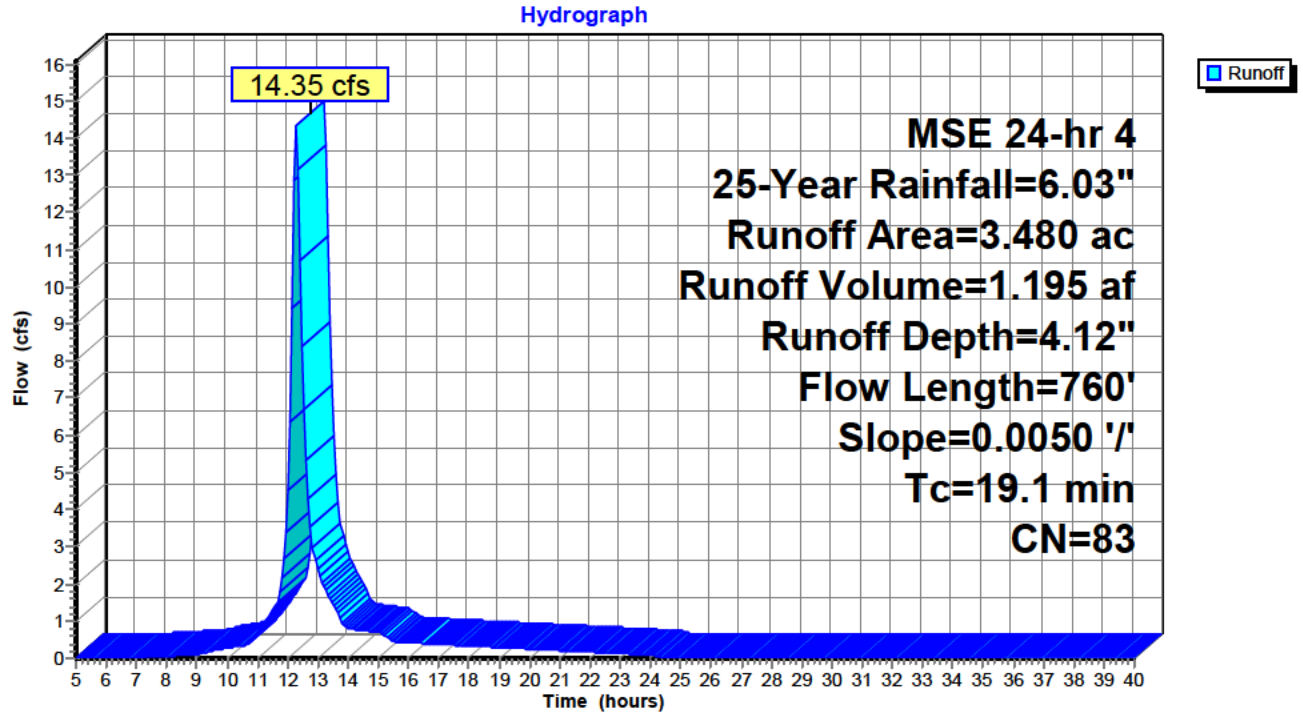
Runoff = 14.35 cfs @ 12.28 hrs, Volume= 1.195 af, Depth= 4.12"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
3.480	83	1/4 acre lots, 38% imp, HSG C
2.158		62.00% Pervious Area
1.322		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
8.1	700	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
19.1	760	Total			

Subcatchment 3S: PR-B.3



Summary for Subcatchment 4S: PR-B.4

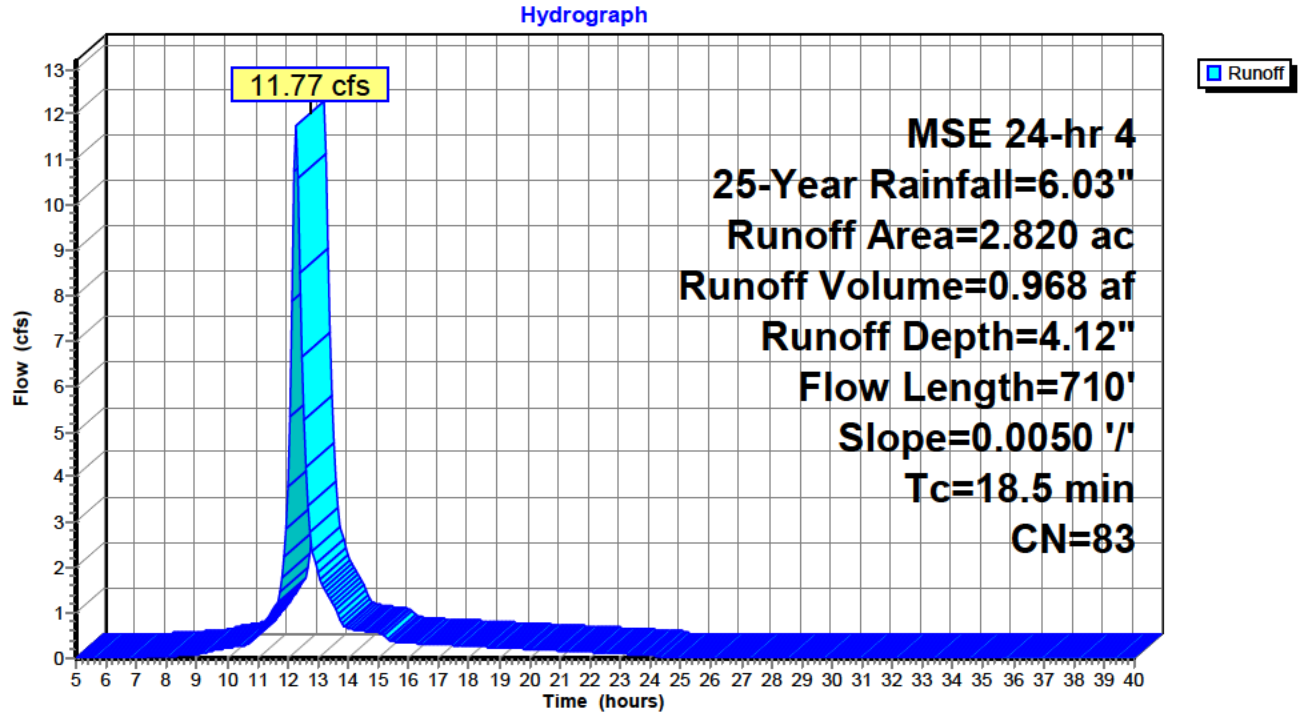
Runoff = 11.77 cfs @ 12.28 hrs, Volume= 0.968 af, Depth= 4.12"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
2.820	83	1/4 acre lots, 38% imp, HSG C
1.748		62.00% Pervious Area
1.072		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
7.5	650	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
18.5	710	Total			

Subcatchment 4S: PR-B.4



Summary for Subcatchment 5S: PR-B.5

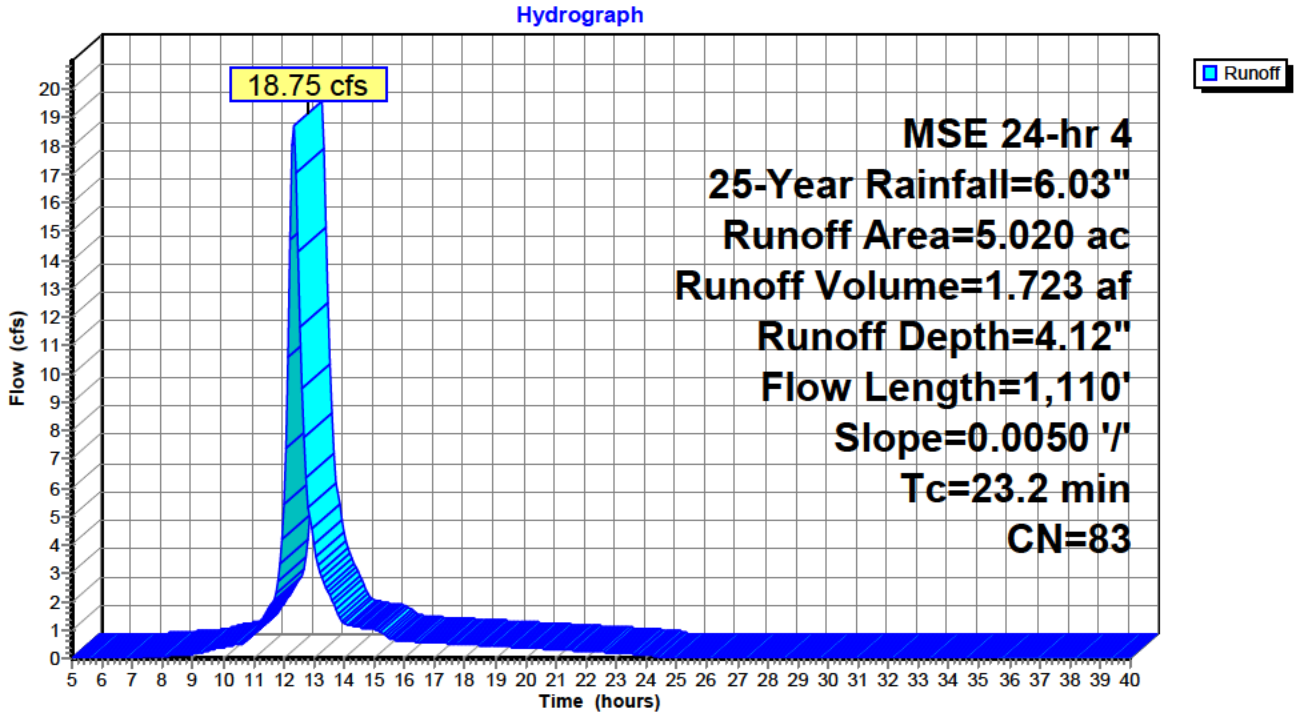
Runoff = 18.75 cfs @ 12.34 hrs, Volume= 1.723 af, Depth= 4.12"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
5.020	83	1/4 acre lots, 38% imp, HSG C
3.112		62.00% Pervious Area
1.908		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
12.2	1,050	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
23.2	1,110	Total			

Subcatchment 5S: PR-B.5



Summary for Subcatchment 6S: BASIN A Subcatch

[47] Hint: Peak is 401% of capacity of segment #4

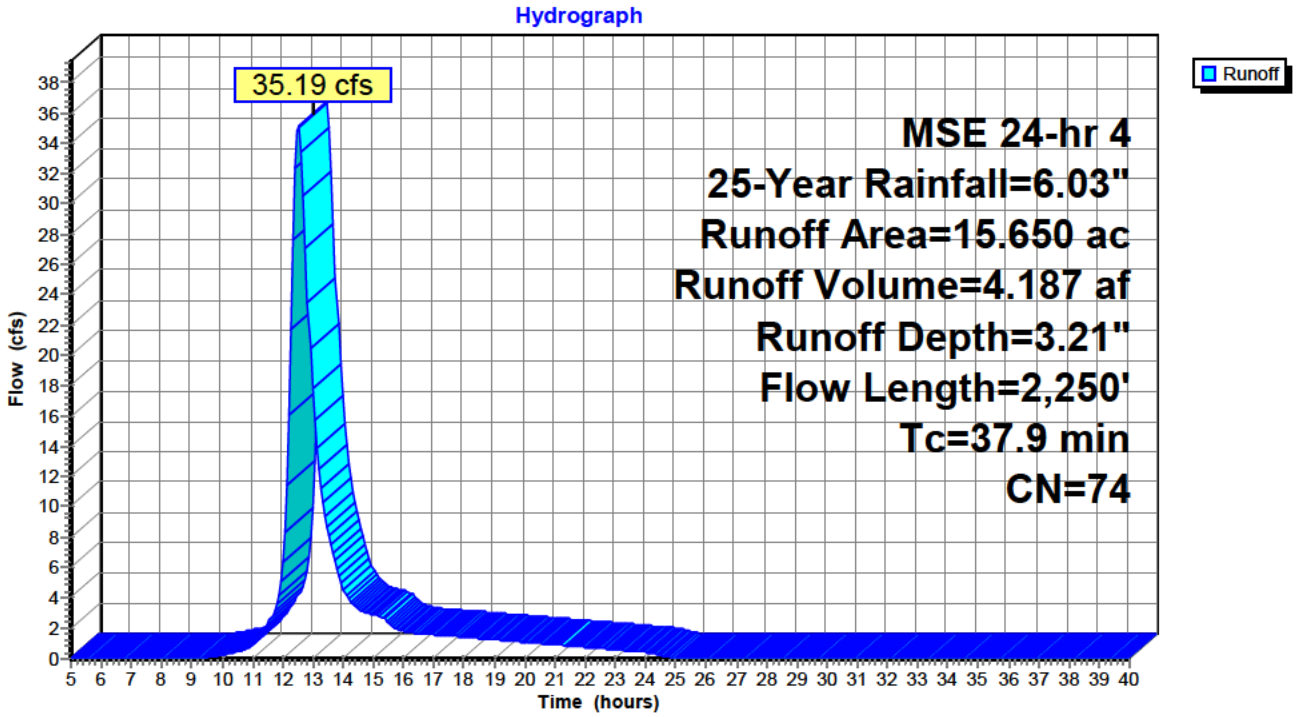
Runoff = 35.19 cfs @ 12.53 hrs, Volume= 4.187 af, Depth= 3.21"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
15.650	74	>75% Grass cover, Good, HSG C
15.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0050	0.10		**Sheet Flow, SHEETING (BACKYARDS)** Grass: Short n= 0.150 P2= 3.38"
19.3	1,100	0.0040	0.95		**Shallow Concentrated Flow, SHALLOW DITCH** Grassed Waterway Kv= 15.0 fps
0.8	750		15.01		**Lake or Reservoir, BASIN AREA** Mean Depth= 7.00'
0.7	200	0.0050	4.97	8.78	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
0.5	100	0.0010	3.09	139.23	**Channel Flow, LINED CHANNEL** Area= 45.0 sf Perim= 38.0' r= 1.18' n= 0.017 Concrete, unfinished
37.9	2,250	Total			

Subcatchment 6S: BASIN A Subcatch



Summary for Subcatchment 9S.1: OS-1

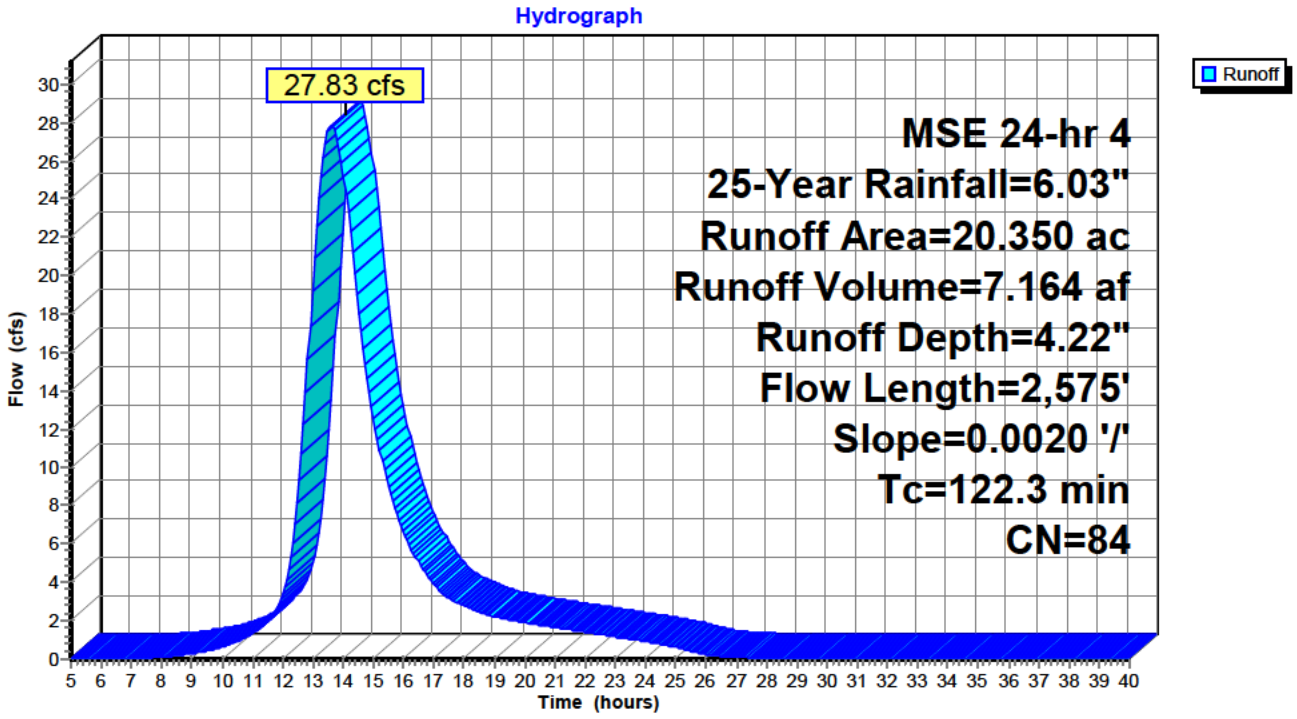
Runoff = 27.83 cfs @ 13.63 hrs, Volume= 7.164 af, Depth= 4.22"
Routed to Reach 10R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
20.250	84	Small grain, SR + CR, Good, HSG D
0.100	96	Gravel surface, HSG D
20.350	84	Weighted Average
20.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.8	1,250	0.0020	0.40		**Shallow Concentrated Flow, Backyard and Open Space Flow** Cultivated Straight Rows Kv= 9.0 fps
70.5	1,325	0.0020	0.31		**Shallow Concentrated Flow, Backyard Flow** Short Grass Pasture Kv= 7.0 fps
122.3	2,575	Total			

Subcatchment 9S.1: OS-1



Summary for Subcatchment 9S.2: EX-1

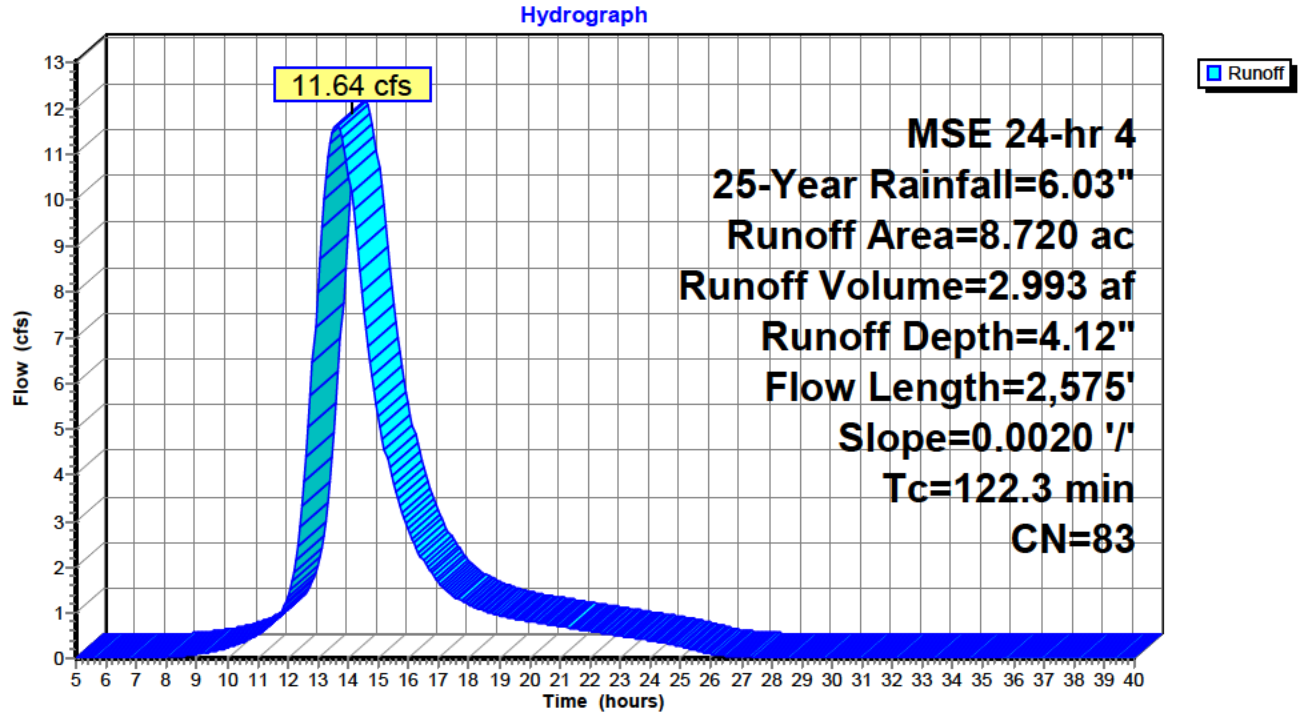
Runoff = 11.64 cfs @ 13.64 hrs, Volume= 2.993 af, Depth= 4.12"
Routed to Reach 10R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
8.720	83	1/4 acre lots, 38% imp, HSG C
5.406		62.00% Pervious Area
3.314		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.8	1,250	0.0020	0.40		**Shallow Concentrated Flow, Backyard and Open Space Flow** Cultivated Straight Rows Kv= 9.0 fps
70.5	1,325	0.0020	0.31		**Shallow Concentrated Flow, Backyard Flow** Short Grass Pasture Kv= 7.0 fps
122.3	2,575	Total			

Subcatchment 9S.2: EX-1



Summary for Subcatchment 11S: PR-B.6

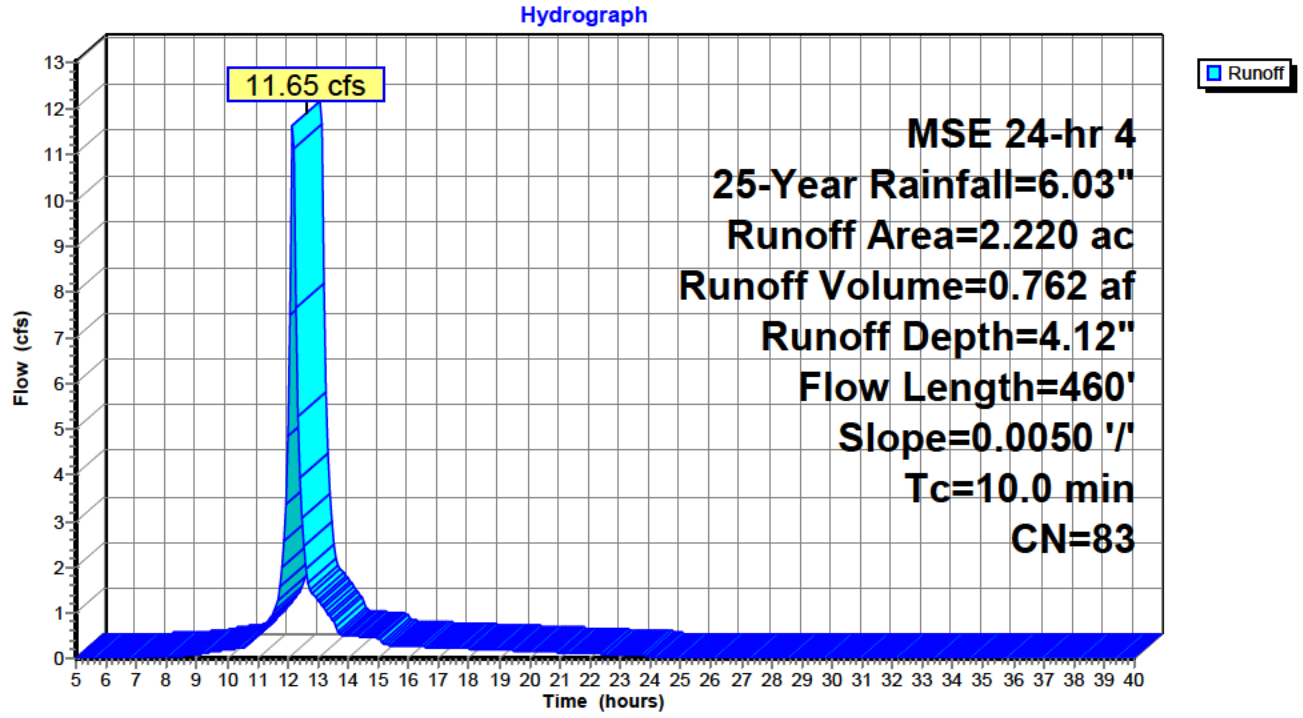
Runoff = 11.65 cfs @ 12.17 hrs, Volume= 0.762 af, Depth= 4.12"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
2.220	83	1/4 acre lots, 38% imp, HSG C
1.376		62.00% Pervious Area
0.844		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	10	0.0050	0.06		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
5.2	450	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
7.8	460	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 11S: PR-B.6



Summary for Subcatchment 12S: PR-B.7

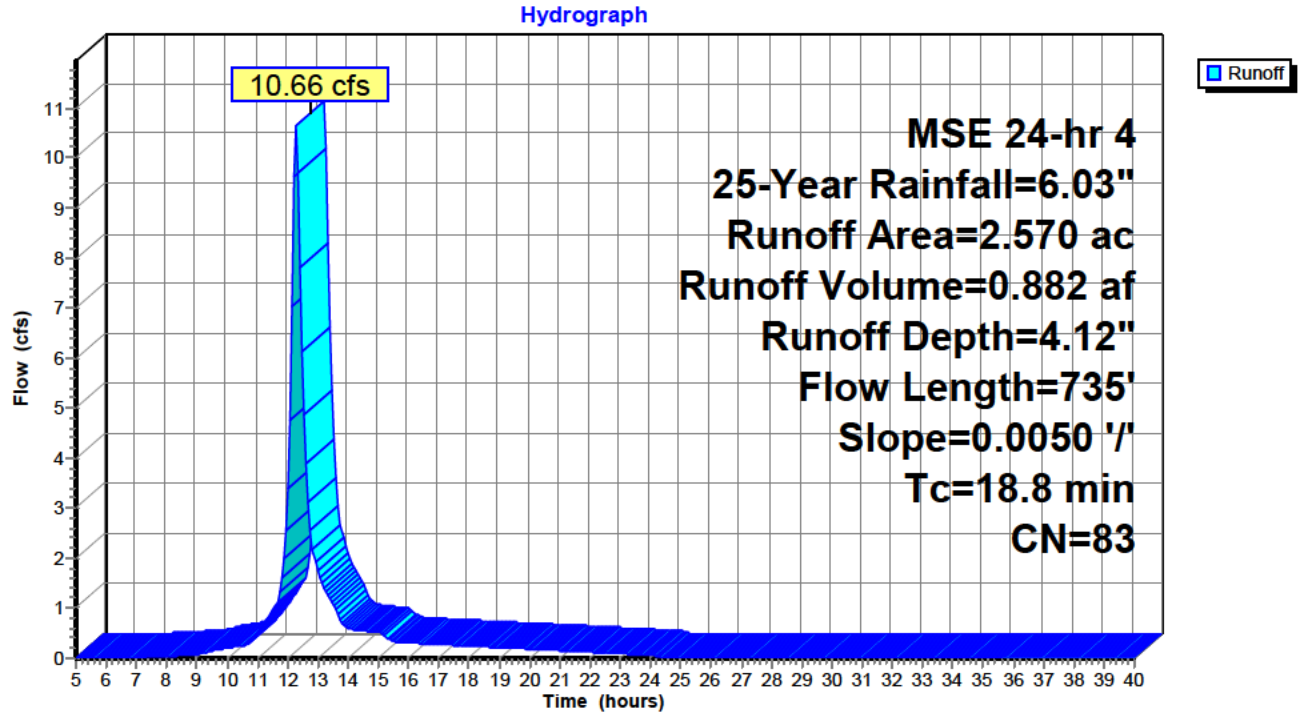
Runoff = 10.66 cfs @ 12.28 hrs, Volume= 0.882 af, Depth= 4.12"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
2.570	83	1/4 acre lots, 38% imp, HSG C
1.593		62.00% Pervious Area
0.977		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
7.8	675	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
18.8	735	Total			

Subcatchment 12S: PR-B.7



Summary for Subcatchment 13S: PR-B.8

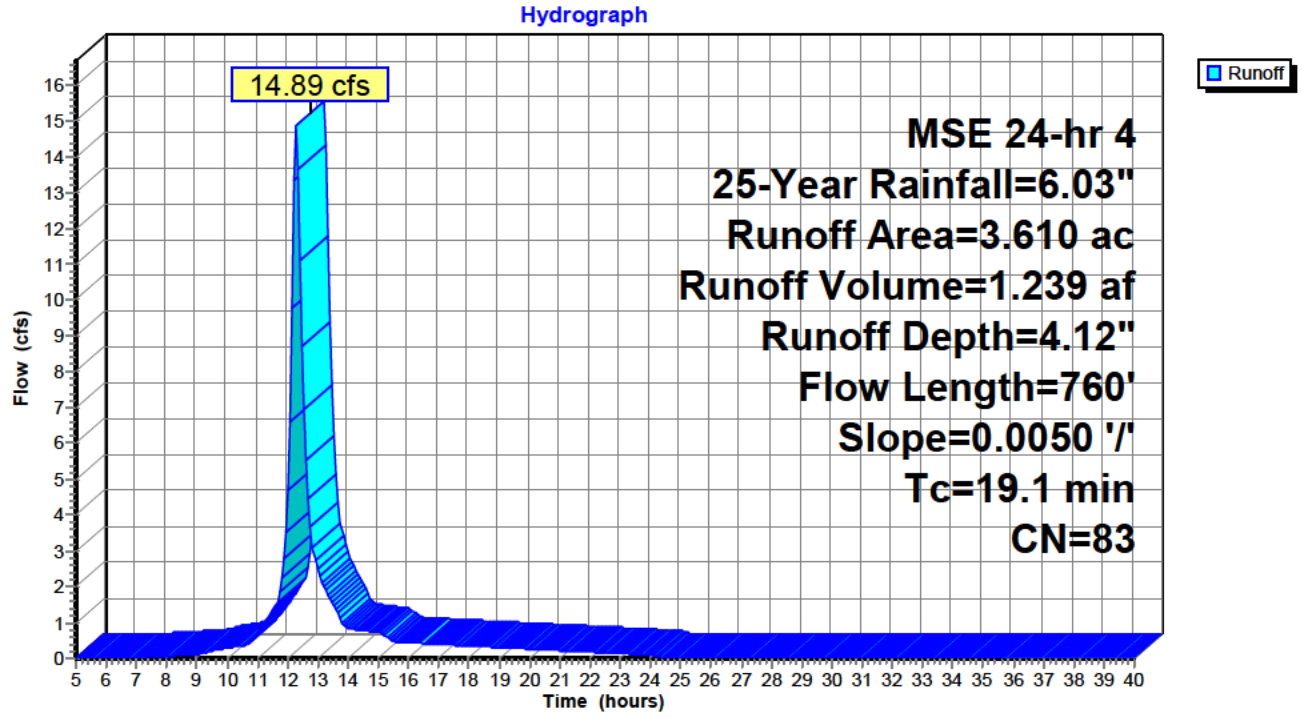
Runoff = 14.89 cfs @ 12.28 hrs, Volume= 1.239 af, Depth= 4.12"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
3.610	83	1/4 acre lots, 38% imp, HSG C
2.238		62.00% Pervious Area
1.372		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
8.1	700	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
19.1	760	Total			

Subcatchment 13S: PR-B.8



Summary for Subcatchment 14S: Basin B Subcatch

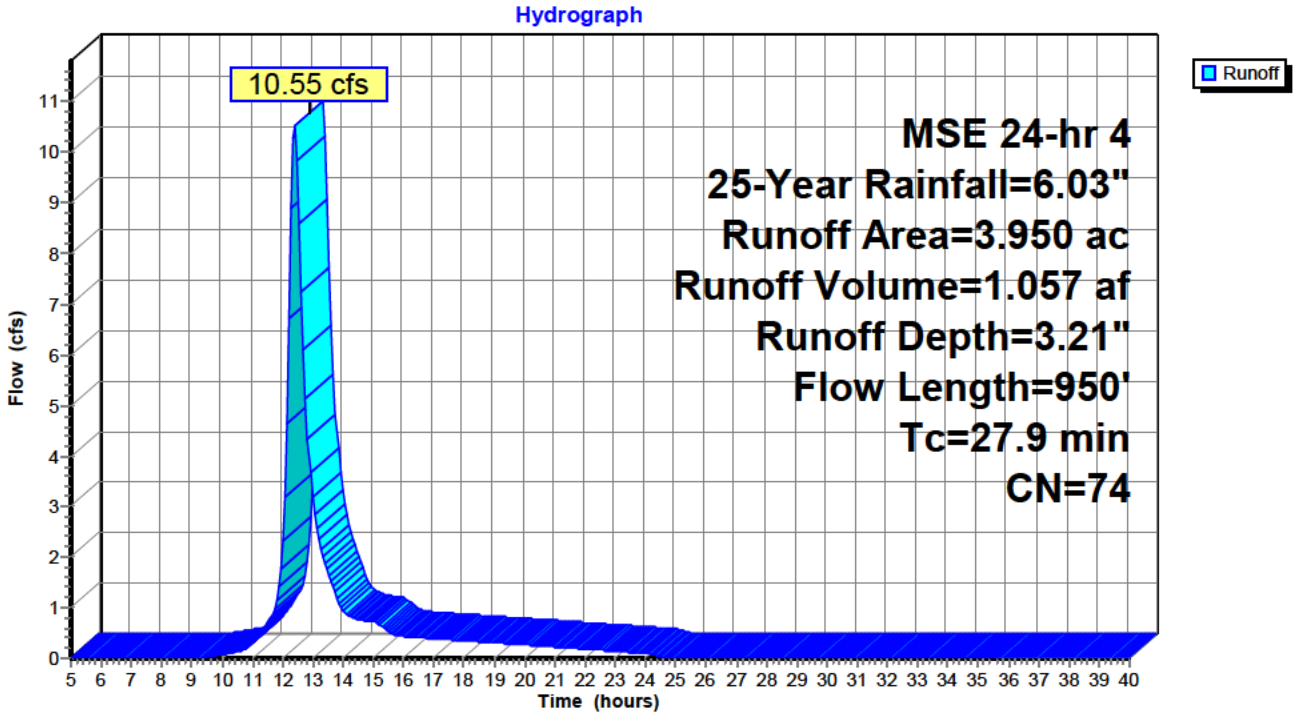
Runoff = 10.55 cfs @ 12.40 hrs, Volume= 1.057 af, Depth= 3.21"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
3.950	74	>75% Grass cover, Good, HSG C
3.950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0050	0.10		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
9.4	600	0.0050	1.06		**Shallow Concentrated Flow, DITCH FLOW** Grassed Waterway Kv= 15.0 fps
0.4	200		8.02		**Lake or Reservoir, Basin Area** Mean Depth= 2.00'
1.5	50	0.0020	0.56	11.24	**Channel Flow, CHANNEL OUTFALL** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.150 Sheet flow over Short Grass
27.9	950	Total			

Subcatchment 14S: Basin B Subcatch



Summary for Subcatchment 17S.1: OS-2

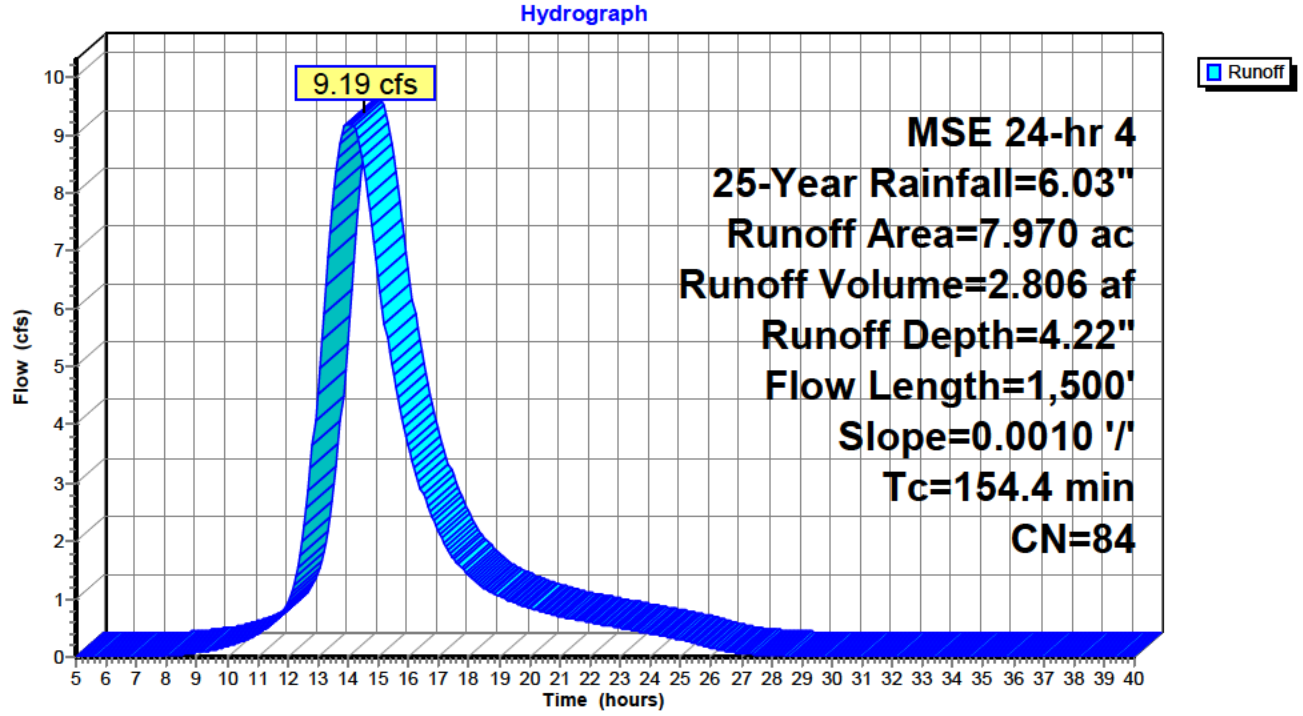
Runoff = 9.19 cfs @ 14.04 hrs, Volume= 2.806 af, Depth= 4.22"
Routed to Reach 18R : IMPACT 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
7.970	84	Small grain, SR + CR, Good, HSG D
7.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
84.1	300	0.0010	0.06		**Sheet Flow, Crop Sheeting** Cultivated: Residue>20% n= 0.170 P2= 3.38"
70.3	1,200	0.0010	0.28		**Shallow Concentrated Flow, Crop Shallow Concentrated** Cultivated Straight Rows Kv= 9.0 fps
154.4	1,500	Total			

Subcatchment 17S.1: OS-2



Summary for Subcatchment 17S.2: EX-2

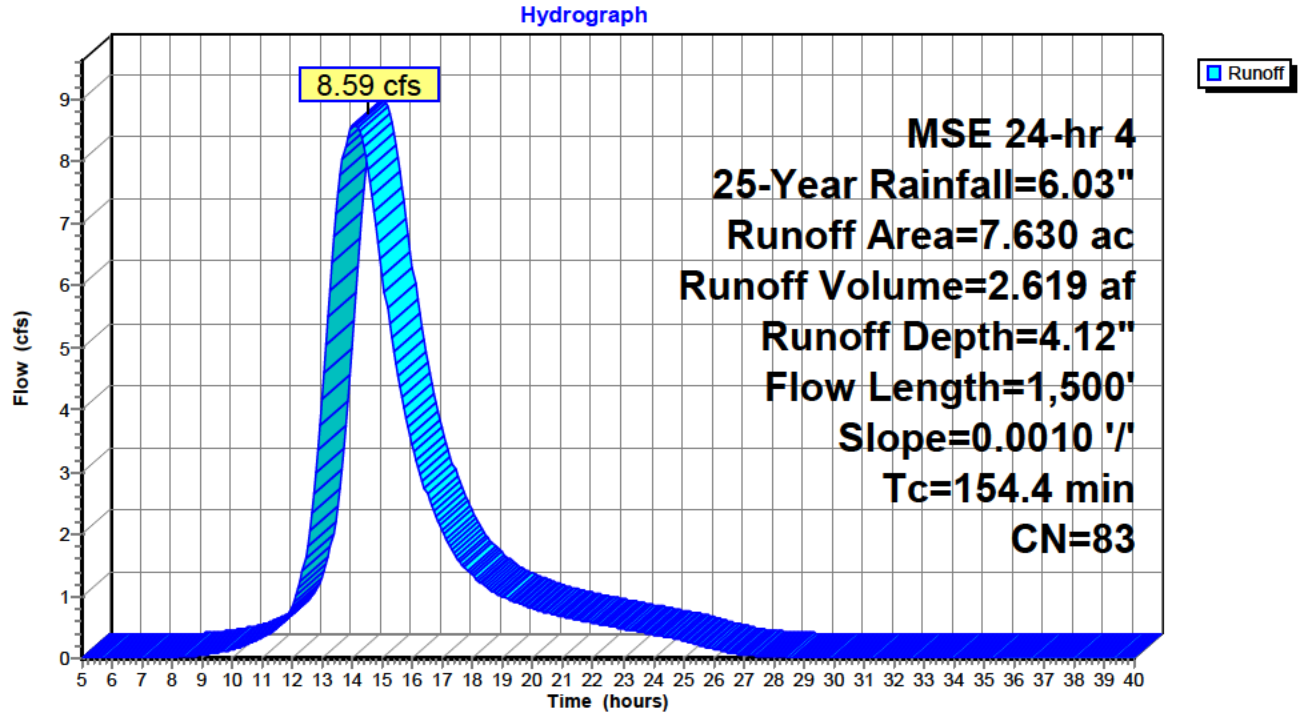
Runoff = 8.59 cfs @ 14.05 hrs, Volume= 2.619 af, Depth= 4.12"
Routed to Reach 18R : IMPACT 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 25-Year Rainfall=6.03"

Area (ac)	CN	Description
7.630	83	1/4 acre lots, 38% imp, HSG C
4.731		62.00% Pervious Area
2.899		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
84.1	300	0.0010	0.06		**Sheet Flow, Crop Sheeting** Cultivated: Residue>20% n= 0.170 P2= 3.38"
70.3	1,200	0.0010	0.28		**Shallow Concentrated Flow, Crop Shallow Concentrated** Cultivated Straight Rows Kv= 9.0 fps
154.4	1,500	Total			

Subcatchment 17S.2: EX-2



Summary for Reach 8R: Culvert

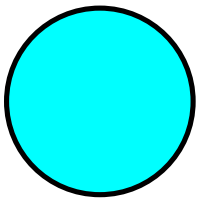
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 681% of Manning's capacity
[76] Warning: Detained 5.180 af (Pond w/culvert advised)
[81] Warning: Exceeded Pond 7P by 0.66' @ 32.30 hrs

Inflow Area = 32.260 ac, 19.57% Impervious, Inflow Depth > 3.67" for 25-Year event
Inflow = 38.64 cfs @ 12.84 hrs, Volume= 9.872 af
Outflow = 5.68 cfs @ 12.07 hrs, Volume= 9.873 af, Atten= 85%, Lag= 0.0 min
Routed to Reach 10R : IMPACT 1

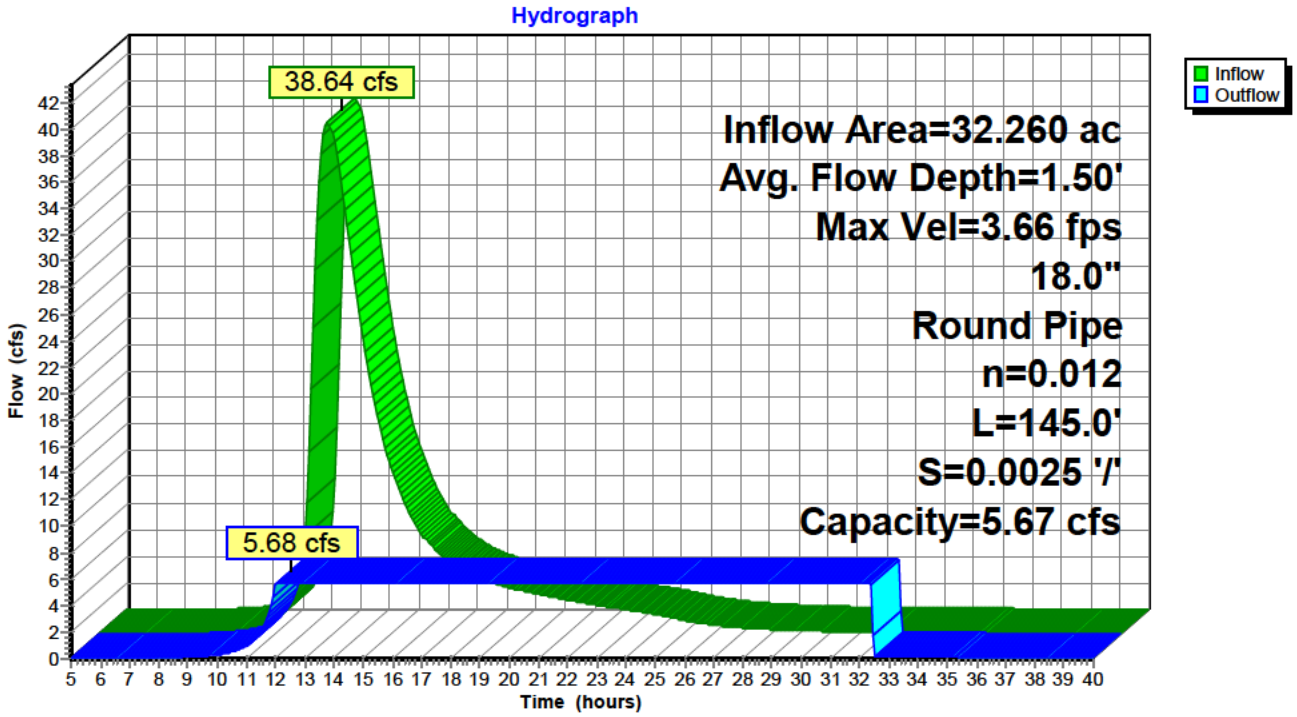
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 3.66 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.45 fps, Avg. Travel Time= 1.0 min

Peak Storage= 256 cf @ 12.07 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 5.67 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 145.0' Slope= 0.0025 '/'
Inlet Invert= 1,350.69', Outlet Invert= 1,350.33'



Reach 8R: Culvert



Summary for Reach 10R: IMPACT 1

Inflow Area = 61.330 ac, 15.69% Impervious, Inflow Depth > 3.92" for 25-Year event
Inflow = 45.14 cfs @ 13.63 hrs, Volume= 20.030 af
Outflow = 44.56 cfs @ 13.98 hrs, Volume= 20.023 af, Atten= 1%, Lag= 20.8 min
Routed to Reach 19R : OUTLET PIPE

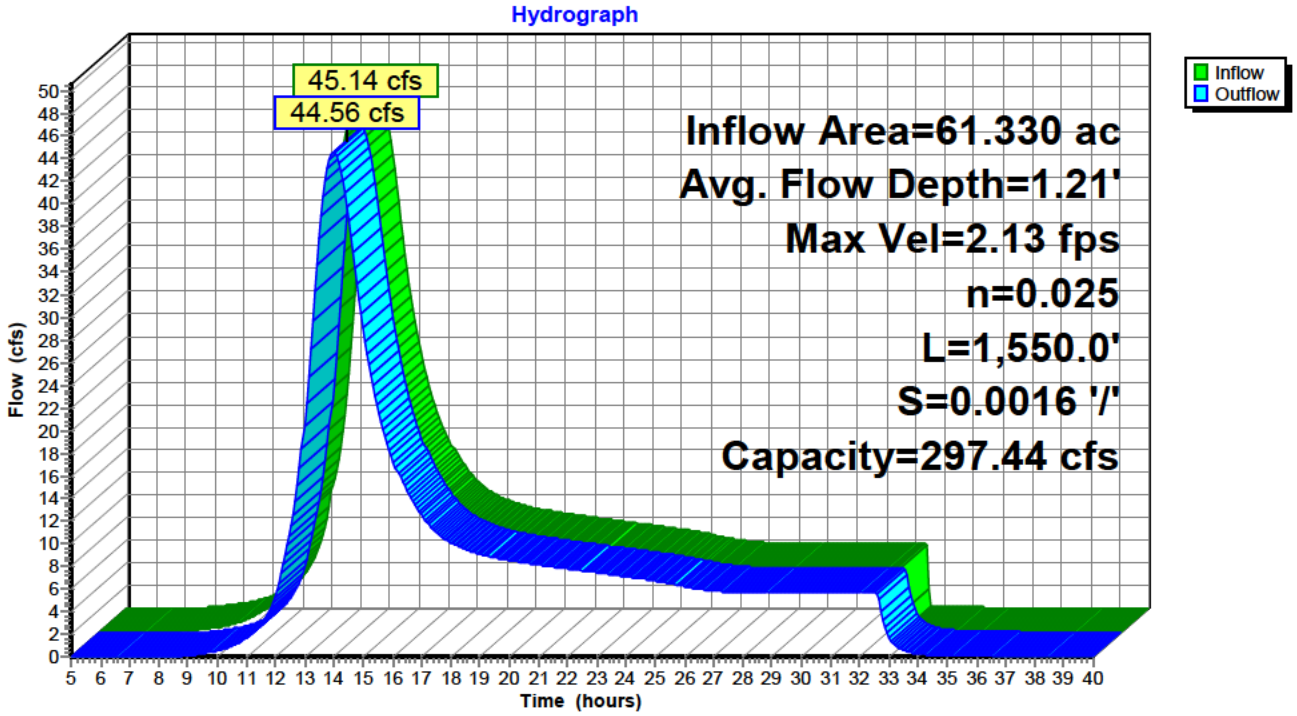
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 2.13 fps, Min. Travel Time= 12.1 min
Avg. Velocity = 0.99 fps, Avg. Travel Time= 26.2 min

Peak Storage= 32,378 cf @ 13.78 hrs
Average Depth at Peak Storage= 1.21' , Surface Width= 24.52'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 297.44 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 6.0 '/' Top Width= 46.00'
Length= 1,550.0' Slope= 0.0016 '/'
Inlet Invert= 1,348.50', Outlet Invert= 1,346.00'

‡

Reach 10R: IMPACT 1



Summary for Reach 16R: IMPACT 2

[81] Warning: Exceeded Pond 15P by 0.50' @ 33.28 hrs

Inflow Area = 12.350 ac, 25.85% Impervious, Inflow Depth = 3.07" for 25-Year event
Inflow = 37.92 cfs @ 12.36 hrs, Volume= 3.157 af
Outflow = 29.57 cfs @ 12.76 hrs, Volume= 3.157 af, Atten= 22%, Lag= 24.1 min
Routed to Reach 19R : OUTLET PIPE

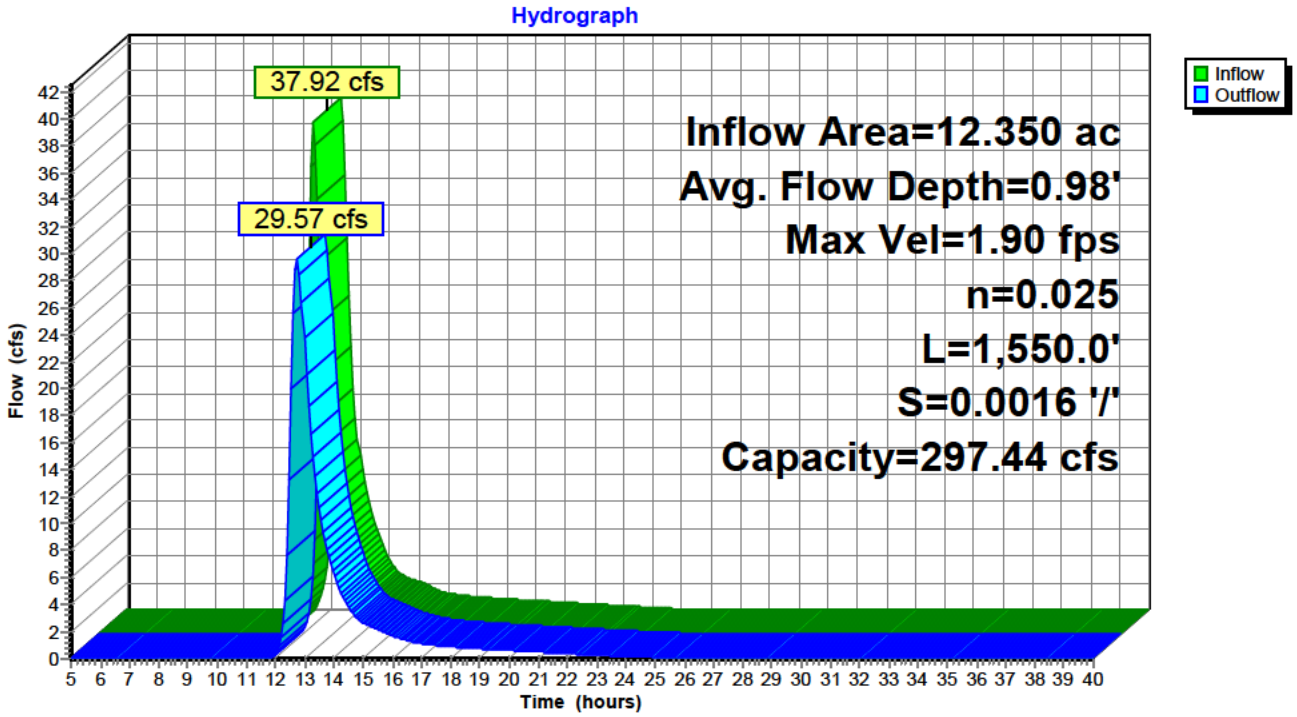
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 1.90 fps, Min. Travel Time= 13.6 min
Avg. Velocity = 0.44 fps, Avg. Travel Time= 58.4 min

Peak Storage= 24,220 cf @ 12.53 hrs
Average Depth at Peak Storage= 0.98' , Surface Width= 21.79'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 297.44 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 6.0 '/' Top Width= 46.00'
Length= 1,550.0' Slope= 0.0016 '/'
Inlet Invert= 1,348.50', Outlet Invert= 1,346.00'

‡

Reach 16R: IMPACT 2



Summary for Reach 18R: IMPACT 3

Inflow Area = 15.600 ac, 18.59% Impervious, Inflow Depth = 4.17" for 25-Year event
Inflow = 17.78 cfs @ 14.04 hrs, Volume= 5.425 af
Outflow = 16.01 cfs @ 15.24 hrs, Volume= 5.419 af, Atten= 10%, Lag= 72.1 min
Routed to Reach 19R : OUTLET PIPE

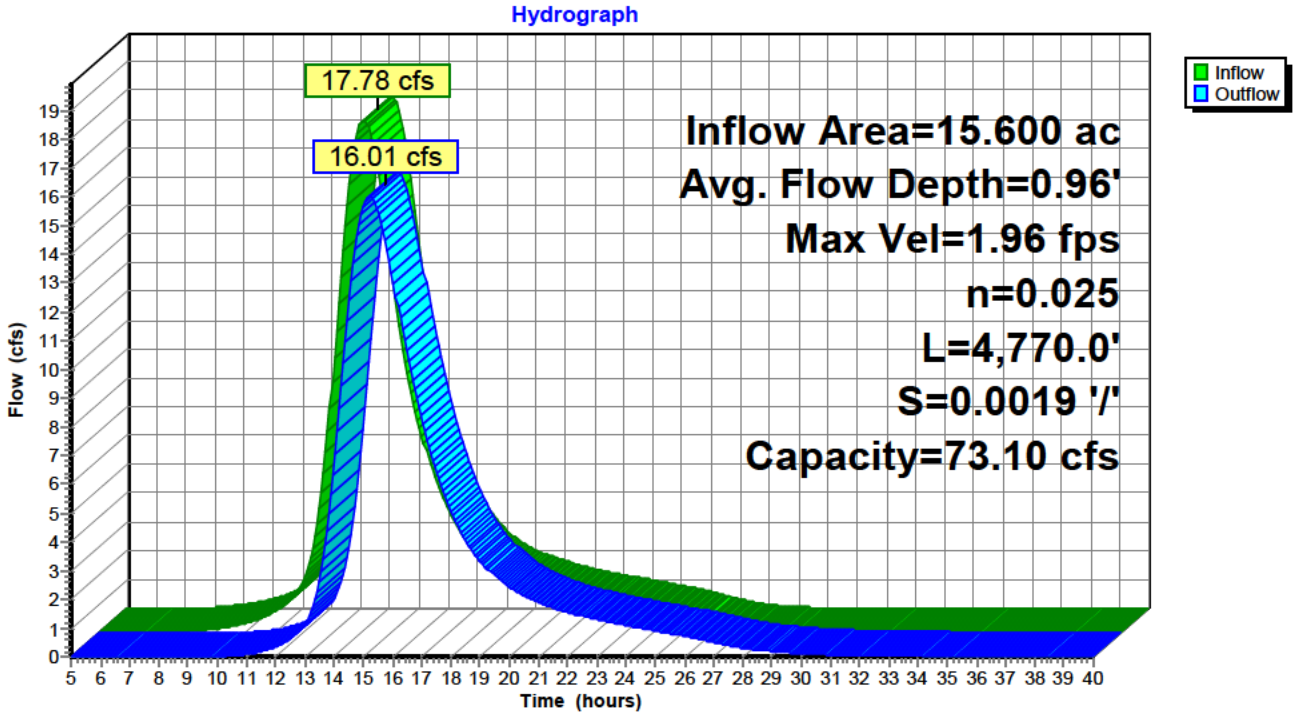
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 1.96 fps, Min. Travel Time= 40.5 min
Avg. Velocity = 0.69 fps, Avg. Travel Time= 115.1 min

Peak Storage= 38,948 cf @ 14.57 hrs
Average Depth at Peak Storage= 0.96' , Surface Width= 12.08'
Bank-Full Depth= 2.00' Flow Area= 24.8 sf, Capacity= 73.10 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.7 '/' Top Width= 19.80'
Length= 4,770.0' Slope= 0.0019 '/'
Inlet Invert= 1,355.00', Outlet Invert= 1,346.00'

‡

Reach 18R: IMPACT 3



Summary for Reach 19R: OUTLET PIPE

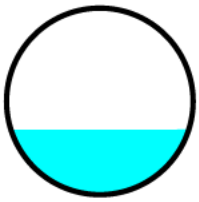
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 10R OUTLET depth by 1.05' @ 12.77 hrs
[62] Hint: Exceeded Reach 16R OUTLET depth by 1.77' @ 14.31 hrs
[62] Hint: Exceeded Reach 18R OUTLET depth by 1.50' @ 12.77 hrs
[64] Warning: Exceeded Reach 18R outlet bank by 0.09' @ 14.08 hrs

Inflow Area = 89.280 ac, 17.60% Impervious, Inflow Depth > 3.84" for 25-Year event
Inflow = 57.61 cfs @ 14.07 hrs, Volume= 28.599 af
Outflow = 57.61 cfs @ 14.09 hrs, Volume= 28.599 af, Atten= 0%, Lag= 1.0 min

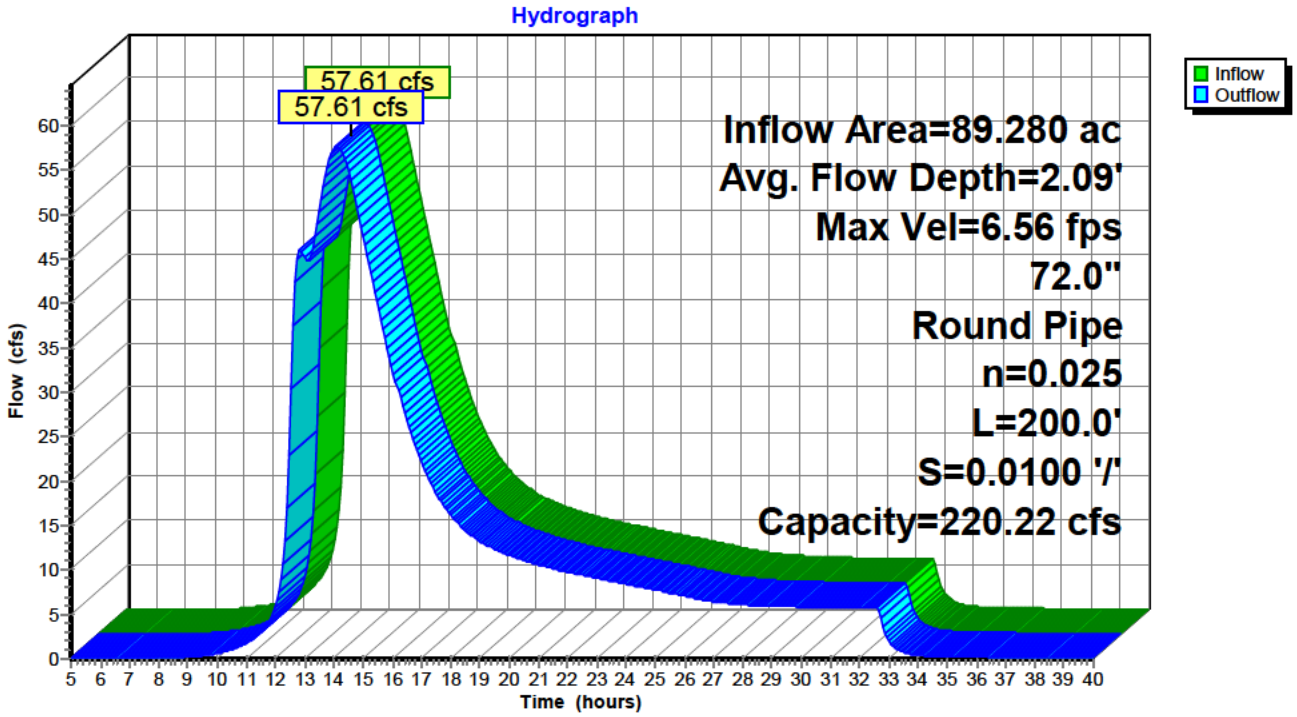
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 6.56 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.16 fps, Avg. Travel Time= 1.1 min

Peak Storage= 1,757 cf @ 14.08 hrs
Average Depth at Peak Storage= 2.09' , Surface Width= 5.72'
Bank-Full Depth= 6.00' Flow Area= 28.3 sf, Capacity= 220.22 cfs

72.0" Round Pipe
n= 0.025 Corrugated metal
Length= 200.0' Slope= 0.0100 '/'
Inlet Invert= 1,346.00', Outlet Invert= 1,344.00'



Reach 19R: OUTLET PIPE



Summary for Pond 7P: BASIN A

Inflow Area = 32.260 ac, 19.57% Impervious, Inflow Depth = 3.68" for 25-Year event
Inflow = 90.06 cfs @ 12.31 hrs, Volume= 9.888 af
Outflow = 38.64 cfs @ 12.84 hrs, Volume= 9.872 af, Atten= 57%, Lag= 31.4 min
Primary = 38.64 cfs @ 12.84 hrs, Volume= 9.872 af
Routed to Reach 8R : Culvert

Routing by Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Peak Elev= 1,352.52' @ 12.84 hrs Surf.Area= 5.091 ac Storage= 3.577 af
Flood Elev= 1,354.50' Surf.Area= 10.869 ac Storage= 15.257 af

Plug-Flow detention time= 93.3 min calculated for 9.852 af (100% of inflow)
Center-of-Mass det. time= 93.7 min (917.6 - 823.9)

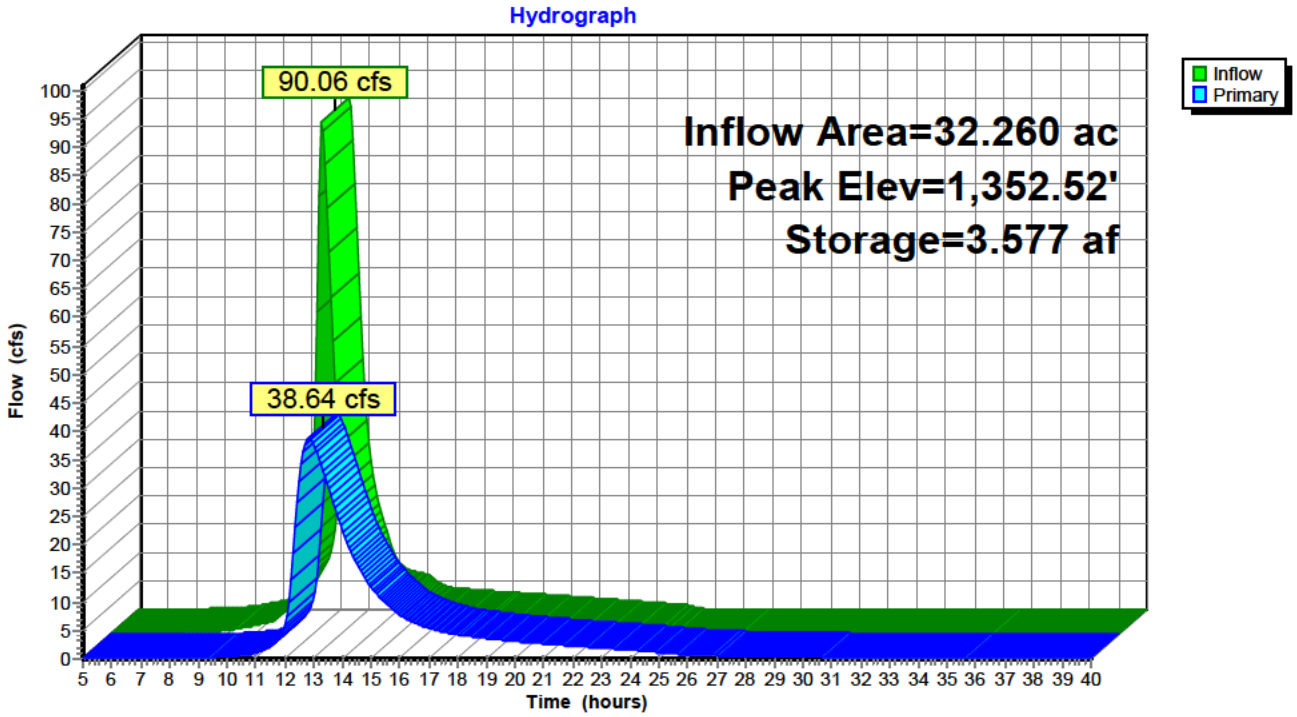
Volume	Invert	Avail.Storage	Storage Description
#1	1,351.50'	15.257 af	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
1,351.50	2.090	0.000	0.000	2.090
1,352.00	3.475	1.377	1.377	3.475
1,353.00	6.880	5.082	6.458	6.880
1,354.00	10.869	8.799	15.257	10.870

Device	Routing	Invert	Outlet Devices
#1	Primary	1,351.50'	**10.0' long + 5.0 '/' SideZ x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=38.63 cfs @ 12.84 hrs HW=1,352.52' TW=1,351.50' (Fixed TW Elev= 1,351.50')
1=Broad-Crested Rectangular Weir (Weir Controls 38.63 cfs @ 2.52 fps)

Pond 7P: BASIN A



Summary for Pond 15P: Basin B

Inflow Area = 12.350 ac, 25.85% Impervious, Inflow Depth = 3.83" for 25-Year event
Inflow = 42.19 cfs @ 12.26 hrs, Volume= 3.940 af
Outflow = 38.72 cfs @ 12.36 hrs, Volume= 3.940 af, Atten= 8%, Lag= 5.8 min
Discarded = 0.81 cfs @ 12.36 hrs, Volume= 0.783 af
Primary = 37.92 cfs @ 12.36 hrs, Volume= 3.157 af
Routed to Reach 16R : IMPACT 2

Routing by Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Peak Elev= 1,349.21' @ 12.36 hrs Surf.Area= 0.956 ac Storage= 0.716 af

Plug-Flow detention time= 66.7 min calculated for 3.940 af (100% of inflow)
Center-of-Mass det. time= 66.5 min (880.5 - 814.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,348.00'	1.012 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

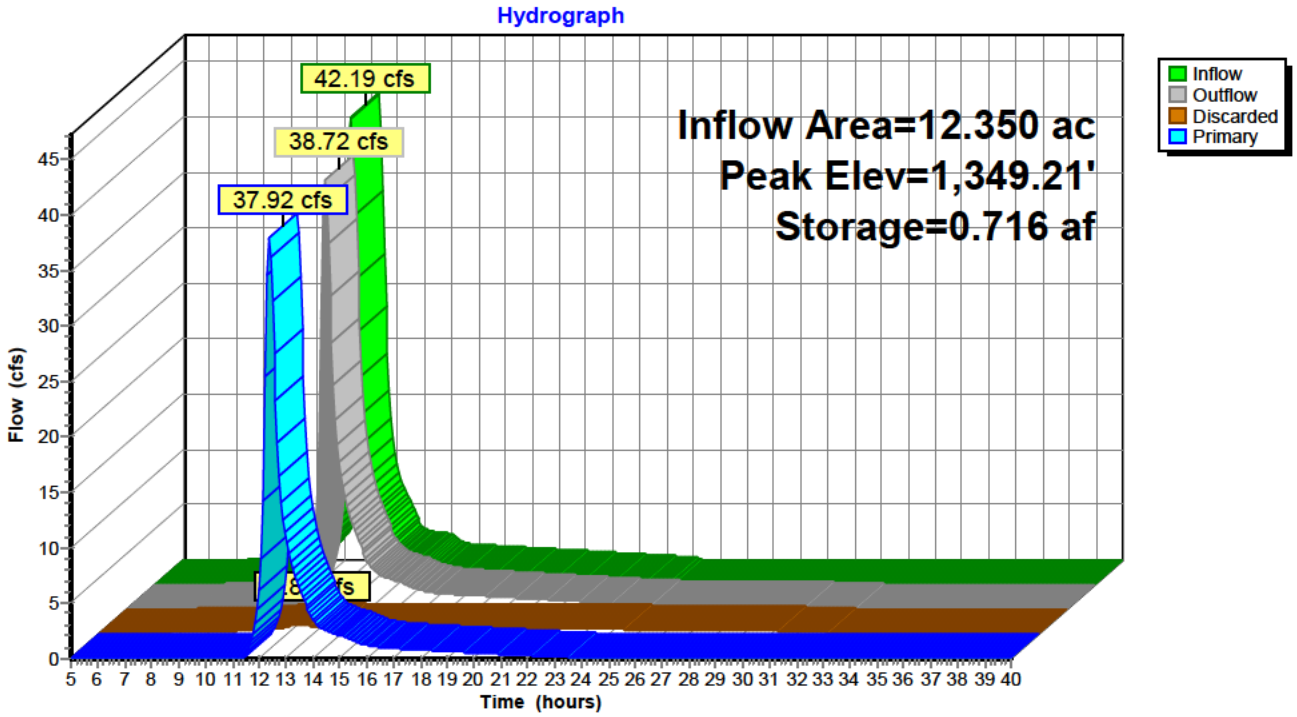
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,348.00	0.250	0.000	0.000
1,348.50	0.500	0.187	0.187
1,349.00	0.850	0.337	0.525
1,349.50	1.100	0.487	1.012

Device	Routing	Invert	Outlet Devices
#1	Primary	1,348.50'	**10.0' long + 10.0 '/' SideZ 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	Discarded	1,348.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 1,342.00'
#3	Primary	1,349.00'	**50.0' long + 10.0 '/' SideZ x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.81 cfs @ 12.36 hrs HW=1,349.21' (Free Discharge)
└**2=Exfiltration** (Controls 0.81 cfs)

Primary OutFlow Max=37.57 cfs @ 12.36 hrs HW=1,349.21' (Free Discharge)
├**1=Broad-Crested Rectangular Weir** (Weir Controls 25.23 cfs @ 2.08 fps)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 12.34 cfs @ 1.13 fps)

Pond 15P: Basin B



Time span=5.00-40.00 hrs, dt=0.07 hrs, 501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PR-B.1 Runoff Area=2.730 ac 38.00% Impervious Runoff Depth=5.82"
Flow Length=480' Slope=0.0050 '/' Tc=15.9 min CN=83 Runoff=16.93 cfs 1.323 af

Subcatchment 2S: PR-B.2 Runoff Area=2.560 ac 38.00% Impervious Runoff Depth=5.82"
Flow Length=510' Slope=0.0050 '/' Tc=16.2 min CN=83 Runoff=15.79 cfs 1.241 af

Subcatchment 3S: PR-B.3 Runoff Area=3.480 ac 38.00% Impervious Runoff Depth=5.82"
Flow Length=760' Slope=0.0050 '/' Tc=19.1 min CN=83 Runoff=19.98 cfs 1.686 af

Subcatchment 4S: PR-B.4 Runoff Area=2.820 ac 38.00% Impervious Runoff Depth=5.82"
Flow Length=710' Slope=0.0050 '/' Tc=18.5 min CN=83 Runoff=16.38 cfs 1.367 af

Subcatchment 5S: PR-B.5 Runoff Area=5.020 ac 38.00% Impervious Runoff Depth=5.82"
Flow Length=1,110' Slope=0.0050 '/' Tc=23.2 min CN=83 Runoff=26.12 cfs 2.433 af

Subcatchment 6S: BASIN A Subcatch Runoff Area=15.650 ac 0.00% Impervious Runoff Depth=4.77"
Flow Length=2,250' Tc=37.9 min CN=74 Runoff=52.45 cfs 6.226 af

Subcatchment 9S.1: OS-1 Runoff Area=20.350 ac 0.00% Impervious Runoff Depth=5.93"
Flow Length=2,575' Slope=0.0020 '/' Tc=122.3 min CN=84 Runoff=38.79 cfs 10.060 af

Subcatchment 9S.2: EX-1 Runoff Area=8.720 ac 38.00% Impervious Runoff Depth=5.82"
Flow Length=2,575' Slope=0.0020 '/' Tc=122.3 min CN=83 Runoff=16.33 cfs 4.226 af

Subcatchment 11S: PR-B.6 Runoff Area=2.220 ac 38.00% Impervious Runoff Depth=5.82"
Flow Length=460' Slope=0.0050 '/' Tc=10.0 min CN=83 Runoff=16.19 cfs 1.076 af

Subcatchment 12S: PR-B.7 Runoff Area=2.570 ac 38.00% Impervious Runoff Depth=5.82"
Flow Length=735' Slope=0.0050 '/' Tc=18.8 min CN=83 Runoff=14.84 cfs 1.245 af

Subcatchment 13S: PR-B.8 Runoff Area=3.610 ac 38.00% Impervious Runoff Depth=5.82"
Flow Length=760' Slope=0.0050 '/' Tc=19.1 min CN=83 Runoff=20.73 cfs 1.749 af

Subcatchment 14S: Basin B Subcatch Runoff Area=3.950 ac 0.00% Impervious Runoff Depth=4.77"
Flow Length=950' Tc=27.9 min CN=74 Runoff=15.67 cfs 1.571 af

Subcatchment 17S.1: OS-2 Runoff Area=7.970 ac 0.00% Impervious Runoff Depth=5.93"
Flow Length=1,500' Slope=0.0010 '/' Tc=154.4 min CN=84 Runoff=12.83 cfs 3.940 af

Subcatchment 17S.2: EX-2 Runoff Area=7.630 ac 38.00% Impervious Runoff Depth=5.82"
Flow Length=1,500' Slope=0.0010 '/' Tc=154.4 min CN=83 Runoff=12.06 cfs 3.698 af

Reach 8R: Culvert Avg. Flow Depth=1.50' Max Vel=3.66 fps Inflow=57.90 cfs 14.258 af
18.0" Round Pipe n=0.012 L=145.0' S=0.0025 '/' Capacity=5.67 cfs Outflow=5.67 cfs 13.691 af

Reach 10R: IMPACT 1 Avg. Flow Depth=1.41' Max Vel=2.32 fps Inflow=60.79 cfs 27.976 af
n=0.025 L=1,550.0' S=0.0016 '/' Capacity=297.44 cfs Outflow=60.08 cfs 27.713 af

Reach 16R: IMPACT 2 Avg. Flow Depth=1.23' Max Vel=2.15 fps Inflow=55.58 cfs 4.787 af
n=0.025 L=1,550.0' S=0.0016 '/' Capacity=297.44 cfs Outflow=45.80 cfs 4.787 af

Reach 18R: IMPACT 3 Avg. Flow Depth=1.14' Max Vel=2.16 fps Inflow=24.89 cfs 7.637 af
n=0.025 L=4,770.0' S=0.0019 '/' Capacity=73.10 cfs Outflow=22.78 cfs 7.631 af

Reach 19R: OUTLET PIPE Avg. Flow Depth=2.49' Max Vel=7.16 fps Inflow=79.45 cfs 40.132 af
72.0" Round Pipe n=0.025 L=200.0' S=0.0100 '/' Capacity=220.22 cfs Outflow=79.44 cfs 40.120 af

Pond 7P: BASIN A Peak Elev=1,352.78' Storage=5.020 af Inflow=128.62 cfs 14.275 af
Outflow=57.90 cfs 14.258 af

Pond 15P: Basin B Peak Elev=1,349.31' Storage=0.814 af Inflow=59.72 cfs 5.642 af
Discarded=0.86 cfs 0.855 af Primary=55.58 cfs 4.787 af Outflow=56.44 cfs 5.642 af

Total Runoff Area = 89.280 ac Runoff Volume = 41.840 af Average Runoff Depth = 5.62"
82.40% Pervious = 73.563 ac 17.60% Impervious = 15.717 ac

Summary for Subcatchment 1S: PR-B.1

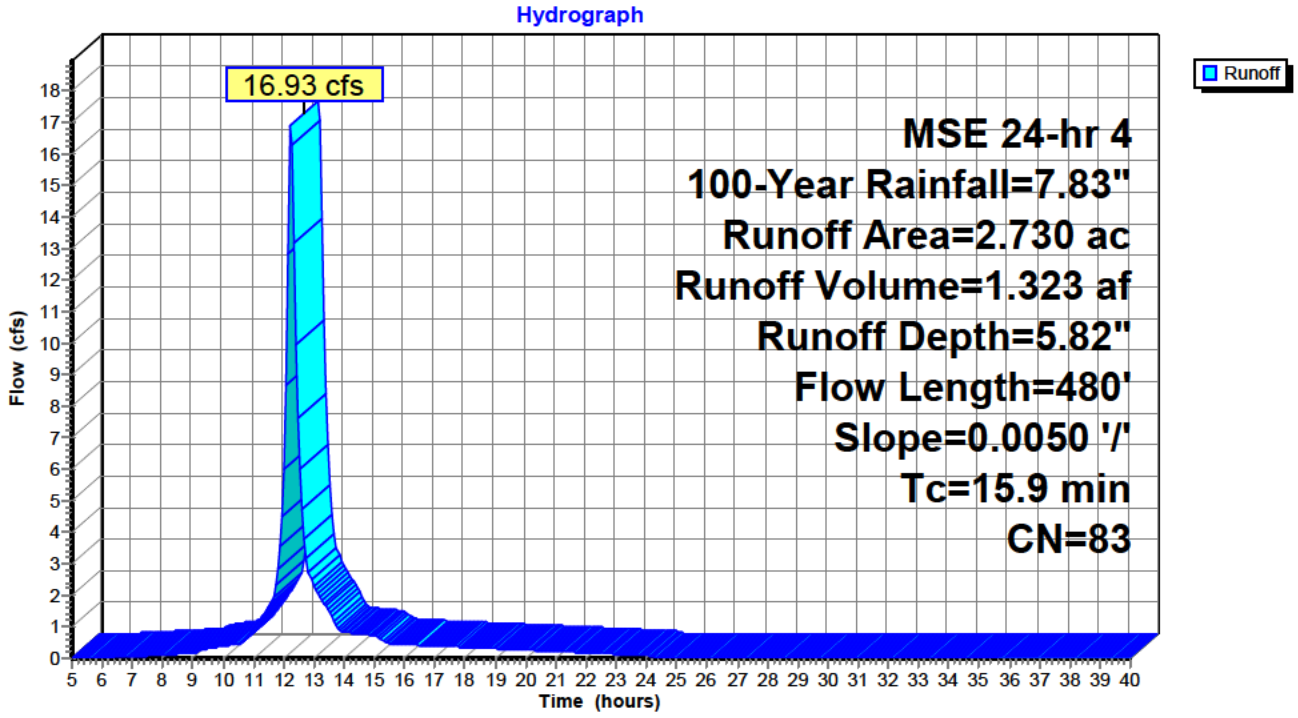
Runoff = 16.93 cfs @ 12.24 hrs, Volume= 1.323 af, Depth= 5.82"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
2.730	83	1/4 acre lots, 38% imp, HSG C
1.693		62.00% Pervious Area
1.037		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
4.9	420	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
15.9	480	Total			

Subcatchment 1S: PR-B.1



Summary for Subcatchment 2S: PR-B.2

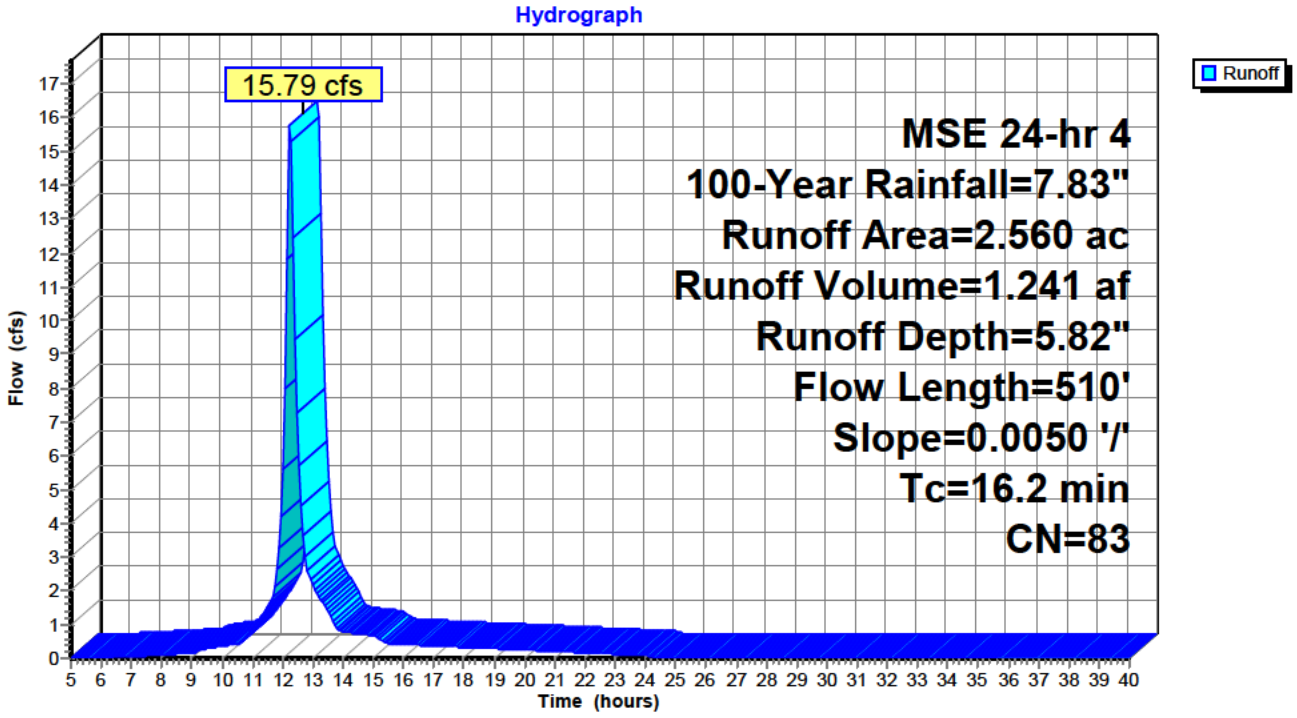
Runoff = 15.79 cfs @ 12.24 hrs, Volume= 1.241 af, Depth= 5.82"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
2.560	83	1/4 acre lots, 38% imp, HSG C
1.587		62.00% Pervious Area
0.973		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
5.2	450	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
16.2	510	Total			

Subcatchment 2S: PR-B.2



Summary for Subcatchment 3S: PR-B.3

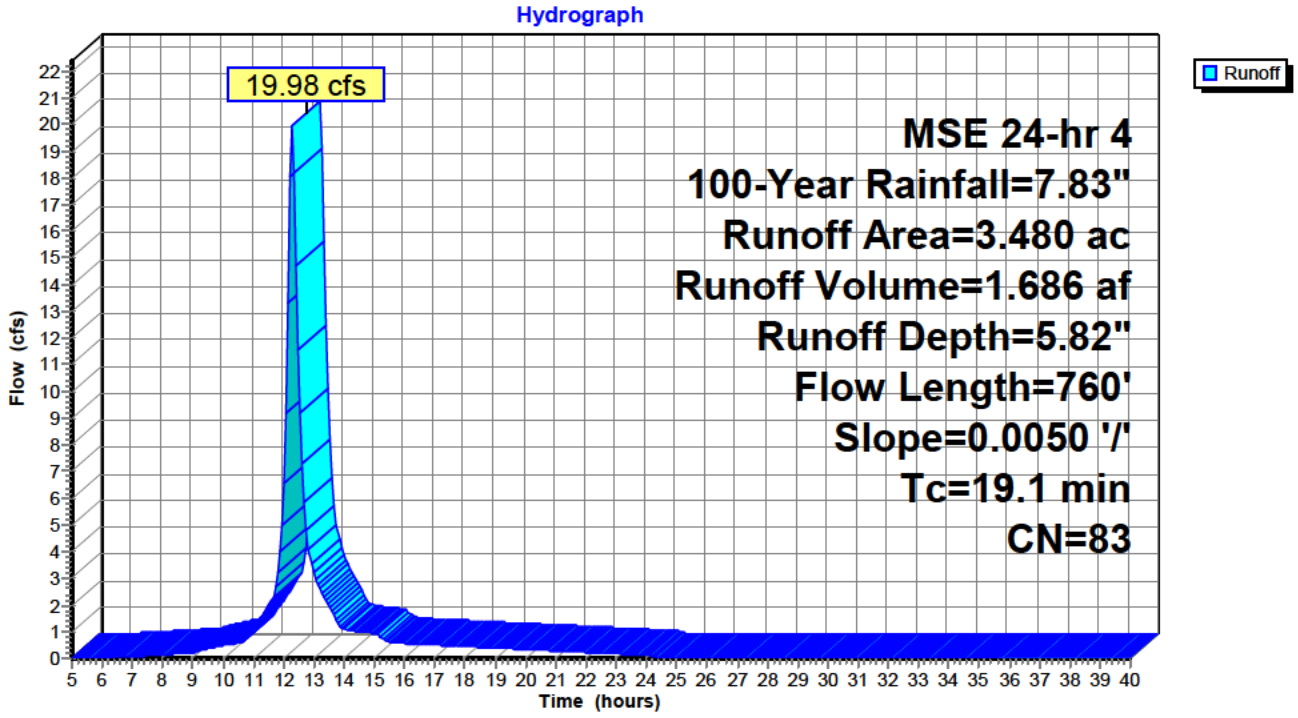
Runoff = 19.98 cfs @ 12.28 hrs, Volume= 1.686 af, Depth= 5.82"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
3.480	83	1/4 acre lots, 38% imp, HSG C
2.158		62.00% Pervious Area
1.322		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
8.1	700	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
19.1	760	Total			

Subcatchment 3S: PR-B.3



Summary for Subcatchment 4S: PR-B.4

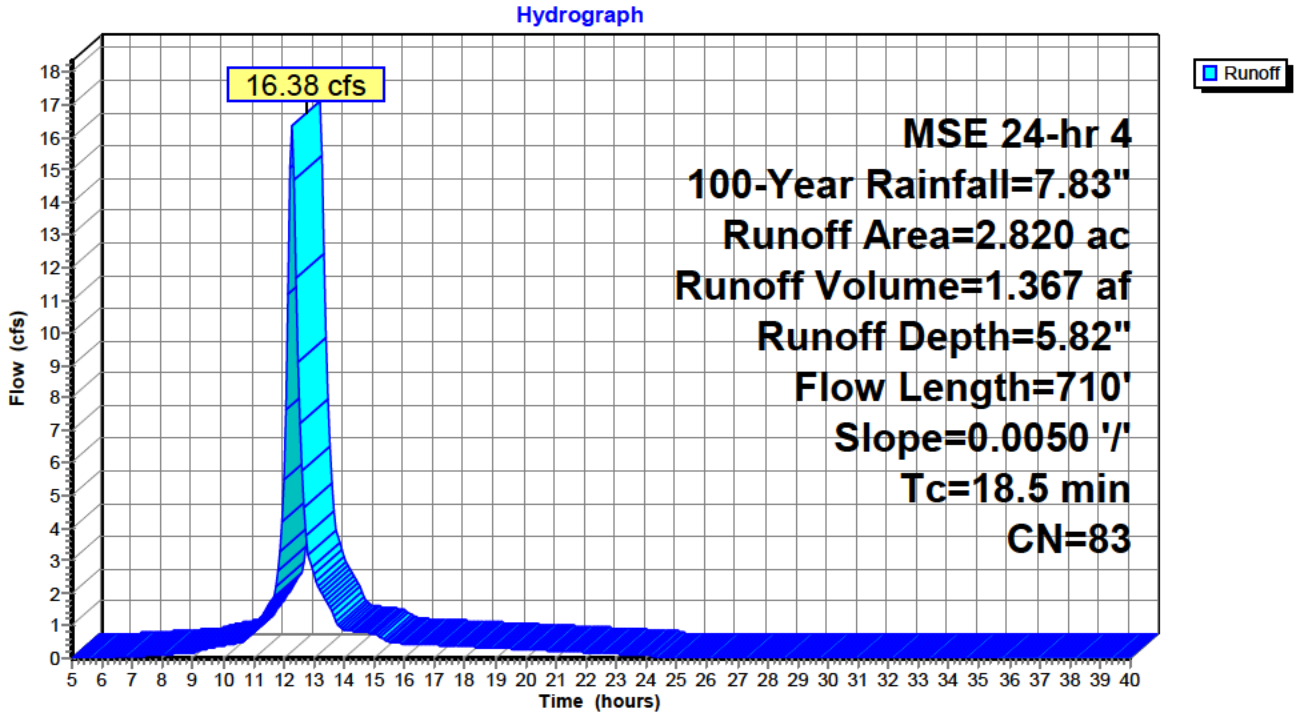
Runoff = 16.38 cfs @ 12.28 hrs, Volume= 1.367 af, Depth= 5.82"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
2.820	83	1/4 acre lots, 38% imp, HSG C
1.748		62.00% Pervious Area
1.072		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
7.5	650	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
18.5	710	Total			

Subcatchment 4S: PR-B.4



Summary for Subcatchment 5S: PR-B.5

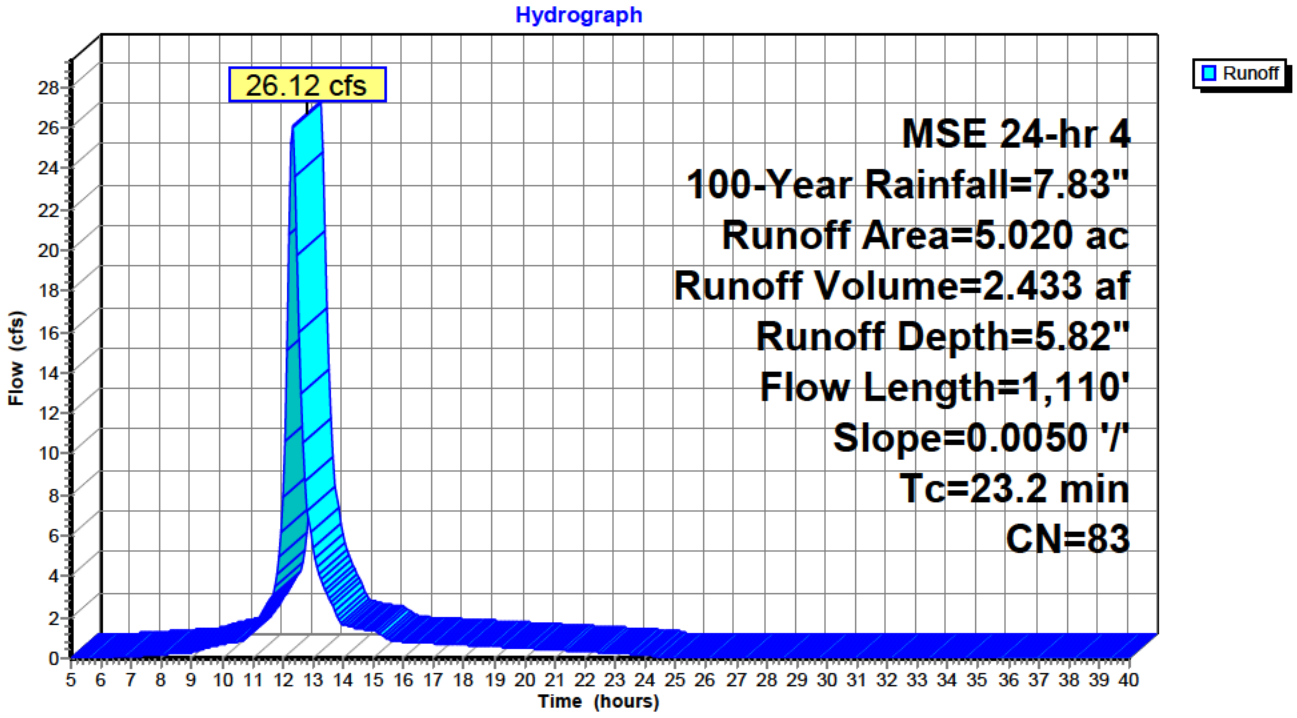
Runoff = 26.12 cfs @ 12.33 hrs, Volume= 2.433 af, Depth= 5.82"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
5.020	83	1/4 acre lots, 38% imp, HSG C
3.112		62.00% Pervious Area
1.908		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
12.2	1,050	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
23.2	1,110	Total			

Subcatchment 5S: PR-B.5



Summary for Subcatchment 6S: BASIN A Subcatch

[47] Hint: Peak is 597% of capacity of segment #4

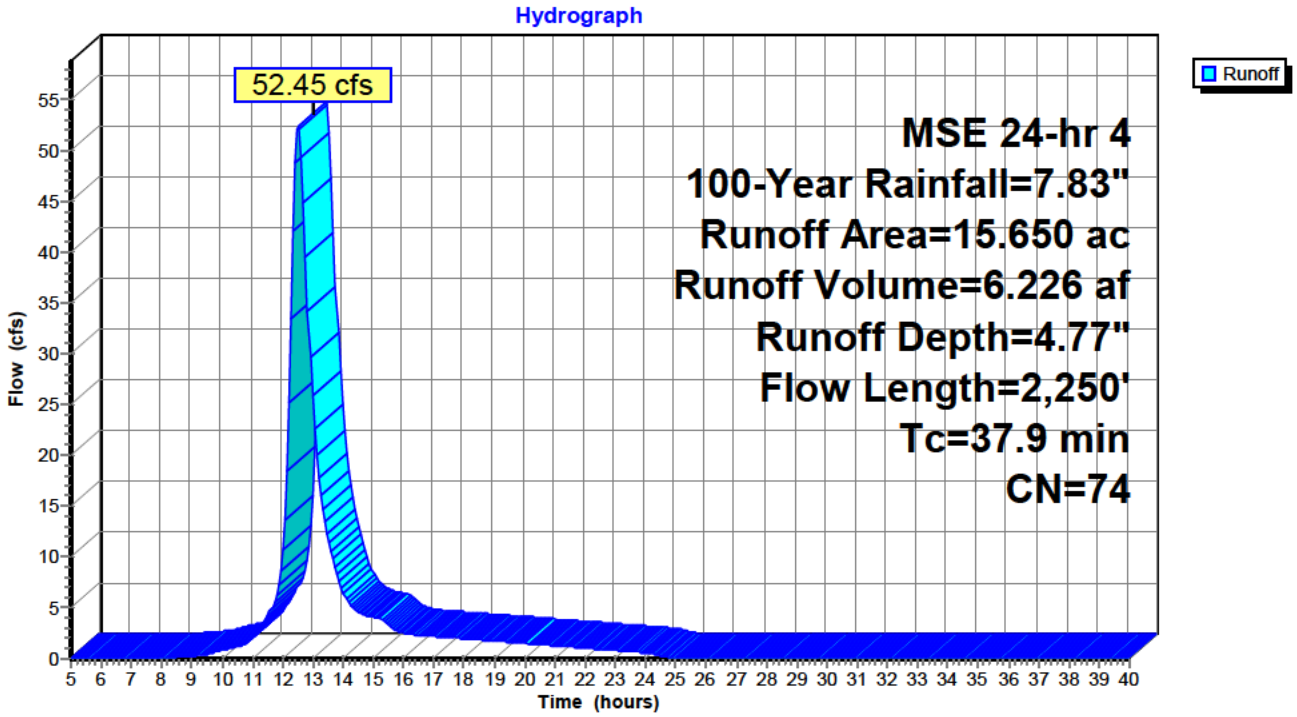
Runoff = 52.45 cfs @ 12.52 hrs, Volume= 6.226 af, Depth= 4.77"
Routed to Pond 7P : BASIN A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
15.650	74	>75% Grass cover, Good, HSG C
15.650		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0050	0.10		**Sheet Flow, SHEETING (BACKYARDS)** Grass: Short n= 0.150 P2= 3.38"
19.3	1,100	0.0040	0.95		**Shallow Concentrated Flow, SHALLOW DITCH** Grassed Waterway Kv= 15.0 fps
0.8	750		15.01		**Lake or Reservoir, BASIN AREA** Mean Depth= 7.00'
0.7	200	0.0050	4.97	8.78	**Pipe Channel, RCP_Round 18"** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.011 Concrete pipe, straight & clean
0.5	100	0.0010	3.09	139.23	**Channel Flow, LINED CHANNEL** Area= 45.0 sf Perim= 38.0' r= 1.18' n= 0.017 Concrete, unfinished
37.9	2,250	Total			

Subcatchment 6S: BASIN A Subcatch



Summary for Subcatchment 9S.1: OS-1

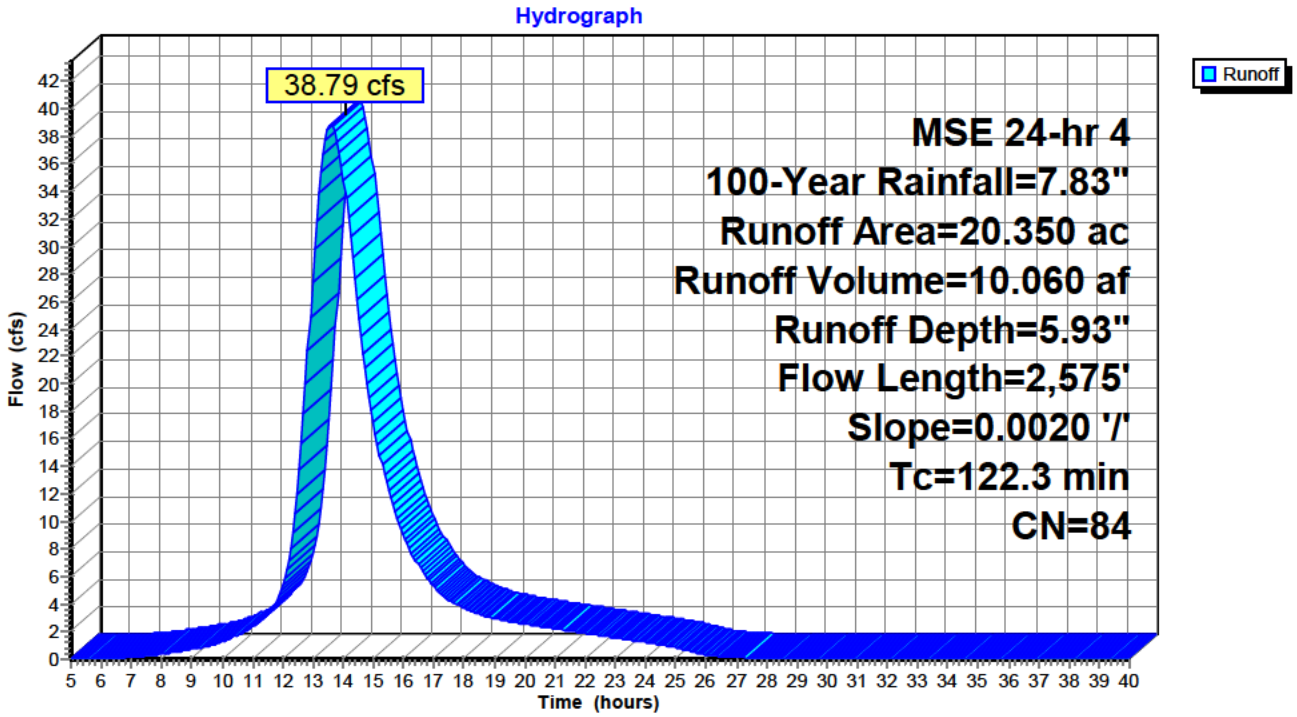
Runoff = 38.79 cfs @ 13.61 hrs, Volume= 10.060 af, Depth= 5.93"
Routed to Reach 10R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
20.250	84	Small grain, SR + CR, Good, HSG D
0.100	96	Gravel surface, HSG D
20.350	84	Weighted Average
20.350		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.8	1,250	0.0020	0.40		**Shallow Concentrated Flow, Backyard and Open Space Flow** Cultivated Straight Rows Kv= 9.0 fps
70.5	1,325	0.0020	0.31		**Shallow Concentrated Flow, Backyard Flow** Short Grass Pasture Kv= 7.0 fps
122.3	2,575	Total			

Subcatchment 9S.1: OS-1



Summary for Subcatchment 9S.2: EX-1

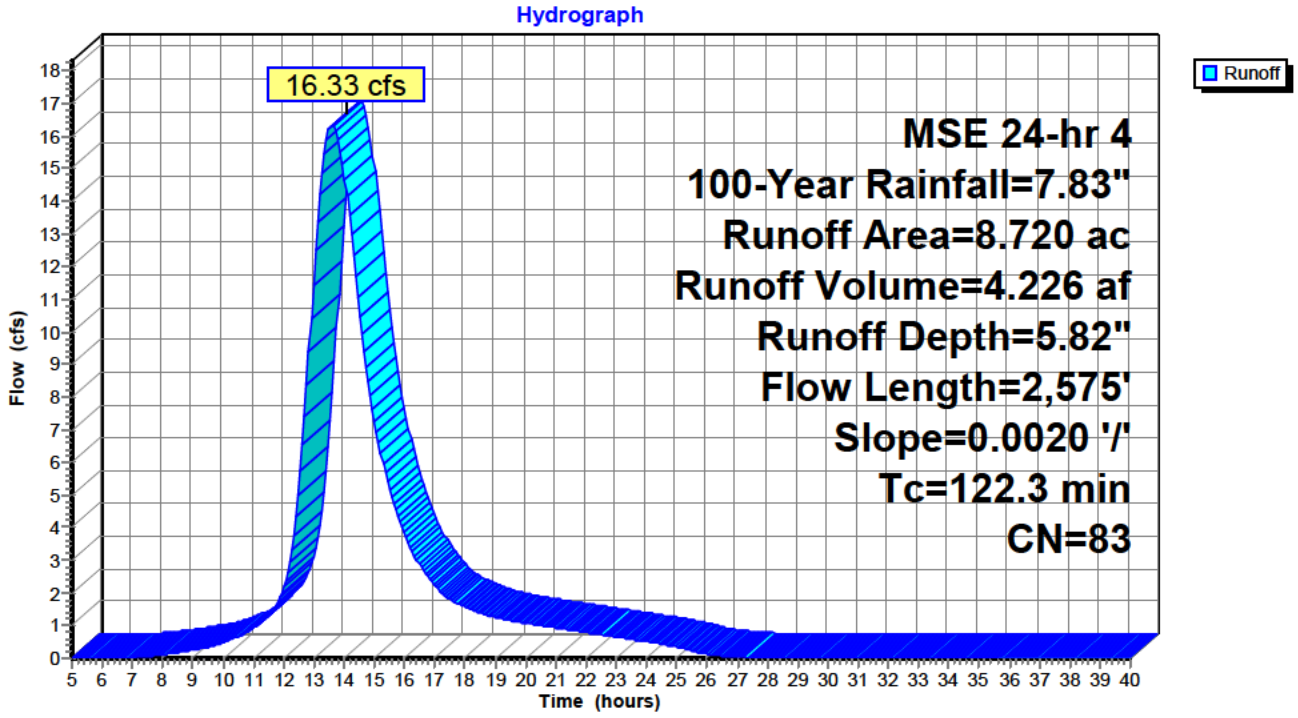
Runoff = 16.33 cfs @ 13.62 hrs, Volume= 4.226 af, Depth= 5.82"
Routed to Reach 10R : IMPACT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
8.720	83	1/4 acre lots, 38% imp, HSG C
5.406		62.00% Pervious Area
3.314		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.8	1,250	0.0020	0.40		**Shallow Concentrated Flow, Backyard and Open Space Flow** Cultivated Straight Rows Kv= 9.0 fps
70.5	1,325	0.0020	0.31		**Shallow Concentrated Flow, Backyard Flow** Short Grass Pasture Kv= 7.0 fps
122.3	2,575	Total			

Subcatchment 9S.2: EX-1



Summary for Subcatchment 11S: PR-B.6

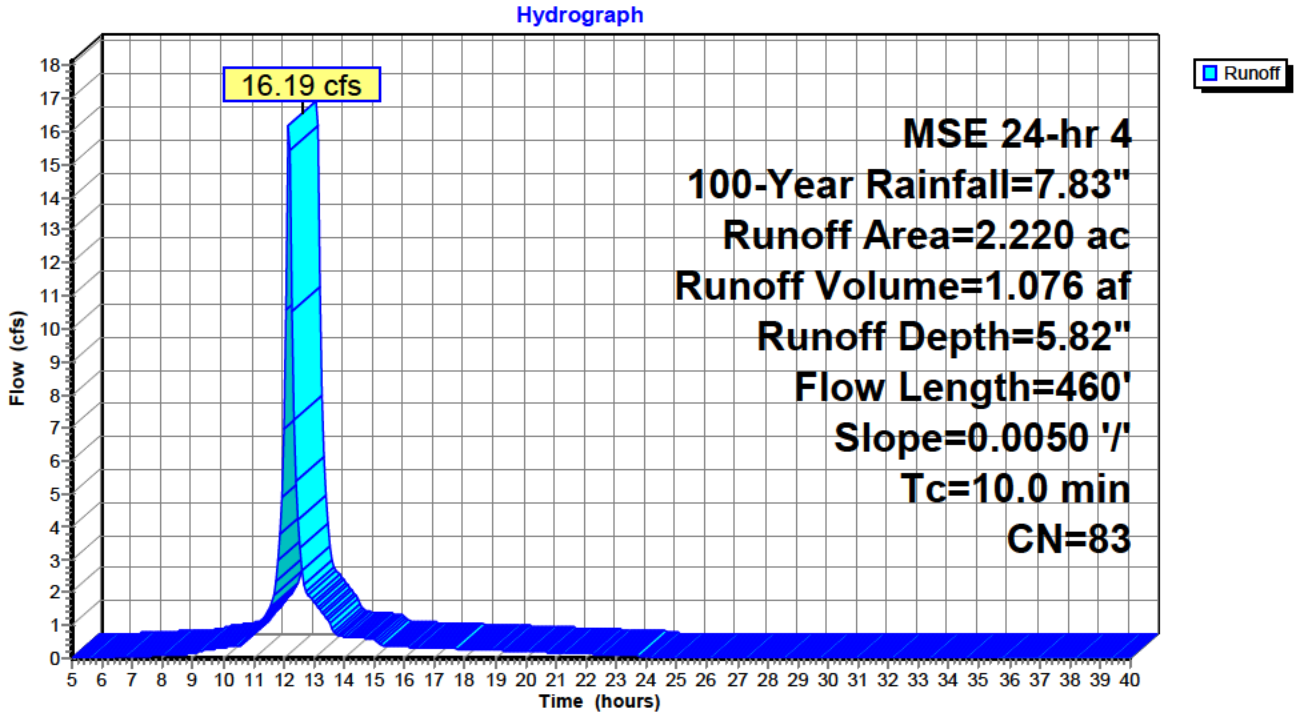
Runoff = 16.19 cfs @ 12.17 hrs, Volume= 1.076 af, Depth= 5.82"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
2.220	83	1/4 acre lots, 38% imp, HSG C
1.376		62.00% Pervious Area
0.844		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	10	0.0050	0.06		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
5.2	450	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
7.8	460	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 11S: PR-B.6



Summary for Subcatchment 12S: PR-B.7

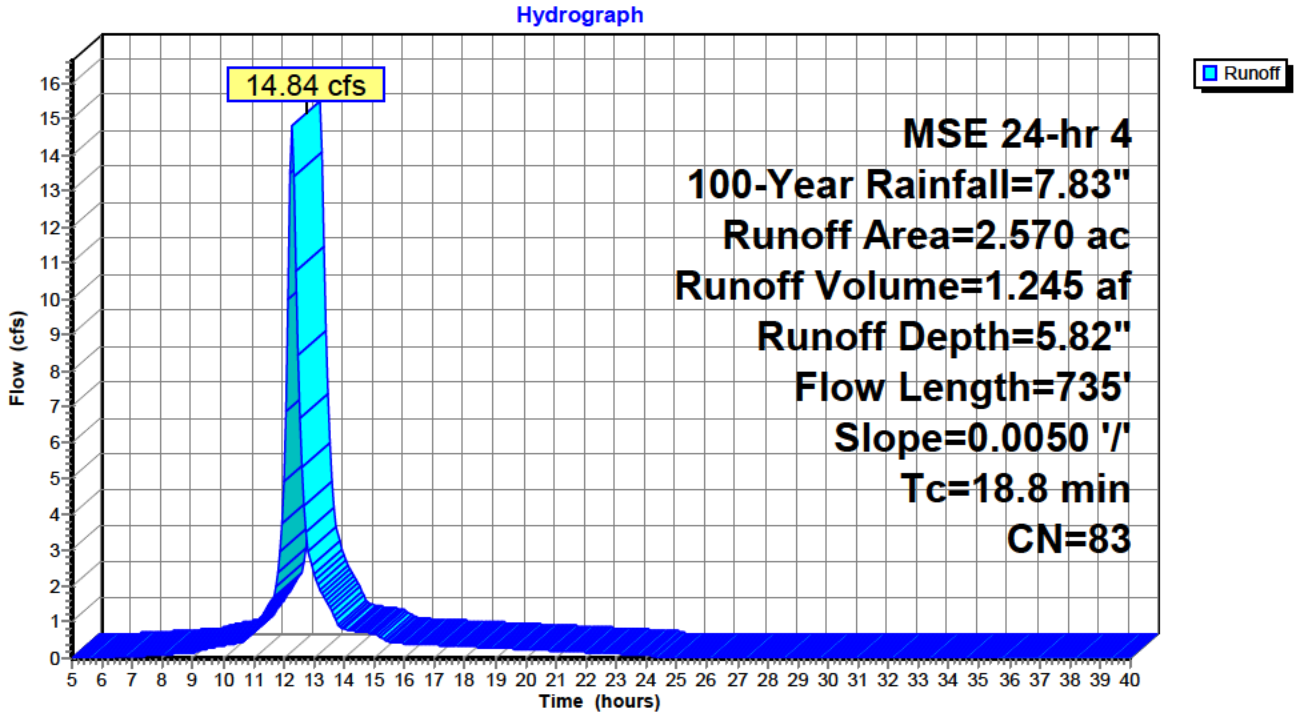
Runoff = 14.84 cfs @ 12.28 hrs, Volume= 1.245 af, Depth= 5.82"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
2.570	83	1/4 acre lots, 38% imp, HSG C
1.593		62.00% Pervious Area
0.977		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
7.8	675	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
18.8	735	Total			

Subcatchment 12S: PR-B.7



Summary for Subcatchment 13S: PR-B.8

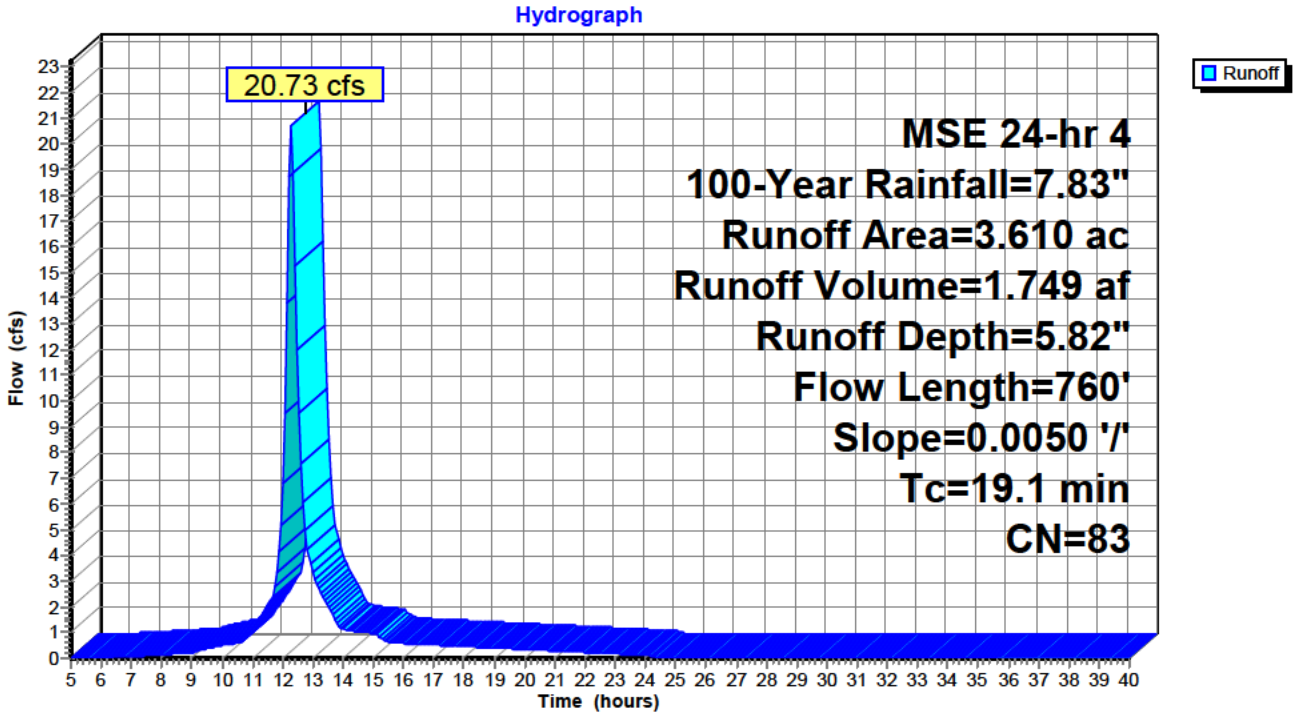
Runoff = 20.73 cfs @ 12.28 hrs, Volume= 1.749 af, Depth= 5.82"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
3.610	83	1/4 acre lots, 38% imp, HSG C
2.238		62.00% Pervious Area
1.372		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	60	0.0050	0.09		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
8.1	700	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
19.1	760	Total			

Subcatchment 13S: PR-B.8



Summary for Subcatchment 14S: Basin B Subcatch

[47] Hint: Peak is 139% of capacity of segment #4

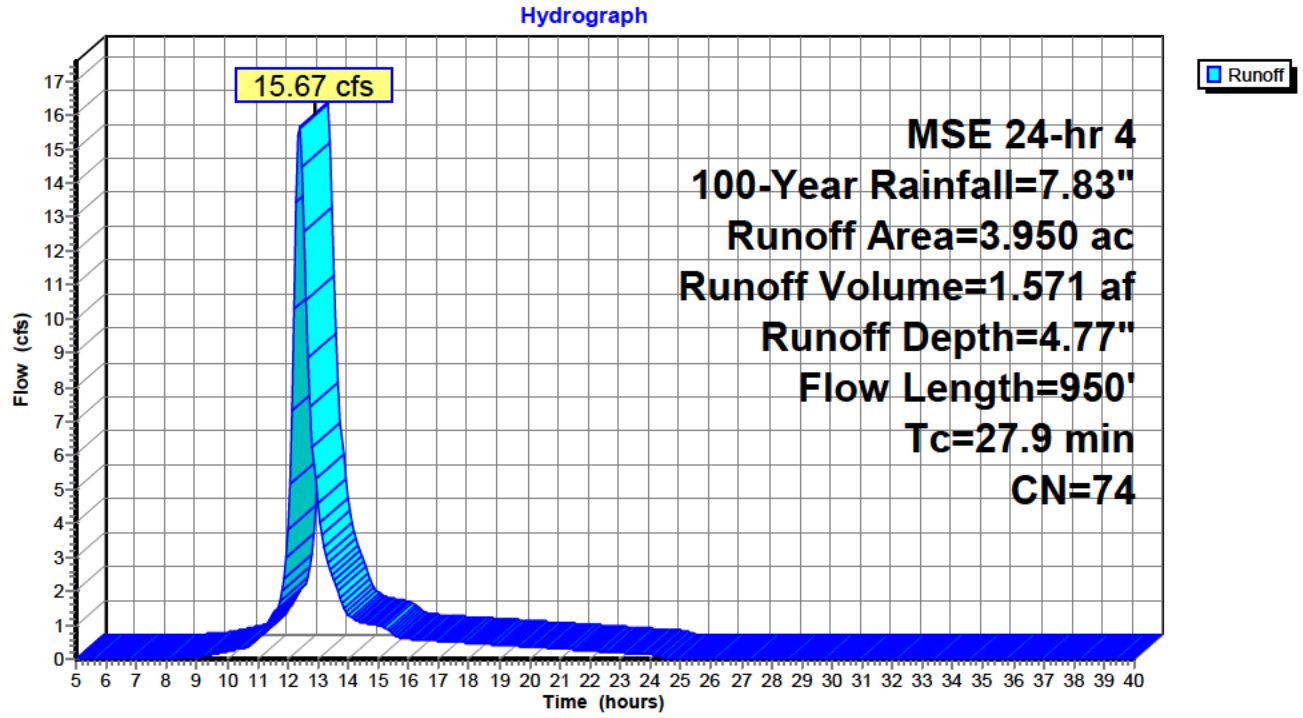
Runoff = 15.67 cfs @ 12.40 hrs, Volume= 1.571 af, Depth= 4.77"
Routed to Pond 15P : Basin B

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
3.950	74	>75% Grass cover, Good, HSG C
3.950		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0050	0.10		**Sheet Flow, SHEETING** Grass: Short n= 0.150 P2= 3.38"
9.4	600	0.0050	1.06		**Shallow Concentrated Flow, DITCH FLOW** Grassed Waterway Kv= 15.0 fps
0.4	200		8.02		**Lake or Reservoir, Basin Area** Mean Depth= 2.00'
1.5	50	0.0020	0.56	11.24	**Channel Flow, CHANNEL OUTFALL** Area= 20.0 sf Perim= 14.0' r= 1.43' n= 0.150 Sheet flow over Short Grass
27.9	950	Total			

Subcatchment 14S: Basin B Subcatch



Summary for Subcatchment 17S.1: OS-2

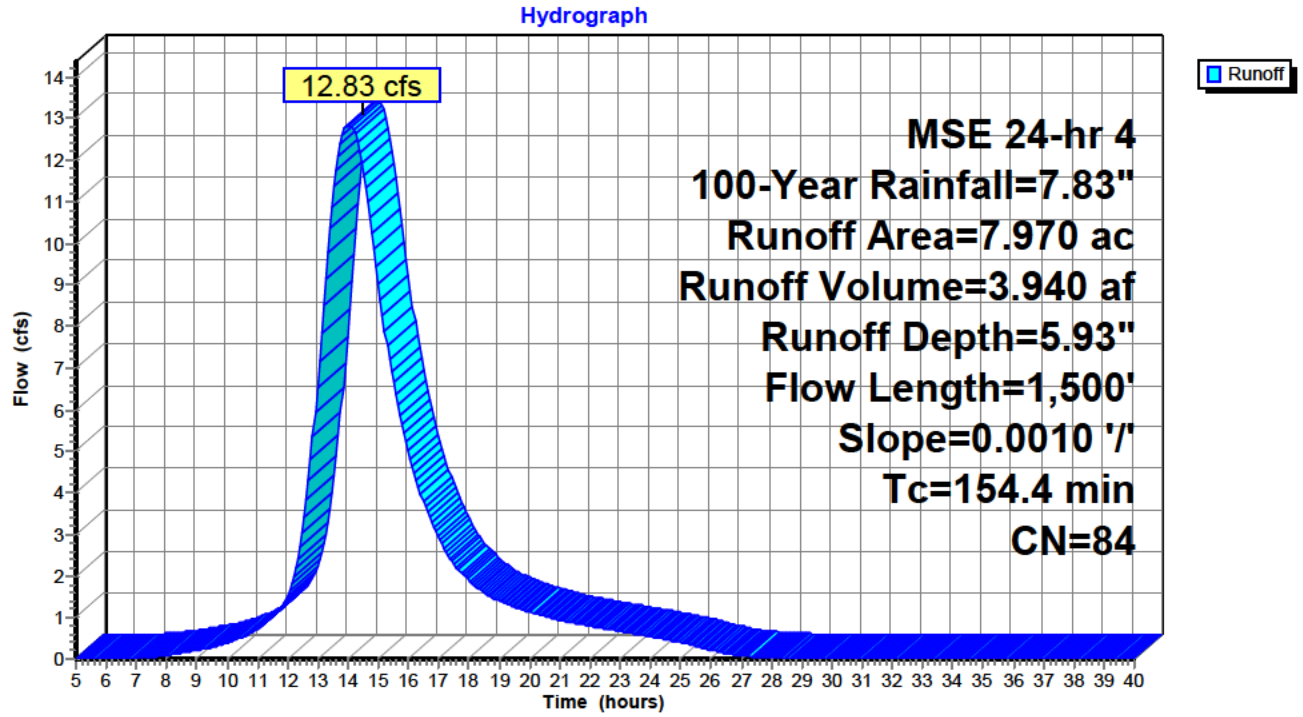
Runoff = 12.83 cfs @ 14.00 hrs, Volume= 3.940 af, Depth= 5.93"
Routed to Reach 18R : IMPACT 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
7.970	84	Small grain, SR + CR, Good, HSG D
7.970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
84.1	300	0.0010	0.06		**Sheet Flow, Crop Sheeting** Cultivated: Residue>20% n= 0.170 P2= 3.38"
70.3	1,200	0.0010	0.28		**Shallow Concentrated Flow, Crop Shallow Concentrated** Cultivated Straight Rows Kv= 9.0 fps
154.4	1,500	Total			

Subcatchment 17S.1: OS-2



Summary for Subcatchment 17S.2: EX-2

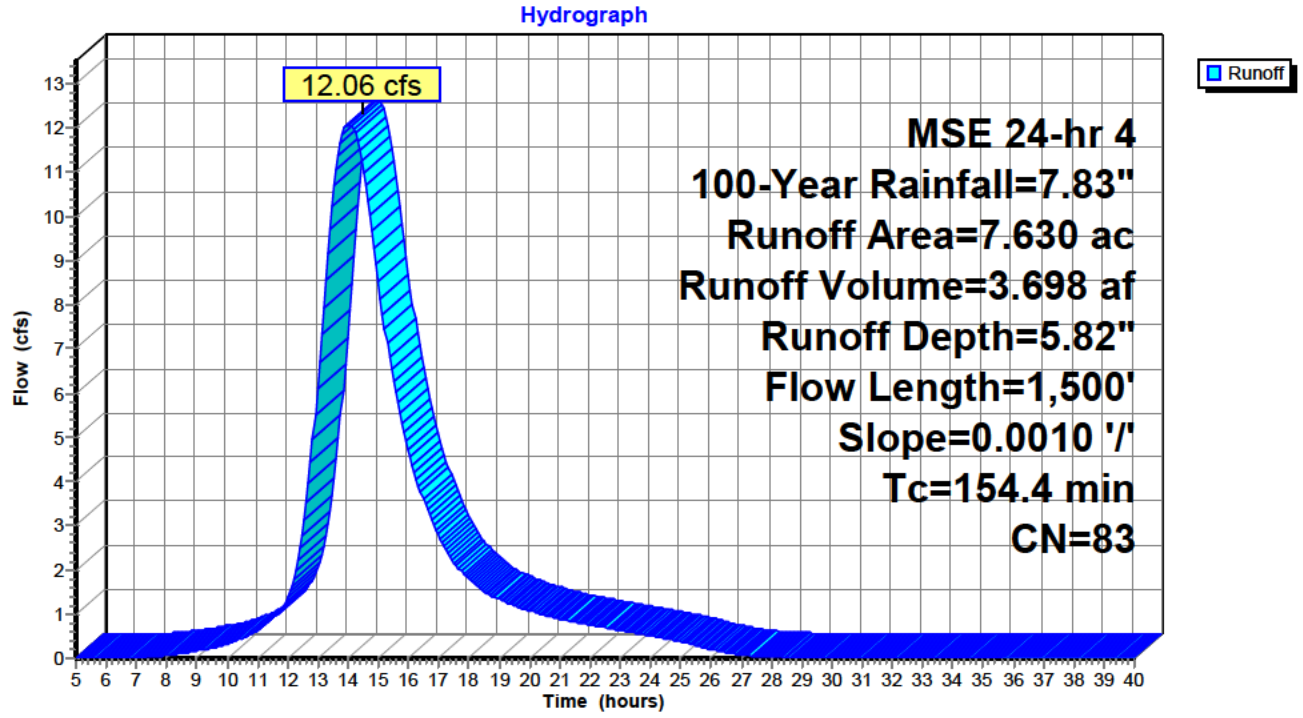
Runoff = 12.06 cfs @ 14.01 hrs, Volume= 3.698 af, Depth= 5.82"
Routed to Reach 18R : IMPACT 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
MSE 24-hr 4 100-Year Rainfall=7.83"

Area (ac)	CN	Description
7.630	83	1/4 acre lots, 38% imp, HSG C
4.731		62.00% Pervious Area
2.899		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
84.1	300	0.0010	0.06		**Sheet Flow, Crop Sheeting** Cultivated: Residue>20% n= 0.170 P2= 3.38"
70.3	1,200	0.0010	0.28		**Shallow Concentrated Flow, Crop Shallow Concentrated** Cultivated Straight Rows Kv= 9.0 fps
154.4	1,500	Total			

Subcatchment 17S.2: EX-2



Summary for Reach 8R: Culvert

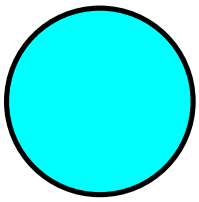
[52] Hint: Inlet/Outlet conditions not evaluated
[55] Hint: Peak inflow is 1021% of Manning's capacity
[76] Warning: Detained 8.705 af (Pond w/culvert advised)
[81] Warning: Exceeded Pond 7P by 0.68' @ 39.93 hrs

Inflow Area = 32.260 ac, 19.57% Impervious, Inflow Depth > 5.30" for 100-Year event
Inflow = 57.90 cfs @ 12.81 hrs, Volume= 14.258 af
Outflow = 5.67 cfs @ 11.72 hrs, Volume= 13.691 af, Atten= 90%, Lag= 0.0 min
Routed to Reach 10R : IMPACT 1

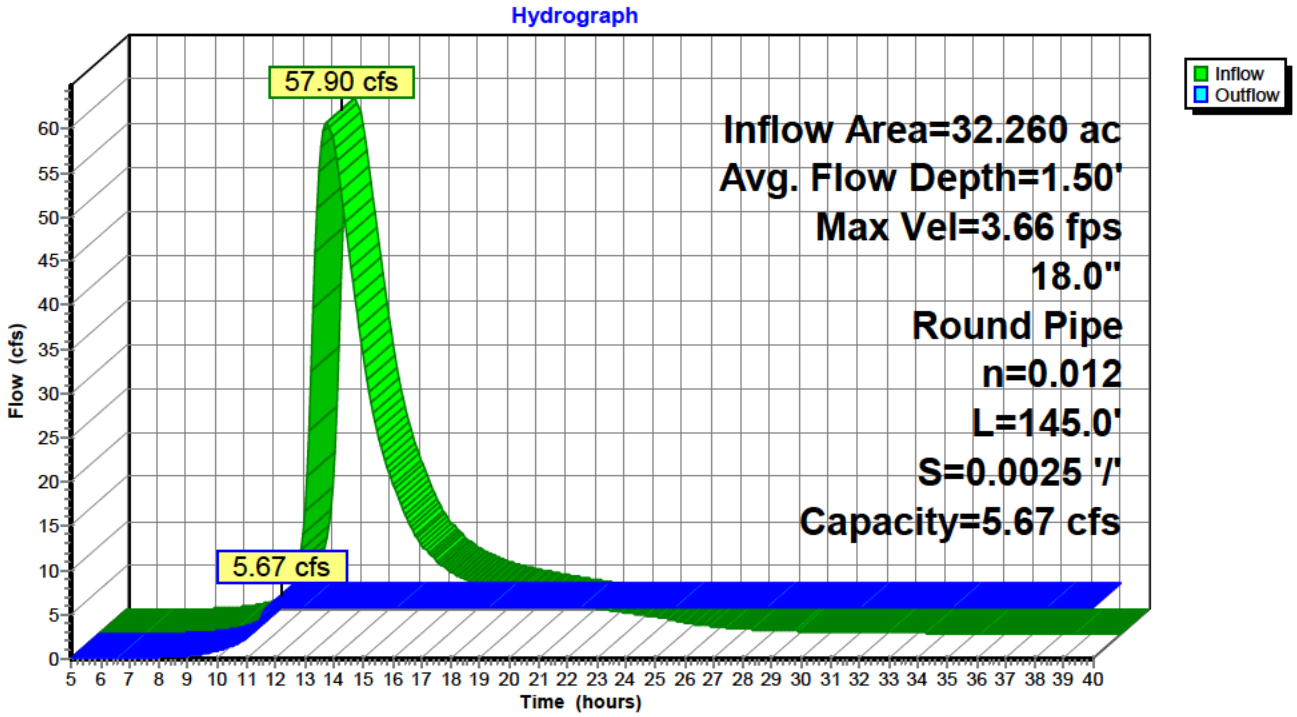
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 3.66 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 2.94 fps, Avg. Travel Time= 0.8 min

Peak Storage= 256 cf @ 11.72 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 5.67 cfs

18.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 145.0' Slope= 0.0025 '/'
Inlet Invert= 1,350.69', Outlet Invert= 1,350.33'



Reach 8R: Culvert



Summary for Reach 10R: IMPACT 1

Inflow Area = 61.330 ac, 15.69% Impervious, Inflow Depth > 5.47" for 100-Year event
Inflow = 60.79 cfs @ 13.61 hrs, Volume= 27.976 af
Outflow = 60.08 cfs @ 13.94 hrs, Volume= 27.713 af, Atten= 1%, Lag= 19.5 min
Routed to Reach 19R : OUTLET PIPE

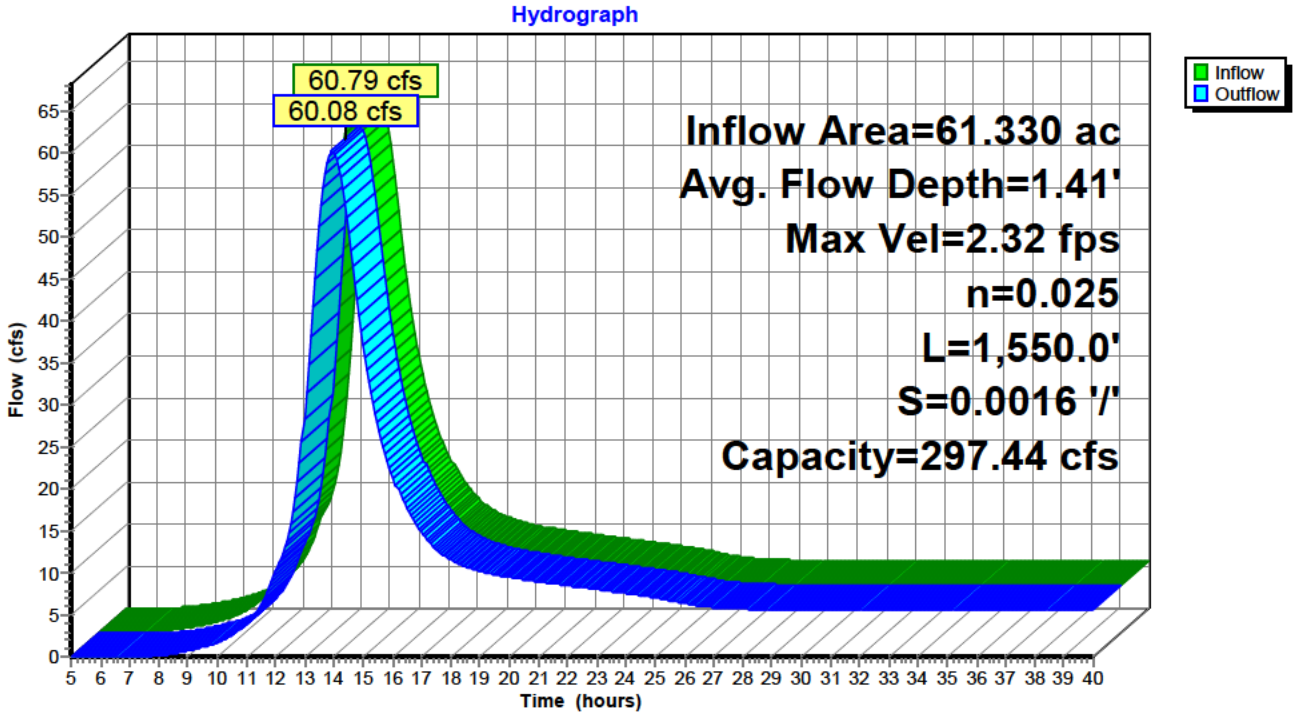
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 2.32 fps, Min. Travel Time= 11.1 min
Avg. Velocity = 1.21 fps, Avg. Travel Time= 21.4 min

Peak Storage= 40,207 cf @ 13.75 hrs
Average Depth at Peak Storage= 1.41' , Surface Width= 26.88'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 297.44 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 6.0 '/' Top Width= 46.00'
Length= 1,550.0' Slope= 0.0016 '/'
Inlet Invert= 1,348.50', Outlet Invert= 1,346.00'

‡

Reach 10R: IMPACT 1



Summary for Reach 16R: IMPACT 2

[81] Warning: Exceeded Pond 15P by 0.50' @ 33.49 hrs

Inflow Area = 12.350 ac, 25.85% Impervious, Inflow Depth = 4.65" for 100-Year event
Inflow = 55.58 cfs @ 12.34 hrs, Volume= 4.787 af
Outflow = 45.80 cfs @ 12.69 hrs, Volume= 4.787 af, Atten= 18%, Lag= 21.0 min
Routed to Reach 19R : OUTLET PIPE

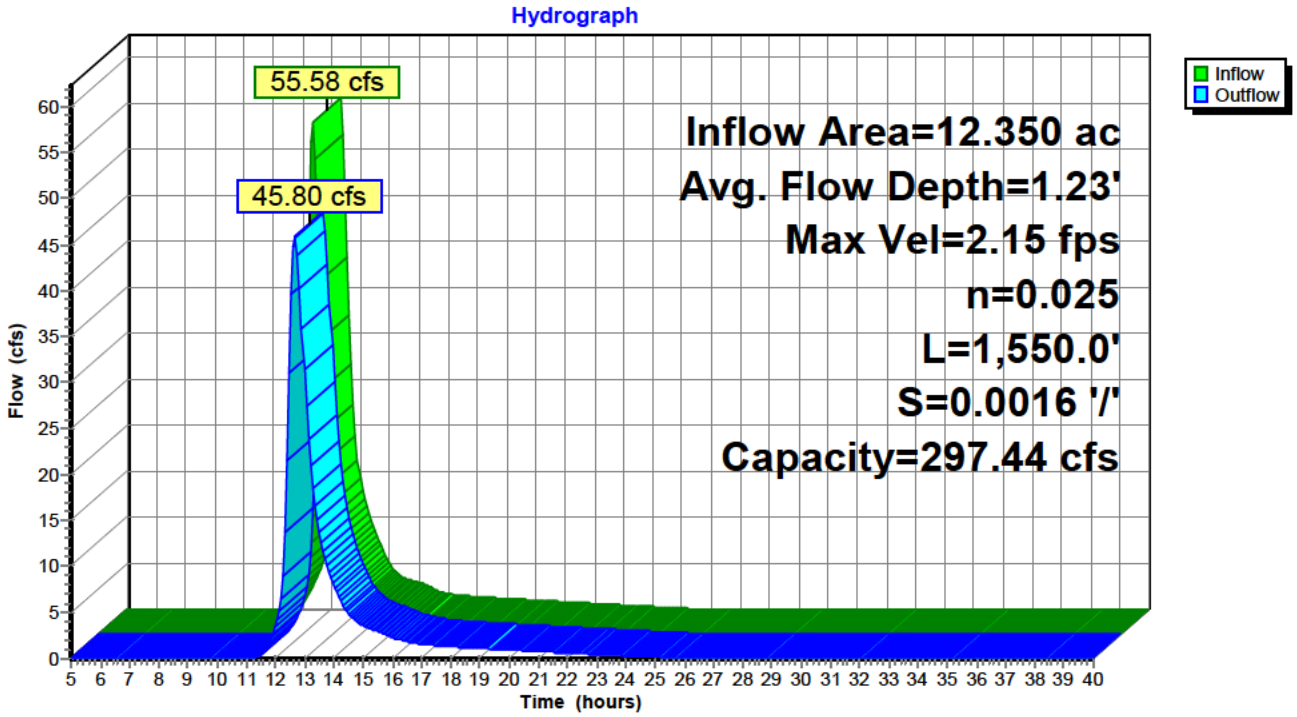
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 2.15 fps, Min. Travel Time= 12.0 min
Avg. Velocity = 0.49 fps, Avg. Travel Time= 52.3 min

Peak Storage= 33,130 cf @ 12.49 hrs
Average Depth at Peak Storage= 1.23' , Surface Width= 24.76'
Bank-Full Depth= 3.00' Flow Area= 84.0 sf, Capacity= 297.44 cfs

10.00' x 3.00' deep channel, n= 0.025 Earth, grassed & winding
Side Slope Z-value= 6.0 '/' Top Width= 46.00'
Length= 1,550.0' Slope= 0.0016 '/'
Inlet Invert= 1,348.50', Outlet Invert= 1,346.00'

‡

Reach 16R: IMPACT 2



Summary for Reach 18R: IMPACT 3

Inflow Area = 15.600 ac, 18.59% Impervious, Inflow Depth = 5.87" for 100-Year event
Inflow = 24.89 cfs @ 14.01 hrs, Volume= 7.637 af
Outflow = 22.78 cfs @ 15.11 hrs, Volume= 7.631 af, Atten= 8%, Lag= 66.3 min
Routed to Reach 19R : OUTLET PIPE

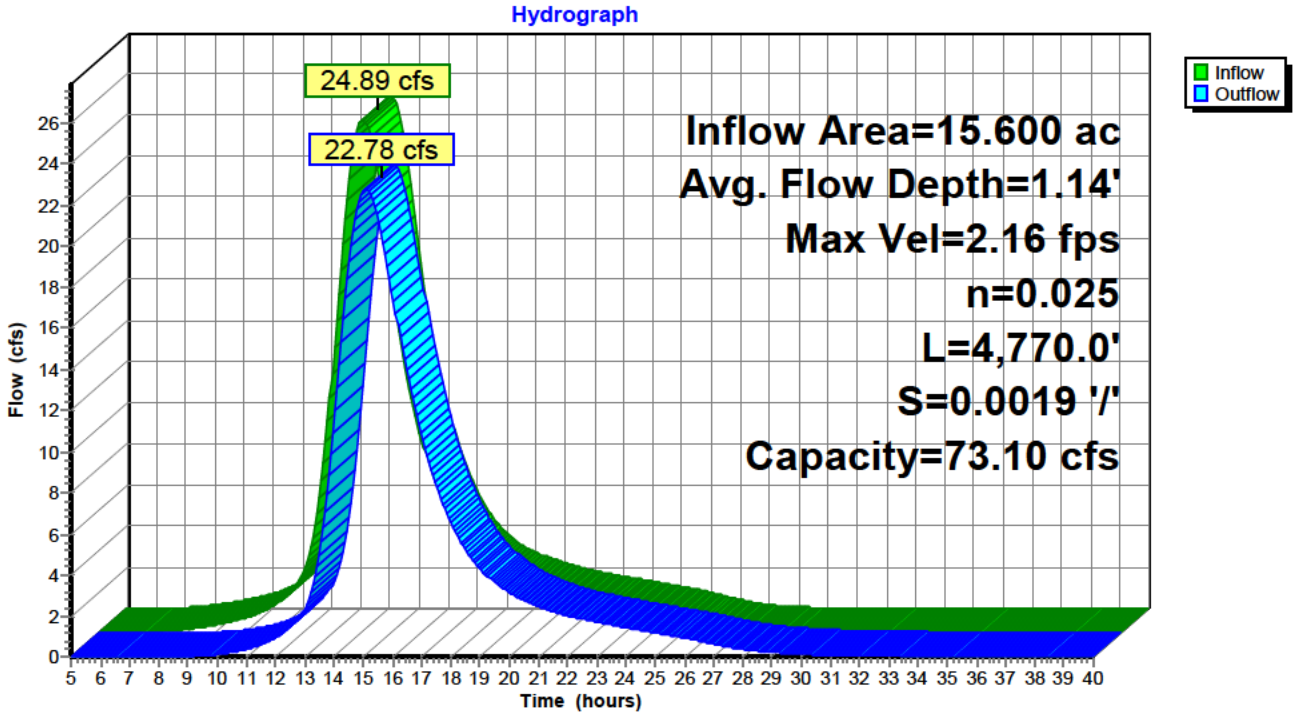
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 2.16 fps, Min. Travel Time= 36.8 min
Avg. Velocity = 0.76 fps, Avg. Travel Time= 105.2 min

Peak Storage= 50,277 cf @ 14.50 hrs
Average Depth at Peak Storage= 1.14' , Surface Width= 13.45'
Bank-Full Depth= 2.00' Flow Area= 24.8 sf, Capacity= 73.10 cfs

5.00' x 2.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.7 '/' Top Width= 19.80'
Length= 4,770.0' Slope= 0.0019 '/'
Inlet Invert= 1,355.00', Outlet Invert= 1,346.00'

‡

Reach 18R: IMPACT 3



Summary for Reach 19R: OUTLET PIPE

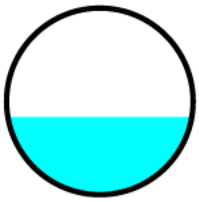
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 10R OUTLET depth by 1.37' @ 12.70 hrs
[62] Hint: Exceeded Reach 16R OUTLET depth by 2.10' @ 14.24 hrs
[62] Hint: Exceeded Reach 18R OUTLET depth by 1.81' @ 12.70 hrs
[64] Warning: Exceeded Reach 18R outlet bank by 0.49' @ 14.05 hrs

Inflow Area = 89.280 ac, 17.60% Impervious, Inflow Depth > 5.39" for 100-Year event
Inflow = 79.45 cfs @ 14.05 hrs, Volume= 40.132 af
Outflow = 79.44 cfs @ 14.06 hrs, Volume= 40.120 af, Atten= 0%, Lag= 0.8 min

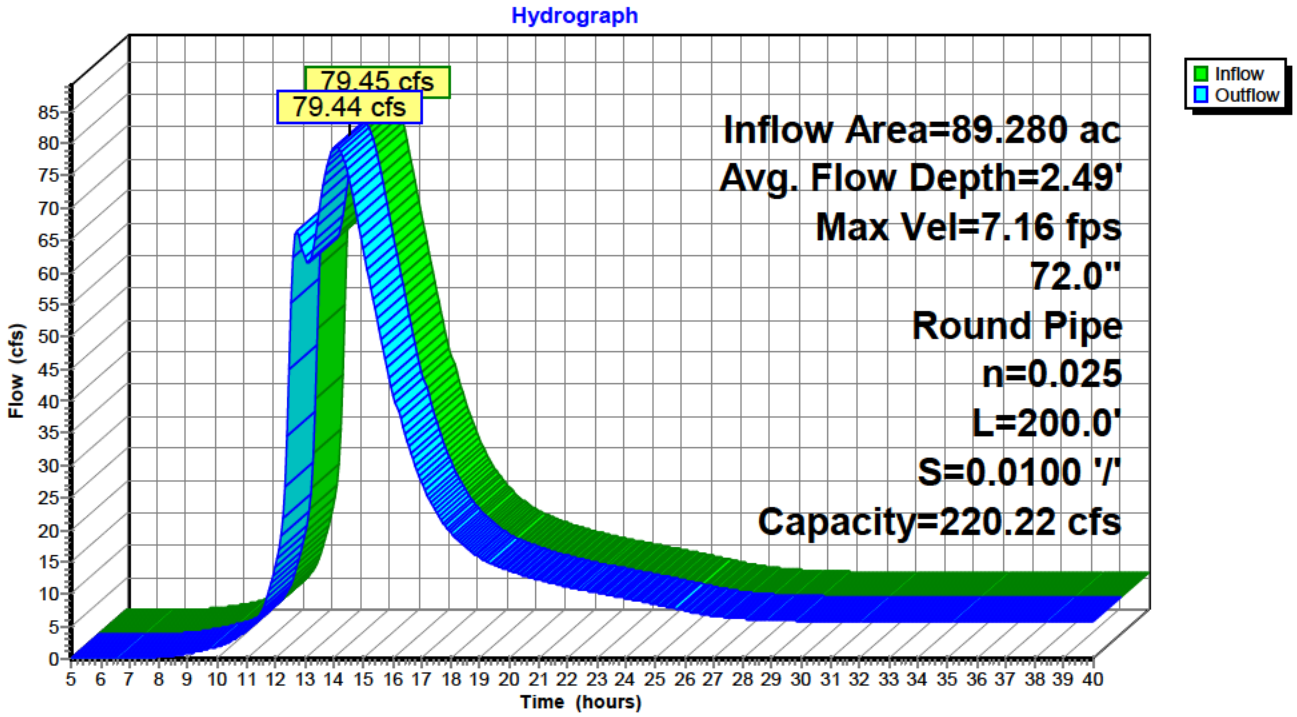
Routing by Stor-Ind+Trans method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Max. Velocity= 7.16 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.77 fps, Avg. Travel Time= 0.9 min

Peak Storage= 2,220 cf @ 14.05 hrs
Average Depth at Peak Storage= 2.49' , Surface Width= 5.91'
Bank-Full Depth= 6.00' Flow Area= 28.3 sf, Capacity= 220.22 cfs

72.0" Round Pipe
n= 0.025 Corrugated metal
Length= 200.0' Slope= 0.0100 '/'
Inlet Invert= 1,346.00', Outlet Invert= 1,344.00'



Reach 19R: OUTLET PIPE



Summary for Pond 7P: BASIN A

Inflow Area = 32.260 ac, 19.57% Impervious, Inflow Depth = 5.31" for 100-Year event
Inflow = 128.62 cfs @ 12.31 hrs, Volume= 14.275 af
Outflow = 57.90 cfs @ 12.81 hrs, Volume= 14.258 af, Atten= 55%, Lag= 29.8 min
Primary = 57.90 cfs @ 12.81 hrs, Volume= 14.258 af
Routed to Reach 8R : Culvert

Routing by Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Peak Elev= 1,352.78' @ 12.81 hrs Surf.Area= 6.020 ac Storage= 5.020 af
Flood Elev= 1,354.50' Surf.Area= 10.869 ac Storage= 15.257 af

Plug-Flow detention time= 85.0 min calculated for 14.229 af (100% of inflow)
Center-of-Mass det. time= 85.6 min (901.3 - 815.7)

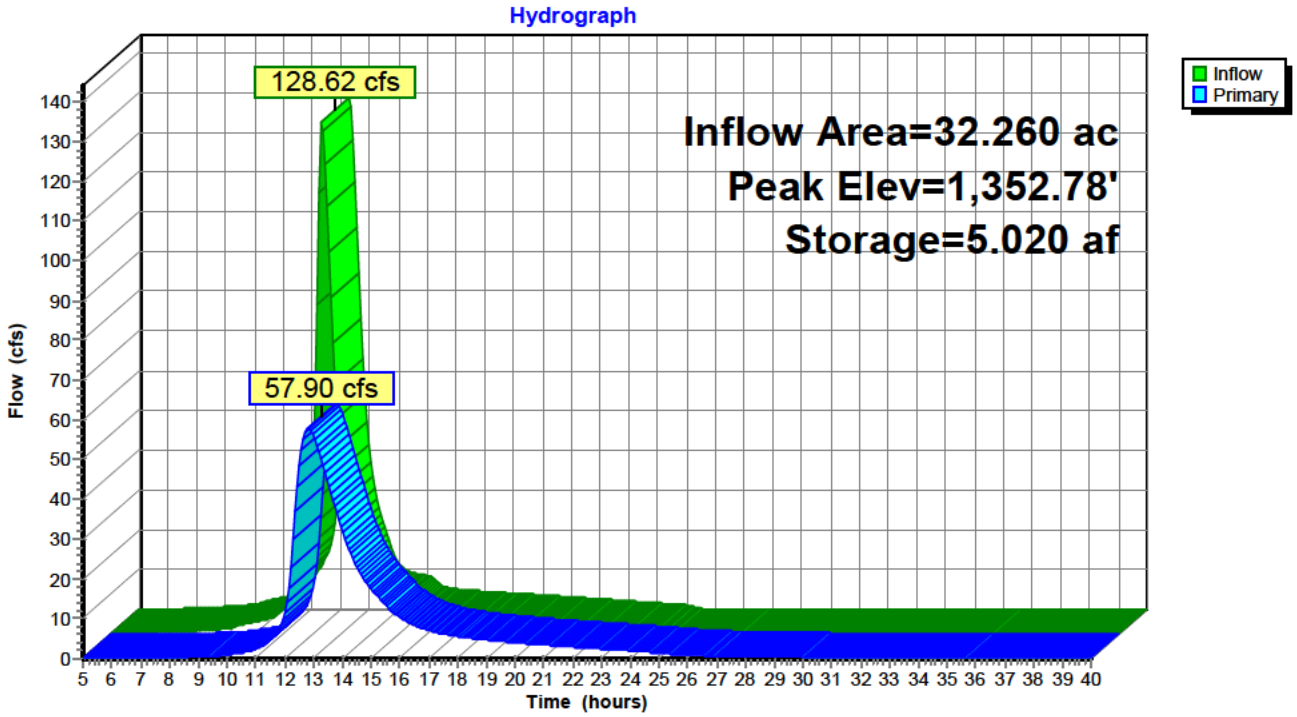
Volume	Invert	Avail.Storage	Storage Description
#1	1,351.50'	15.257 af	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
1,351.50	2.090	0.000	0.000	2.090
1,352.00	3.475	1.377	1.377	3.475
1,353.00	6.880	5.082	6.458	6.880
1,354.00	10.869	8.799	15.257	10.870

Device	Routing	Invert	Outlet Devices
#1	Primary	1,351.50'	**10.0' long + 5.0 '/' SideZ x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=57.82 cfs @ 12.81 hrs HW=1,352.78' TW=1,351.50' (Fixed TW Elev= 1,351.50')
1=Broad-Crested Rectangular Weir (Weir Controls 57.82 cfs @ 2.77 fps)

Pond 7P: BASIN A



Summary for Pond 15P: Basin B

Inflow Area = 12.350 ac, 25.85% Impervious, Inflow Depth = 5.48" for 100-Year event
Inflow = 59.72 cfs @ 12.26 hrs, Volume= 5.642 af
Outflow = 56.44 cfs @ 12.34 hrs, Volume= 5.642 af, Atten= 5%, Lag= 4.6 min
Discarded = 0.86 cfs @ 12.34 hrs, Volume= 0.855 af
Primary = 55.58 cfs @ 12.34 hrs, Volume= 4.787 af
Routed to Reach 16R : IMPACT 2

Routing by Stor-Ind method, Time Span= 5.00-40.00 hrs, dt= 0.07 hrs
Peak Elev= 1,349.31' @ 12.34 hrs Surf.Area= 1.006 ac Storage= 0.814 af

Plug-Flow detention time= 52.0 min calculated for 5.631 af (100% of inflow)
Center-of-Mass det. time= 52.9 min (858.7 - 805.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,348.00'	1.012 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

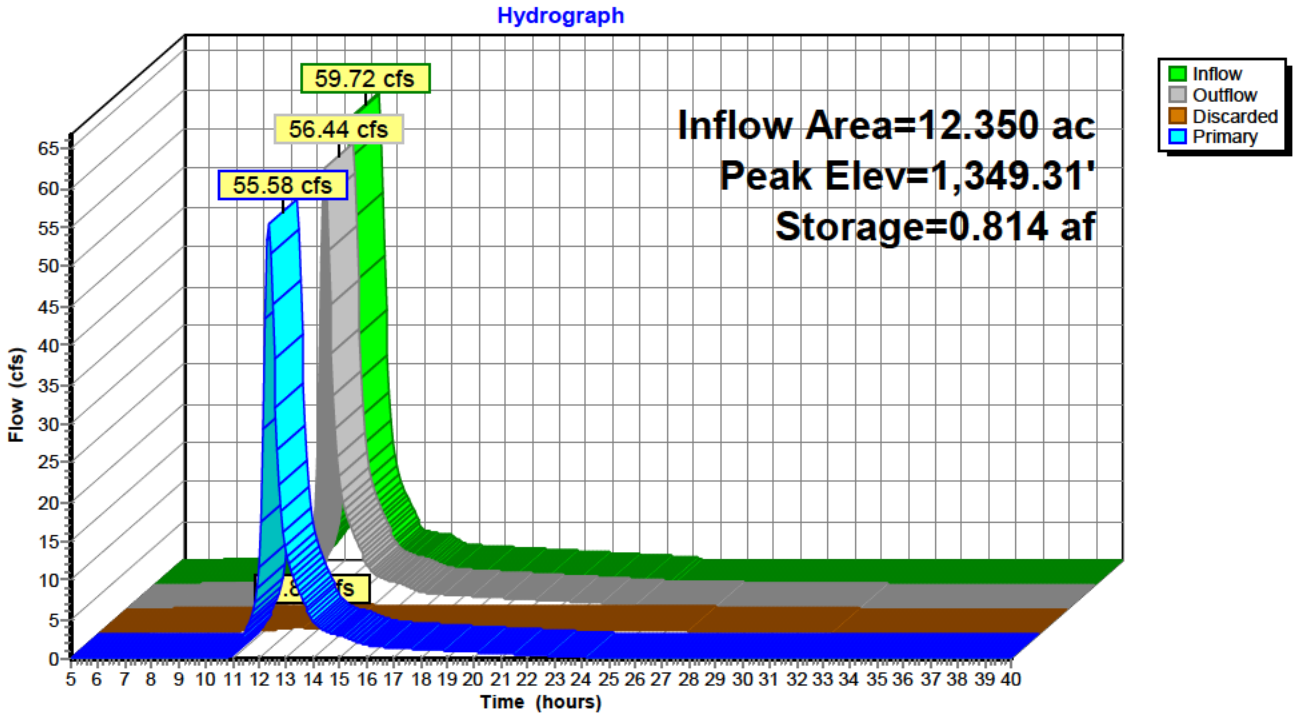
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,348.00	0.250	0.000	0.000
1,348.50	0.500	0.187	0.187
1,349.00	0.850	0.337	0.525
1,349.50	1.100	0.487	1.012

Device	Routing	Invert	Outlet Devices
#1	Primary	1,348.50'	**10.0' long + 10.0 '/' SideZ 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	Discarded	1,348.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 1,342.00'
#3	Primary	1,349.00'	**50.0' long + 10.0 '/' SideZ x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.86 cfs @ 12.34 hrs HW=1,349.31' (Free Discharge)
└**2=Exfiltration** (Controls 0.86 cfs)

Primary OutFlow Max=55.20 cfs @ 12.34 hrs HW=1,349.31' (Free Discharge)
├**1=Broad-Crested Rectangular Weir** (Weir Controls 32.30 cfs @ 2.20 fps)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 22.89 cfs @ 1.39 fps)

Pond 15P: Basin B



KANSAS SECURED TITLE
SERVICE BEYOND EXPECTATION

INVOICE

Invoice Date: 4/24/2025

Customer Reference Number:	Loan Number:	KST File Number:
		SG0716912

To:	Remit To:
Real Broker, LLC Attn: Genni Trilli 7300 W 110th St. Suite. 700 Overland Park, KS 66210	Kansas Secured Title, Inc. - Wichita 232 North Mead Wichita, KS 67202 316-262-8261

Buyer: Bogdan Properties, LLC, a Kansas limited liability company
Seller: KWH Investments LLC, a Kansas limited liability company
Property Address: No Address, Valley Center, KS
No Address, Valley Center, KS

Policy Type	Proposed Amount
Owner's Policy	$720,000.00
Loan Policy	
Second Loan Policy	

Description	Amount	Qty	Total
Recording Service Fee – please collect in addition to recording fees	$6.00	Per Document	
Secured Technology Fee Purchase, $100 split 50-50 Buyer/Seller Refinance, $50 if closed by KST			
Owner's Policy	$1,820.00	1	$1,820.00
Simultaneous Loan	$270.00	1	$270.00
ReIssue Owner	$-728.00	1	$-728.00
		Total	**$1,362.00**

NOTE: PLEASE CALL FOR CHARGES FOR ENDORSEMENTS NOT SHOWN ON THIS INVOICE

Thank you!

File No.: **SG0716912**

Kansas Secured Title, Inc. - Wichita
232 N. Mead
Wichita, Kansas 67202
Phone: 316-262-8261 Fax: 316-330-6630

Transaction Information

The information in this section is provided as a courtesy and is not a part of the commitment.

KST File SG0716912	Loan No.	Customer File
	Your Closer is:	
If KST is to handle closing and a closer is not listed please contact our office.		
	Your Title Officer is	
Joel Wright	**316-262-8261**	**jwright@kstitle.com**
Buyer:	**Bogdan Properties, LLC, a Kansas limited liability company**	
Seller:	**KWH Investments LLC, a Kansas limited liability company**	

Property Address: **No Address**
Valley Center, KS
Property Address: **No Address**
Valley Center, KS

CALL OUR OFFICE TO VERIFY WIRE INSTRUCTIONS BEFORE YOU WIRE ANY FUNDS
DO NOT RELY ON EMAILED WIRE INSTRUCTIONS FROM ANY SOURCE

INFORMATION FROM THE COUNTY TAX RECORDS:

Tax ID VC-00182-0001/00315182 Parcel 1
Taxes for 2024:
General Tax: $255.40
Special Assessments: $4.14
Total: $259.54
2024 taxes are Paid in Full. NOTE: Tax ID contains additional land.

Tax ID VC-00188-0002/00315194 Parcel 2
Taxes for 2024:
General Tax: $31.02
Special Assessments: $0.00
Total: $31.02
2024 taxes are Paid in Full.

THIS COMMITMENT CONTAINS HYPERLINKS TO CERTAIN DOCUMENTS. ITEMS WHICH ARE BLUE AND UNDERLINED ARE HYPER-LINKS AND THE REFERENCED DOCUMENTS MAY BE VIEWED BY CLICKING THEM.

FEES FOR ENDORSEMENTS WILL BE QUOTED UPON REQUEST

E-RECORDING: OUR COMPANY E-RECORDS IN ALL COUNTIES WHERE THIS SERVICE IS OFFERED. An electronic recording service fee of $5.00 per document will be assessed at the time of recording.

CLOSING FUNDS, pursuant to KSA 40-1137(c), funds for closing in excess of $2,500.00 must be in the form of a wire transfer or bank issued check (cashier's, tellers, money order).

RECORDING FEES are generally $21.00 for the first page and $17.00 for each additional page of each document. Recording fees for releases and assignments of a single mortgage will be $20.00 for the first page and $4.00 for each additional page.

ANY DEED to be recorded must be accompanied by a Kansas Real Estate Sales Validation Questionnaire (original form, in triplicate) unless a valid exemption is stated on the face of the deed pursuant to KSA 17-1437.

REAL ESTATE TAXES are billed on November 1 of the tax year and are due and payable at that time. The first half becomes delinquent on December 20 of the tax year; the second half becomes delinquent on May 10 of the following year.

File No.: **SG0716912**

ALTA COMMITMENT FOR TITLE INSURANCE

Issued by OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY

NOTICE

IMPORTANT-READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRACONTRACTUAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

THE COMPANY'S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I-Requirements; Schedule B, Part II-Exceptions; and the Commitment Conditions, **Old Republic National Title Insurance Company, a Florida corporation (the "Company")**, commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Amount of Insurance and the name of the Proposed Insured.

If all of the Schedule B, Part I-Requirements have not been met within six months after the Commitment Date, this Commitment terminates and the Company's liability and obligation end.

Countersigned
Kansas Secured Title, Inc. - Wichita

By Greg D. Haehl

Authorized Officer or Licensed Agent

OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY
A Stock Company
1408 North Westshore Blvd., Suite 900, Tampa, Florida 33607
(612) 371-1111 *www.oldrepublictitle.com*

By C Monroe President

Attest David Wold Secretary

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by Old Republic National Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; Schedule A; Schedule B, Part I-Requirements; and Schedule B, Part II-Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

Transaction Identification Data, for which the Company assumes no liability as set forth in Commitment Condition 5.e.:
Issuing Agent: Kansas Secured Title, Inc. - Wichita
Issuing Office: Kansas Secured Title, Inc.
Issuing Office's ALTA Registry ID: 0048818
Loan ID Number:
Issuing Office File Number: SG0716912
Property Address: No Address Valley Center, KS
Revision Number:

SCHEDULE A

1. Commitment Date: **April 9, 2025**, at **07:00 am**

2. Policy to be Issued:

   (a) ALTA® 2021 Owner's Policy — Premium Amount: $1,092.00

   Proposed Insured: **Bogdan Properties, LLC, a Kansas limited liability company**
   Proposed Policy Amount: **$720,000.00**
   The estate or interest to be insured: **Fee Simple**

   (b) ALTA® 2021 Loan Policy — Premium Amount: $270.00

   Proposed Insured: **Lender with contractual obligations under a loan agreement with the proposed insured owner identified in Item 2(a) above**
   Proposed Policy Amount:
   The estate or interest to be insured: **Fee Simple**

3. The estate or interest in the Land at the Commitment Date is: **Fee Simple**

4. The Title is, at the Commitment Date, vested in **KWH Investments LLC, a Kansas limited liability company**

5. The Land is described as follows:
   SEE ATTACHED EXHIBIT "A"

EXHIBIT A

The Land is described as follows:

Parcel 1: A portion of the Northwest Quarter of Section 25, Township 25 South, Range 1 West of the 6th Principal Meridian, Sedgwick County, Kansas, more particularly described by Daniel E. Garber, Professional Surveyor #683, on April 16, 2025 as follows:

Commencing at the Northeast corner of the Northwest Quarter of Section 25, Township 25 South, Range 1 West of the 6th Principal Meridian; Thence with a bearing of South 00 °44'14" East (basis of bearing is NAD 83 Kansas South Zone) along the East line of said Northwest Quarter a distance of 661.08 feet for the point of beginning (said point being the Southeast corner of Lot 1, Block A, Bobwhite Subdivision, Sedgwick County, Kansas); Thence continuing South 00 °44'14" East along the East line of said Northwest Quarter a distance of 1,103.21 feet; Thence South 89 °18'09" West parallel with the North line of said Northwest Quarter a distance of 1,204.95 feet to the Easterly right-of-way line of North Interurban Drive; Thence North 25 °47'27" West along said right-of-way line a distance of 231.59 feet; Thence North 64 °12'33" East along the South line of Lot 9, Block A in said Bobwhite Subdivision a distance of 126.29 feet to the Southeast corner of said Lot 9; Thence North 00°46'49" West along the East line of Lots 8 and 9, Block A in said Bobwhite Subdivision a distance of 839.92 feet to the Northeast corner of said Lot 8; thence North 89 °18'09" East along the South line of said Bobwhite Subdivision a distance of 1,189.24 feet to the point of beginning.

Parcel 2: A portion of the West Half of Section 25, Township 25 South, Range 1 West of the 6th Principal Meridian in Sedgwick County, Kansas, more particularly described by Daniel E. Garber, Professional Surveyor #683, on January 6, 2025 as follows:

Commencing at the Northeast corner of the Northwest Quarter of Section 25, Township 25 South, Range 1 West of the 6th Principal Meridian; Thence with a bearing South 00 °44'14" East (basis of bearings is NAD 83 Kansas South Zone) along the East line of said Northwest Quarter a distance of 1764.29 feet for the point of beginning; Thence continuing South 00 °44'14" East along the East line of said Northwest Quarter a distance of 879.80 feet to the Southeast corner of said Northwest Quarter; Thence South 00 °44'29" East along the East line of the Southwest Quarter of said Section 25 a distance of 446.60 feet; Thence South 88 °48'14" West a distance of 200.31 feet (200.00 feet record); Thence South 00 °43'16" East a distance of 766.96 feet to the Easterly right-of-way line of North Interurban Drive; Thence North 26 °35'41" West along said right-of-way line a distance of 1,561.57 feet; Thence following the arc of a curve to the right having a radius of 5,599.65 feet Northwesterly 78.56 feet (chord bears North 26°11'34" West 78.56 feet); Thence North 25 °47'27" West along said right-of-way line a distance of 683.99 feet; Thence North 89 °18'09" East parallel with the North line of said Northwest Quarter a distance of 1,204.95 feet to the point of beginning.

File No.: **SG0716912**

SCHEDULE B, PART I - Requirements

All of the following Requirements must be met:

1. The Proposed Insured must notify the Company in writing of the name of any party not referred to in this Commitment who will obtain an interest in the Land or who will make a loan on the Land. The Company may then make additional Requirements or Exceptions.
2. Pay the agreed amount for the estate or interest to be insured.
3. Pay the premiums, fees, and charges for the Policy to the Company.
4. Documents satisfactory to the Company that convey the Title or create the Mortgage to be insured, or both, must be properly authorized, executed, delivered, and recorded in the Public Records.
5. FURNISH executed Affidavit and Indemnification as prescribed by the Company.
6. **Record approved and signed survey, providing a legal description to be insured herewith. (Parcel 1)**
7. **Any instrument to be executed by the limited liability company must be executed in the name of the limited liability company and be signed by all members, or, if management has been retained by the members, by such managers or other persons as provided in the operating agreement, if said document creates a lower approval threshold.**
8. **PLEASE BE ADVISED THAT OUR SEARCH DID NOT DISCLOSE ANY OPEN MORTGAGES OF RECORD. IF YOU SHOULD HAVE KNOWLEDGE OF ANY OUTSTANDING OBLIGATION, PLEASE CONTACT US IMMEDIATELY FOR FURTHER REVIEW PRIOR TO CLOSING.**
9. **Record LLC Warranty Deed from KWH Investments LLC, a Kansas limited liability company to Bogdan Properties, LLC, a Kansas limited liability company, together with Kansas Real Estate Validation Questionnaire, fully completed and signed to accompany said Deed.**
10. **Record Mortgage from Bogdan Properties, LLC, a Kansas limited liability company, to Lender with contractual obligations under a loan agreement with the proposed insured owner identified in Item 2(a) above.**

End of Requirements

SCHEDULE B, PART II - Exceptions

Some historical land records contain Discriminatory Covenants that are illegal and unenforceable by law. This Commitment and the Policy treat any Discriminatory Covenant in a document referenced in Schedule B as if each Discriminatory Covenant is redacted, repudiated, removed, and not republished or recirculated. Only the remaining provisions of the document will be excepted from coverage.

The Policy will not insure against loss or damage resulting from the terms and provisions of any lease or easement identified in Schedule A, and will include the following Exceptions unless cleared to the satisfaction of the Company:

1. Any defect, lien, encumbrance, adverse claim, or other matter that appears for the first time in the Public Records or is created, attaches, or is disclosed between the Commitment Date and the date on which all of the Schedule B, Part I - Requirements are met.
2. Rights or claims of parties in possession not shown by the Public Records.
3. Easements, or claims of easements, not shown by the Public Records.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land.
5. Any lien, or right to a lien, for services, labor or material heretofore or hereafter furnished, imposed by law and not shown by the Public Records.
6. Taxes or special assessments which are not shown as existing liens by the Public Records.

7. General and special taxes for the year 2025 and subsequent years.

8. Notice of Appropriation of Water recorded in Misc. Book 94 Page 255.

9. Right of Way Agreement to Socony-Vacuum Oil Company, Inc. recorded in Misc. Book 130 Page 454, assigned to Magnolia Pipe Line Company in document recorded in Misc. Book 455 Page 260, last assigned to Jayhawk Pipeline Corporation in document recorded on Film 938 Page 362, as affected by Agreement and Partial Release of Right of Way recorded on Film 1134 Page 848.

10. Right of Way Easement to Kansas Gas and Electric Company recorded in Misc. Book 166 Page 108, as affected by Partial Release of Easement recorded on Film 36 Page 1402, as affected by Affidavit recorded on Film 1120 Page 985.

11. Right of Way Agreement for road recorded in Misc. Book 381 Page 64.

12. Cathodic Protection Easement recorded in Misc. Book 498 Page 396, assigned to Jayhawk Pipeline Corporation in document recorded on Film 938 Page 362, as affected by Agreement and Partial Release of Right of Way recorded on Film 1134 Page 848.

13. Notice of Contents of Order Determining and Establishing Vested Rights to Continue the Beneficial Use of Water recorded on Film 319 Page 751.

14. Agreement recorded on Film 772 Page 1484.

15. In the Matter of Vested Right, File No. SG 013 recorded on Film 921 Page 626.

16. Affidavit to give notice of restriction and incumbrance recorded on Film 1212 Page 146.

17. Certificate of Appropriation for Beneficial Use of Water Water Right, File No. 37,740 Priority date March 27, 1985 recorded on Film 1240 Page 288.

18. Correctional Order File No. 37,740 recorded on Film 1284 Page 1213.

19. Any portion of the subject premises lying within public or private roadways.

20. **Record title discloses subject land is encumbered by oil and gas leases, assignments of oil and gas leases, mineral conveyances, production agreements, oil and gas royalty conveyance and other instruments evidencing production of oil and gas. Company assumes no liability for any matters pertaining to the mineral interest including but not limited thereto rights outstanding by virtue of any oil and gas leases, assignments, agreements, oil and gas royalties, community or unitization leases or any other matter of oil and gas reserved or outstanding, or reservations of prior owners of any interest in the minerals. NOTE: Mineral rights have been deeded to the City of Valley Center in Mineral Deed recorded on Film 1203 Page 1869.**

21. **Vested Water rights deeded to the City of Valley Center in Warranty Deed recorded on Film 1203 Page 1870.**

22. **Warranty Deed for Appropriated Water Rights recorded on Film 1340 Page 114.**

23. **Certificate of Appropriation for Beneficial Use of Water recorded on Film 2077 Page 1691.**

24. **Easements, reservations, building set-back lines, notes, lot splits and access limitations, if any, referenced on survey by Daniel E. Garber, PS# 683, recorded January 16, 2025, in Doc.#/FLM-PG: 30358034.**

25. **Rights of Tenants now in possession of the Land by either month-to-month or under written leases.**

26. **Judgments and tax liens, if any, against the party to be insured.**

End of Exceptions

COMMITMENT CONDITIONS

1. DEFINITIONS

a. "Discriminatory Covenant": Any covenant, condition, restriction, or limitation that under applicable law illegally discriminates against a class of individuals based on personal characteristics such as race, color, religion, sex, sexual orientation, gender identity, familial status, disability, national origin, or other legally protected class.

b. "Knowledge" or "Known": Actual knowledge or actual notice, but not constructive notice imparted by the Public Records.

c. "Land": The land described in Item 5 of Schedule A and improvements located on that land that by State law constitute real property. The term "Land" does not include any property beyond that described in Schedule A, nor any right, title, interest, estate, or easement in any abutting street, road, avenue, alley, lane, right-of-way, body of water, or waterway, but does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.

d. "Mortgage": A mortgage, deed of trust, trust deed, security deed, or other real property security instrument, including one evidenced by electronic means authorized by law.

e. "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.

f. "Proposed Amount of Insurance": Each dollar amount specified in Schedule A as the Proposed Amount of Insurance of each Policy to be issued pursuant to this Commitment.

g. "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.

h. "Public Records": The recording or filing system established under State statutes in effect at the Commitment Date under which a document must be recorded or filed to impart constructive notice of matters relating to the Title to a purchaser for value without Knowledge. The term "Public Records" does not include any other recording or filing system, including any pertaining to environmental remediation or protection, planning, permitting, zoning, licensing, building, health, public safety, or national security matters.

i. "State": The state or commonwealth of the United States within whose exterior boundaries the Land is located. The term "State" also includes the District of Columbia, the Commonwealth of Puerto Rico, the U.S. Virgin Islands, and Guam.

j. "Title": The estate or interest in the Land identified in Item 3 of Schedule A.

2. If all of the Schedule B, Part I-Requirements have not been met within the time period specified in the Commitment to Issue Policy, this Commitment terminates and the Company's liability and obligation end.

3. The Company's liability and obligation is limited by and this Commitment is not valid without:

a. the Notice;
b. the Commitment to Issue Policy;
c. the Commitment Conditions;
d. Schedule A;
e. Schedule B, Part I-Requirements; and
f. Schedule B, Part II-Exceptions; and
g. a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND

The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company is not liable for any other amendment to this Commitment.

5. DEFINITIONS

a. The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:
   i. comply with the Schedule B, Part I-Requirements;
   ii. eliminate, with the Company's written consent, any Schedule B, Part II-Exceptions; or
   iii. acquire the Title or create the Mortgage covered by this Commitment.

b. The Company is not liable under Commitment Condition 5.a. if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.

c. The Company is only liable under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.

d. The Company's liability does not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Condition 5.a. or the Proposed Amount of Insurance.

e. The Company is not liable for the content of the Transaction Identification Data, if any.

f. The Company is not obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I-Requirements have been met to the satisfaction of the Company.

g. The Company's liability is further limited by the terms and provisions of the Policy to be issued to the Proposed Insured.

6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT; CHOICE OF LAW AND CHOICE OF FORUM

a. Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.

b. Any claim must be based in contract under the State law of the State where the Land is located and is restricted to the terms and provisions of this Commitment. Any litigation or other proceeding brought by the Proposed Insured against the Company must be filed only in a State or federal court having jurisdiction.

c. This Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or oral, express or implied, relating to the subject matter of this Commitment.

d. The deletion or modification of any Schedule B, Part II-Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.

e. Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company

f. When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT IS ISSUED BY AN ISSUING AGENT

The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for closing, settlement, escrow, or any other purpose.

8. PRO-FORMA POLICY

The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.

9. CLAIMS PROCEDURES

This Commitment incorporates by reference all Conditions for making a claim in the Policy to be issued to the Proposed Insured. Commitment Condition 9 does not modify the limitations of liability in Commitment Conditions 5 and 6.

10. CLASS ACTION

ALL CLAIMS AND DISPUTES ARISING OUT OF OR RELATING TO THIS COMMITMENT, INCLUDING ANY SERVICE OR OTHER MATTER IN CONNECTION WITH ISSUING THIS COMMITMENT, ANY BREACH OF A COMMITMENT PROVISION, OR ANY OTHER CLAIM OR DISPUTE ARISING OUT OF OR RELATING TO THE TRANSACTION GIVING RISE TO THIS COMMITMENT, MUST BE BROUGHT IN AN INDIVIDUAL CAPACITY. NO PARTY MAY SERVE AS PLAINTIFF, CLASS MEMBER, OR PARTICIPANT IN ANY CLASS OR REPRESENTATIVE PROCEEDING. ANY POLICY ISSUED PURSUANT TO THIS COMMITMENT WILL CONTAIN A CLASS ACTION CONDITION.

11. ARBITRATION

The Policy contains an arbitration clause. All arbitrable matters when the Proposed Amount of Insurance is $2,000,000 or less may be arbitrated at the election of either the Company or the Proposed Insured as the exclusive remedy of the parties. A Proposed Insured may review a copy of the arbitration rules at http://www.alta.org/arbitration .

Updated 1/1/2025

OLD REPUBLIC TITLE

FACTS	WHAT DOES OLD REPUBLIC TITLE DO WITH YOUR PERSONAL INFORMATION?

Why?	Financial companies choose how they share your personal information. Federal law gives consumers the right to limit some but not all sharing. Federal law also requires us to tell you how we collect, share, and protect your personal information. Please read this notice carefully to understand what we do.
What?	The types of personal information we collect and share depend on the product or service you have with us. This information can include: ' Social Security number and employment information ' Mortgage rates and payments and account balances ' Checking account information and wire transfer instructions When you are *no longer* our customer, we continue to share your information as described in this notice.
How?	All financial companies need to share customers' personal information to run their everyday business. In the section below, we list the reasons financial companies can share their customers' personal information; the reasons Old Republic Title chooses to share; and whether you can limit this sharing.

Reasons we can share your personal information	Does Old Republic Title share?	Can you limit this sharing?
For our everyday business purposes - such as to process your transactions, maintain your account(s), or respond to court orders and legal investigations, or report to credit bureaus	**Yes**	**No**
For our marketing purposes - to offer our products and services to you	**No**	**We don't share**
For joint marketing with other financial companies	**No**	**We don't share**
For our affiliates' everyday business purposes - information about your transactions and experiences	**Yes**	**No**
For our affiliates' everyday business purposes - information about your creditworthiness	**No**	**We don't share**
For our affiliates to market to you	**No**	**We don't share**
For non-affiliates to market to you	**No**	**We don't share**

	Go to www.oldrepublictitle.com *(Contact Us)*

Who we are	
Who is providing this notice?	Companies with an Old Republic Title name and other affiliates. Please see below for a list of affiliates.

What we do	
How does Old Republic Title protect my personal information?	To protect your personal information from unauthorized access and use, we use security measures that comply with federal law. These measures include computer safeguards and secured files and buildings. For more information, visit http://www.OldRepublicTitle.com/privacy-policy.
How does Old Republic Title collect my personal information?	We collect your personal information, for example, when you: • Give us your contact information or show your driver's license • Show your government-issued ID or provide your mortgage information • Make a wire transfer We also collect your personal information from others, such as credit bureaus, affiliates, or other companies.
Why can't I limit all sharing?	Federal law gives you the right to limit only: • Sharing for affiliates' everyday business purposes - information about your creditworthiness • Affiliates from using your information to market to you • Sharing for non-affiliates to market to you State laws and individual companies may give you additional rights to limit sharing. See the State Privacy Rights section location at https://www.oldrepublictitle.com/privacy-policy for your rights under state law.

Definitions	
Affiliates	Companies related by common ownership or control. They can be financial and nonfinancial companies. • *Our affiliates include companies with an Old Republic Title name, and financial companies such as Attorneys' Title Fund Services, LLC, Lex Terrae National Title Services, Inc., and Mississippi Valley Title Services Company.*
Non-affiliates	Companies not related by common ownership or control. They can be financial and non-financial companies. • *Old Republic Title does not share with non-affiliates so they can market to you*
Joint marketing	A formal agreement between non-affiliated financial companies that together market financial products or services to you. • *Old Republic Title doesn't jointly market.*

Affiliates Who May be Delivering This Notice

	American First Title & Trust Company	American Guaranty Title Insurance Company	Attorneys' Title Fund Services, LLC	Compass Abstract, Inc.	eRecording Partners Network, LLC	
	Genesis Abstract, LLC	Guardian Consumer Services, Inc.	iMarc, Inc	L.T. Service Corp.	Lenders Inspection Company	
	Lex Terrae National Title Services, Inc.	Lex Terrae, Ltd.	Mississippi Valley Title Services Company	Old Republic Branch Information Services, Inc.	Old Republic Diversified Services, Inc.	
	Old Republic Escrow of Vancouver, Inc.	Old Republic Exchange Company	Old Republic Title and Escrow of Hawaii, Ltd.	Old Republic National Title Insurance Company	Old Republic Title Company	
	Old Republic Title Company of Conroe	Old Republic Title Company of Nevada	Old Republic Title Company of Oklahoma	Old Republic Title Company of Oregon	Old Republic Title Company of St. Louis	
	Old Republic Title Information Concepts	Old Republic Title Insurance Agency, Inc.	Old Republic Title, Ltd.	RamQuest Software, Inc	Republic Abstract & Settlement , LLC	
	Sentry Abstract Company	Surety Title Agency, Inc.	Trident Land Transfer Company, LLC			

Kansas Secured Title, Inc. - Wichita/Title Midwest, Inc.

PRIVACY POLICY

We Are Committed to Safeguarding Customer Information

In order to better serve your needs now and in the future, we may ask you to provide us with certain information. We understand that you may be concerned about what we will do with such information - particularly any personal and/or financial information. We agree that you have a right to know how we will utilize the personal information you provide us. Therefore, we have adopted this Privacy Policy to govern the use and handling of your personal information.

APPLICABILITY

This Privacy Policy governs our use of the information that you provide to us. It does not govern the manner in which we may use information we have obtained from any other source, such as information obtained from a public record or from another person or entity.

TYPES OF INFORMATION

Depending upon which of our services you are utilizing, the type of nonpublic personal information that we may collect include:

Information we receive from you on applications, forms and in other communications to us, whether in writing, by telephone or any other means;
Information about your transactions with us, our affiliated companies, or others; and;
Information we receive from a consumer-reporting agent.

USE OF INFORMATION

We request information from you for our own legitimate business purposes and not for the benefit of any nonaffiliated party. Therefore, we will not release your information to nonaffiliated parties except: (1) as necessary for us to provide the product or service you have requested of us; or (2) as permitted by law. We may, however, store such information indefinitely, including the period after which any customer relationship has ceased. Such information may be used for any internal purpose, such as quality control efforts or customer analysis. We may also provide all of the types of nonpublic personal information listed above to one or more of our affiliated companies. Such affiliated companies include financial service providers, such as title insures, property and casualty insurers and trust and investment advisory companies, or companies involved in real estate services, such as appraisal companies, home warranty companies, and escrow companies. Furthermore, we may also provide all the information we collect, as described above, to companies that perform marketing services on our behalf, on behalf of our affiliated companies, or to other financial institutions with whom our affiliated companies have joint marketing agreements.

FORMER CUSTOMERS

Even if you are no longer our customer, our Privacy Policy will continue to apply to you.

CONFIDENTIALITY AND SECURITY

We will use our best efforts to ensure that no unauthorized parties have access to any of your information. We restrict access to nonpublic personal information about you to those individuals and entities that need to know that information to provide products or services to you. We will use our best efforts to train and oversee our employees and agents to ensure that your information will be handled responsibly and in accordance with this Privacy Policy. We currently maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.

Kyle Fiedler

From: Doku Gan <[redacted]>
Sent: Saturday, August 16, 2025 6:59 PM
To: Kyle Fiedler
Subject: Neighborhood Concern with proposed Sub Division File : SD-2025-03
Attachments: 820 N LONGVIEW 2019.jpg; 820 N LONGVIEW 2025.JPG; drainage 820 N LONGVIEW CT.pdf

Kyle,

I have lived at 820 N. Longview Ct since 2016. My backyard backs up to the tree line on the East side of the proposed development. My biggest concern is that the drainage along the northwest corner of the city limits will get even worse than it already is, if a large development happens in the proposed area. I'm requesting that any development plans include better drainage on the West side of the current tree line that backs up to my backyard. There are drainage ditches south of Goff Road; but, none farther north of there. I've attached some pictures of how much water comes into my backyard. We have had cow patties and 55 gallon drums end up in our backyard (maybe from the farm a half mile north) during heavy rains.

Our neighbors all experience sump pumps running for days after a 3" or more rain. Several of us have had the fire department and gas company out because our pilot lights in the basement wouldn't stay lit after heavy rains. They detected the problem was radon gas and recommended that no one sleep in the basement bedrooms after heavy rains.

If this property is developed, I would like to see a drainage ditch built on the west side of the current city limits tree line north of where the Goff Road Entrance would be located.

I am not in favor of using Quail Street as an entrance because it is a very narrow street with curves that would limit visibility of pedestrians. I believe that with the large number of houses being proposed, Interurban should be paved with proper entry to these new neighborhoods.

I have added pictures from the past of my back yard after heavy rains.

Thank you for your time and consideration of my concerns,

Doug Ganoung
820 N. Longview Ct.
Valley Center, KS
PH: 316-640-6703

Kyle Fiedler [redacted]

From: Tyler, Terry (CCI-Central Region) [redacted]
Sent: Monday, August 11, 2025 4:07 PM
To: Kyle Fiedler
Subject: File No. SD-2025-03

Hello Mr. Fiedler,

I am the owner of the property located at 1031 N. Meadow Rd. Valley Center, which borders the east side of the parcel identified in the *Notice to Adjacent Landowners of Proposed Subdivision File No. SD-2025-03* dated August 1, 2025.

I respectfully request that the City include, as a condition of approval for any subdivision of the subject property, a requirement to preserve and protect the existing hedge tree row located along our shared boundary, regardless of how the property in question is divided or developed. The existing hedge tree row borders my property and many others. This tree row has long served as an essential natural barrier, providing privacy, security, wind protection, shade, and habitat for wildlife. In addition, it represents a mature landscape feature that contributes to the character of the area.

I would ask that any development plan include provisions to:

- Avoid removal or disturbance of the existing hedge tree row.
- Maintain an adequate buffer or setback to prevent root damage or decline.
- Ensure construction activities do not compromise the health of the trees.

I appreciate your attention to this request and your commitment to thoughtful planning that balances development needs with preservation of established natural features. Please let me know if additional information, photographs, or a site visit would be helpful.

Thank you for your time and consideration.

Sincerely,
Terry Tyler

COX
Bringing us closer

Terry Tyler | Field Operations Manager
901 S. George Washington Blvd. | Wichita, KS 67211
☎: (316) 260-7133 | 📱: (620) 687-4691
[redacted]
SALUTE VETERANS EMPLOYEE RESOURCE GROUP

Date: August 26th, 2025

Present Zoning: I (Industrial District)

Proposed Special Use: Pallet Recycling Facility

Special Use Application Case Number: SU-2025-01

Applicant: Howard Hancock and Terry Sowers

Property Address: 201 S. Cedar Ave, Valley Center, KS 67147 (outlined in red below)

Applicants' Reasons for Special Use Application: The applicants are requesting approval of the special use application to allow for the subject property to operate a pallet recycling facility. This use is not detailed out as allowed in the Industrial Zoning district, a special use of "Other" is being requested on I (Industrial District) zoned property within the City of Valley Center, Kansas. Dependable Pallets has already moved to the site and

begun operations prior to obtaining the special use permit. The special use application is required to be reviewed by both the Planning and Zoning Board and City Council.

Review Criteria for a Zoning Amendment/Special Use per 17.11.01.H *(criteria in italics)*

1. *What is the character of the subject property and the surrounding neighborhood in relation to existing uses and their condition?*

   The subject property has primarily been vacant since 2007/2008. This property is in an industrial area, with single-family houses to the North with all other sides bordering being Industrial in nature.

2. *What is the current zoning of the subject property and that of the surrounding neighborhood in relationship to the requested change?*

   The current zoning of the subject property is I (Industrial District). The surrounding zoning and land uses are as follows:
   - North: R-1B (Single Family Residential)
   - South: I (Industrial)
   - East: I (Industrial)
   - West: I (Industrial)

3. *Is the length of time that the subject property has remained undeveloped or vacant as zoned a factor in the consideration?*

   No

4. *Would the request correct an error in the application of these regulations?*

   No

5. *Is the request caused by changed or changing conditions in the area of the subject property and, if so, what is the nature and significance of such changed or changing conditions?*

   The special use request is the direct result of the applicants' current use of the building. The applicants are leasing space to and operating a pallet recycling facility, which is not an allowed use in Industrial zoning, without obtaining a Special Use Permit for "other."

6. *Do adequate sewage disposal and water supply and all other necessary public facilities including street access exist or can they be provided to serve the uses that would be permitted on the subject property?*

   This site is served by public water and sewer, as well as a City street, which is gravel.

7. *Would the subject property need to be platted or replatted or in lieu of dedications made for rights-of-way, easements, and access control or building setback lines?*

   No

8. *Would a screening plan be necessary for existing and/or potential uses of the subject property?*

   No screening is required on the south, west and east sides of the property as they are all adjacent to other industrial properties. There are currently trees along the north property line which screens the facility from the residential neighborhood.

9. *Is there suitable vacant land or buildings available or not available for development that currently has the same zoning?*

   This building has sat vacant for 18 years and requires compliance improvements to be up to fire and building code. Other buildings existing of this size are not common in the Valley Center area.

10. *If the request is for business or industrial uses, are such uses needed to provide more services or employment opportunities?*

    The special use application, if approved, will allow for the pallet recycling business to remain at this location as long as the special use requirements are met. This business recycles pallets by either rebuilding them for end users, or mulching them and does bring other employment opportunities to Valley Center.

11. *Is the subject property suitable for the uses in the current zoning to which it has been restricted?*

    In its current zoning of I, the subject property has the following permitted uses:

    - Animal hospitals and clinics including outdoor facilities.
    - Auction houses.
    - Agricultural feed, seed and fertilizer mixing, sales and storage.
    - Agricultural implements, sales and service.
    - Automobile, truck, motorcycle and recreational vehicle sales, repair and refinishing including garages.
    - Bottling works.
    - Building material sales, except for concrete and asphalt mixing plants.
    - Contractor's offices and equipment storage yards.
    - Dog kennels. (See Section 17.02.09 for definition and standards for (DOG KENNELS.)
    - Dry cleaning and/or laundry plants.
    - Food production and frozen food lockers.
    - Greenhouses, hydroponic farming and nurseries, retail and wholesale.
    - Manufacturing operations including sheet metal and machine shops.
    - Machinery sales, repairs and storage.
    - Monument manufacturing and sales.
    - Printing and publishing firms.
    - Rental centers.
    - Sign printing and manufacturing.
    - Truck terminals and truck stops.
    - Upholstery shops.
    - Utility substations, transmission towers, and water towers.
    - Warehouses and mini-storage facilities including outside storage.
    - Wholesale merchandise sales and storage.
    - Manufactured or mobile home, modular home and recreation vehicle manufacturing, sales, service and storage.
    - Manufacturing, processing or fabrication establishments which are not noxious or offensive by reason of vibration, noise, dust, fumes, gas, odor or smoke.
    - Storage yards, but not salvage yards, providing the storage yard is completely enclosed with at least a six foot solid fence or wall.
    - Publicly owned Buildings and operations

The property has most recently been vacant until Dependable Pallet moved into the facility. Under the I zoning district code, the proposed pallet recycling operation is not specifically called out and would be classified as a special use in the "other" category, which means that this use can take place with approval from the Planning and Zoning Board and City Council.

12. *To what extent would the removal of the restrictions, i.e., the approval of the special use request detrimentally affect other property in the neighborhood?*

    The special use request should not have a significantly detrimental impact on the surrounding neighborhood properties, as long as all compliance requirements for building, fire and zoning codes are all met. Attached you will find an operational site plans and an email from Community Development Director Fiedler, listing the issues that will need to be addressed to be in compliance with all regulations:

    - **Traffic:** There is already commercial traffic on South Cedar, the new use of this facility will increase the traffic compared to what has been the recent normal, but is not beyond what this area has had in the past.
    - **Noise/Dust:** Currently, operations are occurring outside of the building, as they have not been approved to move machinery in for operations. Most machinery will operate inside of the building and dust collection systems will be required.

13. *Would the request be consistent with the purpose of the zoning district classification and the intent and purpose of these regulations?*

    Yes, commercial operation involving lumber is not new to Valley Center industrial properties, however the refurbishment of pallets is, which requires storage of excess wood materials in the open. The I zoning district is the most appropriate place for this operation to occur, should a Special Use Permit be granted.

14. *Is the request in conformance with the Comprehensive Plan and does it further enhance the implementation of the Plan?*

    The subject property, is listed in the Comprehensive Plan as Industrial in both the current and future zoning maps.

15. *What is the nature of the support or opposition of the request?*

    - City staff support this special use request, with the following conditions; the facility becomes and remains in compliance with building, fire and zoning regulations/ codes, to ensure compliance, the Valley Center Fire Department will perform quarterly safety/ compliance inspections, the City should also be notified of all ownership changes of the building and Dependable Pallets. The special use permit will be reviewed by the Planning and Zoning Board and a recommendation made to the City Council The standard public notice was published in *The Ark Valley News* and notices were sent out to surrounding property owners within 200 feet of the subject property. Multiple responses have been received as of the date of this report and all, were opposed to this special use request, the only written response is attached.
    - Other public comments in support or opposition will not be known until the public hearing. All written responses received after the agenda packet is officially published will be given to each member of the Planning and Zoning Board prior to the start of the August 26th, 2025 board meeting.

16. *Is there any information or are there recommendations on this request available from professional persons or persons with related expertise which would be helpful in its evaluation?*

    No

17. *By comparison, does the relative gain to the public health, safety and general welfare outweigh the loss in value or the hardship imposed upon the applicant by not approving the request?*

    No, the relative gain to the public health, safety, and general welfare does not outweigh the loss in value or the hardship imposed upon the applicant by not approving this special use request. The applicant will have or will continue to have to put a considerable amount of work into the facility to bring it up to current regulations.

City staff recommend approval of this special use application contingent upon the facility coming into compliance with building, fire and zoning regulations/ codes with the following conditions; the facility remains in compliance with building, fire and zoning regulations/ codes, to ensure compliance, the Valley Center Fire Department will perform quarterly safety/ compliance inspections, the City's Zoning Administrator should also be notified of all ownership changes of the building and Dependable Pallets.

Current state of facility:


48"
48"

City of Valley Center

Case No. SPU 2025 - 01
250391

SPECIAL USE APPLICATION

This application is for a Special Use before the City Planning Commission. The form must be completed in accordance with directions on the accompanying instructions and filed with the Zoning Administrator at Public Works, 545 W. Clay Street, Valley Center, Kansas 67147-0188 or FAX: (316) 755-7324. An incomplete application will not be accepted. For questions, call (316) 755-7310.

Property owner(s) Name & Address Howard Hancock

Phone 316-640-5373 EMAIL [redacted] fax# _____

Petitioners Name & Address Terry Sawers 201 S Cedar Valley Center KS 67147

Phone 3162149778 fax# _____

Contact email address [redacted]xmail.com Contact Cell Phone 3162149778

Relationship of applicant to property is that of ____Owner X Tenant ____Lessee ____Other

Property Zoning is now Industrial

Property shown on Valley Center Land Use Plan is now _____

Special Use is for pallet recycling facility

Address /Location of Request 201 S Cedar Valley Center, KS 67147

Parcel number(s) _____

Justification for requested Special Use (attach narrative to application)

The applicant or his/her authorized agent acknowledges all of the following:

1. That he/she has received instruction material concerning the filing and hearing of this matter
2. That he/she has been advised of the fee requirements established and that the fee accompanies this application for a Special Use
3. That all documents are attached to this petition as noted in the instructions, including a site plan.
4. That the Planning Commission can only recommend action and the City Council has to ratify the Planning Commission's decision as the final decision of the City

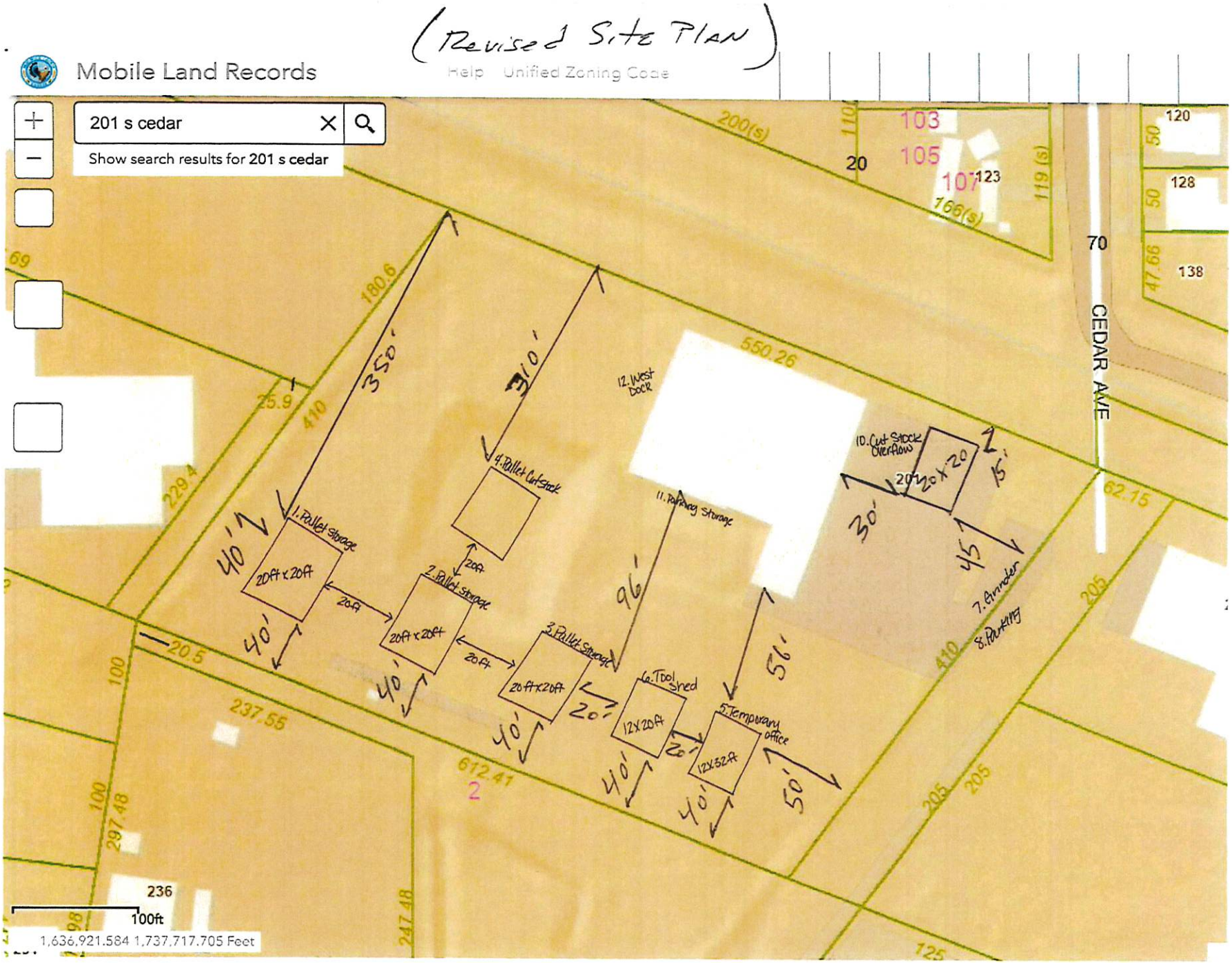
Terry Sawers 7/11/25 _____ _____

Applicant Date Agent (If any) Date

Office use only

A pre-application meeting occurred with the applicant on _____. This application was received at _____ (am) (pm) on _____, 20__ by the Zoning Administrator acting on behalf of the Planning Commission and City Council. It has been checked and found to be complete and accompanied by the required documents and a nonrefundable fee of **$300.**

(Revised Site Plan)



June 12th, 2025
To: Building owner Howard Hancock and Dependable Pallet
From: Valley Center Community Development, Code Enforcement and Fire Dept.

1. Fire Code Compliance, see additional pages.

2. Plan review for all work that has been and will be done to the property to include:
   - Shed and Office
   - New sprinkled areas
   - Electrical
   - Heat & Smoke Vents
   - Any interior remodeling

3. Permits needed for the above items. Each contractor is required to pull their own permit for commercial work.

4. Special Use or Conditional Use Permit
   - June 24th is the deadline for the July 22nd Meeting.

5. Water account needs to be set up.

Timeline

1. Fire Department will work with Owner and/or Tenant to establish appropriate timeline for fire safety compliance.
2. By June 24th we will need to have a complete application for a Special Use Permit or a Conditional Use Permit.
3. By July 14th we will need to be contacted by the engineer chosen to prepare plans for review and give us an approximate timeline for when the plans will be ready for review. Plan review is required commence within 60 days from the date of this meeting which is August 11, 2025.

Kyle Fiedler

From: [redacted]
Sent: Thursday, August 7, 2025 10:20 PM
To: Kyle Fiedler
Subject: Fw: special use app for pallet recycling

----- Forwarded Message -----
[redacted]
Sent: Thursday, August 7, 2025 at 09:42:50 PM CDT
Subject: special use app for pallet recycling

The company has not controlled the sawdust produced by cutting pallets.

It is all over my property and at times is visible in the air.

Inhaling sawdust myself or my pets is very hazardous.

If the pallets are treated for insects of decay prevention, then the dust is an extreme health hazard.

I ask that you deny the application, due to this being an immediate danger to the public.

I am sending photos of the sawdust on various items on my property and from neighbors

The first 3 pics are from Chris Johnson 120 S. Cedar, the remainder are mine\
Due to my messaging file limits I have to send each photo as a separate email.

Please contact me for any questions.

Jeff Black
117 S. Cedar
316-755-1992

October Meeting Date:

The Valley Center Trick or Treat Street event will be happening on October 28th this year, due to the popularity of the event, parking could be an issue for the Planning and Zoning meeting.

If the P&Z board would choose to move the date, we could possibly move it ahead to the 23rd, or push it 2 days and hold it on the 30th.

STORMWATER CITIZENS ADVISORY COMMITTEE MEETING AGENDA

Tuesday, August 26, 2025
7:00 PM

THE STORMWATER CITIZENS ADVISORY COMMITTEE SHALL HOLD ITS REGULAR MEETING IN THE COUNCIL CHAMBER IN THE CITY HALL, LOCATED AT 121 S. MERIDIAN AVE., BEGINNING AT 7:00 P.M. (MEETING WILL ALSO BE BROADCASTED ON CITY'S YOUTUBE CHANNEL AND/OR COX PUBLIC ACCESS CHANNEL 7)

A. CALL TO ORDER THE STORMWATER CITIZENS ADVISORY COMMITTEE MEETING

B. ROLL CALL

___Gary Janzen	___Amy Bradley	___Scot Phillips
___Paul Spranger	___Rick Shellenbarger	___Dalton Wilson
___Steve Conway		

C. SET/AMEND AGENDA

Motion made by (_____). Seconded by (_____). For___ Against___

D. APPROVAL OF DRAFT MINUTES

September 24, 2024, DRAFT meeting minutes
Motion made by (_____). Seconded by (_____). For___ Against___

E. COMMUNICATIONS

F. OLD/UNFINISHED BUSINESS

G. NEW BUSINESS

1. Update on stormwater additions from various projects currently underway.
2. Next Meeting Date

H. ADJOURNMENT OF THE STORMWATER CITIZENS ADVISORY COMMITTEE MEETING

Motion made by _____. Seconded by _____. For___ Against___

Note to Stormwater Citizens Advisory Committee Members: If you are unable to attend this meeting, please contact Rodney Eggleston (316-755-7320) by 4:00 PM on the previous day of the meeting.

*All items listed on this agenda are potential action items unless otherwise noted. The agenda may be modified or changed at the meeting without prior notice. This is an open meeting, open to the public, subject to the Kansas Open Meetings Act (KOMA). The City of Valley Center is committed to providing reasonable accommodations for persons with disabilities upon request of the individual. Individuals with disabilities requiring an accommodation to attend the meeting should contact the Public Works Dept. in a timely manner, at **reggleston@valleycenterks.org** or by phone at (316) 755-7320. For Additional information on any item on the agenda, please visit **www.valleycenterks.org** or call (316) 755-7320.*

STORMWATER CITIZENS ADVISORY COMMITTEE MEETING MINUTES
CITY OF VALLEY CENTER, KANSAS

Tuesday, September 24, 2024, 7:00 P.M.

CALL TO ORDER: Chairperson Janzen called the meeting to order at 7:08 P.M. with the following committee members present: Steve Conway, Scot Phillips, and Dalton Wilson

MEMBERS ABSENT: Paul Spranger and Rick Shellenbarger

CITY STAFF PRESENT: Kyle Fiedler, Rodney Eggleston, and Brittney Ortega

AGENDA: A motion was made by Chairperson Janzen and seconded by Committee Member Conway to set the agenda. Motion passed unanimously.

APPROVAL OF DRAFT MINUTES: Chairperson Janzen made a motion to approve the March 26, 2024, committee meeting minutes. The motion was seconded by Committee Member Wilson. Motion passed unanimously.

COMMUNICATIONS: None

OLD/UNFINISHED BUSINESS: None

NEW BUSINESS:

1. Update on stormwater additions from various projects currently underway.

   R. Eggleston addressed the committee. This is the second of a minimum of two required meetings per year.

   Prairie Lakes Regional Detention Basin/Park
   Adjacent to the Prairie Lakes Development & Trails End Development (future school site). Project incorporates a naturalized channel and wetland areas to restore pre- existing natural features of the Trailsview Slough. The basin provides over 340 Acre- feet of stormwater storage. Project included a Conditional Letter of Map Revision (CLOMR) – approved by FEMA. Final Letters of Map Revision (LOMRs) are ongoing to bring the developed areas out of the floodplain.
   Sunflower Valley - Mixed use development. Project is adjacent to the existing detention pond and pump station. Project runoff is directed to an internal retention pond & the detention pond to the east. Internal retention pond is similar to the pre- existing pond. Currently the retention pond has not filled up (yet). Pre-existing pond was nearly dry prior to this project.

   Harvest Place Retention Ponds - Mixed use Development. Project includes 3 large retention ponds (7' deep). The ponds provide 88 acre-feet of stormwater storage above the wet pond volume. A water rights permit was obtained through KDA-DWR for 200 acre-feet of stored runoff water. This project creates better conveyance of stormwater to this area from offsite locations, significantly enhanced storage, and water quality to downstream channels. Project ultimately flows south through the golf course and future Emporia Avenue corridor.
   Meridian – Main to 5th . Approximately 21 new inlets. Approximately 2000 feet of stormwater pipe

2. Next Meeting Date:
   R. Eggleston suggested the next meeting to be in March of 2025. Confirmation will be sent at a later date.

ADJOURNMENT OF THE STORMWATER CITIZENS ADVISORY COMMITTEE MEETING: At 7:31 At 7:25 P.M., a motion was made by Chairperson Janzen to adjourn and seconded by Committee Member Wilson. The vote was unanimous, and the meeting was adjourned.

Respectfully submitted,

/s/ Rodney Eggleston, Secretary

Gary Janzen, Chairperson

Kansas
Department of Health and Environment

Kansas Permit No.: M-LA16-SU01

Federal Permit No.: KSR410037

KANSAS WATER POLLUTION CONTROL

Municipal Separate Storm Sewer System (MS4) Permit and Authorization to Discharge Under The National Pollutant Discharge Elimination System

Pursuant to the provisions of Kansas Statutes Annotated 65-164 and 65-165, the Federal Water Pollution Control Act as amended, 33 U.S.C. 1251 et seq., the "Act",

Permittee:	Valley Center, City of
Permittee Address:	P.O. Box 188 Valley Center, KS 67147
Drainage Basin:	Lower Arkansas River
County:	Sedgwick

is hereby authorized to discharge stormwater from the municipal separate storm sewer system (MS4) as described herein in accordance with the limitations, conditions and requirements set forth in this permit.

This permit is effective January 1, 2025, supersedes the previously issued MS4 permit M-LA16-SU01 and expires December 31, 2027.

PERMIT AREA AND AUTHORIZED DISCHARGES

This permit covers all areas within the permittee's MS4 jurisdiction which are also located in the Urban Area as defined by the most recent U.S. Census (the Permit Area). The Permit Area may change based upon areas incorporated into or removed from the permittee's jurisdictional area during the term of this permit.

This permit authorizes the discharge of all existing or new stormwater point source discharges from the Municipal Separate Storm Sewer System (MS4) located within the Permit Area. New stormwater discharges are those which are created and/or incorporated into the permittee's MS4 during the term of this permit.

Janet Stanek

Secretary, Kansas Department of Health and Environment

December 10, 2024
Date

PART I: Stormwater Management Program (SMP) Document Requirements

A. Current Stormwater Management Program

The permittee shall continue to implement and enforce their current Stormwater Management Program (SMP), as documented in the SMP document, until an updated SMP is implemented.

Any updated SMP shall be designed to:

1. Reduce the discharge of pollutants from the municipal separate storm sewer system (MS4) to the Maximum Extent Practicable (MEP),

2. Continue to implement the six minimum control measures as listed in PART I Section C,

3. Satisfy the requirements of this permit, the Clean Water Act and Kansas surface water quality statutes and regulations.

Implementation of Best Management Practices (BMPs) consistent with the provisions of the SMP document and this permit constitutes compliance with the standard of reducing pollutants to the Maximum Extent Practicable.

B. Updated Stormwater Management Program document

Modification of the SMP is permitted as the need arises. Modifications can be accomplished with any of the following methods:

1. Typically, the SMP document is updated near the end of the calendar year and submitted to KDHE for review along with the annual report which is due after the first of the calendar year but before the 28th of February. The permittee is required to implement the SMP, which was most recently submitted to KDHE along with the annual report, throughout the entire year and may continue to implement the updated SMP until subsequently modified. The updated SMP as submitted must be accepted by KDHE. If KDHE finds the SMP is not acceptable, requirements for modification and resubmittal will be addressed to the permittee.

2. If it becomes necessary to modify the SMP at some time other than when the annual report is submitted to KDHE, the permittee may make the modifications to the SMP document and submit the SMP document to KDHE for acceptance. The permittee shall not begin implementation of the modified SMP until after KDHE has provided acceptance.

3. KDHE may require the permittee to modify the SMP at any time, requirements for modification and resubmittal will be addressed to the permittee.

C. Six Minimum Control Measures

The Permittee is responsible for implementing a stormwater management program to comply with the requirements of 40 CFR 122.34, including implementation of the six minimum control measures, as described in the body of this permit. In addition to the program requirements, the Permittee is responsible for implementing adequate BMPs, listed in Appendices A through G, to claim at least the required number of points in each calendar year.

Claiming points alone does not satisfy the requirements of this permit if the program does not comply with the requirements of 40 CFR 122.34.

For all six minimum control measures, documentation of compliance with each measure's goal and implementation time schedule must be maintained on file. Permittee is responsible for implementing an adequate program to comply with the requirements of this permit **and** be able to claim the associated required BMP points. Extent of point compliance, i.e., equaling or exceeding the required annual point total or failure to reach the required annual point total, must be reported in the Annual Report.

C. Six Minimum Control Measures (continued)

For any of the six minimum control measures, the permittee is not limited to implementation of the BMPs listed in the tables. Several other BMPs may be implemented, however, only implementation of the BMPs listed in the tables may be documented and counted toward the required annual point total. Additional points may be requested by the permittee for BMPs that are not included in the tables. The request must be submitted to KDHE prior to the annual report submission period in order for points to be included towards the current year. Points cannot be claimed on the annual report if not approved by KDHE.

Guidance useful in implementing the six minimum control measures can be obtained from the Online Water Library (OWL) of the Center for Watershed Protection. A list of links to helpful guidance documents, including OWL, can be found on the KDHE Municipal Stormwater Program website.

Additional helpful guidance and/or resources in implementing the six minimum control measures can be found at the following link: https://www.kdhe.ks.gov/DocumentCenter/View/28893/MS4-NPDES-Permit-Helpful-Guidance-andor-Resources-PDF , **Document titled "MS4 NPDES Permit Helpful Guidance and/or Resources.**

The six minimum control measures and requirements are as follows:

1. Public Education and Outreach

The permittee shall continue to implement a public education program which includes distribution of educational materials to the community or conducting equivalent outreach activities which address the impacts of stormwater discharges on water bodies and the steps the public can take to reduce pollutants in stormwater runoff.

The implementation of BMPs for this minimum control measure must result in accumulation of a minimum of 7 points for each calendar year. **Appendix A** lists various BMPs, measurable goals, and the required timing-period or implementation-schedule to qualify for the points in the year. The permittee may request that KDHE accept additional BMPs of the permittee's creation that meets the intent of this minimum control measure for a reasonable number of points, as described under Part C.

In cases where the permittee is already implementing a BMP which qualifies for points, they may continue implementation of the BMP and earn the listed points as allowed under this permit.

Multiple BMPs involve holding public hearings or public forums; a single public hearing or forum can be held which addresses multiple topics and points claimed for all of the multiple BMPs implemented.

2. Public Involvement/Participation

The permittee shall continue to implement a public involvement and participation program to solicit public comments and recommendations regarding the BMPs and measurable goals utilized by the permittee to comply with the permit. The permittee shall comply with State and local public notice requirements when implementing a public involvement and participation program.

The implementation of BMPs for this minimum control measure must result in accumulation of a minimum of 6 points for each calendar year. **Appendix B** lists various BMPs, measurable goals, and the required timing-period or implementation-schedule to qualify for the points in the year. The permittee may request that KDHE accept additional BMPs of the permittee's creation that meets the intent of this minimum control measure for a reasonable number of points, as described under Part C.

In cases where the permittee is already implementing a BMP which qualifies for points, they may continue implementation of the BMP and earn the listed points as allowed for the first year of implementation under this permit as well as subsequent years.
Multiple BMPs involve holding public hearings or public forums; a single public hearing or public forums can be held which addresses multiple topics and points claimed for all of the multiple BMPs implemented.

3. Illicit Discharge Detection and Elimination

The permittee shall:

a. Continue to implement and enforce a program to detect and eliminate illicit discharges into the MS4.

b. Maintain a storm sewer system map of the permittee's MS4, showing the location of all outfalls, either pipes or open channel drainage, showing the names and location of all streams or lakes receiving discharges from those outfalls. A copy of the map shall be submitted to KDHE with the annual report if requested by KDHE.

c. Implement and enforce an ordinance or resolution to prohibit non-stormwater discharges into the storm sewer system and implement appropriate enforcement procedures and actions. A copy of the ordinance or resolution shall be submitted to KDHE with the annual report if requested by KDHE.

d. Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.

e. Develop and implement a plan to detect/inspect for and address prohibited non-stormwater discharges, including illegal dumping, to the storm sewer system. The plan must include efforts to identify and evaluate dry weather MS4 discharges to detect and eliminate any associated illicit discharge. Unless identified by either the permittee or KDHE as a significant source of pollutants to waters of the state, several types of non-stormwater flow are not normally prohibited from entering the Municipal Separate Storm Sewer System:

Discharges which are not necessarily prohibited include:

Water line flushing	Footing drains
Diverted stream flows	Lawn watering
Rising ground waters	Individual residential car washing
Uncontaminated groundwater infiltration as defined under 40 CFR 35.2005(20) to separate storm sewers	Occasional not-for-profit car wash activities
Uncontaminated pumped groundwater	Flows from riparian habitats and wetlands
Contaminated groundwater if authorized by KDHE and approved by the department	Dechlorinated swimming pool discharges excluding filter backwash
Discharges from potable water sources	Street wash water (excluding street sweepings which have been removed from the street)
Foundation drains	Discharges or flows from firefighting activities
Air condition condensation	Heat pump discharge waters (residential only)
Springs	Treated wastewater meeting requirements of an NPDES permit
Irrigation waters	Sump pump drains
Water from crawl space pumps	Other discharges determined not to be a significant source of pollutants to waters of the state, a public health hazard or nuisance

The implementation of BMPs for this minimum control measure must result in accumulation of a minimum of 7 points for each calendar year. **Appendix C** lists various BMPs, measurable goals, and the required timing-period or implementation-schedule to qualify for the points in the year. The permittee may request that KDHE accept additional BMPs of the permittee's creation that meets the intent of this minimum control measure for a reasonable number of points, as described under Part C.

In cases where the permittee is already implementing a BMP which qualifies for points, they may continue implementation of the BMP and earn the listed points as allowed for the first year of implementation under this permit as well as subsequent years. Multiple BMPs involve holding public hearings or public forums; a single public hearing or public forums can be held which addresses multiple topics and points claimed for all of the multiple BMPs implemented.

4. Construction Site Stormwater Runoff Control

The permittee shall continue to maintain a program to reduce pollutants in any stormwater runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of pollutant discharge associated with stormwater from construction activity disturbing less than one acre must be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. The program must include, at a minimum, all the following:

a. Maintain and enforce an ordinance or resolution, if the permittee has the authority to do so, to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State and local law. A copy of the ordinance or resolution shall be submitted to KDHE with the annual report if requested by KDHE.

b. Maintain requirements for construction site owners or operators to implement appropriate erosion and sediment control best management practices.

c. Maintain requirements for construction site owners or operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that are likely to cause adverse impacts to water quality.

d. Maintain procedures for site plan review which incorporate consideration of potential water quality impacts.

e. Maintain procedures for receipt and consideration of information submitted by the public.

f. Maintain procedures for site inspection and enforcement of control measures.

The implementation of BMPs for this minimum control measure must result in accumulation of a minimum of 6 points for each calendar year. **Appendix D** lists various BMPs, measurable goals, and the required timing-period or implementation-schedule to qualify for the points in the year. The permittee may request that KDHE accept additional BMPs of the permittee's creation that meets the intent of this minimum control measure for a reasonable number of points, as described under Part C.

In cases where the permittee is already implementing a BMP which qualifies for points, they may continue implementation of the BMP and earn the listed points as allowed for the first year of implementation under this permit as well as subsequent years.

Multiple BMPs involve holding public hearings; a single public hearing can be held which addresses multiple topics and points claimed for all of the multiple BMPs implemented.

5. Post-Construction Stormwater Management in New Development and Redevelopment

The permittee shall continue to maintain a program to address post-construction stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the MS4. The program must include, at a minimum, all the following:

a. Maintain a requirement for BMPs to prevent or minimize adverse water quality impacts.

b. Maintain strategies which include a combination of structural and/or non-structural BMPs appropriate for the municipality.

c. Maintain and enforce an ordinance or resolution, if the permittee has the authority to do so, to address post-construction runoff from new development and redevelopment projects to the extent allowable under State and local law.

d. Ensure adequate long-term operation and maintenance of structural BMPs.

5. Post-Construction Stormwater Management in New Development and Redevelopment (continued)

The implementation of BMPs for this minimum control measure must result in accumulation of a minimum of 7 points for each calendar year. **Appendix E** lists various BMPs, measurable goals, and the required timing-period or implementation-schedule to qualify for the points in the year. The permittee may request that KDHE accept additional BMPs of the permittee's creation that meets the intent of this minimum control measure for a reasonable number of points, as described under part C.

In cases where the permittee is already implementing a BMP which qualifies for points, they may continue implementation of the BMP and earn the listed points as allowed for the first year of implementation under this permit as well as subsequent years.

Multiple BMPs involve holding public hearings; a single public hearing can be held which addresses multiple topics and points claimed for all of the multiple BMPs implemented.

6. Pollution Prevention/Good Housekeeping for Municipal Operations

The permittee shall continue to implement an operation and maintenance program that includes employee training to prevent and reduce stormwater pollution from municipal operations. The program must include, at a minimum, the following:

a. Training shall be implemented for all necessary municipal staff, such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance.

b. Maintain a program to ensure proper use and storage of materials at permittee owned facilities that use pesticides, herbicides, and fertilizers.

c. Develop, implement, and maintain site-specific Stormwater Pollution Prevention (SWP2) plan in accordance with Attachment A for permittee owned facilities with significant storage of potential stormwater pollutants. This shall include municipal garages, fleet maintenance areas, salt and sand storage areas, park maintenance shops, fueling stations, sites with material storage that meet the definition of industrial activity, and other permittee owned facilities.

    a. If a SWP2 plan is already required or a facility has qualified for No Exposure Certification (NOEC) under the KDHE Industrial Stormwater General Permit, the applicability of this provision is redundant, and the Industrial Stormwater permit provisions shall be followed in lieu of this requirement.

    ii. If a facility can ensure that a condition of "no exposure" to stormwater exists, a site-specific SWP2 plan is not required. To determine no exposure, see Attachment B. The facility and no exposure determination shall be documented in the annual report and reevaluated yearly by the permittee.

The implementation of BMPs for this minimum control measure must result in accumulation of a minimum of 6 points for each calendar year. **Appendix F** lists various BMPs, measurable goals, and the required timing-period or implementation-schedule to qualify for the points in the year. The permittee may request that KDHE accept additional BMPs of the permittee's creation that meets the intent of this minimum control measure for a reasonable number of points, as described under Part C.

In cases where the permittee is already implementing a BMP which qualifies for points, they may continue implementation of the BMP and earn the listed points as allowed for the first year of implementation under this permit as well as subsequent years. Multiple BMPs involve holding public hearings; a single public hearing can be held which addresses multiple topics and points claimed for all of the multiple BMPs implemented.

D. Total Maximum Daily Load (TMDL) Regulated Pollutants

The Permittee shall continue to review, update, implement and develop, when necessary, structural and non-structural BMPs which will reduce to the Maximum Extent Practicable the discharge of the TMDL regulated pollutants from the MS4 as listed in PART II.

The effort to reduce the discharge of TMDL regulated pollutants is anticipated to be an iterative process with changes in the SMP periodically, generally not more frequently than annually, possibly every two or three years. This "adaptive management" type process is, informed by monitoring data and other information collected during the term of this permit, recommended to attenuate the discharge of TMDL regulated pollutants listed in the TMDL Table of PART II of this permit.
Each updated SMP document shall provide:

1. Best Management Practices (BMPs)

Updates of the SMP document can include structural and/or non-structural BMPs implemented to reduce the discharge of TMDL regulated pollutants from the MS4. This section of the SMP shall identify or include:

a. BMPs which will be implemented, including non-structural and/or structural measures, as selected from EPA's "National Menu of Best Management Practices (BMPs) for Stormwater" or from a local or regionally appropriate storm drainage criteria manual such as the Kansas City Metro Chapter of the American Public Works Association (APWA) Manual of Best Management Practices for Stormwater Quality or such other BMP manuals as are appropriate (links for the National Menu of Best Management Practices (BMPs) for Stormwater and the Kansas City Metro Chapter of the American Public Works Association (APWA) Manual of Best Management Practices for Stormwater Quality can be found on the KDHE document titled "MS4 NPDES Permit Helpful Guidance and/or Resources").

b. Include a description of non-structural practices being implemented, including the six minimum control measures and/or other source control measures.

c. Include the location of the structural BMPs.

d. Identify the design factors associated with the structural BMPs.

e. Include information on the reported effectiveness of the chosen BMPs based on regionally appropriate data or performance analyses in the International Stormwater BMP Database (a link to the Database can be found on the KDHE document titled "MS4 NPDES Permit Helpful Guidance and/or Resources").

f. Include a schedule for constructing and/or implementing additional selected BMPs to reduce the discharge of TMDL regulated pollutants.

g. Include an inspection/maintenance plan and schedule for each BMP, as appropriate.

h. Include a plan and schedule to monitor the effectiveness of the BMPs to reduce the discharge of TMDL regulated pollutants.

2. Measurable goals to assess the effectiveness of the TMDL BMPs

As with the implementation of all stormwater BMPs in the permittee's SMP, BMPs implemented to reduce the discharge of TMDL pollutants listed in the TMDL Table in Part II must include measurable goals.

Overall TMDL measurable goals should be based upon either stormwater sampling in the MS4 or in stream sampling of the stream(s) existing in, or adjacent to the Permit Area (or Permit Areas for co-operative stormwater control efforts as provided in paragraph 4 below) during or immediately following storm events. Stormwater sampling, for the purpose of documenting compliance with goals, within the MS4 will normally compare results upstream of the BMP and downstream of the BMP or perhaps prior to implementation of the BMP and following implementation of the BMP if the BMP is non-structural.

2. Measurable goals to assess the effectiveness of the TMDL BMPs (continued)

The monitoring results of samples obtained to iteratively guide performance evaluation, subsequent selection, and adjustments of BMPs should be maintained on file in compliance with the Standard Conditions records retention requirement. These results do not need to be reported to KDHE via the electronic DMR process at this time. However, these monitoring results and/or a summary of the results are to be reported in the Annual Report as required in PART IV REPORTING. The permittee may use modeling that has been properly calibrated to determine that BMP measurable goals are being met.

Measurable goals for reducing TMDL pollutants contributed by MS4s can be expressed in quantifiable values:

a. to reduce the total mass of pollutants, and

b. be expressed as average and median values (percent reduction of inflow volume, reduction in pollutant mass loading) or for bacteria as a geometric mean.

3. Maps shall be developed and maintained which illustrate:

a. The Permit Area, boundaries of the contributing drainage basins and primary sub-basins, within and outside the Permit Area.

b. The locations of the BMPs, if structural.

c. The location of TMDL stream monitoring locations if such monitoring is required.

d. Storm sewer collection system which includes the outfalls within the Permit Area where the MS4 drains to TMDL listed impaired streams or lakes.

4. Alternative Stormwater Offsite Pollution Reduction Program

As appropriate, when waters of the state are affected by TMDL regulated pollutants from both the Permit Area and surrounding non-jurisdictional lands, the permittees may incorporate and implement plans through their SMP for an offsite pollution reduction program to install Best Management Practices (BMPs) in alternative locations, including outside the Permit Area, within the watershed shared by urban entities or urban and non-urban entities. Any alternative stormwater offsite pollution reduction program should be developed with watershed interests, such as other communities, Watershed Restoration and Protection Strategy (WRAPS) groups and Conservation Districts lying outside the Permit Area for the joint purpose of reducing pollutant loads generated from urban and non-urban lands within the shared watershed. Candidate offsite locations and practices will be consistent with implementing existing watershed plans that identify specific urban and non-urban (such as agricultural) BMP types and locations to achieve TMDLs reductions. The Alternative Stormwater Offsite Pollution Reduction Program shall be subject to KDHE approval and approved by KDHE prior to incorporation into the permittee's SMP.

E. Responsible Parties

The Stormwater Management Program (SMP) Document should list the municipal parties (employees and/or staff and/or departments) responsible for compliance with the SMP document. There is no requirement to name individual employees, rather, organizational units such as positions, divisions or departments may be named as the responsible parties.

F. Monitoring Requirements

The SMP document should address the monitoring requirements for surface water and/or storm water within the MS4 collection system. Surface water monitoring requirements addressed in this permit may be found in PART II.

G. Reporting Requirements

See PART IV.

PART II: Total Maximum Daily Load (TMDL) Best Management Practices and Surface Water Monitoring

Permittees who are required to complete storm event monitoring of surface waters, i.e., streams or rivers, (see TMDL Table and associated text) shall report the results of the storm event monitoring with KEIMS.

A. TMDL BMP Implementation Requirements

The implementation of BMPs for this minimum control measure must result in accumulation of a minimum of 6 points for each calendar year. **Appendix G** lists various BMPs, measurable goals, and the required timing-period or implementation-schedule to qualify for the points in the year.

In cases where the permittee is already implementing a BMP which qualifies for points, they may continue implementation of the BMP and earn the listed points as allowed for the first year of implementation under this permit as well as subsequent years.

Multiple BMPs involve holding public hearings; a single public hearing can be held which addresses multiple topics and points claimed for all of the multiple BMPs implemented.

In addition to implementing a TMDL Pollutant Reduction and Monitoring program as required above, the permittee must implement sufficient listed BMPs in **Appendix G** to qualify for the required number of points.

1. Implementation

The permittee shall implement Best Management Practices (BMPs) to reduce to the Maximum Extent Practicable the discharge of the following TMDL regulated pollutants from the MS4 to the watershed of impaired stream and/or lake.

TMDL TABLE

TMDL Regulated Pollutant	Specific Impaired Stream(s) to Target
Bacteria	Little Arkansas River
Nutrients	Little Arkansas River
Sediment	Little Arkansas River

Total Maximum Daily Loads, TMDLs, are established for waters found on the CWA Section 303d list of impaired waters. The purpose of the TMDL is to define the necessary and allowable pollutant load that may enter those impaired waters, so those waters attain a condition that fully supports all their designated uses. The TMDL then allocates portions of that allowable load among the likely point and non-point sources discharging the pollutant into the water or its watershed. Implementation of the TMDL by the NPDES and 319 programs brings about reductions in current loading from those sources through numeric goals or narrative actions to the allowable level allocated to each source.

The required surface monitoring locations* are identified in the table below:

SURFACE WATER MONITORING LOCATIONS			
Feature Name	Local Description	Latitude	Longitude
001	VCR-1 Valley Cr Dr	37.8378	-97.3885
002	VCR-2 69th St. on Little Ark. R.	37.810402	-97.373015

*Monitoring locations may change with KDHE approval

B. Monitoring Requirements

1. Storm Event Monitoring: the permittee shall implement a wet weather monitoring program with the intent to assess the impact of precipitation related discharges to the stream. Sampling and analysis will normally include instream monitoring of the main stream(s) entering and leaving the Permit Area as identified in the TMDL Table. Alternately, in some cases main stream monitoring may not be appropriate as other sources of pollutants may be introduced by point or non-point discharges and tributaries to the listed main streams, which originate within or near the Permit Area, may be monitored at a single location to characterize the water quality draining from the permit area. The permittee shall implement this monitoring program to support adaptive stormwater management and the evaluation of SMP effectiveness in reducing the discharge of pollutants from the MS4. Monitoring for the parameters listed in the Parameters table shall be conducted as required for each storm event sampled which meets the criteria specified in this section.

   The storm event monitoring data for TMDLs, as required in this PART II, may be used to assist in evaluating trends in water quality. This monitoring is not necessarily intended to demonstrate compliance with the requirements of this MS4 NPDES permit.

2. Additionally, other stream monitoring, monitoring of flow within the MS4, monitoring of discharges from MS4 outfalls, monitoring to detect or locate illicit discharges, and monitoring stormwater flow within structural BMPs may be completed at the permittee's discretion to assist in management and evaluation of the BMPs and the SMP. These additional monitoring results are not required to be reported to KDHE via KEIMS.

   In addition to the storm event monitoring, the permittee may want to conduct dry weather monitoring, as appropriate, to determine the effectiveness of the six minimum control measures, detect illicit discharges, or to confirm baseline water quality data. These additional monitoring results are not required to be reported to KDHE via KEIMS.

C. Monitoring Frequency and Periods Criteria

1. Four storm events per year per monitoring site shall be monitored. Storm event shall mean a 24-hr rain or snow melt event greater than or equal to 0.25 inches.

2. Monitoring shall normally be conducted in the spring (between March 1 and June 30) and summer (between July and October 31) for the parameters listed in the Parameters Table. It is recommended two events be monitored in the spring and two events be monitored in the summer. However, it is most important four events be monitored in each calendar year and storm event monitoring can occur in any month.

D. Parameters

TMDL Impairment	Parameter to Monitored	MRL *	Sample Type
Nutrients	Total Phosphorus as P (mg/l)	0.05 mg/l	Grab or Composite
Nutrients	Nitrate + Nitrite as N (mg/l)	0.10 mg/l	Grab or Composite
Nutrients	Total Kjeldahl Nitrogen (mg/l)	1 mg/l	Grab or Composite
Nutrients	Total Nitrogen (mg/l)		Calculated **
Sediment	Total Suspended Solids (mg/l)	10 mg/l	Grab or Composite
Sediment	Turbidity (NTU)		Grab or Composite
Bacteria	E. coli (Col/100 ml or MPN)	10 ml or MPN	Grab

* Minimum Reportable Limit
** The values for parameters shown as "calculated" will be calculated by the Kansas Environmental Information Management System (KEIMS). The values cannot be entered into KEIMS by the permittee.

For storm events, grab samples, for instream monitoring are to be obtained within 4 hours of rising stages on streams. Monitoring of a storm event for the purpose of complying with the stormwater monitoring and reporting requirements of this permit is not allowed if there is not at least 24 hours between this sampling storm event and the end of the previous rainfall event. If composite sampling is conducted, samples are normally collected over the course of the hydrograph and flow-weighted to provide a representative composite sample for the storm event.

In addition, the permittee should keep a record of the following parameters at the time of sampling:

1. Rainfall (last 24 hours) - inches	Gauge Reading
2. Stream Flow - CFS	Estimate/Reading
3. Stream Depth from a standard - Feet	Estimate/Reading
4. Stream Level (rising, falling, steady)	Describe
5. Stream Velocity (rapid, normal, still [backwater])	Describe

These parameters are not required to be reported to KDHE but will be included as optional parameters in KEIMS.

E. Adaptive Management

The monitoring program may be adapted to improve the effectiveness of the SMP or if supported by additional information. It may also be supplemented or supplanted with modeling approaches to meet monitoring plan objectives. Any modifications to the monitoring program are subject to KDHE approval.

F. Documentation of Stream Monitoring Locations

The storm event monitoring data for TMDLs, as required in this PART II, is required to be reported to KDHE via KEIMS. Additional monitoring of streams flowing within or near the Permit Area, monitoring industrial stormwater discharges (PART III), monitoring of discharges from MS4 outfalls, or discharges from areas with BMPs may be done at the permittee's discretion to assist in management and evaluation of the BMPs (process control/monitoring) and for compliance with the SMP and/or this permit. This additional monitoring is not required to be reported via KEIMS.

PART III: Industrial Stormwater Discharges

This PART III requirement is not applicable to Phase II permittees. No action is required at this time for Monitoring Industrial Stormwater Discharge

PART IV: Reporting

A. The permittee shall submit a calendar year annual report to KDHE by February 28 of each year. The annual report shall be submitted to KDHE in the form specified by KDHE. The completed annual report along with attachments or other documents which need to be submitted in association with the annual report shall all be submitted in PDF file formats to KDHE. As KDHE implements the KEIMS web-based system, all documents submitted will be required to be uploaded through the KEIMS program. KDHE will provide notification to the permittee when annual reporting via the KEIMS system is required. The annual report shall cover the activities during the previous calendar year and must include:

1. Provide the status of compliance with permit conditions, an assessment of the appropriateness of the implemented Best Management Practices, progress towards achieving the statutory goal of reducing the discharge of pollutants to the maximum extent practicable, and the measurable goals (with an indication of the progress toward meeting the goals) for each of the six minimum control measures.

2. Provide results of information collected and analyzed, (for example test results, surveys, or public comments/input) during the annual reporting period. This may include monitoring data used to assess the success of best management practices with respect to reduction in pollutant discharge. Include an interpretation of the information which addresses success or failure of the portion of the program for which the information applies.

3. For Best Management Practices (BMPs), which are directed at reducing the discharge of TMDL regulated pollutants, provide the measurable goals of each BMP with an indication of the progress toward meeting the goals.

4. Provide a summary of the stormwater activities which are scheduled to be undertaken during the next calendar year (including an implementation schedule).

5. Provide a summary of the stormwater activities that were scheduled to be undertaken during the previous calendar year and the status of these activities.

6. Provide a map showing changes in the permittee's Permit Area if the Permit Area has changed within the year.

7. Provide a description of significant changes in any of the BMPs.

8. Provide copies of any ordinances or resolutions which were updated in the last year and are associated with the SMP.

9. Provide a list of other parties (such as other municipalities or consultants), which are responsible for implementing any of the program areas of the Stormwater Management Program.

B. Information and monitoring results gathered in compliance with PART II must be reported in compliance with the reporting requirement as addressed in B. Monitoring Requirements.

C. EPA's National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule ("NPDES eRule") requires regulated entities to report data electronically. KDHE has developed electronic reporting tools to assist permittees in complying with the EPA electronic reporting rule. Unless a waiver has been approved by KDHE, permittees are required to submit information electronically. The electronic reporting system is called the **Kansas Environmental Information Management System (KEIMS)** and can be accessed at https://keims.kdhe.ks.gov.

STANDARD CONDITIONS FOR KANSAS WATER POLLUTION CONTROL AND NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MS4 PERMITS

1. Representative Sampling and Monitoring Report Submittals:

   A. Samples and measurements taken as required herein shall be representative of the quality and quantity of the monitored discharge. Test results shall be recorded for the day the samples were taken. If sampling for a parameter was conducted across more than one calendar day, the test results may be recorded for the day sampling was started or ended. All samples shall be taken at the locations designated in this permit, and unless specified, at the outfall/monitoring location(s) before the wastewater joins or is diluted by any other water or substance.

   B. EPA's *National Pollutant Discharge Elimination System* (NPDES) *Electronic Reporting Rule* ("NPDES eRule") requires regulated entities to report data electronically. KDHE has developed electronic reporting tools to assist permittees in complying with the EPA electronic reporting rule. Unless a waiver has been approved by KDHE, permittees are required to submit information electronically. The electronic reporting system is called the **Kansas Environmental Information Management System (KEIMS)** and can be accessed at https://keims.kdhe.ks.gov Monitoring results shall be submitted no later than the 28th day of the month following the completed reporting period. If granted a waiver, signed and certified copies of data, information and reports, required herein, prepared in accordance with KAR 28-16-59, may be e-mailed as scanned attachments to kdhe.bowkeims@ks.gov, faxed to 785.559.4257, or sent by U.S. mail to:

      Kansas Department of Health & Environment
      Bureau of Water-Technical Services Unit
      1000 SW Jackson Street, Suite 420
      Topeka, KS 66612-1367

2. Definitions:

   A. A "grab sample" is an individual sample collected in less than 15 minutes. A "composite sample" is a combination of individual samples in which the volume of each individual sample is proportional to the flow, or the sample frequency is proportioned to the flow rate over the sample period, or the sample frequency is proportional to time.

   B. The terms "Director", "Division", and "Department" refer to the Director, Division of Environment, Kansas Department of Health and Environment, respectively.

   C. "Severe property damage" means substantial physical damage to property, damage to the treatment/control facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a diversion.

3. Duty to Mitigate: The permittee shall take all reasonable steps to minimize or prevent any damage to the environment or hazard to human health from any discharge in violation of this permit.

4. Test Procedures: All analyses required by this permit shall conform to the requirements of 40 CFR Part 136, unless otherwise specified, and shall be conducted in a laboratory accredited by the Department. For each measurement or sample, the permittee shall record the exact place, date, and time of measuring/sampling; the date and time of the analyses, the analytical techniques or methods used, minimum detection or reportable level, and the individual(s) who performed the measuring/sampling and analysis and, the results. If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved procedures, the results shall be included in the Monitoring Report form required in 1.B. above. Such increased frequencies shall also be indicated.

5. Change in Discharge: All stormwater discharges shall be in compliance with the conditions of the permit. Modification or expansion of the storm sewer system is allowed. All new storm sewer segments and outfalls constructed after the effective date of the permit, which are located within the permit area, are authorized under the permit and must comply with the permit conditions.

6. Proper Operations and Maintenance: The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the requirements of this permit and Kansas and Federal law.

7. Incident Reporting: The permittee shall report any unanticipated significant incidents which would be expected to result in non-compliance with the permit requirements within 24 hours from the time the permittee became aware of the incident. A written submission shall be provided within 5 days of the time the permittee became aware of the incident. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times; and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

   For an anticipated incident or any planned changes or activities in the permitted control/treatment facility that may result in noncompliance with the permit requirements, the permittee shall submit written notice, if possible, at least ten days before the date of the event.

8. Removed Substances: Solids, sludges, debris, or other pollutants removed in the course of control/treatment of stormwater shall be utilized or disposed of in a manner acceptable to the Division.

9. Right of Entry: The permittee shall allow authorized representatives of the Division of Environment or the Environmental Protection Agency upon the presentation of credentials, to enter upon the permittee's premises where a stormwater discharge or source is located, or in which are located any records required by this permit, and at reasonable times, to have access to and copy any records required by this permit, to inspect any facilities, monitoring equipment or monitoring method required in this permit, and to sample any stormwater discharges from or influents into the stormwater control/treatment facilities.

10. Transfer of Ownership: The permittee shall notify the succeeding owner or controlling person of the existence of this permit by certified letter, a copy of which shall be forwarded to the Division. The succeeding owner shall secure a new permit. This permit is not transferable to any person except after notice and approval by the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary.

11. Records Retention: Unless otherwise specified, all records and information resulting from the monitoring activities required by this permit, including all records of analyses and calibration and maintenance of instruments and recordings from continuous monitoring instruments, shall be retained for a minimum of 3 years, or longer if requested by the Division.

12. Availability of Records: Except for data determined to be confidential under 33 USC Section 1318, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department. Treated and raw stormwater data shall not be considered confidential. Knowingly making any false statement on any such report or tampering with equipment to falsify data may result in the imposition of criminal penalties as provided for in 33 USC Section 1319 and KSA 65-170c.

13. Permit Modifications and Terminations: As provided by KAR 28-16-62, after notice and opportunity for a hearing, this permit may be modified, suspended or revoked or terminated in whole or in part during its term for cause as provided, but not limited to those set forth in KAR 28-16-62 and KAR 28-16-28b through g. The permittee shall furnish to the Director, within a reasonable amount of time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish upon request, copies of all records required to be kept by this permit. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

14. Administrative, Civil and Criminal Liability: The permittee shall comply with all requirements of this permit. Nothing in this permit shall be construed to relieve the permittee from administrative, civil or criminal penalties for noncompliance as provided for in KSA 65-161 et seq., and 33 USC Section 1319.

15. Oil and Hazardous Substance Liability: Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties to which the permittee is or may be subject to under 33 USC Section 1321 or KSA 65-164 et seq. A permittee shall promptly notify the Division by telephone upon discovering crude oil or any petroleum derivative in its storm sewer system or stormwater control/treatment facilities.

16. Property Rights: The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights nor any infringements of or violation of federal, state or local laws or regulations.

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

18. Removal from Service: The permittee shall inform the Division at least three months before any control/treatment unit, or any other part of the control/treatment facility permitted by this permit is to be removed from service and shall make arrangements acceptable to the Division to decommission the facility or part of the facility being removed from service such that the public health and waters of the state are protected.

19. Duty to Reapply: A permit holder wishing to continue any activity regulated by this permit after the expiration date, must apply for a new permit at least 180 days prior to expiration of the permit.

APPENDIX A:
Public Education and Outreach (PE&O) BMP Table

APPENDIX A: Public Education and Outreach (PE&O) BMP Table

BMP ID	Summary	Measurable Goal	Points
PE&O - 1	Maintain a stormwater webpage for the permittee.	Maintain the webpage with up-to-date information with all links effective and valid information. Check all links and update website as necessary on a minimum monthly basis. The webpage must be available throughout the year once it is posted. In the initial year posted it must be available for a minimum of 3 months to qualify for the points. In subsequent calendar years the points may be claimed if the webpage has been maintained throughout the twelve months.	3 points may be claimed in the first year implemented, and 2 points may be claimed for each successive year the webpage is maintained available.
PE&O - 2	Distribute educational materials (either flyers, brochures, catalog mailings, handouts, or e-mails) addressing various pertinent stormwater public education topics.	Number of all flyers, brochures, catalog mailings, handouts, or e-mails distributed in a year shall be recorded and reported in each Annual Report. . Copies of the flyers, brochures, or e-mails shall be retained on file. Flyers, brochures, catalog mailings, handouts, and/or e-mails are to be distributed in at least two separate batches, ideally in separate seasons (either winter, spring, summer or fall)	2 points may be claimed in a year in which flyers, brochures, catalog mailings, handouts, or e-mails are distributed.
PE&O - 3	Provide either training or educational materials to permittee identified businesses at high risk of contributing to stormwater pollution. Such businesses can include, but are not limited to, food service, auto service, disaster response and janitorial services. The training or educational materials shall address best management practices they can employ to minimize or avoid adverse stormwater impacts due to their operations.	Training or educational materials must be provided, within the year, to at least five separate businesses if the population of the municipality is greater than 10,000, or three businesses if the population of the municipality is between 3,000 and 9,999, or two separate businesses if the population of the municipality is less than 3,000. There is no requirement to provide training to business in separate business categories, although it is allowed.	2 points may be claimed in any year in which the required amount of training or distribution of educational material occurs.
PE&O - 4	Apply notification, placard, covers/hatches with message, or stencil, on stormwater inlets to provide a message similar to "No Dumping – Drains to River"	Apply this notification on at least 10% of all known stormwater inlets in the MS4.	2 points may be claimed in years when at least 10% of all known inlets receive placards, covers/hatches with message, or stencils or in subsequent years when an additional 5% of all known stormwater inlets in the MS4 bear the message.

APPENDIX A: Public Education and Outreach (PE&O) BMP Table

PE&O - 5	Post the municipality's MS4 permit and SMP document on either the stormwater web page or the municipal webpage.	The two documents must be posted for at least six months of the year to claim one point.	1 point may be claimed for posting both documents each year
PE&O - 6	Provide either a stormwater telephone hotline or web based or text message method for public reporting of illicit discharges.	Respond to all reported complaints within 10 days and, if found valid, resolve, or establish a schedule for resolution within 20 days. Actual resolution may take more than 20 days, but the schedule for resolution must be finalized and the efforts to implement resolution must begin within 20 days following receipt of complaint. Document complaints and response/resolution process for all complaints received in the year. Resolution of an illicit discharge can include, but is not limited to; elimination of the discharge; on-site treatment to allow discharge to the MS4 (normally requires an NPDES permit); redirecting the discharge to a location that the discharge is not considered illicit, i.e., sanitary sewer or to holding tanks to allow the waste to be hauled off for appropriate treatment, reuse/recycle or disposal.	2 points may be claimed for each full year the hotline / reporting system is maintained and available. An additional point may be claimed for each illicit discharge resolved in the year up to a limit of 2 additional points per year. One point allowed per illicit discharge resolved.
PE&O - 7	Provide educational material annually to at least four groups, including each of the following types: Residents, Businesses/Institutions, Commercial entities/Developers, and Industrial facilities. The educational material may be provided as any of the following: ➢ Brochures ➢ Flyers ➢ E-mails ➢ Press release	Identify and educate at least 4 groups/entities from the listed types annually developing topics that are group specific and address activities and or pollutants of concern.	3 points may be claimed each year this BMP is implemented in compliance with the specified requirements.
PE&O - 8	Provide stormwater education for students at a school campus within K-12 (those grades present at the campus) within the permittee's jurisdiction or within 30 miles from this permit area. The training may be limited to the individual campus (local school buildings associated with a single address). This training does not need to be provided to the entire school system, e.g., USD. Alternately, funding stormwater BMP installations and/or field trips at the school campus will qualify.	In a single year, Provide or fund an educator or speaker that will reach at least 5% of the K-12 students as normally attend school in the selected school campus. Alternately, the funding of BMPs at the school campus may provide for any of the following: ➢ Installation of BMPs at the school ➢ stormwater related field trips ➢ water quality stream sampling activities ➢ construction of rain gardens on school property ➢ rain barrel workshops ➢ rain garden workshops	3 points may be claimed each year this BMP is implemented in compliance with the specified requirements (provide education and/or fund stormwater BMP installations at the school campus).

APPENDIX A: Public Education and Outreach (PE&O) BMP Table

PE&O - 9	1. Operate an information booth at a large public event, (such as a sports event, fair, or music festival) where at least an estimated 1,000 or more individuals attend. 2. Alternately, operate an information booth at multiple public events, (such as a sports event, fair, or music festival) where a cumulative estimated total of 3,000 or more individuals attend. 3. And finally, a single point can be claimed for operating an information both at a public event where at least an estimated 200 or more individuals attend.	Provide information about stormwater topics of current interest. All events shall have the booth staffed by the permittee for at least 50% of the days the event occurs.	2 points may be claimed each year this BMP is implemented in compliance with the specified requirements for alternative 1. (1,000 or more attendees) or alternative 2. (3,000 attendees). 1 point may be claimed each year this BMP is implemented in compliance with the specified requirements for alternative 3(200 attendees).
PE&O- 10	Provide either training or educational materials to Lawn/Turf care service entities addressing best management practices they can employ to minimize or avoid adverse stormwater impacts due to their operations.	Training or educational materials must be provided, within the year, to at least five lawn/turf care service entities or at least 20% of the lawn care service entities located in the municipality whichever is least.	2 points may be claimed in any year in which the required amount of training or distribution of educational material occurs.
PE&O-11	Adopt a public education program to reduce littering.	Install and/or maintain signs to discourage littering. Signs are to be located in areas where littering has been a problem.	1 point may be claimed for the year when signs are posted for six months or more, or 1 point may be claimed in subsequent years where the signs remain posted throughout the year.
PE&O -12	Create a stormwater information brochure to provide to the public at public meetings and/or hearings	Have multiple copies of the brochure available during at least 10 meetings or hearings open to the public during the year. Provide the brochures to the public at no charge.	1 point may be claimed in any year the brochures are made available at meetings and/or hearings as required.

APPENDIX A: Public Education and Outreach (PE&O) BMP Table

PE&O-13	Operate an adopt a highway program to utilize public volunteers to clean road right-of-way.	The volunteers shall clean at least a two-mile segment of road either within the permit area or adjacent to the permit area. Alternately multiple spots (roadways, parks, and waterways) which are cleaned and equate to a two-mile road clean-up can qualify for a point.	1 point may be claimed in any year a two-mile road segment is cleaned or alternately multiple spots are cleaned which equate to or exceed a two-mile road clean-up.
PE&O-14	Conduct a media campaign addressing various pertinent stormwater public education topics.	The media campaign shall occur during prime-time broadcasting. The date, time, estimated media exposure, and population value for each spot broadcast shall be documented.	2 points may be claimed in a year in which the media campaign meets the requirements
PE&O-15	Develop or participate in an ongoing social media program to share pertinent stormwater public education topics.	Publish or share social media content on the permittee's social media accounts at least six times per year. Record post topic, the number of impressions and engagement for each post. Include link to permittee's stormwater education website.	2 points can be claimed in a year which the required number of content is shared
PE&O-16	Operate an information booth at a public event or hold a public event which is intended to improve public understanding of issues related to water quality. The event may be associated with any environmental related issue including but not limited to an environmental expo, earth day, world wetlands day, International Day of Action for rivers, world fish migration day, world biodiversity day, world oceans day, world cleanup day, world water monitoring day, world rivers day, and America recycles day.	At least an estimated 800 or more individuals must attend the event. The booth must be staffed at least 50% of the time the event is open to the public.	2 points may be claimed each year this BMP is implemented in compliance with the specified requirements. Municipal staff from multiple permittees may staff the booth and claim points, for their municipality, for this BMP if their staff meet the 50% of the time staffing requirement.
PE&O- 17	Operate an adopt a street program to utilize public volunteers to clean street right-of-way.	The volunteers shall clean at least a two-mile segment of street, either a single street or multiple streets, either within the permit area or adjacent to the permit area.	1 point may be claimed in any year at least two miles of street right-of-way is cleaned by volunteers.

APPENDIX B:
Public Involvement/Participation (P I/P) BMP Table

APPENDIX B: Public Involvement/Participation (P I/P) BMP Table

BMP ID	Summary	Measurable Goal	Points
P I/P- 1	Hold a public hearing or public forum to notify the public about stormwater program activities and to solicit public comments regarding stormwater issues.	Provide public notice of the hearing/forum, invite local news media, either newspaper, radio, or TV, and document the hearing with attendance sign-in sheet and minutes of the hearing which include public comments and responses. Retain copies of the notices to public, invitations to attend, attendance sign-in sheets, and minutes.	2 points may be claimed each year this BMP is implemented in compliance with the specified requirements.
P I/P - 2	Establish a citizens advisory committee.	Host the citizens advisory committee meetings twice yearly and receive comments and guidance from the committee regarding the SMP. Retain on file copies of the attendance list and minutes of the meetings.	3 points may be claimed each year the citizens advisory committee holds at least two meetings within one year
P I/P - 3	Hold a park or stream bank clean-up events for public volunteers to aid municipal staff in removing trash, debris, or pollutant sources from the selected clean-up area.	Clean an area which must be equal to or greater than one acre or alternately at least 200 yards of streambank. Alternately, for municipalities with less than 500 population clean an area which must be equal to or greater than a quarter of an acre or alternately at least 100 feet of streambank.	3 points may be claimed each year this BMP is implemented in compliance with the specified requirements.
P I/P- 4	Train either citizen watch groups, homeowner associations (HOAs), or public service groups to recognize illicit discharge activities and communicate observations to appropriate municipal staff.	Provide training or distribute training materials to the citizen group participants at least once annually.	2 points may be claimed each year this BMP is implemented in compliance with the specified requirements.
P I/P - 5	Provide at least two events for residents to engage in cleanup activities and improve water quality in the municipality.	Provide at least two events in streams, streamside parks, areas adjacent to public waterways, and/or other green infrastructure/water resources. These events must be one of the following: Environmental restoration events, stream cleanups, tree plantings, or stream monitoring.	3 points may be claimed each year this BMP is implemented in compliance with the specified requirements.

APPENDIX B: Public Involvement/Participation (P I/P) BMP Table

P I/P - 6	Establish a program to encourage residents to install stormwater treatment best management practices on their property.	Encouragement can include funding, grants, and other financial incentives, trainings and or giveaways. Stormwater treatment BMPs can include rain barrels, rain gardens, native plantings, native trees, cisterns and vegetated swales. Record participation numbers annually.	2 points may be claimed each year this BMP is implemented in compliance with the specified requirements, with the addition of 1 additional point (for a total of 3 points in the year) each year that participation increases from the previous year.
P I/P- 7	Enact either an ordinance, a resolution, or other enforceable requirement that requires pet owners or their keepers to immediately and properly dispose of their pet's solid waste deposited at parks or rest areas owned by the permittee.	The ordinance or resolution or other enforceable measure shall be enacted, and signs posted informing the public of their obligation at the park. The installation of a pet waste bag dispenser in the public area qualifies as adequate signage.	1 point may be claimed for the initial and subsequent year the Measurable Goal requirements remain in effect.
P I/P - 8	Provide a monetary donation to a scholarship fund for students pursuing a degree in an environmental program which would qualify them to work in a field which can result in water pollution control.	A $500 contribution in a year is the minimum acceptable amount to achieve this goal. The donation must be made in the year the points are claimed.	2 points may be claimed each year this BMP goal is achieved.
P I/P - 9	Distribute stormwater educational materials to the public within this permit area. Alternately, the permittee may provide stormwater educational materials, e.g. brochures, flyers, or pamphlets addressing various stormwater topics. For this alternative these materials may be provided to other nearby municipalities within 30 miles from this permit area for distribution to the public.	The educational materials, for each topic, which are distributed or supplied must have a value of at least $50. Topics may be anything related to stormwater including but not limited to guidance on clean-up following flooding, discouraging littering, explaining and discouraging illicit discharges to the storm sewers, constructed BMPs for homeowners, area household hazardous waste receiving centers, and area recycling programs.	1 point may be claimed per topic addressed in compliance with the requirements, up to a total of 5 points/topics.
P I/P - 10	Establish a program to employ a high school or college age environmental interns in an environmental related program including but not limited to either the wastewater utility, stormwater utility, potable water utility or solid waste utility.	The intern must receive the same environmental related training a new full-time employee would receive, within the first six months of the full-time employee's employment, during their internship. The internship must last at least 8 weeks in the year when points are claimed.	2 points may be claimed each year this BMP goal is achieved per intern.

APPENDIX C:
Illicit Discharge Detection and Elimination (IDD&E) BMP Table

APPENDIX C: Illicit Discharge Detection and Elimination (IDD&E) BMP Table

BMP ID	Summary	Measurable Goal	Points
IDD&E - 1	Hold a public hearing or public forum to educate the public about illicit discharges and alternate acceptable methods of disposal or reuse of substances and/or materials.	Provide public notice of the hearing/forum, invite local news media (either newspaper, radio or TV), and document the hearing with attendance sign-in sheet and minutes of the hearing which include questions/comments from the attendees and answers/comments from the permittee staff. Retain copies of the notices to public, invitations to attend, attendance sign-in sheets, and minutes	2 points may be claimed for any year a hearing/forum is held.
IDD&E - 2	Implement a program to abandon failed or failing residential or commercial on-site wastewater treatment facilities. These on-site wastewater treatment systems such as septic tank – lateral systems or lagoon systems are then connected to the municipal wastewater collection system for treatment of wastewater at the municipal wastewater treatment plant. Alternately, upgrade or replace the failed system to restore performance.	Redirect the wastewater generated by the facility to the municipal wastewater treatment collection system for proper treatment and disposal. Alternately, upgrade or replace the failed system with improvements which meet or exceed the present code or local requirements.	3 points may be claimed for each abandoned system in the year it is abandoned, alternately for systems which are upgraded or replaced as per the requirements. And a total of 2 points may be claimed in the year upgrade or replacement is completed.
IDD&E - 3	Develop a spill response plan and, if appropriate, coordinate emergency response with other agencies or organizations.	The plan shall include, at a minimum, explanation of appropriate spill response activities for spills associated with vehicle accidents, at grade or above ground storage tanks, and vehicle fluids from mechanical equipment such as construction equipment, cars, or trucks. The written plan shall be maintained on file.	3 points may be claimed in the year initially implemented. 2 points may be claimed for each successive year the plan remains effective.
IDD&E - 4	Implement a program to evaluate MS4 outfalls to identify illicit discharges. Inspect at least 5% of the known MS4 outfalls during a calendar year and evaluate the ones which have dry weather discharges. Evaluate the water quality of the dry weather discharges to recognize non-stormwater contributions and trace the source of any illicit discharge.	When at least 5% of the known MS4 outfalls are inspected and for which at least one outfall was identified as discharging (entirely or partially) flow from an illicit discharge, the allotted points may be claimed in the year when the illicit discharge is eliminated. Document the MS4 outfalls inspected, the outfalls with dry weather discharges and the MS4 outfalls associated with illicit discharges.	1 point may be claimed in the year when a 5% of the known MS4 outfalls are finally inspected, and 2 additional points may be claimed in which illicit discharge(s), associated with this group of evaluated outfalls are detected and eliminated.

APPENDIX C: Illicit Discharge Detection and Elimination (IDD&E) BMP Table

IDD&E - 5	Distribute a letter (or flier) and/or e-mail along with a press release from a municipal official with the intent of reaching every resident and business in the MS4 permit area. The distributed documents shall provide information on how to avoid illicit discharges to the MS4, i.e., proper disposal methods for common substances or materials often discharged illicitly. Provide a link to the municipal website where applicable ordinances and disposal guidance are posted.	The letter (or flier) and/or e-mail along with the press release shall highlight the requirements for proper disposal of wastes and disposal methods. Copies of these documents shall be retained on file along with the distribution/mailing lists to document distribution to the target area (minimum MS4 permit area) to avoid illicit discharges to the MS4. Provide a link to the municipal website where applicable ordinances and disposal guidance are posted.	2 points may be claimed within the year these documents are distributed
IDD&E - 6	Inspect, by televising pipelines or direct visualization of open channel drainage, 2% of the MS4 system within the permit area all conducted within a 12-month period to aid in identifying illicit discharges as well as evaluate the condition of the storm sewer lines/drainage channels-ditches. If in a 12-month period 10% of the MS4 system is inspected a higher point value may be claimed.	Generate a summary report of the inspection including the number of linear feet televised, number of linear feet visually inspected, condition comments, illicit discharges identified and the results of efforts to eliminate illicit discharges, e.g., discharge line disconnected and redirected to the sanitary sewer or discharge practice terminated.	3 points may be claimed for inspection of 2% of the MS4 system, alternately if 10% of the MS4 system is inspected 5 points may be claimed.
IDD&E - 7	Implement a Household Hazardous Waste Collection Program (HHWCP) or document others have implemented such a program to provide such service to all property owners or residents located within the permit area.	Document the residents and property owners within the MS4 permit area were able to dispose of such wastes at the HHWCP during a calendar year. Retain this documentation on file.	3 points may be claimed for any year in which this BMP was implemented in compliance with the requirements.

APPENDIX C: Illicit Discharge Detection and Elimination (IDD&E) BMP Table

IDD&E - 8	Implement a program to increase the reliability of sanitary sewer pump stations above the minimum standard design requirements.	An upgraded pump station shall include the following: ➢ A dedicated on-site standby generator shall be installed (with automatic transfer switch) for use when main line power fails. ➢ A dialer system, or telemetry system, or connection to a SCADA system shall be installed to provide real time or nearly real time notification of failures at the pump station which can potentially lead to sanitary sewer overflow. ➢ The permittee shall purchase and maintain for immediate operation a trailer mounted motor driven sewage pump for use when the pump station fails to operate. The motor driven pump shall be sized to pump at a rate at least equal to the firm pumping capacity of any sanitary sewer pump station the permittee claims points for under this BMP. ➢ The pump station shall be modified to facilitate the connection of the trailer mounted pump discharge to the force main and convenient installation of the suction line from the trailer mounted pump into the wet well.	5 points may be claimed (for each pump station upgraded in compliance with this BMP) in the first year the improvements, as listed under measurable goals, are installed and ready for operation, 4 points may be claimed for (for each pump station upgraded in compliance with this BMP) each successive year the improvements, as listed under measurable goals, remain operational.
IDD&E - 9	Provide a contribution to area recycle programs or programs (such as household hazardous waste disposal facilities, e-cycle facilities, paper shred facilities, pharmaceutical disposal facilities etc.) designed to properly dispose of types of waste or materials which have previously been discarded to or adjacent to either the MS4, streams, or lakes within or adjacent to the permittee's permit area. The area program must be within 30 miles from this permit area.	The contributions may be made to programs which take tires, automotive fluids, batteries, or other wastes documented that are mentioned in this BMP summary. The contributions must total a minimum of $500 in the year ($100 for alternative lower population municipalities) which points are claimed. The contributions can be monetary or can be in the form of goods and/or services with an agreed specified value. Contributions may be made to area household hazardous waste programs, private recycle/reuse facilities or civic/volunteer organizations assisting in recycle.	2 points may be claimed each year this BMP goal is achieved.
IDD&E-10	Inspect, 5% of the MS4 system Stormwater inlets and/or outfalls within the permit area all conducted within a 12-month period to aid in identifying illicit discharges. If in a 12-month period 15% of the MS4 system inlets and/or outfalls are inspected a higher point value may be claimed.	Generate a summary report of the inspection including the number of inlets and/or outfalls visually inspected, condition comments, illicit discharges identified and the results of efforts to eliminate illicit discharges, e.g., discharge line disconnected and redirected to the sanitary sewer or discharge practice terminated.	3 points may be claimed for inspection of 2% of the MS4 system in the year the required percentage of inlets and/or outfalls are inspected. If 15% of the MS4 system is inspected 5 points may be claimed.

APPENDIX D:
Construction Site Stormwater Runoff Controls (CSSRC) BMP Table

APPENDIX D: Construction Site Stormwater Runoff Controls (CSSRC) BMP Table

BMP ID	BMP Summary	Measurable Goal	Points
CSSRC - 1	Implement a requirement for a Soil Erosion and Sediment Control(SESC) Plan for any land Disturbance sites which are either equal to or greater than 1 acre or for which there is construction activity disturbing less than one acre which is part of a larger common plan of development or sale that in total disturbs one acre or more.	Enact a regulatory ordinance, or other enforceable measure that requires an SESC Plan for all developments disturbing sites equal to or greater than 1 acre or for construction activity disturbing less than one acre which is part of a larger common plan of development or sale that in total disturbs one acre or more.	3 points may be claimed in the year the ordinance initially becomes effective. 2 points may be claimed for each successive year thereafter for which the ordinance remains effective.
CSSRC - 2	Develop and adopt a design manual for erosion and sediment control BMPs which are required to be used on sites disturbing sites equal to or greater than 1 acre or for construction activity disturbing less than one acre which is part of a larger common plan of development or sale that in total disturbs one acre or more.	Require implementation of BMPs in compliance with the design manual on all sites which meet the disturbed area standard as specified.in the BMP Summary.	3 points may be claimed in the year the manual is initially implemented. 2 points may be claimed for each successive year the manual remains effective.
CSSRC - 3	Provide access to at least one training class for contractors, developers or others involved with land disturbance projects which provides training on requirements for a Stormwater Pollution Prevention Plan (SWPPP) and implementation of appropriate BMPs.	This training class must address all local requirements for a SWPPP, requirements for implementation of BMPs and address the requirements for permits.	3 points may be claimed for the year in which the training class is held
CSSRC - 4	Develop a site plan review process which considers potential water quality impacts which may occur during construction as well as post construction impacts.	Review process must have written guidance for the reviewer. Issuance of a building permit or approval to start construction may not be provided until the site plan has successfully passed the review process either based on the initial site plan submittal or has been modified to comply with requirements identified during the review process. Measures must be included to enforce the installation of water quality BMPs included in the site plan.	3 points may be claimed in the year the review process is initially developed and implemented. 2 points may be claimed for each successive year the review process continues to be implemented.

APPENDIX D: Construction Site Stormwater Runoff Controls (CSSRC) BMP Table

CSSRC - 5	Establish effective requirements for construction sites to control wastes. Develop through ordinance or other enforceable means requirements for construction site Operators or owners. At a minimum control shall be imposed to prevent entry into the MS4 for the following wastes: ➢ discarded building materials ➢ concrete ➢ Truck washout chemicals ➢ litter, and ➢ sanitary waste	Enact ordinance or other effective means to achieve control of wastes at construction sites.	3 points may be claimed in the year of enactment. 2 points may be claimed for each successive year the method of effective control of construction site waste remains in effect.
CSSRC - 6	Develop written procedures for inspection of construction sites. Develop a Stormwater Construction Site Inspection Guide for use by municipal inspectors.	The procedures document must address the administrative aspects associated with required inspections of construction sites, the issuance of inspection reports, notices of violations, and enforcement actions. The Inspection Guide must provide inspectors guidance on how to conduct a construction site stormwater inspection, the required procedures, and guidance on acceptable conditions of various BMPs employed on such sites, enforcement actions and/or reference of cases for enforcement by other municipal staff, guidance on photo log of the inspection and inspection checklists for use by the inspector.	3 points may be claimed in the year of initial development. 2 points may be claimed for each successive year the written procedures and inspection guide continue to be utilized.
CSSRC - 7	Acquire or develop a software tracking system to track inspections and related tasks.	The tracking system must allow for scheduling and follow-up activities such as re-inspections, mailing notices or reports, etc.	1 point may be claimed for each year the software is utilized.

APPENDIX E:
Post-Construction Stormwater Management in New Development and Redevelopment Projects (PCSM) BMP Table

APPENDIX E: Post-Construction Stormwater Management in New Development and Redevelopment Projects (PCSM) BMP Table

BMP ID	BMP Summary	Measurable Goal	Points
PCSM - 1	Develop and adopt a custom design manual for Post-Construction Stormwater Management which specifies various structural BMPs which are required for new development and re-development construction sites which are greater than 1 acre or for which there is construction activity disturbing less than one acre which is part of a larger common plan of development or sale that in total disturbs one acre or more. Alternately, adopt and implement the APWA 5600 Stormwater Design Criteria and the MARC/APWA BMP Manual.	The custom design manual shall impose requirements to achieve at least one of the following standards: ➢ Capture, at least, the first 0.5 inches of precipitation on the development/re-development site and utilize methods to prevent discharge off-site, including but not limited to: • retain on-site • infiltrate • evaporate • transpire or • beneficially reuse ➢ Through implementation of appropriate BMP(s) reduce the peak stormwater flow rate to a value equal to or less than the rate which would be experienced on the site prior to the development/re-development project based upon modeling a standard storm event, e.g. 1.0 inch – 6-hour event assuming saturated soil conditions. ➢ Other sizing or detention standards generally accepted by design engineers as adequate for the permittee's local. As an alternative to a custom design manual the APWA 5600 Stormwater Design Criteria and the MARC/APWA BMP Manual may be adopted and implemented. Measures must be included to enforce the installation of the various structural BMPs required.	4 points may be claimed in the year of initial implementation of a custom design manual. 6 points may be claimed in the year of initial implementation of the APWA 5600 stormwater design criteria and the MARC/APWA BMP Manual, 3 points may be claimed for each successive year compliance with the custom design manual is implemented. 5 points may be claimed in each successive year the implementation of the APWA 5600 stormwater design criteria and the MARC/APWA BMP Manual is implemented.
PCSM - 2	Develop a list of post-construction structural or non-structural BMPs which are required to be incorporated in any development/re-development project. The list must include guidance regarding the BMPs which must be incorporated in various projects as determined appropriate by the permittee. The list is to be provided to entities involved with the design of projects prior to site plan review by the permittee.	Development and implementation of the list and guidance is necessary to claim points in the first year. The list of required BMPs must be enforceable through ordinance or other means.	3 points may be claimed in the year of initial implementation. 2 points may be claimed for each successive year the list is maintained and implemented.

APPENDIX E: Post-Construction Stormwater Management in New Development and Redevelopment Projects (PCSM) BMP Table

PCSM - 3	Develop and implement a program to ensure adequate long-term cleaning, operation and maintenance of all municipally owned or operated post-construction structural stormwater BMP facilities. The program shall address several different types of these BMP systems. The systems, which are addressed, shall include any type of post-construction structural BMP system, contained in the MS4. These shall include, if so present, at a minimum the following: • detention ponds • retention ponds • grass swales • pervious paving systems • wetlands • vegetative filter strips • manufactured stormwater treatment devices (swirl separators, screens, etc.) • drop inlet-catch basin	The program shall be detailed in a written document and made available to all pertinent maintenance staff.	3 points may be claimed in the year of initial implementation. 2 points may be claimed for each successive year the program is maintained and utilized.
PCSM - 4	Develop a master plan or comprehensive development plan which establishes zoning and development standards with establishment of both structural and non-structural BMPs intended to avoid or minimize adverse water quality impacts post-construction.	Runoff problems can be addressed efficiently with sound planning procedures. This master or comprehensive development plan must include, a zoning ordinance, a stream buffer ordinance, site plan development requirements which include minimizing the increase of impervious surfaces and maximization/preservation of open space. The plan must also impose requirements for new development or re-development projects to utilize stormwater retention or detention BMPs and vegetative BMPs (such as grassy swales, filter strips, artificial wetlands, and rain gardens).	5 points may be claimed in the year all aspects are initially implemented. 2 points may be claimed for each successive year all aspects continue to be implemented.
PCSM - 5	Develop and implement a program for inspection of permittee owned structural BMPs which includes implementation of needed maintenance to ensure long-term operation of the BMPs	The program shall require inspection of at least 10% of the structural BMPs on an annual basis. Identified maintenance activities shall be completed: 1. in the same year of inspection or 2. completed as dictated by the permittee's maintenance/O&M plan 3. or a written plan for completion of the necessary maintenance shall be completed in the same year of inspection with the objective for completion of the maintenance activity within 18 months.	3 points may be claimed in the year the program is initially developed and implemented. 2 points may be claimed for each successive year the program continues to be implemented.

APPENDIX E: Post-Construction Stormwater Management in New Development and Redevelopment Projects (PCSM) BMP Table

PCSM - 6	Develop and implement a program for inspection of known privately owned structural BMPs which includes providing the owner of the BMPs an inspection report which specifies needed maintenance to ensure long-term operation of the BMPs.	The program shall require inspection of at least 10% of the known privately owned structural BMPs on an annual basis. Identified maintenance activities shall be completed in the same year of inspection or a written plan for completion of the necessary maintenance shall be completed in the same year of inspection with the objective for completion of the maintenance activity within 18 months.	3 points may be claimed in the year the program is initially developed and implemented. 2 points may be claimed for each successive year the program continues to be implemented.
PCSM - 7	Enact either an ordinance, a resolution, or other enforceable requirement which requires the installation of pervious surfaces on property.	The ordinance or resolution or other enforceable requirement must specify when installation of impervious surfaces is not acceptable and what allowable pervious surfaces can be installed in lieu of impervious surfaces.	3 points may be claimed in the year of initial implementation. 2 points may be claimed for each successive year the ordinance, resolution, or other enforceable requirement is implemented.
PCSM - 8	Implement a program to encourage residential owners to install stormwater BMPs, including but not limited to, native trees, native flower gardens, rain gardens, rain barrels, pervious surfaces, and vegetated swales.	A program which results in installation of such BMPs on 1% of the residential parcels in a year will allow two points to be claimed for that year. In a year when installation of such BMPs on 5% of the residential parcels occurs, a larger number of points may be claimed.	2 points may be claimed in a single year BMPs are installed on 1% of residential parcels. 4 points may be claimed in a single year BMPs are installed on 5% of residential parcels.

APPENDIX F:
Pollution Prevention/Good Housekeeping for Municipal Operations (PP/GH)
BMP Table

APPENDIX F: Pollution Prevention/Good Housekeeping for Municipal Operations (PP/GH) BMP Table

BMP ID	BMP Summary	Measurable Goal	Points
PP/GH - 1	Install a screening device or method at a single municipal storm sewer outfall or on the storm sewer line immediately upstream of the outfall to reduce the discharge of floatables or other objects to receiving waters.	The screening device or method is required to remove objects that exceed at least 1½ inches in size. The device or method must be capable of continuous operation during stormwater discharges. An emergency bypass or overflow line can be included to avoid surcharging/flooding in the event the screening device or method fails to operate properly at any time. A log of the material captured and prevented from discharge to the receiving water shall be maintained.	3 points may be claimed in the year the screening device or method is initially implemented. 2 points may be claimed for each successive year the screening device or method continues to be implemented.
PP/GH - 2	Implement a recycle and proper waste disposal program for municipal staff to reduce potential for litter, to recycle waste oil, batteries, glass containers, plastic containers, and paper products.	A log of the materials directed to recycle shall be maintained. Entries in the log shall record either weight or volume of recycle materials removed from the containers and transported to the recycle facility as well as the date of transport.	3 points may be claimed in the initial year the recycle program is implemented. 2 points may be claimed for each year the recycle program continues to be implemented. Recycle containers shall be available for staff use all days of the year in which points are claimed.
PP/GH - 3	Develop a guidance document for municipal staff or third-party contractors which apply pesticides. The guidance shall require municipal staff who apply restricted use pesticides to have a commercial applicator certification from the Kansas Department of Agriculture if required by that Department.	Require staff which apply pesticides to use such pesticides in compliance with the guidance document. The guidance document must require use of pesticides in compliance with the label instructions.	2 points may be claimed in the year the guidance document is initially implemented. 1 point may be claimed for each successive year the guidance document continues to be implemented.

APPENDIX F: Pollution Prevention/Good Housekeeping for Municipal Operations (PP/GH) BMP Table

PP/GH - 4	Implement a program, with guidance to municipal staff or third-party contractors, to ensure any municipal vehicle or other mechanical equipment washing is conducted in a manner which ensures the wash water is disposed of in the sanitary sewer or otherwise receives proper treatment prior to discharge to the environment.	Maintain proper wash facilities for municipal staff to wash vehicles and/or equipment or implement a program which includes guidance to municipal staff to take vehicles and/or equipment to commercial wash facilities, either of which ensures the wash water is conveyed to the sanitary sewer, or otherwise receives proper treatment prior to discharge to the environment, and not discharged untreated to the MS4 or directly to the environment.	2 points may be claimed in the year the guidance document is finalized and implemented. 1 point may be claimed for each successive year the guidance document continues to be implemented.
PP/GH - 5	Implement a program for street sweeping in which the street sweepings are collected and disposed of properly or recycled/reused if possible.	All paved streets which can be swept shall be listed in the schedule for street sweeping. A log shall be maintained listing the street segments which are swept and, dates of sweeping and where the street sweepings are disposed or where the material was sent to be recycled and/or reused. Alternatively, for municipalities with less than 500 population street sweeping can be limited to sweeping the gutters. The log which must be maintained need only indicate the street segments which were swept in the year and confirm the sweepings were properly disposed or recycled and/or reused	3 points may be claimed in the year at least 10% of the listed streets are swept and street sweeping equipment is purchased. 2 points may be claimed for each year at least 10% of the listed streets are swept or alternately for municipalities with less than 500 population if at least 5% of the street gutters are swept. 1 point may be claimed in years when street sweeping equipment is purchased for use by the permittee.
PP/GH - 6	Develop an employee training program to ensure permittee's staff understand what actions they can take in the workplace to minimize stormwater pollution.	Provide guidance documents in the form of either fact sheets, flyers or e-mails to staff to coach them in appropriate actions they can take while working to minimize stormwater pollution. Alternately, provide in-person training or videos with sign-in-sheets for signature documentation of personal or video training. Retain copies of the guidance documents and/or sign-in-sheets. A log of when the guidance was distributed, or training was provided to staff should be maintained. Provide appropriate guidance and/or training to staff a minimum of twice per year.	In years when guidance documents or training (in-person or video) are provided on at least two separate dates 1 point may be claimed.

APPENDIX F: Pollution Prevention/Good Housekeeping for Municipal Operations (PP/GH) BMP Table

PP/GH - 7	Implement a program to inspect stormwater inlets to identify illicit discharges and clean drop inlets of accumulated debris.	Inspect at least 5% of all inlets annually. Additionally, if 10% of all inlets are inspected in a year an additional point may be claimed. For any inlets which have evidence of dumped paint, oil or other substances which are considered illicit discharges follow up with efforts to educate individuals near the impacted inlet about illicit discharges. For inlets which have any accumulation of debris, remove the debris for proper disposal.	1 point may be claimed in years when staff inspect at least 5% of all stormwater inlets and remove accumulated debris. 2 points may be claimed in years when staff inspect at least 10% of all stormwater inlets and remove accumulated debris.
PP/GH - 8	Make updated online storm sewer map accessible to the public.	Map shall cover the entire MS4 within the permit area and include all the MS4 lines both pipe and open drainage (i.e. ditches) and shall also illustrate all impaired waterways (i.e. 303(d) listed and TMDL listed streams/rivers) with an indication of the listed impairment.	3 points may be claimed in the first year if the map was posted for at least 6 months. 2 points may be claimed for each year thereafter for which the map remains posted.
PP/GH - 9	Identify permittee owned facilities, open space and buildings that can be retrofitted for stormwater BMPs.	Retrofit projects can include green infrastructure, catchment improvements, Pollutant of Concern targeted BMPs, and native plant restoration projects.	1 point may be claimed in the first year for each site retrofitted (up to two sites/points maximum. 2 points may be claimed for each year at least two sites continue to operate all of the retrofitted BMPs which were installed.
PP/GH-10	Install and operate a constructed wetland at a municipal facility such as at a parking lot, shop, maintenance facility, rest area or any other industrial/commercial type facility, e.g. recycling facility, transfer station, kennel, or airport.	The wetland shall include a water surface area of at least 1/4 acre or equivalent submerged surface area for submerged wetlands.	2 points may be claimed for the year in which the wetland is constructed. 1 point may be claimed for each subsequent year the wetland remains in operation.

APPENDIX F: Pollution Prevention/Good Housekeeping for Municipal Operations (PP/GH) BMP Table

PP/GH-11	Install a canopy or other covered area for load-out of salt or other de-icing chemicals where such de-icing materials are stored either within the permit area or a storage facility located within 30 miles of this permit area. The canopy or other covered area for load-out of salt or other de-icing materials may be installed at a facility owned by the permittee or at a facility owned by an entity the permittee contracts with as long as the facility is located within 30 miles of this permit area.	The canopy or covered area shall be large enough to allow normal load-out and cleanup of spilled de-icing materials, without mixing with precipitation and resulting in contaminated runoff from the site, during and immediately following load out operations	3 points may be claimed for the year in which the canopy/covered area is constructed. 2 points may be claimed for each subsequent year the canopy/covered area remains in operation.
PP/GH-12	Install a stormwater treatment system for capture of either trash, sediment, or debris. Systems may include any proprietary stormwater treatment system including CDS, Hancor, Enviro 21, etc. or similar custom designed systems. A system can be installed at a single municipal storm sewer outfall or on the storm sewer line immediately upstream of the outfall to reduce the discharge of floatables or other objects to receiving waters. Alternately, a system may be installed on a stormwater line to provide treatment at problem locations.	The treatment system or method must be capable of continuous operation during stormwater discharges. An emergency bypass or overflow line can be included to avoid surcharging/flooding in the event the system is overloaded or fails to operate properly at any time. A log of the material (noting either volume or weight) captured and prevented from discharge to the receiving water shall be maintained.	3 points may be claimed in the year the treatment system is initially implemented. 2 points may be claimed for each successive year the treatment system continues to be implemented.

APPENDIX G:
Total Maximum Daily Load (TMDL) BMP Table

APPENDIX G: Total Maximum Daily Load (TMDL) BMP Table

BMP ID	BMP Summary	Measurable Goal	Points
TMDL - 1	Install pet waste stations which include a glove/bag dispenser with signage and waste can to encourage pet waste disposal at either parks, trails, rest areas or other public lands owned by the permittee.	At least one pet waste station shall be installed at the selected park, trail, rest area or other public land. The station(s) shall include signage which encourages proper pet waste disposal/cleanup and a waste can.	1 point may be claimed for the year in which the Measurable Goal requirements are enacted. 1 point may be claimed for each subsequent year the Measurable Goal requirements remain in effect.
TMDL - 2	Establish a program to encourage installation of residential rain gardens.	Provide public education on rain gardens and design guidance for the installation of residential rain gardens. The rain gardens must have a minimum area of 20 square feet. The installation of rain gardens on five various residential parcels shall qualify the permittee to claim points for this BMP.	3 points may be claimed for the year in which five or more residential parcels install rain gardens and initiate operation. 2 points may be claimed for each subsequent year at least five or more residential parcels have rain gardens remain in operation.
TMDL - 3	Install and operate a constructed wetland.	The wetland shall include a water surface area of at least one acre or equivalent submerged surface area for submerged wetlands.	3 points may be claimed for the year the wetland is constructed. 2 points may be claimed for each subsequent year the wetland remains in operation.
TMDL - 4	Enact a stream buffer ordinance, resolution, or other enforceable requirement to impose stream buffer standards.	The enactment of stream buffer standards must include enforcement capability. Consider use of the EPA stream buffer model ordinance or similar such requirement.	3 points may be claimed for the year in which the ordinance, resolution or other enforceable requirement is enacted. 2 points may be claimed for each subsequent year it remains in effect.

APPENDIX G: Total Maximum Daily Load (TMDL) BMP Table

TMDL - 5	Develop a pet waste brochure or flyer document to educate the public about animal waste contamination of stormwater. The document encourages pet owners to pick up their pet's waste. Alternately, post the document on social media or the municipal website.	The brochures or flyers are to be posted in various public buildings and distributed to the public throughout the year. In the year the number of documents shall equal or exceed the most recent U.S. Census Bureau decennial housing units value for the permit area. The applicable U.S. Census housing units value shall be documented, and the number of documents distributed shall also be documented. This information and copies of the documents shall be retained on file. Documents posted to social media or the website shall have the page copied and printed to retain on file.	1 point may be claimed in a year in which the required number of brochures and/or flyers are distributed, documents posted on website(s) shall be posted for at least six months in the year. Documents posted on social media shall be posted six times within the year points are claimed..
TMDL - 6	Distribute "Only Rain Down the Drain" door hangers or similar document.	Provide in portions of the permit area with suspected illicit discharges. Recipients of the documents and copies of the documents shall be retained on file.	2 points may be claimed in a year in which the required number of hangers or similar documents are distributed or Alternately, the document may be posted to social media (at least three times in the year) or posted on the municipal website for a minimum of three months in the year to qualify for points .
TMDL - 7	Inspect 10% of all known MS4 outfalls for dry weather discharges either annually or twice per year to identify potential illicit discharges.	Complete inspection of all known MS4 outfalls either annually or twice per year during dry weather periods. If dry weather discharge is found follow-up with investigation to determine if a portion or all the discharge is illicit. Document the findings and initiate efforts to eliminate any identified illicit discharges.	3 points may be claimed for annual inspection as required by this BMP. 5 points may be claimed for these inspections completed twice in a year but they must be seasonal (winter, spring, summer, and fall). If an illicit discharge is detected and eliminated, 2 additional points may be claimed either in the year detected or in the year the illicit discharge is eliminated.

APPENDIX G: Total Maximum Daily Load (TMDL) BMP Table

TMDL - 8	Implement an Alternative Stormwater Offsite Pollution Reduction Program.	This program will include installation of BMPs in alternative locations, including outside the Permit Area, within the watershed shared by urban entities or urban and non-urban entities. The alternative stormwater offsite pollution reduction program shall be developed with watershed interests, such as other communities, Watershed Restoration and Protection Strategy (WRAPS) groups and Conservation Districts lying outside the Permit Area for the joint purpose of reducing pollutant loads generated from urban and non-urban lands within the shared watershed. Candidate offsite locations and practices will be consistent with implementing existing watershed plans that identify specific urban and non-urban (such as agricultural) BMP types and locations to achieve TMDLs reductions. The Alternative Stormwater Offsite Pollution Reduction Program shall be subject to KDHE approval and approved by KDHE prior to incorporation into the permittee's SMP.	5 points may be claimed in the year KDHE approves the program. 4 points may be claimed for each subsequent year it remains in effect.
TMDL - 9	Implement a program to collect and properly dispose of litter, on four separate occasions per calendar year, within areas where littering has been identified as a problem. Such areas may include municipal parks, trails, rest areas, or other public lands owned by the permittee.	The four litter collection efforts should, but are not required to, occur seasonally, i.e., winter, spring, summer and fall. If it is unreasonable to collect litter in any season the required four collection efforts may occur in either three seasons or in a minimum of two seasons.	2 points may be claimed for any year in which four collection efforts have occurred in compliance with the requirements of this BMP.
TMDL -10	Establish a program to encourage Rainwater Harvesting.	Provide public education on rainwater harvesting and design guidance for the installation of rain barrels, cisterns, raingardens, and other rainwater harvesting devices. When rain barrels are utilized they must be a minimum size of 50 gallons. When raingardens are utilized they must be a minimum of 20 square feet. A rain harvesting system on a commercial setting must have adequate capacity to hold the runoff from the impervious surface for which it is designed to collect on the commercial parcel equal to that generated by a 0.1-inch rainfall event. The installation of rain barrels or rain gardens on five residential lots, or the installation of one rain harvesting system in a commercial setting shall qualify the permittee to claim points for this BMP.	3 points may be claimed for any year in which 5 or more residential barrel systems, or one commercial cistern is constructed and operational. 2 points may be claimed in the year that the program is established. 1 point may be claimed in subsequent years the program is maintained

APPENDIX G: Total Maximum Daily Load (TMDL) BMP Table

TMDL -11	Construct and maintain a structural BMP to reduce loadings of sediment and nutrients, including bioretention, detention basins, porous pavement, retention ponds, media filters and any composite treatment trains of multiple BMPs	A construction project installing a structural BMP must be completed prior to awarding of points. Any individual project will be awarded points scaled on the basis of the extent of the contributing area that the BMP will control. The permittee will document maintenance of the constructed BMP in subsequent years to continue to be awarded points.	4 points may be claimed for any year in which a structural BMP is completed for an area exceeding one acre. 3 points may be claimed for any year in which a structural BMP is completed for an area under one acre. 1 bonus point may be awarded for a composite BMP project. 2 points may be awarded in subsequent years for ongoing maintenance of the BMPs.
TMDL -12	Construct a stream bank stabilization project.	Install a minimum of 100 feet of bank stabilization at a site(s) with a history of erosion. The sites may be on the same stream or on different streams.	3 points may be claimed for the year in which the required minimum amount of stream bank stabilization is installed. 2 points may be claimed for each subsequent year it remains in effect.

ATTACHMENT A

Stormwater Pollution Prevention Plan Requirements and Guidelines

The Stormwater Pollution Prevention (SWP2) plan shall be specific to the industrial activities and site characteristics occurring at the location described in this permit. The permittee shall fully implement the provisions of the SWP2 plan required under this permit as a condition of this permit.

The purpose of the SWP2 plan is to ensure the design, implementation, management, and maintenance of Best Management Practices (BMPs) in order to reduce the amount of pollutants in stormwater discharges associated with the industrial activities at the facility. The SWP2 plan shall evaluate BMPs from each of three major classes: managerial/administrative; structural controls and non-structural controls.

As guidance, the permittee shall evaluate, select, install, utilize, operate and maintain the BMPs in accordance with best professional judgment, generally accepted and scientifically defensible guidance, and the concepts and methods described in Environmental Protection Agency (EPA) document number EPA 833-B-09-002, entitled ***Developing Your Stormwater Pollution Prevention Plan**, a Guide for Industrial Operators*, dated March 2021[a] and the *U.S. EPA National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activities (MSGP)*; as modified effective September 29, 2021, and subsequent modifications.

The SWP2 plan and any amendments shall be developed by an individual knowledgeable in stormwater management and control and familiar with the site characteristics of the facility. Due to technical and site-specific requirements in developing a SWP2 plan, KDHE highly encourages and recommends that the SWP2 plan and any amendments be prepared by, or under the supervision of a Kansas licensed professional engineer. The SWP2 plan shall be reviewed and re-certified for compliance with accepted standards for stormwater pollution prevention at least once every five years. If KDHE determines the SWP2 plan to be inadequate KDHE, reserves the right to require the permittee to obtain the services of a qualified consultant to correct any deficiencies in the SWP2 plan. The SWP2 plan shall contain, at a minimum, the following items:

1. Pollution Prevention Team - Specific individuals or positions shall be identified within the facility organization as members of a Stormwater Pollution Prevention Team who are responsible for developing, implementing, maintaining and revising the SWP2 plan. Each member's responsibilities shall be clearly identified in the SWP2 plan. The activities and responsibilities of the team shall address all aspects of the facility's SWP2 plan.

2. Description of Potential Pollutant Sources - pollutant sources which may reasonably be expected to add significant amounts of pollutants to the stormwater discharge shall be described. The description shall include, at a minimum:
   a. Site Map - a site map identifying the following: the outline of drainage area(s) for each stormwater outfall; the location of significant materials exposed to precipitation; storage tanks; scrap yards and general refuse areas; fuel storage and distribution areas; vehicle and equipment maintenance and storage areas; loading/unloading areas; waste treatment, storage or disposal areas; short and long term material storage areas (including but not limited to: supplies, construction materials, plant equipment, oils, fuels, used and unused solvents, cleaning materials, paint, water treatment chemicals, fertilizers, and pesticides); landfills; construction sites; stock piles; major spills or leaks; surface water bodies and existing structural control measures to reduce pollutants in stormwater runoff (such as bermed areas, grassy swales, etc.).
   b. Inventory of Exposed Materials - a narrative description of significant materials handled, treated, stored, leaked, spilled or disposed of in a manner to allow exposure to stormwater within the period starting three years prior to the date of this permit; existing structural and nonstructural control measures to reduce pollutants in stormwater runoff; and any treatment the stormwater receives. A list of significant spills and leaks of toxic/hazardous materials in exposed areas shall be maintained and kept updated.
   c. Sampling Data - a summary of existing sampling data, if available.
   d. Risk Identification and Summary of Potential Pollutant Sources - A narrative description of the potential pollutant sources and pollutant parameter of concern shall be identified.

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[a] The EPA Manual entitled ***Developing Your Stormwater Pollution Prevention Plan**, a Guide for Industrial Operators*, dated March 2021; and the *U.S. EPA National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activities (MSGP)*; as modified effective September 29, 2021 are available online at: https://www.epa.gov/npdes/industrial-stormwater-guidance or the KDHE website: https://www.kdhe.ks.gov/756/Industrial-Programs-Section-Stormwater-P .

3. Measures and Controls - A description of stormwater management controls appropriate for the facility which addresses the following minimum components, including a schedule for implementing such controls to the extent practical:
   a. Good housekeeping requiring the maintenance of areas in a clean, orderly manner including handling and storage areas (exposed to precipitation) for raw metals, scrap metals, fuels, paints and other process areas.
   b. Preventive Maintenance - Including timely inspection and maintenance of stormwater management devices, like oil water separators, catch basins, etc.
   c. Spill Prevention and Response Procedures - Appropriate material handling procedure, storage requirements, use of equipment such as diversion valves, and procedures for cleaning up spills should be identified. Availability of the necessary equipment to implement a clean-up should be addressed. The following areas should be addressed:
      (1) Metal fabrication and finishing areas - include measures for maintaining clean, dry, orderly conditions and use of dry clean-up techniques;
      (2) Receiving, Unloading and Storage Areas and Raw Material Storage Areas - include measures to prevent spills & leaks; easy access for spill clean-up; quick and correct identification of materials; and train employees on clean-up techniques.
      (3) Storage of Equipment - include procedures for proper clean-up and/or covering of equipment before storing outdoors.
      (4) Storage of Metal Working Fluids - measures to identify proper controls.
      (5) Cleaners and Rinse Water - include measures to control spills, build-up and disbursement of sand from sand blasting, and use of less toxic cleaners.
      (6) Lubricating Oils and Hydraulic Fluids - include procedures for using detecting and control devices to reduce, prevent, and contain leaks and overflows.
      (7) Chemical Storage Areas - include a program to inspect containers and identify proper disposal and spill controls to prevent stormwater contamination.
   d. Inspections: Identification of qualified facility personnel to inspect, at appropriate intervals, designated storage areas for raw metal, finished product, materials and chemicals, recycling, equipment, paint, fueling and maintenance; and loading, unloading, and waste management areas. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections shall be maintained on-site for at least three years after the date of the inspection.
   e. Employee Training: Employee training programs to inform personnel responsible for implementing activities identified in the SWP2 plan or otherwise responsible for stormwater management, at all levels of responsibility, of the components and goals of the SWP2 plan. The SWP2 plan shall provide for training existing and new staff.
   f. Record keeping and Internal Reporting Procedures: A log, along with other information, needs to be developed and maintained to document a description of incidents (i.e., spills or other discharges) that may impact the quality and quantity of stormwater discharges. Reporting procedures, inspections and maintenance activities shall be developed and included in the SWP2 plan.
   g. Non-stormwater Discharges - The SWP2 plan must identify all unauthorized, non-stormwater (dry weather) discharges directed to surface or groundwater. KDHE shall be notified of all unauthorized discharge(s) within 5 days, and identify and ensure the implementation of appropriate pollution prevention measures for the dry weather flow component(s) of the discharge. A list of authorized non-stormwater discharges is contained in the *Kansas Water Pollution Control (KWPC) General Permit for Stormwater Runoff from Industrial Activities*[b].
   h. Sediment and Erosion Control: Measures to minimize erosion in areas which, due to topography, activities, or other factors, have a high potential for significant soil erosion. At a minimum consider structural, vegetative, and/or stabilization measures to limit erosion. Must include measures to minimize erosion related to the high volume of traffic from heavy equipment for delivery to and from the facility and for equipment operating at the facility on a daily basis such as forklifts, cranes etc.
   i. Management of Runoff: Describe existing and/or proposed stormwater management practices (practices other than those which control the generation or source(s) of pollutants) to divert, infiltrate, reuse or otherwise manage stormwater runoff in a manner that reduces pollutants in stormwater discharges from the site. The pollutant sources at the facility identified in Item 2 above, Description of Potential Pollutant Sources, with potential to contribute pollutants to stormwater discharges associated with industrial activity shall be considered when determining reasonable and appropriate measures to implement.

[b] The *KWPC General Permit for Stormwater Runoff from Industrial Activities* issued November 1, 2021 is available online at: https://www.kdhe.ks.gov/DocumentCenter/View/23383/2021-11-01-SW-Ind-GP-Packet-PDF?bidId=

4. Comprehensive Site Compliance Evaluation - Qualified personnel shall conduct site compliance evaluations at least once a year. Such evaluations shall provide for:
   a. Visual inspection of areas contributing to a stormwater discharge associated with industrial activity for evidence of, or the potential for, pollutants entering the drainage system. Evaluation of measures to reduce pollutant loadings to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. A visual evaluation of equipment needed to implement the plan, such as spill response equipment and containment drums, shall be made to determine it is functioning properly and drums are not corroded.
   b. A report summarizing the scope of the evaluation, personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the SWP2 plan, and any actions taken shall be made and retained as part of the SWP2 plan.
   c. The report shall include resolution to any incident of non-compliance determined from the comprehensive site evaluation within 90 days.

   If the comprehensive site evaluation does not identify any incidents of non-compliance, the report shall include a statement that the facility is in compliance with the SWP2 plan and the conditions of this permit.

5. Monitoring and Record Keeping Requirements.
   a. Visual Examination of Stormwater Quality: The permittee shall periodically perform and document a visual examination of a stormwater discharge associated with industrial activity from each identified stormwater outfall. Visual examination reports shall be maintained on-site and be made available for KDHE & EPA inspection upon request. Each report shall include the date and time, name of the person performing examination, nature of discharge (runoff or snow melt), visual quality of the discharge (i.e., color, odor, clarity, floating solids, suspended solids, foam, oil sheen, and other indicators of stormwater pollution) and probable sources of any observed contamination.
   b. Records of all stormwater monitoring data[c], unless otherwise indicated in this permit, shall be kept on file for three (3) years.

6. The SWP2 plan shall be re-evaluated and modified in a timely manner, but in no case more than 90 days after:
   a. A change in design, construction, operation or maintenance that has a significant effect on the potential for the discharge of pollutants to the waters of the State, or
   b. the permittee's inspections (including the regular comprehensive site compliance evaluation required herein) indicate deficiencies in the SWP2 plan or any BMP; or
   c. a visual inspection of contributing areas or a visual inspection of the stormwater discharges or monitoring of the stormwater discharges indicate the plan appears to be ineffective in eliminating or significantly minimizing pollutants from sources identified in the plan.
   d. Written notification from KDHE or EPA determining the site best management practices are or will not be effective in eliminating or minimizing pollutants in the stormwater discharges.

[c] For sampling methods and procedures please refer to *Industrial Stormwater Monitoring and Sampling Guide*, EPA 832-B-09-003, April 2021 Final Draft available online at: https://www.epa.gov/sites/production/files/2015-11/documents/msgp_monitoring_guide.pdf

ATTACHMENT B

No Exposure Checklist

Are any of the following materials or activities exposed to stormwater, now or in the foreseeable future?

1. Using, storing, or cleaning industrial machinery or equipment, and areas where residuals from using, storing or cleaning industrial machinery or equipment remain and are exposed to stormwater
2. Materials or residuals on the ground or in stormwater inlets from spills/leaks
3. Materials or products from past industrial activities
4. Material handling equipment (except adequately maintained vehicles)
5. Materials or products during loading/unloading or transporting activities
6. Materials or products stored outdoors (except final products intended for outside use where exposure to stormwater does not result in the discharge of pollutants
7. Materials contained in open, deteriorated or leaking storage drums, barrels, tanks and similar containers
8. Materials or products handled/stored on roads owned or maintained by the discharger
9. Waste material (except waste in covered, non-leaking containers [e.g. dumpsters])
10. Application or disposal of process wastewater (unless otherwise permitted)
11. Particulate matter or visible deposits of residuals from roof stacks and/or vents not otherwise regulated (i.e., under an air quality control permit) and evident in the stormwater outflow

If you answer "Yes" to any of these questions, you are no longer eligible for a "No Exposure" exclusion and need to prepare a Stormwater Pollution Prevention (SWP2) plan.

5. Post-Construction Stormwater Management in New Development and Redevelopment (continued)

The implementation of BMPs for this minimum control measure must result in accumulation of a minimum of 7 points for each calendar year. **Appendix E** lists various BMPs, measurable goals, and the required timing-period or implementation-schedule to qualify for the points in the year. The permittee may request that KDHE accept additional BMPs of the permittee's creation that meets the intent of this minimum control measure for a reasonable number of points, as described under part C.

In cases where the permittee is already implementing a BMP which qualifies for points, they may continue implementation of the BMP and earn the listed points as allowed for the first year of implementation under this permit as well as subsequent years.

Multiple BMPs involve holding public hearings; a single public hearing can be held which addresses multiple topics and points claimed for all of the multiple BMPs implemented.

6. Pollution Prevention/Good Housekeeping for Municipal Operations

The permittee shall continue to implement an operation and maintenance program that includes employee training to prevent and reduce stormwater pollution from municipal operations. The program must include, at a minimum, the following:

a. Training shall be implemented for all necessary municipal staff, such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance.

b. Maintain a program to ensure proper use and storage of materials at permittee owned facilities that use pesticides, herbicides, and fertilizers.

c. Develop, implement, and maintain site-specific Stormwater Pollution Prevention (SWP2) plan in accordance with Attachment A for permittee owned facilities with significant storage of potential stormwater pollutants. This shall include municipal garages, fleet maintenance areas, salt and sand storage areas, park maintenance shops, fueling stations, sites with material storage that meet the definition of industrial activity, and other permittee owned facilities.

    i. If a SWP2 plan is already required or a facility has qualified for No Exposure Certification (NOEC) under the KDHE Industrial Stormwater General Permit, the applicability of this provision is redundant, and the Industrial Stormwater permit provisions shall be followed in lieu of this requirement.

    ii. If a facility can ensure that a condition of "no exposure" to stormwater exists, a site-specific SWP2 plan is not required. To determine no exposure, see Attachment B. The facility and no exposure determination shall be documented in the annual report and reevaluated yearly by the permittee.

The implementation of BMPs for this minimum control measure must result in accumulation of a minimum of 6 points for each calendar year. **Appendix F** lists various BMPs, measurable goals, and the required timing-period or implementation-schedule to qualify for the points in the year. The permittee may request that KDHE accept additional BMPs of the permittee's creation that meets the intent of this minimum control measure for a reasonable number of points, as described under Part C.

In cases where the permittee is already implementing a BMP which qualifies for points, they may continue implementation of the BMP and earn the listed points as allowed for the first year of implementation under this permit as well as subsequent years. Multiple BMPs involve holding public hearings; a single public hearing can be held which addresses multiple topics and points claimed for all of the multiple BMPs implemented.

ATTACHMENT A

Stormwater Pollution Prevention Plan Requirements and Guidelines

The Stormwater Pollution Prevention (SWP2) plan shall be specific to the industrial activities and site characteristics occurring at the location described in this permit. The permittee shall fully implement the provisions of the SWP2 plan required under this permit as a condition of this permit.

The purpose of the SWP2 plan is to ensure the design, implementation, management, and maintenance of Best Management Practices (BMPs) in order to reduce the amount of pollutants in stormwater discharges associated with the industrial activities at the facility. The SWP2 plan shall evaluate BMPs from each of three major classes: managerial/administrative; structural controls and non-structural controls.

As guidance, the permittee shall evaluate, select, install, utilize, operate and maintain the BMPs in accordance with best professional judgment, generally accepted and scientifically defensible guidance, and the concepts and methods described in Environmental Protection Agency (EPA) document number EPA 833-B-09-002, entitled ***Developing Your Stormwater Pollution Prevention Plan****, a Guide for Industrial Operators*, dated March 2021[a] and the *U.S. EPA National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activities (MSGP)*; as modified effective September 29, 2021, and subsequent modifications.

The SWP2 plan and any amendments shall be developed by an individual knowledgeable in stormwater management and control and familiar with the site characteristics of the facility. Due to technical and site-specific requirements in developing a SWP2 plan, KDHE highly encourages and recommends that the SWP2 plan and any amendments be prepared by, or under the supervision of a Kansas licensed professional engineer. The SWP2 plan shall be reviewed and re-certified for compliance with accepted standards for stormwater pollution prevention at least once every five years. If KDHE determines the SWP2 plan to be inadequate KDHE, reserves the right to require the permittee to obtain the services of a qualified consultant to correct any deficiencies in the SWP2 plan. The SWP2 plan shall contain, at a minimum, the following items:

1. Pollution Prevention Team - Specific individuals or positions shall be identified within the facility organization as members of a Stormwater Pollution Prevention Team who are responsible for developing, implementing, maintaining and revising the SWP2 plan. Each member's responsibilities shall be clearly identified in the SWP2 plan. The activities and responsibilities of the team shall address all aspects of the facility's SWP2 plan.

2. Description of Potential Pollutant Sources - pollutant sources which may reasonably be expected to add significant amounts of pollutants to the stormwater discharge shall be described. The description shall include, at a minimum:
   a. Site Map - a site map identifying the following: the outline of drainage area(s) for each stormwater outfall; the location of significant materials exposed to precipitation; storage tanks; scrap yards and general refuse areas; fuel storage and distribution areas; vehicle and equipment maintenance and storage areas; loading/unloading areas; waste treatment, storage or disposal areas; short and long term material storage areas (including but not limited to: supplies, construction materials, plant equipment, oils, fuels, used and unused solvents, cleaning materials, paint, water treatment chemicals, fertilizers, and pesticides); landfills; construction sites; stock piles; major spills or leaks; surface water bodies and existing structural control measures to reduce pollutants in stormwater runoff (such as bermed areas, grassy swales, etc.).
   b. Inventory of Exposed Materials - a narrative description of significant materials handled, treated, stored, leaked, spilled or disposed of in a manner to allow exposure to stormwater within the period starting three years prior to the date of this permit; existing structural and nonstructural control measures to reduce pollutants in stormwater runoff; and any treatment the stormwater receives. A list of significant spills and leaks of toxic/hazardous materials in exposed areas shall be maintained and kept updated.
   c. Sampling Data - a summary of existing sampling data, if available.
   d. Risk Identification and Summary of Potential Pollutant Sources - A narrative description of the potential pollutant sources and pollutant parameter of concern shall be identified.

[a] The EPA Manual entitled ***Developing Your Stormwater Pollution Prevention Plan****, a Guide for Industrial Operators*, dated March 2021; and the *U.S. EPA National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activities (MSGP)*; as modified effective September 29, 2021 are available online at: https://www.epa.gov/npdes/industrial-stormwater-guidance or the KDHE website: https://www.kdhe.ks.gov/756/Industrial-Programs-Section-Stormwater-P .

3. Measures and Controls - A description of stormwater management controls appropriate for the facility which addresses the following minimum components, including a schedule for implementing such controls to the extent practical:
   a. Good housekeeping requiring the maintenance of areas in a clean, orderly manner including handling and storage areas (exposed to precipitation) for raw metals, scrap metals, fuels, paints and other process areas.
   b. Preventive Maintenance - Including timely inspection and maintenance of stormwater management devices, like oil water separators, catch basins, etc.
   c. Spill Prevention and Response Procedures - Appropriate material handling procedure, storage requirements, use of equipment such as diversion valves, and procedures for cleaning up spills should be identified. Availability of the necessary equipment to implement a clean-up should be addressed. The following areas should be addressed:
      (1) Metal fabrication and finishing areas - include measures for maintaining clean, dry, orderly conditions and use of dry clean-up techniques;
      (2) Receiving, Unloading and Storage Areas and Raw Material Storage Areas - include measures to prevent spills & leaks; easy access for spill clean-up; quick and correct identification of materials; and train employees on clean-up techniques.
      (3) Storage of Equipment - include procedures for proper clean-up and/or covering of equipment before storing outdoors.
      (4) Storage of Metal Working Fluids - measures to identify proper controls.
      (5) Cleaners and Rinse Water - include measures to control spills, build-up and disbursement of sand from sand blasting, and use of less toxic cleaners.
      (6) Lubricating Oils and Hydraulic Fluids - include procedures for using detecting and control devices to reduce, prevent, and contain leaks and overflows.
      (7) Chemical Storage Areas - include a program to inspect containers and identify proper disposal and spill controls to prevent stormwater contamination.
   d. Inspections: Identification of qualified facility personnel to inspect, at appropriate intervals, designated storage areas for raw metal, finished product, materials and chemicals, recycling, equipment, paint, fueling and maintenance; and loading, unloading, and waste management areas. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections shall be maintained on-site for at least three years after the date of the inspection.
   e. Employee Training: Employee training programs to inform personnel responsible for implementing activities identified in the SWP2 plan or otherwise responsible for stormwater management, at all levels of responsibility, of the components and goals of the SWP2 plan. The SWP2 plan shall provide for training existing and new staff.
   f. Record keeping and Internal Reporting Procedures: A log, along with other information, needs to be developed and maintained to document a description of incidents (i.e., spills or other discharges) that may impact the quality and quantity of stormwater discharges. Reporting procedures, inspections and maintenance activities shall be developed and included in the SWP2 plan.
   g. Non-stormwater Discharges - The SWP2 plan must identify all unauthorized, non-stormwater (dry weather) discharges directed to surface or groundwater. KDHE shall be notified of all unauthorized discharge(s) within 5 days, and identify and ensure the implementation of appropriate pollution prevention measures for the dry weather flow component(s) of the discharge. A list of authorized non-stormwater discharges is contained in the *Kansas Water Pollution Control (KWPC) General Permit for Stormwater Runoff from Industrial Activities*[b].
   h. Sediment and Erosion Control: Measures to minimize erosion in areas which, due to topography, activities, or other factors, have a high potential for significant soil erosion. At a minimum consider structural, vegetative, and/or stabilization measures to limit erosion. Must include measures to minimize erosion related to the high volume of traffic from heavy equipment for delivery to and from the facility and for equipment operating at the facility on a daily basis such as forklifts, cranes etc.
   i. Management of Runoff: Describe existing and/or proposed stormwater management practices (practices other than those which control the generation or source(s) of pollutants) to divert, infiltrate, reuse or otherwise manage stormwater runoff in a manner that reduces pollutants in stormwater discharges from the site. The pollutant sources at the facility identified in Item 2 above, Description of Potential Pollutant Sources, with potential to contribute pollutants to stormwater discharges associated with industrial activity shall be considered when determining reasonable and appropriate measures to implement.

[b] The *KWPC General Permit for Stormwater Runoff from Industrial Activities* issued November 1, 2021 is available online at: https://www.kdhe.ks.gov/DocumentCenter/View/23383/2021-11-01-SW-Ind-GP-Packet-PDF?bidId=

4. Comprehensive Site Compliance Evaluation - Qualified personnel shall conduct site compliance evaluations at least once a year. Such evaluations shall provide for:
   a. Visual inspection of areas contributing to a stormwater discharge associated with industrial activity for evidence of, or the potential for, pollutants entering the drainage system. Evaluation of measures to reduce pollutant loadings to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. A visual evaluation of equipment needed to implement the plan, such as spill response equipment and containment drums, shall be made to determine it is functioning properly and drums are not corroded.
   b. A report summarizing the scope of the evaluation, personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the SWP2 plan, and any actions taken shall be made and retained as part of the SWP2 plan.
   c. The report shall include resolution to any incident of non-compliance determined from the comprehensive site evaluation within 90 days.

   If the comprehensive site evaluation does not identify any incidents of non-compliance, the report shall include a statement that the facility is in compliance with the SWP2 plan and the conditions of this permit.

5. Monitoring and Record Keeping Requirements.
   a. Visual Examination of Stormwater Quality: The permittee shall periodically perform and document a visual examination of a stormwater discharge associated with industrial activity from each identified stormwater outfall. Visual examination reports shall be maintained on-site and be made available for KDHE & EPA inspection upon request. Each report shall include the date and time, name of the person performing examination, nature of discharge (runoff or snow melt), visual quality of the discharge (i.e., color, odor, clarity, floating solids, suspended solids, foam, oil sheen, and other indicators of stormwater pollution) and probable sources of any observed contamination.
   b. Records of all stormwater monitoring data[c], unless otherwise indicated in this permit, shall be kept on file for three (3) years.

6. The SWP2 plan shall be re-evaluated and modified in a timely manner, but in no case more than 90 days after:
   a. A change in design, construction, operation or maintenance that has a significant effect on the potential for the discharge of pollutants to the waters of the State, or
   b. the permittee's inspections (including the regular comprehensive site compliance evaluation required herein) indicate deficiencies in the SWP2 plan or any BMP; or
   c. a visual inspection of contributing areas or a visual inspection of the stormwater discharges or monitoring of the stormwater discharges indicate the plan appears to be ineffective in eliminating or significantly minimizing pollutants from sources identified in the plan.
   d. Written notification from KDHE or EPA determining the site best management practices are or will not be effective in eliminating or minimizing pollutants in the stormwater discharges.

[c] For sampling methods and procedures please refer to *Industrial Stormwater Monitoring and Sampling Guide*, EPA 832-B-09-003, April 2021 Final Draft available online at: https://www.epa.gov/sites/production/files/2015-11/documents/msgp_monitoring_guide.pdf

ATTACHMENT B

No Exposure Checklist

Are any of the following materials or activities exposed to stormwater, now or in the foreseeable future?

1. Using, storing, or cleaning industrial machinery or equipment, and areas where residuals from using, storing or cleaning industrial machinery or equipment remain and are exposed to stormwater
2. Materials or residuals on the ground or in stormwater inlets from spills/leaks
3. Materials or products from past industrial activities
4. Material handling equipment (except adequately maintained vehicles)
5. Materials or products during loading/unloading or transporting activities
6. Materials or products stored outdoors (except final products intended for outside use where exposure to stormwater does not result in the discharge of pollutants
7. Materials contained in open, deteriorated or leaking storage drums, barrels, tanks and similar containers
8. Materials or products handled/stored on roads owned or maintained by the discharger
9. Waste material (except waste in covered, non-leaking containers [e.g. dumpsters])
10. Application or disposal of process wastewater (unless otherwise permitted)
11. Particulate matter or visible deposits of residuals from roof stacks and/or vents not otherwise regulated (i.e., under an air quality control permit) and evident in the stormwater outflow

If you answer “Yes” to any of these questions, you are no longer eligible for a “No Exposure” exclusion and need to prepare a Stormwater Pollution Prevention (SWP2) plan.

NPDES Permit Changes for 2025

Our plan is to make the changes needed to be exempt from the SWP2 requirement.

We have some housekeeping to do at our Public Works facility and some runoff prevention measures around our brine making area, diesel tank, and salt/sand storage.

We plan to consult with KDHE for guidance with this.

We will bring updates to the next meeting.