

Guadalupe Readymix, LLC

Water Pollution Abatement Plan &
Aboveground Storage Tank Plan
WPAP & AST

Garden Ridge 2
10 FM 2252
Schertz, TX, 78056
Comal County

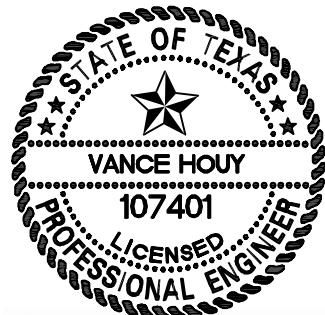
Submitted to: TCEQ Region 13, San Antonio

Prepared By:



Boerne, Texas
830-249-8284

Date: August 2024
Project No. 11491-002
-MRM-



Signature: _____

Vance Houy

Vance Houy, PE - License No. 107401
TX PE Firm No. 4524

Date: 8/16/2024

Texas Commission on Environmental Quality

Edwards Aquifer Application Cover Page

Our Review of Your Application

The Edwards Aquifer Program staff conducts an administrative and technical review of all applications. The turnaround time for administrative review can be up to 30 days as outlined in 30 TAC 213.4(e). Generally administrative completeness is determined during the intake meeting or within a few days of receipt. The turnaround time for technical review of an administratively complete Edwards Aquifer application is 90 days as outlined in 30 TAC 213.4(e). Please know that the review and approval time is directly impacted by the quality and completeness of the initial application that is received. In order to conduct a timely review, it is imperative that the information provided in an Edwards Aquifer application include final plans, be accurate, complete, and in compliance with [30 TAC 213](#).

Administrative Review

1. [Edwards Aquifer applications](#) must be deemed administratively complete before a technical review can begin. To be considered administratively complete, the application must contain completed forms and attachments, provide the requested information, and meet all the site plan requirements. The submitted application and plan sheets should be final plans. Please submit one full-size set of plan sheets with the original application, and half-size sets with the additional copies.

To ensure that all applicable documents are included in the application, the program has developed tools to guide you and web pages to provide all forms, checklists, and guidance. Please visit the below website for assistance: <http://www.tceq.texas.gov/field/eapp>.

2. This Edwards Aquifer Application Cover Page form (certified by the applicant or agent) must be included in the application and brought to the administrative review meeting.
3. Administrative reviews are scheduled with program staff who will conduct the review. Applicants or their authorized agent should call the appropriate regional office, according to the county in which the project is located, to schedule a review. The average meeting time is one hour.
4. In the meeting, the application is examined for administrative completeness. Deficiencies will be noted by staff and emailed or faxed to the applicant and authorized agent at the end of the meeting, or shortly after. Administrative deficiencies will cause the application to be deemed incomplete and returned.

An appointment should be made to resubmit the application. The application is re-examined to ensure all deficiencies are resolved. The application will only be deemed administratively complete when all administrative deficiencies are addressed.

5. If an application is received by mail, courier service, or otherwise submitted without a review meeting, the administrative review will be conducted within 30 days. The applicant and agent will be contacted with the results of the administrative review. If the application is found to be administratively incomplete, it can be retrieved from the regional office or returned by regular mail. If returned by mail, the regional office may require arrangements for return shipping.
6. If the geologic assessment was completed before October 1, 2004 and the site contains “possibly sensitive” features, the assessment must be updated in accordance with the *Instructions to Geologists* (TCEQ-0585 Instructions).

Technical Review

1. When an application is deemed administratively complete, the technical review period begins. The regional office will distribute copies of the application to the identified affected city, county, and groundwater conservation district whose jurisdiction includes the subject site. These entities and the public have 30 days to provide comments on the application to the regional office. All comments received are reviewed by TCEQ.
2. A site assessment is usually conducted as part of the technical review, to evaluate the geologic assessment and observe existing site conditions. The site must be accessible to our staff. The site boundaries should be

clearly marked, features identified in the geologic assessment should be flagged, roadways marked and the alignment of the Sewage Collection System and manholes should be staked at the time the application is submitted. If the site is not marked the application may be returned.

3. We evaluate the application for technical completeness and contact the applicant and agent via Notice of Deficiency (NOD) to request additional information and identify technical deficiencies. There are two deficiency response periods available to the applicant. There are 14 days to resolve deficiencies noted in the first NOD. If a second NOD is issued, there is an additional 14 days to resolve deficiencies. If the response to the second notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, the application must be withdrawn or will be denied. Please note that because the technical review is underway, whether the application is withdrawn or denied **the application fee will be forfeited**.
4. The program has 90 calendar days to complete the technical review of the application. If the application is technically adequate, such that it complies with the Edwards Aquifer rules, and is protective of the Edwards Aquifer during and after construction, an approval letter will be issued. Construction or other regulated activity may not begin until an approval is issued.

Mid-Review Modifications

It is important to have final site plans prior to beginning the permitting process with TCEQ to avoid delays.

Occasionally, circumstances arise where you may have significant design and/or site plan changes after your Edwards Aquifer application has been deemed administratively complete by TCEQ. This is considered a “Mid-Review Modification”. Mid-Review Modifications may require redistribution of an application that includes the proposed modifications for public comment.

If you are proposing a Mid-Review Modification, two options are available:

- If the technical review has begun your application can be denied/withdrawn, your fees will be forfeited, and the plan will have to be resubmitted.
- TCEQ can continue the technical review of the application as it was submitted, and a modification application can be submitted at a later time.

If the application is denied/withdrawn, the resubmitted application will be subject to the administrative and technical review processes and will be treated as a new application. The application will be redistributed to the affected jurisdictions.

Please contact the regional office if you have questions. If your project is located in Williamson, Travis, or Hays County, contact TCEQ’s Austin Regional Office at 512-339-2929. If your project is in Comal, Bexar, Medina, Uvalde, or Kinney County, contact TCEQ’s San Antonio Regional Office at 210-490-3096

Please fill out all required fields below and submit with your application.

1. Regulated Entity Name: Garden Ridge 2				2. Regulated Entity No.: 111984811			
3. Customer Name: Guadalupe Readymix, LLC				4. Customer No.: 605932839			
5. Project Type: (Please circle/check one)	<input checked="" type="radio"/> New	Modification		Extension		Exception	
6. Plan Type: (Please circle/check one)	<input checked="" type="radio"/> WPAP	<input type="radio"/> CZP	<input type="radio"/> SCS	<input type="radio"/> UST	<input checked="" type="radio"/> AST	<input type="radio"/> EXP	<input type="radio"/> EXT
7. Land Use: (Please circle/check one)	<input type="radio"/> Residential		<input checked="" type="radio"/> Non-residential		8. Site (acres):		13.7
9. Application Fee:	\$10,650		10. Permanent BMP(s):		Extended Detention Basin, Grassy Swale, Natural Vegetative Filter Strip		
11. SCS (Linear Ft.):			12. AST/UST (No. Tanks):		1		
13. County:	Comal		14. Watershed:		Comal River - Guadalupe River		

Application Distribution

Instructions: Use the table below to determine the number of applications required. One original and one copy of the application, plus additional copies (as needed) for each affected incorporated city, county, and groundwater conservation district are required. Linear projects or large projects, which cross into multiple jurisdictions, can require additional copies. Refer to the “Texas Groundwater Conservation Districts within the EAPP Boundaries” map found at:

http://www.tceq.texas.gov/assets/public/compliance/field_ops/eapp/EAPP%20GWCD%20map.pdf

For more detailed boundaries, please contact the conservation district directly.

Austin Region			
County:	Hays	Travis	Williamson
Original (1 req.)	—	—	—
Region (1 req.)	—	—	—
County(ies)	—	—	—
Groundwater Conservation District(s)	<input type="checkbox"/> Edwards Aquifer Authority <input type="checkbox"/> Barton Springs/ Edwards Aquifer <input type="checkbox"/> Hays Trinity <input type="checkbox"/> Plum Creek	<input type="checkbox"/> Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	<input type="checkbox"/> Austin <input type="checkbox"/> Buda <input type="checkbox"/> Dripping Springs <input type="checkbox"/> Kyle <input type="checkbox"/> Mountain City <input type="checkbox"/> San Marcos <input type="checkbox"/> Wimberley <input type="checkbox"/> Woodcreek	<input type="checkbox"/> Austin <input type="checkbox"/> Bee Cave <input type="checkbox"/> Pflugerville <input type="checkbox"/> Rollingwood <input type="checkbox"/> Round Rock <input type="checkbox"/> Sunset Valley <input type="checkbox"/> West Lake Hills	<input type="checkbox"/> Austin <input type="checkbox"/> Cedar Park <input type="checkbox"/> Florence <input type="checkbox"/> Georgetown <input type="checkbox"/> Jerrell <input type="checkbox"/> Leander <input type="checkbox"/> Liberty Hill <input type="checkbox"/> Pflugerville <input type="checkbox"/> Round Rock

San Antonio Region					
County:	Bexar	Comal	Kinney	Medina	Uvalde
Original (1 req.)	—	<u>X</u>	—	—	—
Region (1 req.)	—	<u>X</u>	—	—	—
County(ies)	—	<u>X</u>	—	—	—
Groundwater Conservation District(s)	<input type="checkbox"/> Edwards Aquifer Authority <input type="checkbox"/> Trinity-Glen Rose	<input checked="" type="checkbox"/> Edwards Aquifer Authority	<input type="checkbox"/> Kinney	<input type="checkbox"/> EAA <input type="checkbox"/> Medina	<input type="checkbox"/> EAA <input type="checkbox"/> Uvalde
City(ies) Jurisdiction	<input type="checkbox"/> Castle Hills <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Helotes <input type="checkbox"/> Hill Country Village <input type="checkbox"/> Hollywood Park <input type="checkbox"/> San Antonio (SAWS) <input type="checkbox"/> Shavano Park	<input type="checkbox"/> Bulverde <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Garden Ridge <input type="checkbox"/> New Braunfels <input checked="" type="checkbox"/> Schertz	NA	<input type="checkbox"/> San Antonio ETJ (SAWS)	NA

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review.

Vance Houy - PE, TX License No. 107401, TX Firm No. 4524

Print Name of Customer/Authorized Agent

Vance Houy

8/16/2024

Signature of Customer/Authorized Agent

Date

****FOR TCEQ INTERNAL USE ONLY****

Date(s) Reviewed:		Date Administratively Complete:	
Received From:		Correct Number of Copies:	
Received By:		Distribution Date:	
EAPP File Number:		Complex:	
Admin. Review(s) (No.):		No. AR Rounds:	
Delinquent Fees (Y/N):		Review Time Spent:	
Lat./Long. Verified:		SOS Customer Verification:	
Agent Authorization Complete/Notarized (Y/N):		Fee Check:	Payable to TCEQ (Y/N):
Core Data Form Complete (Y/N):			Signed (Y/N):
Core Data Form Incomplete Nos.:			Less than 90 days old (Y/N):

General Information Form

Texas Commission on Environmental Quality

For Regulated Activities on the Edwards Aquifer Recharge and Transition Zones and Relating to 30 TAC §213.4(b) & §213.5(b)(2)(A), (B) Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **General Information Form** is hereby submitted for TCEQ review. The application was prepared by:

Print Name of Customer/Agent: Vance Houy - PE, TX License No. 107401, TX Firm No. 4524

Date: 8/16/2024

Signature of Customer/Agent:



Project Information

1. Regulated Entity Name: Garden Ridge 2
2. County: Comal County
3. Stream Basin: Guadalupe River Basin
4. Groundwater Conservation District (If applicable): EAA, Comal Trinity GCD
5. Edwards Aquifer Zone:
☒ Recharge Zone
☐ Transition Zone
6. Plan Type:

<input checked="" type="checkbox"/> WPAP	<input checked="" type="checkbox"/> AST
<input type="checkbox"/> SCS	<input type="checkbox"/> UST
<input type="checkbox"/> Modification	<input type="checkbox"/> Exception Request

7. Customer (Applicant):

Contact Person: Jeff Shea

Entity: Guadalupe Readymix, LLC

Mailing Address: P.O. Box 129

City, State: Comfort, TX

Zip: 78013

Telephone: (830) 995-5100

FAX: _____

Email Address: jeff.shea@guadrm.com

8. Agent/Representative (If any):

Contact Person: Vance Houy

Entity: Westward Environmental Inc.

Mailing Address: 4 Shooting Club Road

City, State: Boerne, TX

Zip: 78006

Telephone: 830-249-8284

FAX: _____

Email Address: vhoy@westwardenv.com

9. Project Location:

- ☒ The project site is located inside the city limits of Garden Ridge.
- ☐ The project site is located outside the city limits but inside the ETJ (extra-territorial jurisdiction) of _____.
- ☐ The project site is not located within any city's limits or ETJ.

10. ☒ The location of the project site is described below. The description provides sufficient detail and clarity so that the TCEQ's Regional staff can easily locate the project and site boundaries for a field investigation.

On the NW side of Nacogdoches RD (FM 2252), approx. 1.7 miles E/NE of the intersection of FM 2252 & FM 3009

11. ☒ **Attachment A – Road Map.** A road map showing directions to and the location of the project site is attached. The project location and site boundaries are clearly shown on the map.

12. ☒ **Attachment B - USGS / Edwards Recharge Zone Map.** A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is attached. The map(s) clearly show:

- ☒ Project site boundaries.
- ☒ USGS Quadrangle Name(s).
- ☒ Boundaries of the Recharge Zone (and Transition Zone, if applicable).
- ☒ Drainage path from the project site to the boundary of the Recharge Zone.

13. ☒ **The TCEQ must be able to inspect the project site or the application will be returned.** Sufficient survey staking is provided on the project to allow TCEQ regional staff to locate the boundaries and alignment of the regulated activities and the geologic or manmade features noted in the Geologic Assessment.

☒ Survey staking will be completed by this date: Site is Staked

14. ☒ **Attachment C – Project Description.** Attached at the end of this form is a detailed narrative description of the proposed project. The project description is consistent throughout the application and contains, at a minimum, the following details:

- ☒ Area of the site
- ☒ Offsite areas
- ☒ Impervious cover
- ☒ Permanent BMP(s)
- ☒ Proposed site use
- ☒ Site history
- ☒ Previous development
- ☒ Area(s) to be demolished

15. Existing project site conditions are noted below:

- ☐ Existing commercial site
- ☒ Existing industrial site
- ☐ Existing residential site
- ☒ Existing paved and/or unpaved roads
- ☒ Undeveloped (Cleared)
- ☒ Undeveloped (Undisturbed/Uncleared)
- ☐ Other: _____

Prohibited Activities

16. ☒ I am aware that the following activities are prohibited on the Recharge Zone and are not proposed for this project:

- (1) Waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);
- (2) New feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;
- (3) Land disposal of Class I wastes, as defined in 30 TAC §335.1;
- (4) The use of sewage holding tanks as parts of organized collection systems; and
- (5) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).
- (6) New municipal and industrial wastewater discharges into or adjacent to water in the state that would create additional pollutant loading.

17. ☒ I am aware that the following activities are prohibited on the Transition Zone and are not proposed for this project:

- (1) Waste disposal wells regulated under 30 TAC Chapter 331 (relating to Underground Injection Control);

- (2) Land disposal of Class I wastes, as defined in 30 TAC §335.1; and
- (3) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

Administrative Information

18. The fee for the plan(s) is based on:

- ☒ For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.
- ☐ For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.
- ☒ For a UST Facility Plan or Modification or an AST Facility Plan or Modification, the total number of tanks or piping systems.
- ☐ A request for an exception to any substantive portion of the regulations related to the protection of water quality.
- ☐ A request for an extension to a previously approved plan.

19. ☒ Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:

- ☒ TCEQ cashier
- ☐ Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)
- ☐ San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

20. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

21. ☒ No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the Executive Director.

Guadalupe Ready Mix, LLC

Garden Ridge 2

Project Description

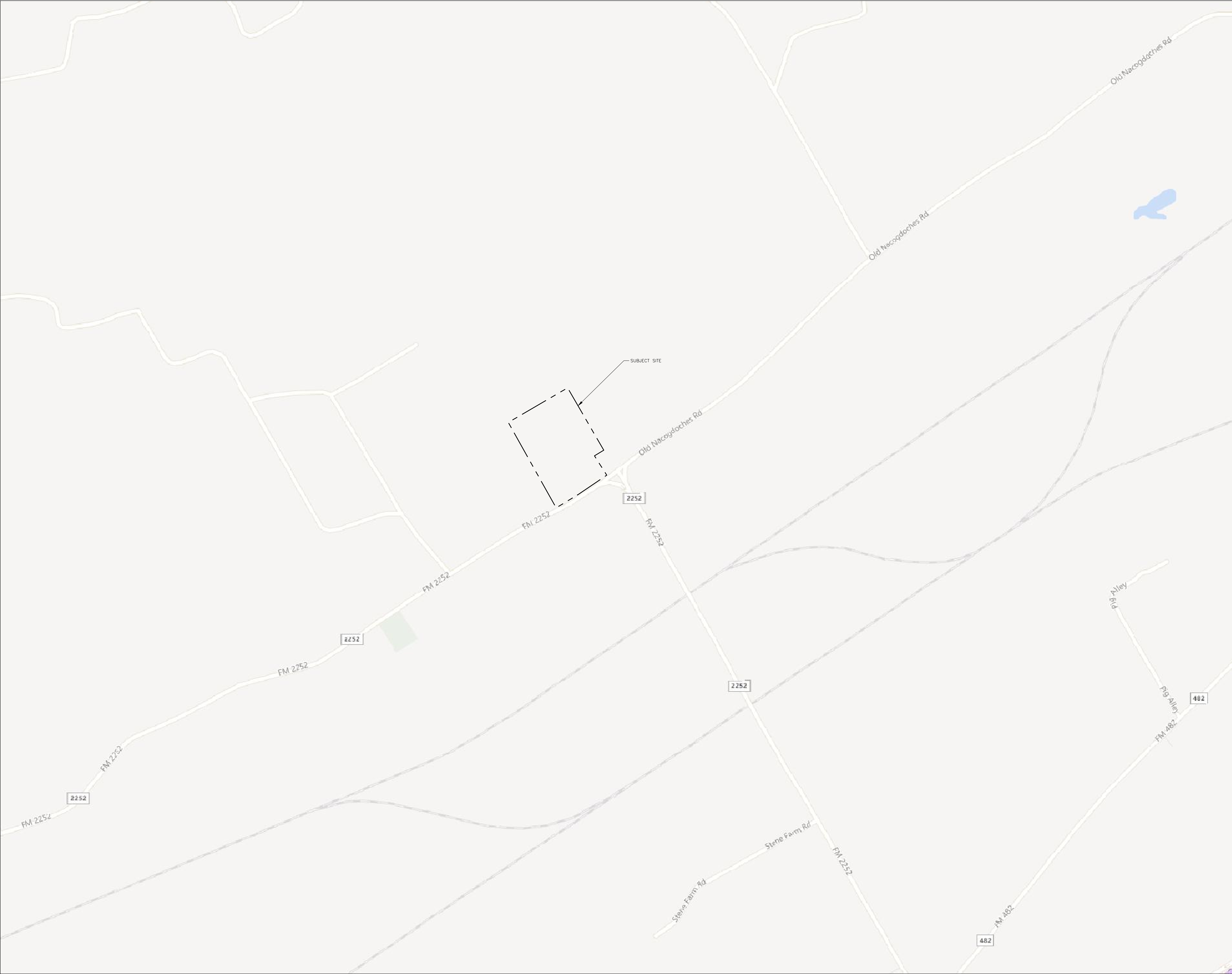
Guadalupe Ready-mix, LLC is proposing to build two concrete batch plants and office on their plot of land. (10 FM 2252, Schertz, TX). This site is located over the Edwards Aquifer Recharge Zone. Regulated activity on the site may include maintenance on the vehicles inside the shop and the operation of the fuel tank located on a concrete pad on site. The site previously had 3 structures on site that have been demolished.

The new impervious cover will be from the addition of the site pad for the two new CBPs, a fuel storage island, and adjacent compacted base. The site pad may be paved in the future. There will also be 3 water tanks added near the CBPs for the processing of material. There will be a power washer added as shown on the Site Map for maintenance and cleaning vehicles on-site. Aggregate material will be stored on site in the proposed stockpile areas shown on the Site Map.

The proposed fuel tank that will be added is a 10,000-gallon double-walled steel diesel tank. This tank will be stored on a concrete pad with a 3-inch rounded curb and a sump for collection of minor spills or leaks. The pad will have a drive through filling station and compacted base area for truck to drive and fill on as shown in the site map.

There will be 1 foot of free board left in the pre-treatment pond along with Pond B to retain the runoff from the concrete batch plants which will be used as process water for the CBPs. These have been sized to completely retain the volume of the 10-year 24-Hour storm from area draining around the CBPs. Any overflow water from Pond B will run into Pond A via the weir labeled on the site map. Pond A (an extended detention pond), in conjunction with a grassy swale will be used for treatment of stormwater from the site pad and northern road. Pond A is oversized to account for treatment of proposed driveways in DA-003A and DA-003B. The natural vegetative buffer will be used to treat all runoff from DA-002, which includes the building, parking lots, and a portion of the road on the southern portion of the site.

A GA was performed on the tract for this property (approx. 13.7 acres). There were no sensitive features identified on-site. A copy of the GA performed on December 15th, 2023 is included below with this application. On site trash and debris will be treated with a licensed waste management service.



N

0

200'

400'

800'

SCALE: 1" = 400'

LEGEND

PROPERTY LINE

IMAGE:	
ISSUE DATE:	02/02/2024
DRAWN BY:	MRM
CHECKED BY:	CGG
SCALE:	1" = 400'
JOB NO.:	11491-002
SHEET NO.:	
1	
OF 1	

WESTWARD

Environmental Engineering, Natural Resources,

P.O. Box 2205 Boerne, Texas 78006

(830) 249-8284 Fax: (830) 249-0221

TBPE REG. NO.: F-4524

TBPG REG. NO.: 50112

REV	DESCRIPTION	BY	DATE

8/16/2024

STATE OF TEXAS

VANCE HOUY

107401

LICENSED PROFESSIONAL ENGINEER

Vance Houy

8/16/2024

P.E.

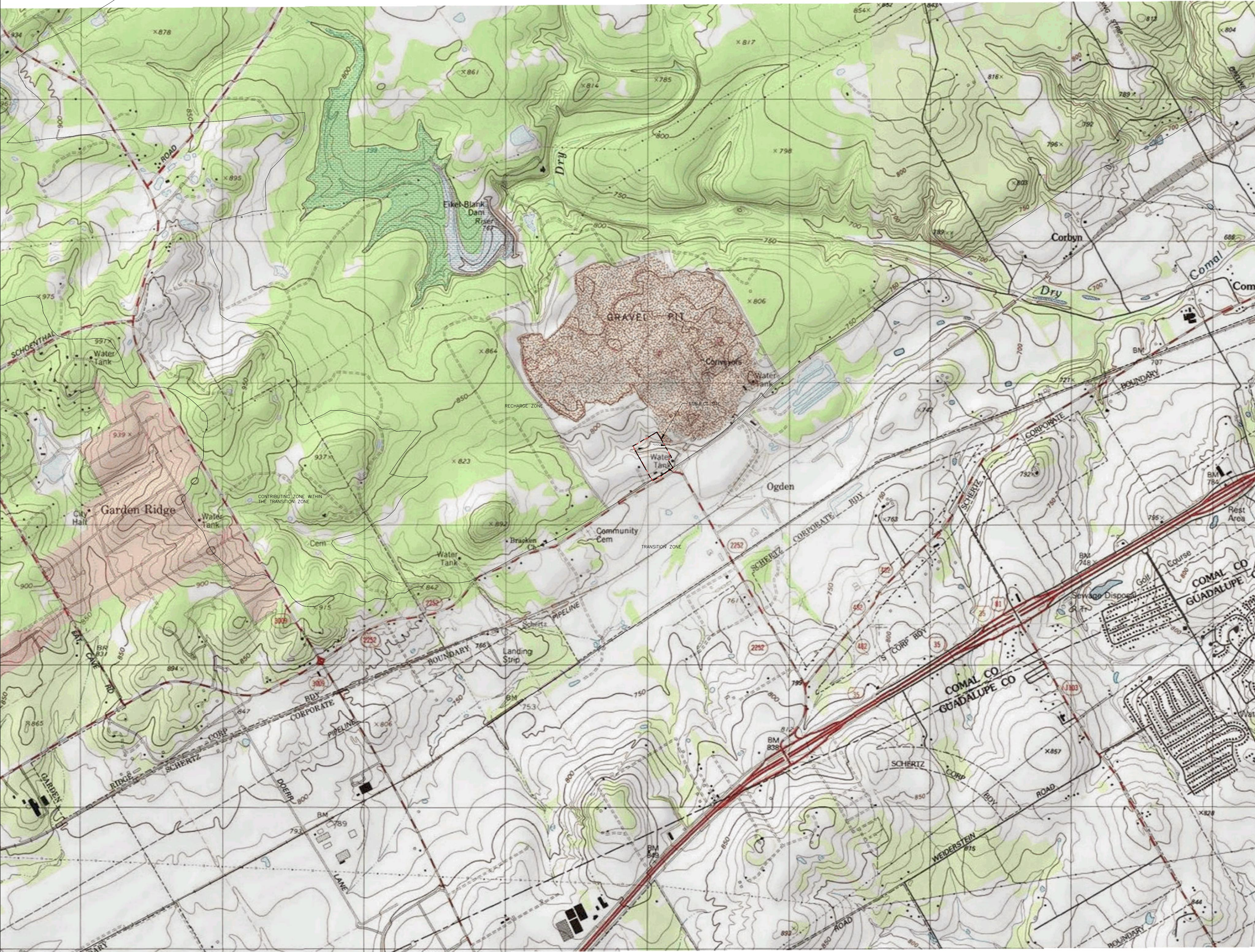
License No. 107401

ROAD MAP

GARDEN RIDGE 2 WPAP & AST

GUADALUPE READYMIX, LLC.

10 FM 2252, GARDEN RIDGE, TX



N

0500'1000'2000'

SCALE: 1" = 1000'

LEGEND

PROPERTY LINE

EDWARDS' BOUNDARY LINE

FLOW ARROW

IMAGE:	
ISSUE DATE:	02/02/2024
DRAWN BY:	MRM
CHECKED BY:	CCG
SCALE:	1" = 1000'
JOB NO.:	11491-002

SHEET NO.:	1
OF 1	

WESTWARD

Environmental Engineering, Natural Resources,

P.O. Box 2205 Boerne, Texas 78006

(830) 249-8284 Fax: (830) 249-0221

TBPE REG. NO.: F-4524

TBPE REG. NO.: 50112

REV	DESCRIPTION	BY	DATE

8/16/2024

STATE OF TEXAS

VANCE HOUSTON

107401

PROFESSIONAL ENGINEER

Vance Houston

P.E.

License No.: 107401

USGS MAP

GARDEN RIDGE 2 WPAP & AST

GUADALUPE READYMIX, LLC.

10 FM 2252, GARDEN RIDGE, TX

GUADALUPE READYMIX, LLC

GEOLOGIC ASSESSMENT

GARDEN RIDGE 2
NACOGDOCHES RD.
GARDEN RIDGE, TEXAS 78132
COMAL COUNTY

Submitted to: TCEQ Region 13, San Antonio

Prepared By:



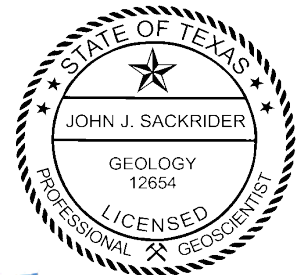
Boerne, Texas

830-249-8284

Date: June 2024

Project No. 11491-002

-JG-



Signature: 

John J. Sackrider, P.G. - License No. 12654

TX PG Firm No. 50112

Date: 6/7/2024

Article I. Geologic Assessment

Texas Commission on Environmental Quality

For Regulated Activities on The Edwards Aquifer Recharge/transition Zones and Relating to 30 TAC §213.5(b)(3), Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

Section 1.01 Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Print Name of Geologist:

Telephone: 830-249-8284

John J. Sackrider, P.G. #12654

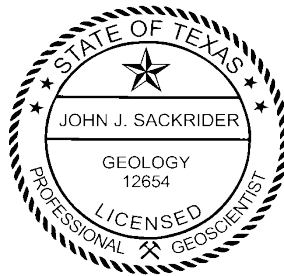
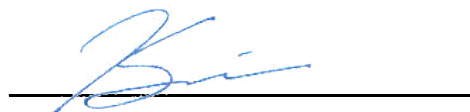
Fax: 830-249-0221

Date: 6/7/2024

Representing: Westward Environmental, Inc., TBPB Registered Geoscience Firm 50012

(Name of Company and TBPB or TBPE registration number)

Signature of Geologist:



Regulated Entity Name: Garden Ridge 2

Section 1.02 Project Information

1. Date(s) Geologic Assessment was performed: October 9, 2023

2. Type of Project:



WPAP



AST



SCS



UST

3. Location of Project:



Recharge Zone



Transition Zone



Contributing Zone within the Transition Zone

4. ☒ **Attachment A - Geologic Assessment Table.** Completed Geologic Assessment Table (Form TCEQ-0585-Table) is attached.
5. ☒ Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups* (Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A, Soil Conservation Service, 1986). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map.

Article II. Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
CrD	D	< 2
HeB	D	< 6

** Soil Group Definitions (Abbreviated)*

- A. *Soils having a high infiltration rate when thoroughly wetted.*
- B. *Soils having a moderate infiltration rate when thoroughly wetted.*
- C. *Soils having a slow infiltration rate when thoroughly wetted.*
- D. *Soils having a very slow infiltration rate when thoroughly wetted.*

6. ☒ **Attachment B – Stratigraphic Column.** A stratigraphic column showing formations, members, and thicknesses is attached. The outcropping unit, if present, should be at the top of the stratigraphic column. Otherwise, the uppermost unit should be at the top of the stratigraphic column.
7. ☒ **Attachment C – Site Geology.** A narrative description of the site specific geology including any features identified in the Geologic Assessment Table, a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure(s), and karst characteristics is attached.
8. ☒ **Attachment D – Site Geologic Map(s).** The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1": 400'
 Applicant's Site Plan Scale: 1" = 50'
 Site Geologic Map Scale: 1" = 50'
 Site Soils Map Scale (if more than 1 soil type): 1" = 50'
9. Method of collecting positional data:
 - ☒ Global Positioning System (GPS) technology.
 - ☐ Other method(s). Please describe method of data collection: _____

10. ☒ The project site and boundaries are clearly shown and labeled on the Site Geologic Map.
11. ☒ Surface geologic units are shown and labeled on the Site Geologic Map.
12. ☒ Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.
- ☐ Geologic or manmade features were not discovered on the project site during the field investigation.
13. ☒ The Recharge Zone boundary is shown and labeled, if appropriate.
14. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.): If applicable, the information must agree with Item No. 20 of the WPAP Application Section.
- ☒ There is 1 (#) well present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
- ☐ The wells are not in use and have been properly abandoned.
- ☐ The wells are not in use and will be properly abandoned.
- ☒ The well is in use and comply with 16 TAC Chapter 76.
- ☐ There are no wells or test holes of any kind known to exist on the project site.

Section 2.01 Administrative Information

15. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

Attachment A


Geologic Assessment Table (Form TCEQ-0585)

Attachment B

Stratigraphic Column

Generalized Stratigraphic Column

Hydrogeologic subdivision			Group formation or member		Hydrologic Function	Thickness (feet)	Lithology	Cavern development	Porosity / permeability type
Quaternary			Alluvium		AQ	0-30	Siltstone to sandstone	None	High porosity/high permeability
			Fluviate terrace deposits		AQ where saturated	0-45	Coarse gravel, sand, and silt	None	High porosity/high permeability
Upper Cretaceous	Upper confining units		Navarro and Taylor Groups, undivided		CU	600	Clay, chalky limestone	None	Low porosity / low permeability
			Austin Group		CU; rarely AQ	130-150	White to gray limestone	None	Low porosity; rare water production from fractures / low permeability
			Eagle Ford Group		CU	30-50	Brown, flaggy shale and argillaceous limestone	None	Primary porosity lost / low permeability
			Buda Limestone		CU	40-50	Buff, light gray, dense mudstone	Minor surface karst	Low porosity / low permeability
			Del Rio Clay		CU	40-50	Blue-green to yellow-brown clay	None	Low porosity / low permeability
	I		Georgetown Formation		Karst AQ; not karst CU		Reddish-brown, gray to light tan marly limestone	None	Low porosity / low permeability
Lower Cretaceous	II	Edwards Aquifer	E M	Cyclic & marine members undivided	AQ	89-90	Mudstone to packstone; miliolid grainstone; chert	Many sub-surface	Laterally extensive; water yielding
	Person			Leached & collapsed members	AQ	70-90	Crystalline limestone; mudstone to grainstone; chert collapsed breccia	Extensive lateral development; large rooms	Majority not fabric / one of the most permeable
				Regional dense members	CU	20-24	Dense, argillaceous mudstone	Very few; only vertical fracture enlargement	Not fabric / low permeability; vertical barrier
				F M	Grainstone member	AQ	50-60	Miliolid grainstone; mudstone to wackestone; chert	Few
	Kirschberg evaporite member		AQ		50-60	Highly altered crystalline limestone; chalky mudstone; chert	Probably extensive cave development	Majority fabric / one of the most permeable	
	Kainer		Dolomitic member		AQ	110-130	Mudstone to grainstone; crystalline limestone; chert	Caves related to structure or bedding planes	Mostly not fabric; some bedding plane fabric / water yielding
			Basal nodular member		Karst AQ; not karst CU	50-60	Shaly, nodular limestone; mudstone and miliolid grainstone	Large lateral caves at surface	Fabric; stratigraphically controlled/ large conduit flow at surface; no permeability in subsurface
			Lower confining unit	Upper member of the Glen Rose Limestone		CU; evaporite beds AQ	350-1150	Yellowish tan, thinly bedded limestone and marl. Thick massive limestone bed at base.	Some surface cave development.
	Lower Member of the Glen Rose Limestone								

 Indicates surface units mapped onsite.

Note: CU = confining unit; AQ = Aquifer

Adapted from Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Recharge Zone, Bexar County, Texas, USGS Water-Resources Investigations Report 95-4030 (USGS, 1995)

Attachment C

Site Geology (Geologic Narrative)

Geologic Narrative

1.0 PURPOSE

Westward Environmental, Inc. (WESTWARD) was retained by Guadalupe Readymix, LLC, Inc. (Client) to prepare a Geologic Assessment (GA) on a ~13-acre tract (Site). This GA was prepared as a required attachment to a Water Pollution Abatement Plan (WPAP) for the Site as required by the Texas Commission of Environmental Quality (TCEQ).

2.0 REGULATORY GUIDANCE

Title 30, Chapter 213 of the Texas Administrative Code

This report was prepared in accordance with *Instructions for Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones (TCEQ-0585 (Rev. 10-01-04))* and will be reviewed pursuant to Title 30, Chapter 213 of the Texas Administrative Code.

3.0 PROJECT LOCATION

The Site is located west of the intersection of Nacogdoches Road and FM 2252 in Garden Ridge, Comal County, Texas. The entire Site is located over the Edwards Aquifer Recharge Zone (EARZ).

4.0 METHODOLOGY

As part of the GA, WESTWARD performed a desktop review of selected published information. WESTWARD also conducted a field investigation in accordance with *TCEQ-0585 (Rev. 10-01-04)*.

4.1 Desktop Review

WESTWARD conducted a review of aerial imagery, the University of Texas Bureau of Economic Geology (BEG) Geologic Atlas of Texas (GAT) San Antonio Sheet, applicable U.S. Geological Survey (USGS) Topographic quadrangle(s) and geospatial dataset(s), the Texas Natural Resources Information System (TNRIS), the Texas Water Development Board's Water Data Interactive Groundwater Data Viewer (TWDB Viewer), the Railroad Commission of Texas (RRC), and the U.S. Department of Agriculture (USDA) National Resource Conservation Service (NRCS) Web Soil Survey prior to the field investigation.

4.2 Field Investigation

A field investigation was performed at the Site by WESTWARD staff under the direction of John J. Sackrider, P.G. (TBPG Lic. No. 12654) on October 9, 2023. Field transects of the Site were walked in accordance with *TCEQ-0585 (rev. 10-01-04)*.

5.0 DESKTOP REVIEW

The desktop review was utilized for preliminary planning of the field investigation. The accuracy of the desktop review was limited by the accessibility, scale, and age of the data available.

5.1 Published Surface Geology

A review of the published geology revealed the lower Cretaceous-aged Edwards Limestone (Ked) mapped across most of the Site and the upper Cretaceous-aged Pecan Gap Chalk (Kpg) mapped across a small portion along the southeastern boundary. The two formations are separated by a fault.

5.2 Published Structure

The Site is located within the Balcones Fault Zone (BFZ). The desktop review revealed that there are two faults mapped across the Site. The dominant fault runs parallel to the southern boundary of the Site. This fault separates the Kpg and Ked and has an approximate trend of 55°. The faults are shown on the Site Geologic Map (Attachment D).

The dominant fault trend range at this Site, which for the purpose of this assessment, is approximated to be between 40° and 70°.

5.3 Karst Features

The desktop review did not reveal karst features within the Site.

5.4 Non-karst & Manmade Features

A review of the TWDB Viewer did not reveal any onsite groundwater wells at the Site. The desktop review of aerial imagery did not reveal any non-karst or other manmade features.

5.5 Soils

Two (2) soil units were identified on the Site through the NRCS Web Soil Survey. They are detailed below as well as included on the Geologic Assessment Form TCEQ-0585 (Rev. 02-11-15). A Site Soils Map is included in Attachment D.

Published Soil Unit Descriptions			
<i>Soil Name</i>	<i>Group</i>	<i>Thickness (Feet)</i>	<i>Description</i>
Comfort-Rock outcrop complex (CrD), 1 to 8 percent slopes	D	< 2	10 to 20 inches to lithic bedrock, well drained, moderately low to moderately high (0.06 to 0.20 in/hr) Ksat capacity
Heiden clay (HeB), 1 to 3 percent slopes	D	< 6	40 to 65 inches to densic bedrock, well drained, very low to moderately low (0.00 to 0.06 in/hr) Ksat capacity

6.0 FIELD INVESTIGATION

The field investigation was performed on October 9, 2023 by WESTWARD staff under the direction of John J. Sackrider, P.G. to verify the presence or absence of recharge features identified in the desktop review and to identify recharge features not found during the desktop review. Field reconnaissance was performed in accordance with the *TCEQ-0585-Instructions (Rev. 10-1-04)*.

6.1 Surface Geology

The majority of the Site has been disturbed but the Ked was observed in a few places where bedrock was exposed. A Site Geology Map is included in Appendix D.

6.2 Structure

One of the faults identified during the desktop review was observed during the field investigation. No additional structural features were observed.

6.3 Karst Features

Karst features were not observed during the field investigation.

6.4 Non-karst & Manmade Features

One (1) non-karst closed depression and one (1) manmade feature in bedrock were identified and recorded during the field investigation. None of these features are rated sensitive.

6.5 Feature Descriptions

S-1 (CD)

Not Sensitive

Feature S-1 is a large non-karst closed depression located along the northwestern Site boundary. It measures approximately 70 ft. x 70 ft. x 10 ft., and the central point of the feature is located just outside the Site boundary (as shown on the attached maps). However, this feature is included in this assessment because the depression extends into the Site. Trees line the western part of the feature and tree debris littered the fine-grained vegetated soil floor at the time of the field investigation. The catchment area of the feature is greater than 1.6 acres, but due to the vegetated fine-grained soil floor, the interpreted probability of rapid infiltration is low. This feature is rated not sensitive.

S-2 (MB)

Not Sensitive

Feature S-2 is a water well classified as a manmade feature in bedrock. It is located within an enclosed structure near the house on the southcentral part of the Site. The feature has a steel casing that measures approximately 0.50 ft. and extends approximately 0.33 ft. above the ground surface. It is capped with a steel plate. The depth is unknown as there was no public information available pertaining to this well during the desktop review. This well appeared to be in use and in compliance at the time of the field investigation. The catchment area of the feature is less than 1.6 acres, and the interpreted probability of rapid infiltration is low. This feature is rated not sensitive.

S-3 (F)

Not Sensitive

Feature S-3 is a published fault identified during the desktop review with an approximate trend of 105°. Evidence of the fault was not observed in the field. Given that there is neither evidence to confirm nor refute the presence of the fault, it has been included and recorded as a feature. The catchment area of the of the feature is greater than 1.6 acres, and the interpreted probability of rapid infiltration is low. This feature is rated not sensitive.

S-4 (F)

Not Sensitive

Feature S-4 is a published fault identified during the desktop review. The presence of the fault was evidenced by the significant elevation change between the site and Old Nacogdoches Road. The trend is approximately 55° and is used as the dominant trend for the site. The catchment area of the of the feature is greater than 1.6 acres, and the interpreted probability of rapid infiltration is low. This feature is rated not sensitive.

SELECT PHOTOGRAPHS



S-1: Closed depression near the northwestern Site boundary, view to the southwest.



S-1: Closed depression near the northwestern Site boundary, view to the northwest.



S-2: Water well near the house on the southcentral part of the Site.

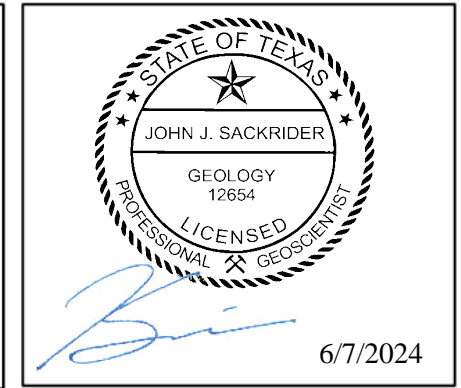
Attachment D

Site Geologic Map Site Soils Map



SITE GEOLOGIC MAP

GARDEN RIDGE 2
GUADALUPE READYMIX, LLC
GARDEN RIDGE, COMAL COUNTY, TEXAS



REV	DESCRIPTION	BY	DATE

WESTWARD
Environmental, Engineering, Natural Resources.
P.O. Box 2205, Boerne, Texas 78006
(830) 249-8284 Fax: (830) 249-0221
TBPE REG. NO.: F-4524
TBPG REG. NO.: 50112

SHEET NO.: 01 OF 02	ISSUE DATE: 06/06/2024
	DRAWN BY: JG
CHECKED BY: JIS	SCALE: 1" = 50'
JOB NO.: 1191-002	IMAGE: ESRI WORLD IMAGERY



LEGEND

Approximate Project Boundary

GA Features

Published Soil Units (USDA NCRS*)

CrD - Comfort-Rock outcrop complex

HeB - Heiden clay

N

0

25

50

100

Feet

1:600

*United States Department of Agriculture
Natural Resources Conservation Service

SITE SOILS MAP
GARDEN RIDGE 2
GUADALUPE READYMIX, LLC
GARDEN RIDGE, COMAL COUNTY, TEXAS

STATE OF TEXAS

JOHN J. SACKRIDER

GEOLGY

19904

LICENSED

PROFESSIONAL GEOLOGIST

6/7/2024

REV	DESCRIPTION	BY	DATE

WESTWARD
Environmental. Engineering. Natural Resources.
P.O. Box 2205, Boerne, Texas 78006
(830) 249-8284 Fax: (830) 249-0221
TBPE REG. NO.: F-4524
TBPGE REG. NO.: 50112

02

OF 02

SHEET NO.:

1191-002

ISSUE DATE:

06/06/2024

DRAWN BY:

JG

CHECKED BY:

JIS

SCALE:

1" = 50'

JOB NO.:

1191-002

IMAGE: ESRI WORLD IMAGERY

Water Pollution Abatement Plan Application

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b), Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

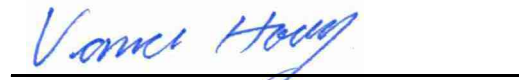
Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Water Pollution Abatement Plan Application Form** is hereby submitted for TCEQ review and Executive Director approval. The form was prepared by:

Print Name of Customer/Agent: Vance Houy - PE, TX License No. 107401, TX Firm No. 4524

Date: 8/16/2024

Signature of Customer/Agent:



Regulated Entity Name: Garden Ridge 2

Regulated Entity Information

1. The type of project is:

- ☐ Residential: Number of Lots: _____
- ☐ Residential: Number of Living Unit Equivalents: _____
- ☐ Commercial
- ☒ Industrial
- ☐ Other: _____

2. Total site acreage (size of property): 13.7

3. Estimated projected population: 15

4. The amount and type of impervious cover expected after construction are shown below:

Table 1 - Impervious Cover Table

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	11,225	$\div 43,560 =$.258
Parking	16,953	$\div 43,560 =$.389
Other paved surfaces	244,320	$\div 43,560 =$	5.61
Total Impervious Cover	272,498	$\div 43,560 =$	6.26

Total Impervious Cover 6.26 \div Total Acreage 13.7 X 100 = 45.7% Impervious Cover

5. ☒ **Attachment A - Factors Affecting Surface Water Quality.** A detailed description of all factors that could affect surface water and groundwater quality that addresses ultimate land use is attached.
6. ☒ Only inert materials as defined by 30 TAC §330.2 will be used as fill material.

For Road Projects Only

Complete questions 7 - 12 if this application is exclusively for a road project.

7. Type of project:

- ☐ TXDOT road project.
- ☐ County road or roads built to county specifications.
- ☐ City thoroughfare or roads to be dedicated to a municipality.
- ☐ Street or road providing access to private driveways.

8. Type of pavement or road surface to be used:

- ☐ Concrete
- ☐ Asphaltic concrete pavement
- ☐ Other: _____

9. Length of Right of Way (R.O.W.): _____ feet.

Width of R.O.W.: _____ feet.

$L \times W =$ _____ $\text{Ft}^2 \div 43,560 \text{ Ft}^2/\text{Acre} =$ _____ acres.

10. Length of pavement area: _____ feet.

Width of pavement area: _____ feet.

$L \times W =$ _____ $\text{Ft}^2 \div 43,560 \text{ Ft}^2/\text{Acre} =$ _____ acres.

Pavement area _____ acres \div R.O.W. area _____ acres $\times 100 =$ _____ % impervious cover.

11. ☐ A rest stop will be included in this project.

☒ A rest stop will not be included in this project.

12. ☐ Maintenance and repair of existing roadways that do not require approval from the TCEQ Executive Director. Modifications to existing roadways such as widening roads/adding shoulders totaling more than one-half (1/2) the width of one (1) existing lane require prior approval from the TCEQ.

Stormwater to be generated by the Proposed Project

13. ☒ **Attachment B - Volume and Character of Stormwater.** A detailed description of the volume (quantity) and character (quality) of the stormwater runoff which is expected to occur from the proposed project is attached. The estimates of stormwater runoff quality and quantity are based on the area and type of impervious cover. Include the runoff coefficient of the site for both pre-construction and post-construction conditions.

Wastewater to be generated by the Proposed Project

14. The character and volume of wastewater is shown below:

<u>100%</u> Domestic	<u>225</u> Gallons/day
<u> </u> % Industrial	<u> </u> Gallons/day
<u> </u> % Commingled	<u> </u> Gallons/day
TOTAL gallons/day <u>225</u>	

15. Wastewater will be disposed of by:

☒ On-Site Sewage Facility (OSSF/Septic Tank):

☒ **Attachment C - Suitability Letter from Authorized Agent.** An on-site sewage facility will be used to treat and dispose of the wastewater from this site. The appropriate licensing authority's (authorized agent) written approval is attached. It states that the land is suitable for the use of private sewage facilities and will meet or exceed the requirements for on-site sewage facilities as specified under 30 TAC Chapter 285 relating to On-site Sewage Facilities.

☒ Each lot in this project/development is at least one (1) acre (43,560 square feet) in size. The system will be designed by a licensed professional engineer or registered sanitarian and installed by a licensed installer in compliance with 30 TAC Chapter 285.

☐ Sewage Collection System (Sewer Lines):

☐ Private service laterals from the wastewater generating facilities will be connected to an existing SCS.

☐ Private service laterals from the wastewater generating facilities will be connected to a proposed SCS.

☐ The SCS was previously submitted on .

☐ The SCS was submitted with this application.

☐ The SCS will be submitted at a later date. The owner is aware that the SCS may not be installed prior to Executive Director approval.

☐ The sewage collection system will convey the wastewater to the _____ (name) Treatment Plant. The treatment facility is:

☐ Existing.

☐ Proposed.

16. ☐ All private service laterals will be inspected as required in 30 TAC §213.5.

Site Plan Requirements

Items 17 – 28 must be included on the Site Plan.

17. ☒ The Site Plan must have a minimum scale of 1" = 400'.

Site Plan Scale: 1" = 50'.

18. 100-year floodplain boundaries:

☐ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.

☒ No part of the project site is located within the 100-year floodplain.

The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): 48091C0420F, eff. 9/2/2009

19. ☒ The layout of the development is shown with existing and finished contours at appropriate, but not greater than ten-foot contour intervals. Lots, recreation centers, buildings, roads, open space, etc. are shown on the plan.

☐ The layout of the development is shown with existing contours at appropriate, but not greater than ten-foot intervals. Finished topographic contours will not differ from the existing topographic configuration and are not shown. Lots, recreation centers, buildings, roads, open space, etc. are shown on the site plan.

20. All known wells (oil, water, unplugged, capped and/or abandoned, test holes, etc.):

☒ There are 1 (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply)

☒ The wells are not in use and have been properly abandoned.

☐ The wells are not in use and will be properly abandoned.

☐ The wells are in use and comply with 16 TAC §76.

☐ There are no wells or test holes of any kind known to exist on the project site.

21. Geologic or manmade features which are on the site:

☐ All sensitive geologic or manmade features identified in the Geologic Assessment are shown and labeled.

☒ No sensitive geologic or manmade features were identified in the Geologic Assessment.

☐ **Attachment D - Exception to the Required Geologic Assessment.** A request and justification for an exception to a portion of the Geologic Assessment is attached.

- 22. ☒ The drainage patterns and approximate slopes anticipated after major grading activities.
- 23. ☒ Areas of soil disturbance and areas which will not be disturbed.
- 24. ☒ Locations of major structural and nonstructural controls. These are the temporary and permanent best management practices.
- 25. ☒ Locations where soil stabilization practices are expected to occur.
- 26. ☐ Surface waters (including wetlands).
☒ N/A
- 27. ☐ Locations where stormwater discharges to surface water or sensitive features are to occur.
☒ There will be no discharges to surface water or sensitive features.
- 28. ☒ Legal boundaries of the site are shown.

Administrative Information

- 29. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
- 30. ☒ Any modification of this WPAP will require Executive Director approval, prior to construction, and may require submission of a revised application, with appropriate fees.

Guadalupe Ready Mix, LLC
Garden Ridge 2

Water Pollution Abatement Plan Attachment A

Factors Affecting Surface Water Quality

The major factor that may affect water quality from the proposed development is the additional sediment in stormwater runoff from disturbed areas. Additional factors may include fuels and lubricants from vehicles and trash/debris.

The site will be graded so that the runoff from the plant area will drain towards the pre-treatment pond and Pond B (process water pond), which will overflow into Pond A. The rest of the stormwater runoff from the pad area and the northern roads will drain directly into Pond A. There the water will be treated by Pond A (extended detention pond) and a grassy swale in series with a sediment removal efficiency of 83.75%, which exceeds the minimum additional TSS requirements in RG-348 of 80%. Drainage from DA-002 will be treated by a 50-foot natural vegetative buffer coming as shown in the Site Map. Pond A has been sized to overtreat for the driveways located in DA-003A and DA-003B. Any spills or leaks will be cleaned immediately and disposed of in the proper manner. A trash receptacle will be on site for both employees and potential visitors to use.

Water Pollution Abatement Plan Attachment B

Volume and Character of Stormwater

The total area being developed, as shown on the Site Map is 13.7 acres. The stormwater from this disturbed area is anticipated to carry an increased level of total suspended solids (TSS); however, this additional impervious cover will be treated with a BMP. The site has been divided by grading as shown on the Site Map. DA-001 is proposed to have 4.8 total acres of added impervious cover which will be treated by Pond A in series with a 185-foot grassy swale. In addition, 1.2 acres of this Impervious cover will first be treated by a pre-treatment pond in addition to Pond B, prior to overflowing into Pond A. DA-002 is proposed to have an additional 1.16 acres of impervious cover and will be treated with a 50-foot natural vegetative buffer. For DA-003A and DA-003B, Pond A has been sized to overtreat for additional 0.3 acres of impervious cover. The treatment volume, or water quality volume (WQV), was determined using the RG-348 spreadsheet provided by TCEQ. Refer to the drainage report below for the WQVs used to size the proposed pond. The process water runoff from the CBP area was measured to be 0.604 acre-ft for the 10 Year 24-Hour Storm. Pond B has been sized to retain all runoff for this storm event.

Due to the use of BMPs during and after construction, the character of stormwater runoff from the site will be nearly the same as prior to construction. The runoff coefficient for the impervious areas is 0.9 and the pre-development coefficient used was 0.05 per TCEQ guidance. The annual storm was used to determine the expected levels of TSS and the required WQVs that will need to be treated per RG-348. For the proposed stormwater pond, the WQV was determined to be 1.32 ac-ft. The pond in series with the grassy swale will provide the areas required 80% TSS removal.

Aboveground Storage Tank Facility Plan Application

Texas Commission on Environmental Quality

For Permanent Storage on The Edwards Aquifer Recharge and Transition Zones And Relating to 30 TAC §213.5(e), Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Aboveground Storage Tank Facility Plan Application** is hereby submitted for TCEQ review and Executive Director approval. The application was prepared by:

Print Name of Customer/Agent: Vance Houy - PE, TX License No. 107401, TX Firm No. 4524

Date: 8/16/2024

Signature of Customer/Agent:



Regulated Entity Name: Garden Ridge 2

Aboveground Storage Tank (AST) Facility Information

1. Tanks and substance stored:

Table 1 - Tank and Substance Storage

<i>AST Number</i>	<i>Size (Gallons)</i>	<i>Substance to be Stored</i>	<i>Tank Material</i>
1	10,000	Diesel	Double-Walled Steel
2			
3			
4			

<i>AST Number</i>	<i>Size (Gallons)</i>	<i>Substance to be Stored</i>	<i>Tank Material</i>
5			

Total x 1.5 = 15,000 Gallons

2. ☐ The AST will be placed within a containment structure that is sized to capture one and one-half (1 1/2) times the storage capacity of the system. For facilities with more than one tank system, the containment structure is sized to capture one and one-half (1 1/2) times the cumulative storage capacity of all systems.

☒ **Attachment A - Alternative Methods of Secondary Containment.** Alternative methods for providing secondary containment are proposed. Specifications that show equivalent protection for the Edwards Aquifer are attached.

3. Inside dimensions and capacity of containment structure(s):

Table 2 - Secondary Containment

<i>Length (L) (Ft.)</i>	<i>Width (W) (Ft.)</i>	<i>Height (H) (Ft.)</i>	<i>L x W x H = (Ft3)</i>	<i>Gallons</i>

Total: N/A Gallons

4. ☒ All piping, hoses, and dispensers will be located inside the containment structure.
☐ Some of the piping to dispensers or equipment will extend outside the containment structure.
☒ The piping will be aboveground
☐ The piping will be underground
5. ☒ The containment area must be constructed of and in a material impervious to the substance(s) being stored. The proposed containment structure will be constructed of The tank is double-walled.
6. ☒ **Attachment B - Scaled Drawing(s) of Containment Structure.** A scaled drawing of the containment structure that shows the following is attached:
☒ Interior dimensions (length, width, depth and wall and floor thickness).
☒ Internal drainage to a point convenient for the collection of any spillage.
☒ Tanks clearly labeled.
☒ Piping clearly labeled.
☒ Dispenser clearly labeled.

Site Plan Requirements

Items 7 - 18 must be included on the Site Plan.

7. ☒ The Site Plan must have a minimum scale of 1" = 400'.
Site Plan Scale: 1" = 50".
8. 100-year floodplain boundaries:
- ☐ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.
 - ☒ No part of the project site is located within the 100-year floodplain.
 - ☒ The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): 48091C0420F, eff. 9/2/2024.
9. ☒ The layout of the development is shown with existing and finished contours at appropriate, but not greater than ten-foot contour intervals. Show lots, recreation centers, buildings, roads, etc.
- ☐ The layout of the development is shown with existing contours. Finished topographic contours will not differ from the existing topographic configuration and are not shown.
10. All known wells (oil, water, unplugged, capped and/or abandoned, test holes, etc.):
- ☒ There are 1 (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply):
 - ☒ The wells are not in use and have been properly abandoned.
 - ☐ The wells are not in use and will be properly abandoned.
 - ☐ The wells are in use and comply with 16 TAC § 76.
 - ☐ There are no wells or test holes of any kind known to exist on the project site.
11. Geologic or manmade features which are on the site:
- ☐ All sensitive geologic or manmade features identified in the Geologic Assessment are shown and labeled.
 - ☒ No sensitive geologic or manmade features were identified in the Geologic Assessment.
 - ☐ **Attachment C - Exception to the Geologic Assessment.** A request and justification for an exception to a portion of the Geologic Assessment is attached.
12. ☒ The drainage patterns and approximate slopes anticipated after major grading activities.
13. ☒ Areas of soil disturbance and areas which will not be disturbed.
14. ☒ Locations of major structural and nonstructural controls. These are the temporary and permanent best management practices.

15. ☒ Locations where soil stabilization practices are expected to occur.
16. ☐ Surface waters (including wetlands).
☒ N/A
17. ☐ Locations where stormwater discharges to surface water or sensitive features.
☒ There will be no discharges to surface water or sensitive features.
18. ☒ Legal boundaries of the site are shown.

Best Management Practices

19. ☒ Any spills must be directed to a point convenient for collection and recovery. Spills from storage tank facilities must be removed from the controlled drainage area for disposal within 24 hours of the spill.
☒ In the event of a spill, any spillage will be removed from the containment structure within 24 hours of the spill and disposed of properly.
☐ In the event of a spill, any spillage will be drained from the containment structure through a drain and valve within 24 hours of the spill and disposed of properly. The drain and valve system are shown in detail on the scaled drawing.
20. ☒ All stormwater accumulating inside the containment structure will be disposed of through an authorized waste disposal contractor.
☐ Containment area will be covered by a roof.
☒ Containment area will not be covered by a roof.
☐ A description of the alternate method of stormwater disposal is submitted for the executive director's review and approval and is attached.
21. ☒ **Attachment D - Spill and Overfill Control.** A site-specific description of the methods to be used at the facility for spill and overfill control is attached.
22. ☒ **Attachment E - Response Actions to Spills.** A site-specific description of the planned response actions to spills that will take place at the facility is attached.

Administrative Information

23. A Water Pollution Abatement Plan (WPAP) is required for construction of any associated commercial, industrial or residential project located on the Recharge Zone.
☐ The WPAP application for this project was approved by letter dated _____. A copy of the approval letter is attached at the end of this application.
☒ The WPAP application for this project was submitted to the TCEQ on concurrent, but has not been approved.
☐ A WPAP application is required for an associated project, but it has not been submitted.

- ☐ There will be no building or structure associated with this project. In the event a building or structure is needed in the future, the required WPAP will be submitted to the TCEQ.
- ☐ The proposed AST is located on the Transition Zone and a WPAP is not required. Information requested in 30 TAC 213.5 subsection (b) (4)(B) and (C) and (5) is provided with this application. (Forms TCEQ-0600 Permanent Stormwater Section and TCEQ-0602 Temporary Stormwater Section or Stormwater Pollution Prevention Plan/SW3P).
24. ☒ This facility is subject to the requirements for the reporting and cleanup of surface spills and overfills pursuant to 30 TAC 334 Subchapter D relating to Release Reporting and Corrective Action.
25. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
26. ☒ Any modification of this AST Facility Plan application will require executive director approval, prior to construction, and may require submission of a revised application, with appropriate fees.

Guadalupe Ready Mix, LLC
Garden Ridge 2
AST Attachment A

Alternate Methods to Secondary Containment

The proposed diesel tank will be a double-walled steel tank, which will be placed on a curbed concrete pad. Double-walled tanks are manufactured to provide secondary containment for their contents and these tanks will be fabricated per UL 2085 specifications. Tank specifications are available and have been included below. Fill lines and dispensing lines will be plumbed to the top of the tanks to prevent free outward flow of the tank contents. Drainage from the interstices between the inner and outer tank will be prevented by a drain plug in the exterior tank. The three-inch height of the curb will provide approximately 125 cubic feet of impervious containment (approximately 935 gallons) to provide containment for associated piping, dispenser, hoses, nozzle, and potential drips. All piping will be aboveground and completely housed within the concrete rounded curb.

AST Attachment B

Scaled Drawing of Containment Structure

See attached containment drawings.

AST Attachment D

Spill and Overfill Control

Personnel in charge of loading/unloading tanks will be trained to utilize proper techniques and preventative measures to avoid spills. The tank levels will be checked prior to loading/unloading and the operator will be present at all times when the tank is loading/unloading.

The site will be subject to the Environmental Protection Agency's requirements as specified in 40 CFR part 112 regarding spills, prevention, control, and countermeasures (SPCC). The site will maintain an SPCC plan in accordance with applicable rules.

Guadalupe Ready Mix, LLC
Garden Ridge 2
AST Attachment E

Spill Response Actions

Education

1. Be aware that different materials pollute in different amounts. Make sure that each employee knows what a “significant spill” is for each material they use, and what is the appropriate response for “significant” and “insignificant” spills. Employees should also be aware of when a spill must be reported to the TCEQ.
2. Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
3. Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
4. Establishing a continuing education program to indoctrinate new employees.
5. Have a contractor’s superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

1. To the extent that the work can be accomplished safely, spills of oil, petroleum products, and substances listed under 40 CFR parts 110.117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
2. Store hazardous materials and wastes in covered containers and protect from vandalism.
3. Place a stockpile of spill clean-up materials where it will be readily accessible.
4. Train employees in spill prevention and cleanup.
5. Designate responsible individuals to oversee and enforce control measures.
6. Spills should be covered and protected from stormwater run-on during rainfall to the extent that it doesn’t compromise cleanup activities.
7. Do not bury or wash spills with water.
8. Store and dispose of used clean-up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
9. Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with applicable regulations.
10. Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.

Guadalupe Ready Mix, LLC

Garden Ridge 2

11. Place Safety Data Sheets (SDS), as well as proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
12. Keep waste storage areas clean, well-organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

1. Clean up leaks and spills immediately.
2. Use a rag for small spills on paved surfaces. A damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be disposed of as hazardous waste.
3. Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

Minor Spills

1. Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
2. Use absorbent materials on small spills rather than hosing down or burying the spill.
3. Absorbent materials should be promptly removed and disposed of properly.
4. Follow the practice below for a minor spill.
5. Contain the spread of the spill.
6. Recover spilled materials.
7. Clean the contaminated area and properly dispose of contaminated materials.

Semi-Significant Spills

Semi-Significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities.

Spills should be cleaned up immediately:

1. Contain spread of the spill.
2. Notify the project foreman immediately.

Guadalupe Ready Mix, LLC
Garden Ridge 2

3. If the spill occurs on paved or impermeable surfaces, clean up using “dry” methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
4. If the spill occurs in dirt areas, contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
5. If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

For significant or hazardous spills that are in reportable quantities:

1. Notify the TCEQ by telephone as soon as possible within 24 hours at 512-339-2929 (Austin) or 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the Environmental Release Hotline at 1-800-832-8224. It is the contractor’s responsibility to have all emergency phone numbers at the construction site.
2. For spills of the federal reportable quantities, in conformance with the requirements in 40 CFR parts 110, 117, and 302, the contractor should notify the National Response Center at (800) 424-8802.
3. Notification should first be made by telephone and followed up with a written report.
4. The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
5. Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.

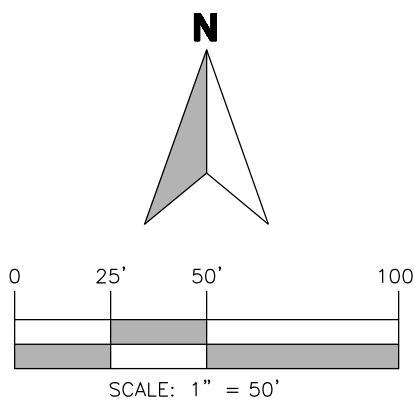
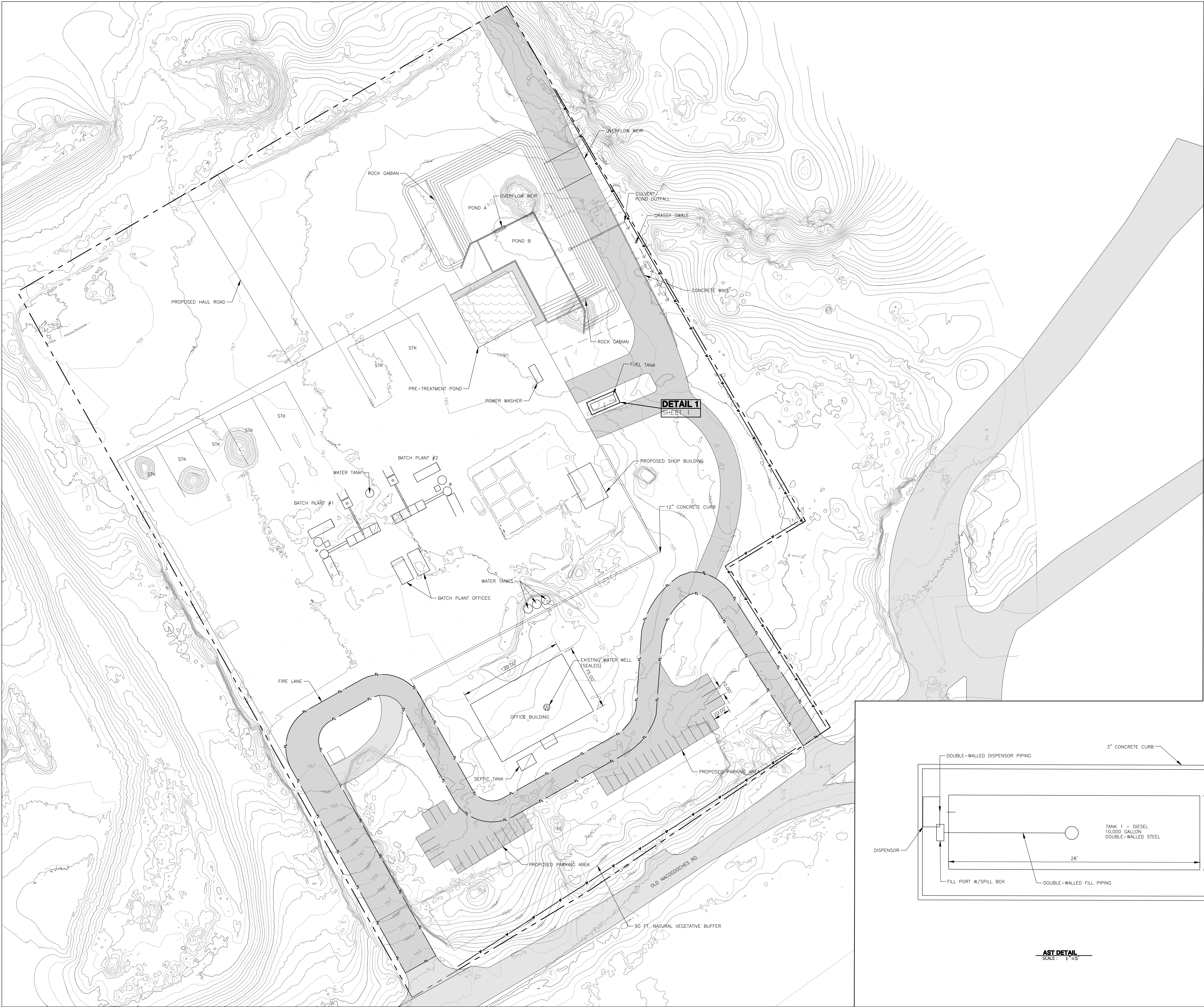
In the event of a reportable spill, the following Emergency Response Agencies can be contacted for assistance. Always inform your supervisor of a reportable spill immediately. Follow company policy when responding to an emergency.

State Emergency Response Commission	(512) 424-2208
National Response Center	(800) 424-8802
US EPA Region 6, Dallas, 24-hr Number	(866) 372-7745
National Weather Service	(281) 337-5074
TCEQ 24-hr	(800) 832-8224
TCEQ Region 13	(210) 410-3096

Guadalupe Ready Mix, LLC
Garden Ridge 2

Vehicle and Equipment

1. If maintenance must occur on-site, use a designated area and a secondary containment, located away from drainage courses, to prevent the run-on of stormwater and the runoff of spills.
2. Regularly inspect on-site vehicles and equipment for leaks and repairs.
3. Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment on-site.
4. Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
5. Place drip pans or absorbent materials under paving equipment when it is not in use.
6. Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.
7. Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
8. Oil Filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters
9. Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure that it is not leaking.



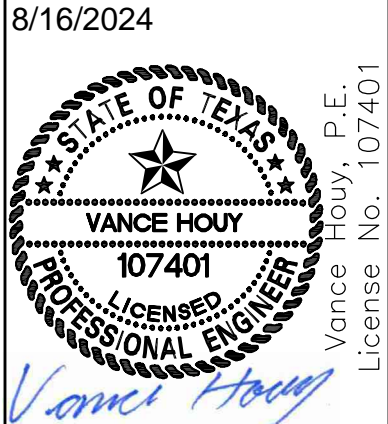
- LEGEND**
- PROPERTY LINE
 - EXISTING MAJOR CONTOUR
 - EXISTING MINOR CONTOUR
 - PROPOSED MAJOR CONTOUR
 - PROPOSED MINOR CONTOUR
 - PROPOSED FIRE LANE
 - LINEAR WATER BODIES
 - STK STOCKPILE
 - WATER WELL
 - FLOW ARROW
-
- CONCRETE AREA
 - BASE AREA
 - WATER BODY AREA
 - GRASS/VEGETATED BUFFER AREA
 - ROCK RIPRAP

IMAGE:	XXX
ISSUE DATE:	01/20/2024
DRAWN BY:	MRM
CHECKED BY:	CGG
SCALE:	1" = 50'
JOB NO.:	11491-002

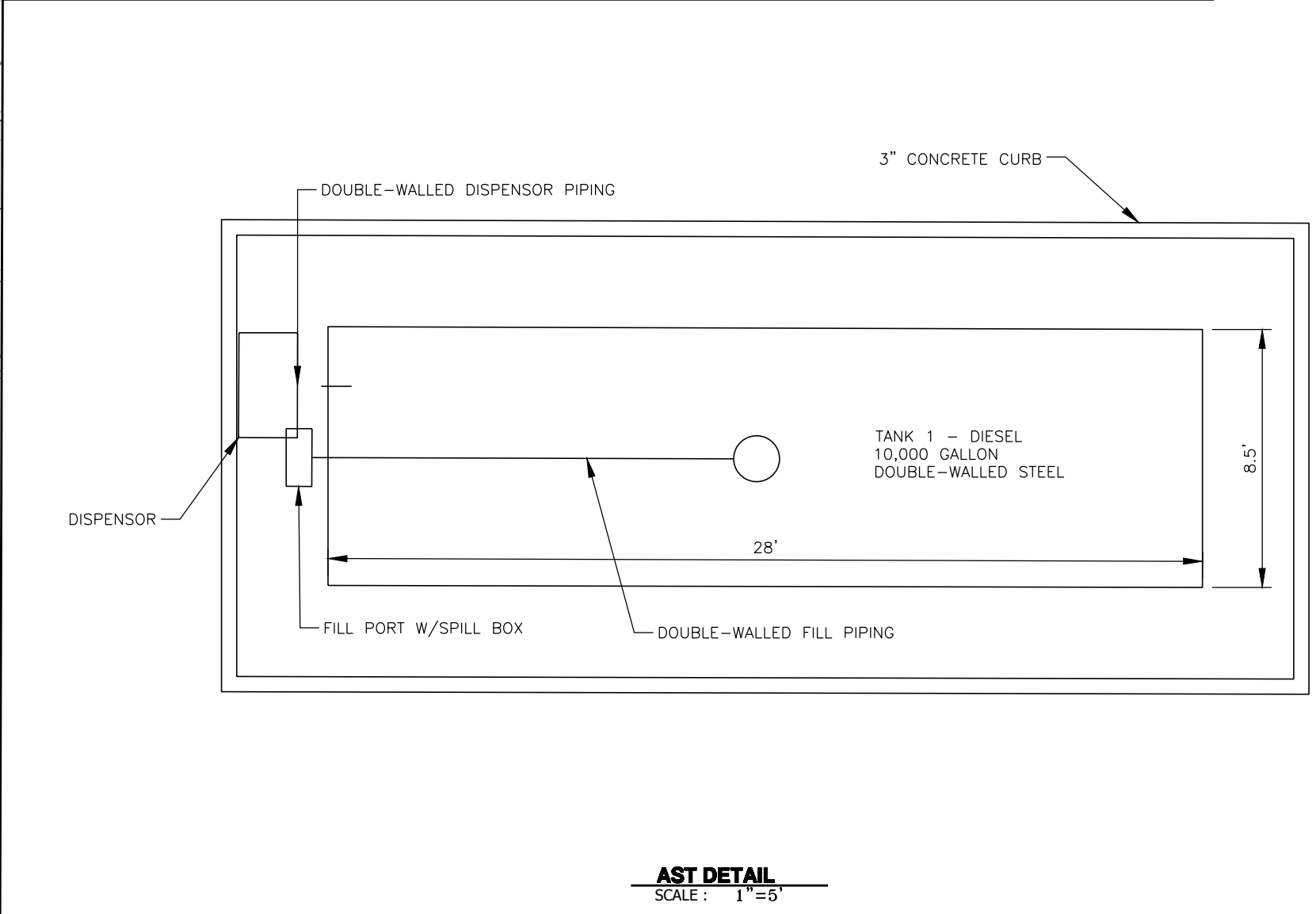
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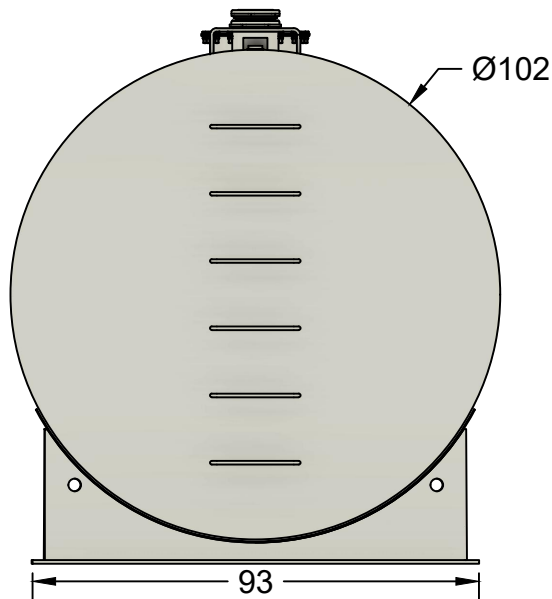
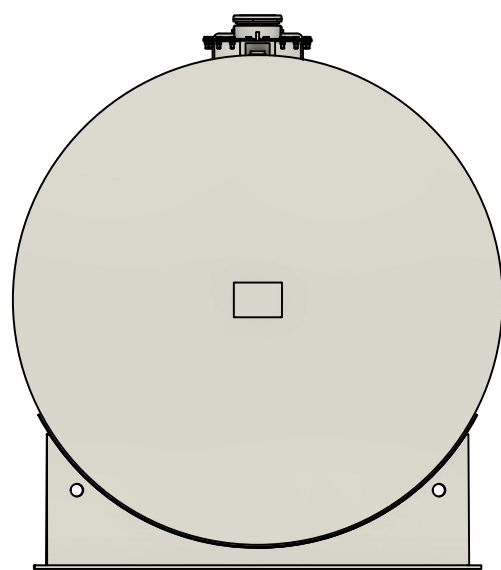
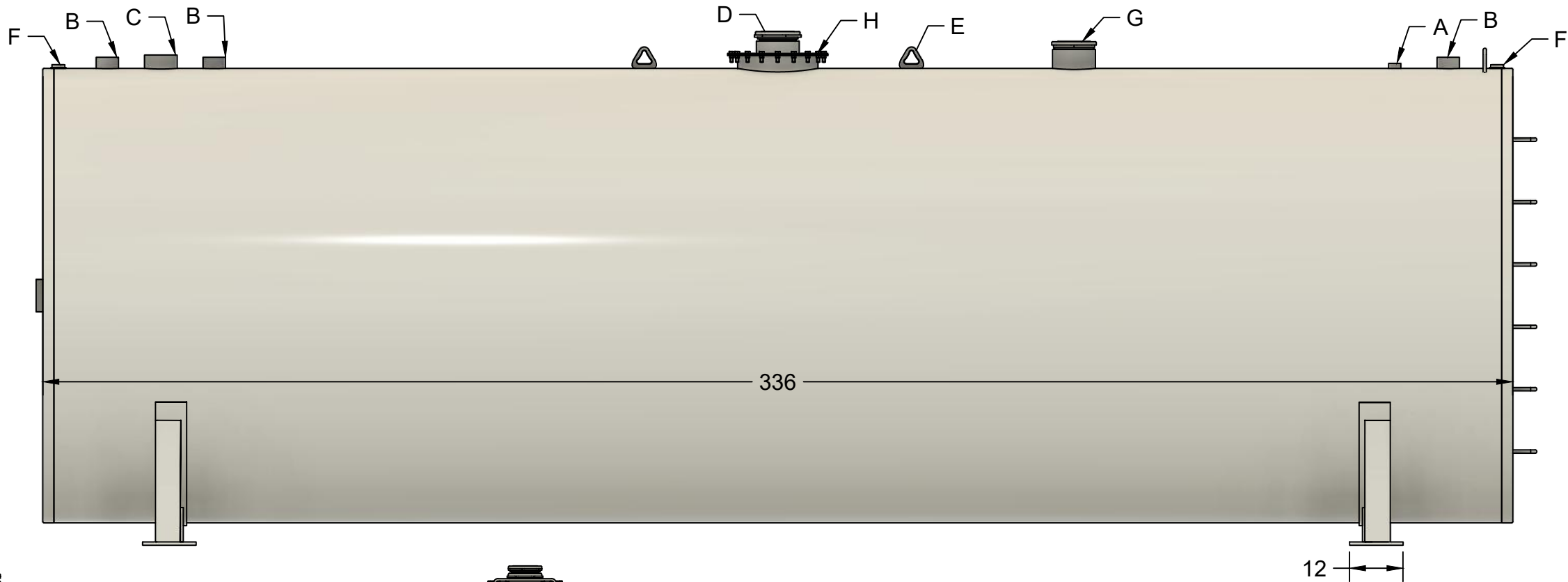
WESTWARD
Environmental Engineering, Natural Resources,
P.O. Box 2205 Boerne, Texas 78006
(830) 249-8284 Fax: (830) 249-0221
TBPB REG. NO.: F-4524
TBPB REG. NO.: 50112

REV.	DESCRIPTION	BY	DATE



AST PLAN
GARDEN RIDGE WPAP & AST PLAN
GUADALUPE READY MIX
10 FM 2252, GARDEN RIDGE, TX





- Material: A36 Mild Carbon Steel
- Internal: Surface prep - Clean of Debris
- External: Surface prep - SSPC-SP6 (commercial blast)
- External: (WHITE) Enviroastic 940 LV Polyurthane
Test: Lables:
- Inner tank: 5PSIG Hydrostatic - UL 2085
- Outer tank: Hydrostatic
- Pressure Test: 3-5 PSI
This drawing may contain **CONFIDENTIAL** information and is intended **ONLY** for the use of the specific individual to which it is addressed.

CUSTOMER APROVAL SIGNATURE: _____ DATE: _____ <u>Note:</u> At no time shall the pressure in the secondary tank exceed the pressure in the primary tank.	A	Coupling	2"	2" threaded fitting	Primary
	B	Coupling	4"	4" threaded fitting	Primary
	C	Coupling	6"	6" threaded fitting	Primary
	D	Emergency Vent	8"	8"emergency vent	Primary
	E	Lifting Lug	Med.	Medium lifting lug	Secondary
	F	Interstitial	2"	2" interstitial fitting	Secondary
	G	Emergency Vent	8"	8"emergency vent	Secondary
	H	Manhole	18"	18" manhole	Primary
CUSTOMER: Reladyne					
PROJECT: 10000G UL 2085 FIREGUARD					
WEIGHT			REV	SHEET 1/1	

RelaDyne, LLC.
Jeff.Knigga@RelaDyne.com

DESIGN: Fabricated per UL 2085 specifications double wall construction.

- Air test are no less than 3 PSI and no more than 5 PSI.
- Primary tank to be tested alone. Secondary tank to be pressure tested with primary tank. This shall be accomplished by bleeding air from the primary tank to the secondary tank.

Temporary Stormwater Section

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(A), (B), (D)(I) and (G); Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Temporary Stormwater Section** is hereby submitted for TCEQ review and executive director approval. The application was prepared by:

Print Name of Customer/Agent: Vance Houy - PE, TX License No. 107401, TX Firm No. 4524

Date: 8/16/2024

Signature of Customer/Agent:



Regulated Entity Name: Garden Ridge 2

Project Information

Potential Sources of Contamination

Examples: Fuel storage and use, chemical storage and use, use of asphaltic products, construction vehicles tracking onto public roads, and existing solid waste.

1. Fuels for construction equipment and hazardous substances which will be used during construction:

☒ The following fuels and/or hazardous substances will be stored on the site: Diesel

These fuels and/or hazardous substances will be stored in:

- ☐ Aboveground storage tanks with a cumulative storage capacity of less than 250 gallons will be stored on the site for less than one (1) year.

- ☒ Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.
- ☒ Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An Aboveground Storage Tank Facility Plan application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.
- ☐ Fuels and hazardous substances will not be stored on the site.
- 2. ☒ **Attachment A - Spill Response Actions.** A site specific description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is attached.
- 3. ☒ Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature.
- 4. ☒ **Attachment B - Potential Sources of Contamination.** A description of any activities or processes which may be a potential source of contamination affecting surface water quality is attached.

Sequence of Construction

- 5. ☒ **Attachment C - Sequence of Major Activities.** A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is attached.
 - ☒ For each activity described, an estimate (in acres) of the total area of the site to be disturbed by each activity is given.
 - ☒ For each activity described, include a description of appropriate temporary control measures and the general timing (or sequence) during the construction process that the measures will be implemented.
- 6. ☒ Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project: N/A

Temporary Best Management Practices (TBMPs)

Erosion control examples: tree protection, interceptor swales, level spreaders, outlet stabilization, blankets or matting, mulch, and sod. Sediment control examples: stabilized construction exit, silt fence, filter dikes, rock berms, buffer strips, sediment traps, and sediment basins. Please refer to the Technical Guidance Manual for guidelines and specifications. All structural BMPs must be shown on the site plan.

- 7. ☒ **Attachment D – Temporary Best Management Practices and Measures.** TBMPs and measures will prevent pollution of surface water, groundwater, and stormwater. The construction-phase BMPs for erosion and sediment controls have been designed to retain sediment on site to the extent practicable. The following information is attached:

- ☒ A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.
 - ☒ A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.
 - ☒ A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.
 - ☒ A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.
8. ☒ The temporary sealing of a naturally-occurring sensitive feature which accepts recharge to the Edwards Aquifer as a temporary pollution abatement measure during active construction should be avoided.
- ☐ **Attachment E - Request to Temporarily Seal a Feature.** A request to temporarily seal a feature is attached. The request includes justification as to why no reasonable and practicable alternative exists for each feature.
- ☒ There will be no temporary sealing of naturally-occurring sensitive features on the site.
9. ☒ **Attachment F - Structural Practices.** A description of the structural practices that will be used to divert flows away from exposed soils, to store flows, or to otherwise limit runoff discharge of pollutants from exposed areas of the site is attached. Placement of structural practices in floodplains has been avoided.
10. ☒ **Attachment G - Drainage Area Map.** A drainage area map supporting the following requirements is attached:
- ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.
 - ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.
 - ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.
 - ☐ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

- ☒ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. Erosion and sediment controls other than sediment basins or sediment traps within each disturbed drainage area will be used.
11. ☐ **Attachment H - Temporary Sediment Pond(s) Plans and Calculations.** Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are attached.
- ☒ N/A
12. ☒ **Attachment I - Inspection and Maintenance for BMPs.** A plan for the inspection of each temporary BMP(s) and measure(s) and for their timely maintenance, repairs, and, if necessary, retrofit is attached. A description of the documentation procedures, recordkeeping practices, and inspection frequency are included in the plan and are specific to the site and/or BMP.
13. ☒ All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.
14. ☒ If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).
15. ☒ Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.
16. ☒ Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

Soil Stabilization Practices

Examples: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, or preservation of mature vegetation.

17. ☒ **Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices.** A schedule of the interim and permanent soil stabilization practices for the site is attached.

- 18. ☒ Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.
- 19. ☒ Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

Administrative Information

- 20. ☒ All structural controls will be inspected and maintained according to the submitted and approved operation and maintenance plan for the project.
- 21. ☒ If any geologic or manmade features, such as caves, faults, sinkholes, etc., are discovered, all regulated activities near the feature will be immediately suspended. The appropriate TCEQ Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TCEQ has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.
- 22. ☒ Silt fences, diversion berms, and other temporary erosion and sediment controls will be constructed and maintained as appropriate to prevent pollutants from entering sensitive features discovered during construction.

Guadalupe Ready Mix, LLC
Garden Ridge 2

Temporary Stormwater Runoff Attachment A

Spill Response Actions

Education

1. Be aware that different materials pollute in different amounts. Make sure that each employee knows what a “significant spill” is for each material they use, and what is the appropriate response for “significant” and “insignificant” spills. Employees should also be aware of when a spill must be reported to the TCEQ.
2. Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
3. Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
4. Establishing a continuing education program to indoctrinate new employees.
5. Have a contractor’s superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

1. To the extent that the work can be accomplished safely, spills of oil, petroleum products, and substances listed under 40 CFR parts 110.117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
2. Store hazardous materials and wastes in covered containers and protect from vandalism.
3. Place a stockpile of spill clean-up materials where it will be readily accessible.
4. Train employees in spill prevention and cleanup.
5. Designate responsible individuals to oversee and enforce control measures.
6. Spills should be covered and protected from stormwater run-on during rainfall to the extent that it doesn’t compromise cleanup activities.
7. Do not bury or wash spills with water.
8. Store and dispose of used clean-up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
9. Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with applicable regulations.
10. Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.

Guadalupe Ready Mix, LLC

Garden Ridge 2

11. Place Safety Data Sheets (SDS), as well as proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
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1. Clean up leaks and spills immediately.
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3. Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

Minor Spills

1. Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
2. Use absorbent materials on small spills rather than hosing down or burying the spill.
3. Absorbent materials should be promptly removed and disposed of properly.
4. Follow the practice below for a minor spill.
5. Contain the spread of the spill.
6. Recover spilled materials.
7. Clean the contaminated area and properly dispose of contaminated materials.

Semi-Significant Spills

Semi-Significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities.

Spills should be cleaned up immediately:

1. Contain spread of the spill.
2. Notify the project foreman immediately.

Guadalupe Ready Mix, LLC
Garden Ridge 2

3. If the spill occurs on paved or impermeable surfaces, clean up using “dry” methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
4. If the spill occurs in dirt areas, contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
5. If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

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5. Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.

In the event of a reportable spill, the following Emergency Response Agencies can be contacted for assistance. Always inform your supervisor of a reportable spill immediately. Follow company policy when responding to an emergency.

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TCEQ Region 13	(210) 410-3096

Guadalupe Ready Mix, LLC
Garden Ridge 2

Vehicle and Equipment

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3. Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment on-site.
4. Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
5. Place drip pans or absorbent materials under paving equipment when it is not in use.
6. Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.
7. Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
8. Oil Filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters
9. Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure that it is not leaking.

Guadalupe Ready Mix, LLC
Garden Ridge 2

Temporary Stormwater Attachment B

Potential Sources of Contamination

Potential sources of contamination include fuels, lubricants from vehicles and equipment, runoff from the CBPs and, trash/debris.

Temporary Stormwater Attachment C

Sequence of Major Activities

The construction of this site will begin with the clearing of trees and vegetation in the project area. Sediment and extended detention ponds will be roughly graded to be utilized as a temporary sediment trap during site construction. Then the base for the site pad/entrances will be graded and compacted and the roads will be paved as shown on the site map. The Pre-Treatment Pond and Pond B will be set and formed with a sidewalk in between the two as shown on the Site Map. Pond A and the grassy swale will be constructed as shown on the plan set. Once the BMPs have been constructed, the CBPs will be constructed, and fuel pad will be built. The double walled fuel tank will be set in the proposed fuel pad as shown on the Site Map.

Temporary Stormwater Attachment D

Temporary Best Management Practices and Measures (TBMPs)

7a) TBMPs and measures will prevent pollution of surface water, groundwater and stormwater that originates upgradient from the site and flows across the site.

The site will be graded so stormwater originating from upstream of the site will drain across the north portion of the site and be directed into Pond A

7b) TBMPs and measures will prevent pollution of surface water, groundwater and stormwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.

The site will be graded so that the runoff from the CBPs will drain into the pre-treatment pond and Pond B. The rest of the site pad and road on the north side of the site will be graded to drain to the two sediment forebays located in Pond A. The stormwater will then drain from Pond A out of the low flow outfall or the overflow weir shown on the road on the east side of Pond A. A silt fence will be used downgradient of the disturbed areas until Pond A is complete and the berm, swales, and vegetative filter strip are stabilized with vegetation.

7c) TBMPs and measures will prevent pollution of surface streams, sensitive features stormwater and the aquifer. There are no sensitive features that have been noted on site. There are no surface streams that will be affected by runoff from the site.

7d) To the maximum extent practicable TBMPs and measures will maintain flow to naturally occurring sensitive features identified in the geologic assessment, TCEQ inspections, or during evacuation, blasting, or construction.

There were no sensitive features identified on site during the geological assessment.

Guadalupe Ready Mix, LLC
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Temporary Stormwater Attachment F

Structural Practices

Temporary best management practices proposed for the site include silt fences, an earthen berm, and swales. The silt fences will be used during the initial clearing and construction to mitigate potential additional TSS runoff due to disturbances. The site pad will be graded to divert onsite runoff from the CBPs to the Pre-Treatment Pond and Pond B. The rest of the site pad and northern road will be graded to drain into Pond A.

Temporary Stormwater Attachment G

Drainage Area Map

Please see attached Temporary Stormwater Plan showing on and off-site drainage areas.

Temporary Stormwater Attachment I

Inspection and Maintenance for BMPs

The ponds should be inspected weekly for any erosion and swales and earthen berms and vegetative buffers should be inspected monthly. Written documentation of these inspections should be kept during the course of construction at the project site. Any erosion of the berm should be backfilled and compacted as soon as possible. Trash should be removed, and any eroded areas of the buffers should be reseeded as soon as possible.

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Garden Ridge 2

Temporary Stormwater Attachment J

Schedule of Interim and Permanent Soil Stabilization Practices

Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased but in no case more than 14 days after construction activity in that portion of the site has been ceased. Where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 21 days, temporary stabilization measures do not need to be initiated on that portion of the site. In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.

Examples of soil stabilization practices may include establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures.

Permanent Stormwater Section

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(C), (D)(li), (E), and (5), Effective June 1, 1999

To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.

Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.

Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Permanent Stormwater Section** is hereby submitted for TCEQ review and executive director approval. The application was prepared by:

Print Name of Customer/Agent: Vance Houy - PE, TX License No. 107401, TX Firm No. 4524

Date: 8/16/2024

Signature of Customer/Agent



Regulated Entity Name: Garden Ridge 2

Permanent Best Management Practices (BMPs)

Permanent best management practices and measures that will be used during and after construction is completed.

1. ☒ Permanent BMPs and measures must be implemented to control the discharge of pollution from regulated activities after the completion of construction.
☐ N/A
2. ☒ These practices and measures have been designed, and will be constructed, operated, and maintained to insure that 80% of the incremental increase in the annual mass loading of total suspended solids (TSS) from the site caused by the regulated activity is removed. These quantities have been calculated in accordance with technical guidance prepared or accepted by the executive director.
☒ The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.

- ☐ A technical guidance other than the TCEQ TGM was used to design permanent BMPs and measures for this site. The complete citation for the technical guidance that was used is: _____
- ☐ N/A
3. ☒ Owners must insure that permanent BMPs and measures are constructed and function as designed. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the appropriate regional office within 30 days of site completion.
- ☐ N/A
4. Where a site is used for low density single-family residential development and has 20 % or less impervious cover, other permanent BMPs are not required. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.
- ☐ The site will be used for low density single-family residential development and has 20% or less impervious cover.
- ☐ The site will be used for low density single-family residential development but has more than 20% impervious cover.
- ☒ The site will not be used for low density single-family residential development.
5. The executive director may waive the requirement for other permanent BMPs for multi-family residential developments, schools, or small business sites where 20% or less impervious cover is used at the site. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.
- ☐ **Attachment A - 20% or Less Impervious Cover Waiver.** The site will be used for multi-family residential developments, schools, or small business sites and has 20% or less impervious cover. A request to waive the requirements for other permanent BMPs and measures is attached.
- ☐ The site will be used for multi-family residential developments, schools, or small business sites but has more than 20% impervious cover.
- ☒ The site will not be used for multi-family residential developments, schools, or small business sites.
6. ☒ **Attachment B - BMPs for Upgradient Stormwater.**

- ☒ A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is attached.
 - ☐ No surface water, groundwater or stormwater originates upgradient from the site and flows across the site, and an explanation is attached.
 - ☐ Permanent BMPs or measures are not required to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site, and an explanation is attached.
7. ☒ **Attachment C - BMPs for On-site Stormwater.**
- ☒ A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is attached.
 - ☐ Permanent BMPs or measures are not required to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff, and an explanation is attached.
8. ☐ **Attachment D - BMPs for Surface Streams.** A description of the BMPs and measures that prevent pollutants from entering surface streams, sensitive features, or the aquifer is attached. Each feature identified in the Geologic Assessment as sensitive has been addressed.
- ☒ N/A
9. ☒ The applicant understands that to the extent practicable, BMPs and measures must maintain flow to naturally occurring sensitive features identified in either the geologic assessment, executive director review, or during excavation, blasting, or construction.
- ☒ The permanent sealing of or diversion of flow from a naturally-occurring sensitive feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure has not been proposed.
 - ☐ **Attachment E - Request to Seal Features.** A request to seal a naturally-occurring sensitive feature, that includes, for each feature, a justification as to why no reasonable and practicable alternative exists, is attached.
10. ☒ **Attachment F - Construction Plans.** All construction plans and design calculations for the proposed permanent BMP(s) and measures have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer, and are signed, sealed, and dated. The plans are attached and, if applicable include:
- ☒ Design calculations (TSS removal calculations)
 - ☒ TCEQ construction notes
 - ☐ All geologic features
 - ☒ All proposed structural BMP(s) plans and specifications
- ☐ N/A

11. ☒ **Attachment G - Inspection, Maintenance, Repair and Retrofit Plan.** A plan for the inspection, maintenance, repairs, and, if necessary, retrofit of the permanent BMPs and measures is attached. The plan includes all of the following:
- ☒ Prepared and certified by the engineer designing the permanent BMPs and measures
 - ☒ Signed by the owner or responsible party
 - ☒ Procedures for documenting inspections, maintenance, repairs, and, if necessary retrofit
 - ☒ A discussion of record keeping procedures
- ☐ N/A
12. ☐ **Attachment H - Pilot-Scale Field Testing Plan.** Pilot studies for BMPs that are not recognized by the Executive Director require prior approval from the TCEQ. A plan for pilot-scale field testing is attached.
- ☒ N/A
13. ☐ **Attachment I - Measures for Minimizing Surface Stream Contamination.** A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is attached. The measures address increased stream flashing, the creation of stronger flows and in-stream velocities, and other in-stream effects caused by the regulated activity, which increase erosion that results in water quality degradation.
- ☒ N/A

Responsibility for Maintenance of Permanent BMP(s)

Responsibility for maintenance of best management practices and measures after construction is complete.

14. ☒ The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. Such entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred.
- ☐ N/A
15. ☒ A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days of the transfer if the site is for use as a multiple single-family residential development, a multi-family residential development, or a non-residential development such as commercial, industrial, institutional, schools, and other sites where regulated activities occur.
- ☐ N/A

Guadalupe Ready Mix, LLC
Garden Ridge 2

Permanent Stormwater Section Attachment B

BMPs for Upgradient Stormwater

A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater or stormwater that originates upgradient from the site and flows across the site.

The site will be graded so that stormwater originating from upstream of the site will drain across the north portion of the site and be directed into Pond A.

Permanent Stormwater Section Attachment C

BMPs for On-Site Stormwater

A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site:

DA-001 is proposed to have 4.8 acres of added impervious cover, which will be treated by Pond A in series with a 185-foot grassy swale. 1.2 acres of this added impervious cover will first be treated by a pre-treatment pond in addition to retention Pond B, prior to overflowing into Pond A. DA-002 is proposed to have an additional 1.16 acres of added impervious cover that will be treated by a natural vegetative filter strip. DA-003A and DA-003B will include 0.3 acres of impervious cover that will be uncaptured. Pond A has been sized to overtreat for these uncaptured areas of impervious cover.

Permanent Stormwater Section Attachment F

Construction Plans

Please see attached Construction Plans.

Permanent Stormwater Section Attachment G

Inspection, Maintenance, Repair, and Retrofit Plan

The earthen berm should be inspected quarterly until sufficiently stabilized with vegetation. Written documentation of these inspections should be kept throughout the course of construction of the project site. Any erosion of berms should be backfilled and compacted as soon as possible.

Engineered vegetated filter strips and the earthen berm should be inspected at least twice annually, until the Final Earthen Berm has been vegetated, for erosion or damage to vegetation. Written documentation of these inspections should be kept during the course of construction at the project site. Any observed bare spots or areas of erosion should be reseeded.

Pond A and Pond B should be inspected at least twice a year and sediment should be removed accordingly to maintain adequate storage volume.

Extended Detention Basin:

Guadalupe Ready Mix, LLC

Garden Ridge 2

Extended Detention Basin:

Routine Maintenance

- *Inspections.* Basins should be inspected at least twice a year (once during or immediately following wet weather) to evaluate facility operation. When possible, inspections should be conducted during wet weather to determine if the pond is meeting the target detention times. In particular, the extended detention control device should be regularly inspected for evidence of clogging, or conversely, for too rapid a release. If the design drawdown times are exceeded by more than 24 hours, then repairs should be scheduled immediately. The upper stage pilot channel, if any, and its flow path to the lower stage should be checked for erosion problems. During each inspection, erosion areas inside and downstream of the BMP should be identified and repaired or revegetated immediately.
- *Mowing.* The upper stage, side slopes, embankment, and emergency spillway of an extended detention basin must be mowed regularly to discourage woody growth and control weeds. Grass areas in and around basins should be mowed at least twice annually to limit vegetation height to 18 inches. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas. When mowing of grass is performed, a mulching mower should be used, or grass clippings should be caught and removed.
- *Debris and Litter Removal.* Debris and litter will accumulate near the extended detention control device and should be removed during regular mowing operations and inspections. Particular attention should be paid to floating debris that can eventually clog the control device or riser.
- *Erosion Control.* The pond side slopes, emergency spillway, and embankment all may periodically suffer from slumping and erosion, although this should not occur often if the soils are properly compacted during construction. Regrading and revegetation may be required to correct the problems. Similarly, the channel connecting an upper stage with a lower stage may periodically need to be replaced or repaired.
- *Nuisance Control.* Standing water (not desired in a extended detention basin) or soggy conditions within the lower stage of the basin can create nuisance conditions for nearby residents. Odors, mosquitoes, weeds, and litter are all occasionally perceived to be problems. Most of these problems are generally a sign that regular inspections and maintenance are not being performed (e.g., mowing, debris removal, clearing the outlet control device).

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Non-Routine Maintenance

- *Structural Repairs and Replacement.* With each inspection, any damage to the structural elements of the system (pipes, concrete drainage structures, retaining walls, etc.) should be identified and repaired immediately. These repairs should include patching of cracked concrete, sealing of voids, and removal of vegetation from cracks and joints. The various inlet/outlet and riser works in a basin will eventually deteriorate and must be replaced. Public works experts have estimated that corrugated metal pipe (CMP) has a useful life of about 25 yr, whereas reinforced concrete barrels and risers may last from 50 to 75 yr.

- *Sediment Removal.* When properly designed, dry extended detention basins will accumulate quantities of sediment over time. Sediment accumulation is a serious maintenance concern in extended detention dry ponds for several reasons. First, the sediment gradually reduces available stormwater management storage capacity within the basin. Second, unlike wet extended detention basins (which have a permanent pool to conceal deposited sediments), sediment accumulation can make dry extended detention basins very unsightly. Third, and perhaps most importantly, sediment tends to accumulate around the control device. Sediment deposition increases the risk that the orifice will become clogged, and gradually reduces storage capacity reserved for pollutant removal. Sediment can also be resuspended if allowed to accumulate over time and escape through the hydraulic control to downstream channels and streams. For these reasons, accumulated sediment needs to be removed from the lower stage when sediment buildup fills 20% of the volume of the basin or at least every 10 years.

Grassy Swales:

Routine Maintenance

- *Pest Management.* An Integrated Pest Management (IPM) Plan should be developed for vegetated areas. This plan should specify how problem insects and weeds will be controlled with minimal or no use of insecticides and herbicides.

- *Seasonal Mowing and Lawn Care.* Lawn mowing should be performed routinely, as needed, throughout the growing season. Grass height should not exceed 18 inches. Grass cuttings should be collected and disposed of offsite, or a mulching mower can be used. Regular mowing should also include weed control practices; however, herbicide use should be kept to a minimum (Urbonas et al., 1992). Healthy grass can be maintained without using fertilizers because runoff usually contains sufficient nutrients.

- *Inspection.* Inspect swales at least twice annually for erosion or damage to vegetation; however, additional inspection after periods of heavy runoff is most desirable. The swale should be checked for uniformity of grass cover, debris and litter, and areas of sediment accumulation. More frequent inspections of the grass cover during the first few years after establishment will help to determine if any problems are developing,

Guadalupe Ready Mix, LLC

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and to plan for long-term restorative maintenance needs. Bare spots and areas of erosion identified during semi-annual inspections should be replanted and restored to meet specifications. Construction of a level spreader device may be necessary to reestablish shallow overland flow.

- *Debris and Litter Removal.* Trash tends to accumulate in swale areas, particularly along highways. Any swale structures (i.e. check dams) should be kept free of obstructions to reduce floatables being flushed downstream, and for aesthetic reasons. The need for this practice is determined through periodic inspection, but should be performed no less than two times per year (Urbonas et al., 1992).
- *Sediment Removal.* Sediment accumulating near culverts and in channels needs to be removed when they build up to 3 inches at any spot, or cover vegetation. Excess sediment should be removed by hand or with flat-bottomed shovels. If areas are eroded, they should be filled, compacted, and reseeded so that the final grade is level with the bottom of the swale. Sediment removal should be performed periodically, as determined through inspection.
- *Grass Reseeding and Mulching.* A healthy dense grass should be maintained in the channel and side slopes. Grass damaged during the sediment removal process should be promptly replaced using the same seed mix used during swale establishment. If possible, flow should be diverted from the damaged areas until the grass is firmly established.
- *Public Education.* Private homeowners are often responsible for roadside swale maintenance. Unfortunately, overzealous lawn care on the part of homeowners can present some problems. For example, mowing the swale too close to the ground, or excessive application of fertilizer and pesticides will all be detrimental to the performance of the swale. Pet waste can also be a problem in swales, and should be removed to avoid contamination from fecal coliform and other waste-associated bacteria. The delegation of maintenance responsibilities to individual landowners is a cost benefit to the locality. However, localities should provide an active educational program to encourage the recommended practices.

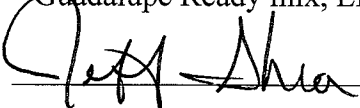
Inspection, Maintenance, Repair and Retrofit Plan

I, Jeff Shea, have read and understand the Inspection, Maintenance, Repair and Retrofit (IMRR) Plan contained in this Water Pollution Abatement Plan (WPAP) Modification plan.

I understand the specific Permanent Best Management Practices (PBMPs) and associated inspection and maintenance schedule which are outlined in this IMRR Plan. Guadalupe Ready mix, LLC will implement these inspections and perform maintenance as required to meet the intent of the IMRR Plan.

Name and signature of responsible party for maintenance of permanent BMPs

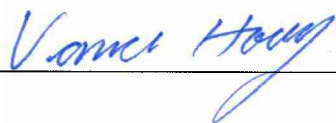
Print Name: Jeff Shea
Guadalupe Ready mix, LLC

Signature 

Date: 8/16/24

Name and signature of Engineer

Print Name: Vance Houy
Westward Environmental, Inc.

Signature 

Date: 8/16/2024

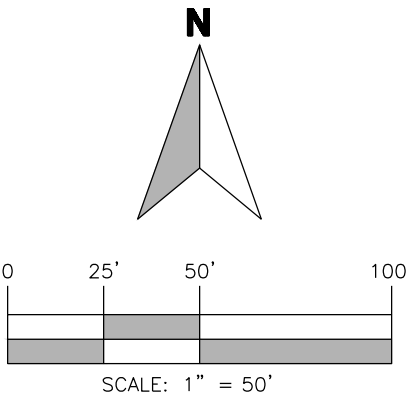


**TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
WATER POLLUTION ABATEMENT PLAN
GENERAL CONSTRUCTION NOTES**














1. THE WRITTEN CONSTRUCTION NOTIFICATION MUST BE SUBMITTED TO THE TCEQ REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. THIS NOTICE MUST INCLUDE:
 - THE NAME OF THE APPROVED PROJECT;
 - THE ACTIVITY START DATE; AND
 - THE CONTACT INFORMATION OF THE PRIME CONTRACTOR
2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROJECT MUST BE PROVIDED WITH COMPLETE COPIES OF THE APPROVED WATER POLLUTION ABATEMENT PLAN (WPAP) AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS ARE REQUIRED TO KEEP ON-SITE COPIES OF THE APPROVED PLAN AND APPROVAL LETTER.
3. IF ANY SENSITIVE FEATURE(S) (CAVES, SOLUTION, CAVITY, SIN HOLE, ETC.) IS DISCOVERED DURING CONSTRUCTION, ALL REGULATED ACTIVITIES MUST BE IMMEDIATELY SUSPENDED IMMEDIATELY. THE APPROPRIATE TCEQ REGIONAL OFFICE MUST BE IMMEDIATELY NOTIFIED OF ANY SENSITIVE FEATURES ENCOUNTERED DURING CONSTRUCTION. CONSTRUCTION ACTIVITIES MAY NOT BE RESUMED UNTIL THE TCEQ HAS REVIEWED AND APPROVED THE APPROPRIATE PROTECTIVE MEASURES IN ORDER TO PROTECT ANY SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY.
4. NO TEMPORARY OR PERMANENT HAZARDOUS SUBSTANCE STORAGE TANK SYSTEM SHALL BE INSTALLED WITHIN 150 FEET OF A WATER SUPPLY SOURCE, DISTRIBUTION SYSTEM, WELL, OR SENSITIVE FEATURE.
5. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE INSTALLED PRIOR TO INITIAL GRADING. EROSION CONTROL MEASURES MUST BE IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS. INSPECTIONS INDICATE THAT CONTROL HAS BEEN USED INAPPROPRIATELY, OR INCORRECTLY, THE APPLICANT MUST REPLACE OR MODIFY THE CONTROL FOR SITE SITUATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL EROSION AND SEDIMENTATION ARE NO LONGER A SIGNIFICANT RISK.
6. ANY SEDIMENT THAT ESCAPES THE CONSTRUCTION SITE MUST BE COLLECTED AND PROPERLY DISPOSED BEFORE THE NEXT RAIN FALL TO ENSURE IT IS NOT WASHED INTO SURFACE WATERBODIES, STREAMS, CREEKS, SENSITIVE FEATURES, ETC.
7. SEDIMENT MUST BE REMOVED FROM THE SEDIMENT TRAPS OR SEDIMENTATION BASINS NOT LATER THAN WHEN IT OCCUPIES 50% OF THE BASIN'S DESIGN CAPACITY.
8. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHANGES EXPOSED TO STORMWATER MUST BE PREVENTED FROM BEING DISCHARGED OFFSITE.
9. ALL SPOILS (EXCAVATED MATERIAL) GENERATED FROM THE PROJECT SITE MUST BE STORED ON-SITE WITH PROPER E&S CONTROL MEASURES. FOR STORAGE OR DISPOSAL OF SPOILS AT ANOTHER SITE ON THE EDWARDS AQUIFER RECHARGE ZONE, THE CONTRACTOR MUST OBTAIN A PERMIT FROM THE TCEQ REGIONAL OFFICE. THE PLAN FOR THE PLACEMENT OF LITTER, MATERIAL OR MASS GRADING PRIOR TO THE PLACEMENT OF SPOILS AT THE OTHER SITE.
10. IF PORTIONS OF THE SITE WILL HAVE A TEMPORARY OR PERMANENT CHANGE IN CONSTRUCTION ACTIVITY LASTING LONGER THAN 14 DAYS, SOIL STABILIZATION IN THOSE AREAS MUST BE INITIATED AS SOON AS POSSIBLE PRIOR TO THE 14TH DAY OF CONSTRUCTION. IF PORTIONS OF THE SITE WILL HAVE TEMPORARY OR PERMANENT WEATHER PREVENT ACTIVATION FOR THE 14TH DAY, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS POSSIBLE.
11. THE FOLLOWING RECORDS SHALL BE MAINTAINED AND MADE AVAILABLE TO THE TCEQ UPON REQUEST:
 - THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR;
 - THE DATES WHEN STABILIZATION MEASURES ARE USED;
 - THE DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CHANGE ON A PORTION OF THE SITE;
12. THE HOLDER OF ANY APPROVED EDWARDS AQUIFER PROTECTION PLAN MUST NOTIFY THE APPROPRIATE REGIONAL OFFICE OF ANY WRITING AND OBTAIN APPROVAL FROM THE EXECUTIVE DIRECTOR PRIOR TO INITIATING ANY OF THE FOLLOWING:
 - A. ANY PHYSICAL OR OPERATIONAL MODIFICATION OF ANY WATER POLLUTION ABATEMENT STRUCTURE(S), INCLUDING BUT NOT LIMITED TO POND, DAMS, BERMS, SEWAGE TREATMENT PLANTS, AND OVERSOURCING STRUCTURES;
 - B. ANY CHANGE IN THE NATURE OR CHARACTER OF THE REGULATED ACTIVITY FROM THAT WHICH WAS ORIGINALLY SET FORTH IN THE APPROVED EDWARDS AQUIFER PROTECTION PLAN OR THAT COULD POTENTIALLY PREVENT POLLUTION OF THE EDWARDS AQUIFER;
 - C. ANY DEVELOPMENT OF LAND PREVIOUSLY IDENTIFIED AS UNDEVELOPED IN THE ORIGINAL WATER POLLUTION ABATEMENT PLAN.

AUSTIN REGIONAL OFFICE	SAN ANTONIO REGIONAL OFFICE
12100 PARK 35 CIRCLE, BLDG A	14250 JUDSON ROAD
AUSTIN, TEXAS 78753-1808	SAN ANTONIO, TEXAS 78233-4480
PHONE (512) 339-2929	PHONE (210) 490-3096
FAX (512) 339-2375	FAX (210) 536-3390

THESE GENERAL CONSTRUCTION NOTES MUST BE INCLUDED ON THE CONSTRUCTION PLANS PROVIDED TO THE CONTRACTOR AND ALL SUBCONTRACTORS.



LEGEND

- | | |
|---|------------------------|
|  | PROPERTY LINE |
|  | EXISTING MAJOR CONTOUR |
|  | EXISTING MINOR CONTOUR |
|  | PROPOSED MAJOR CONTOUR |
|  | PROPOSED MINOR CONTOUR |
|  | PROPOSED FIRE LANE |
-
- | | |
|---|------------|
|  | STOCKPILE |
|  | WATER WELL |
-
- | | |
|---|-----------------------------|
|  | CONCRETE AREA |
|  | BASE AREA |
|  | GRASS BODY AREA |
|  | GRASS/VEGETATED BUFFER AREA |
|  | ROCK GABION |

NOTE* - NO SENSITIVE FEATURES WERE IDENTIFIED ON SITE

POND A STAGE STORAGE TABLE						
ELEV	AREA (sq. ft.)	DEPT H (ft)	AVG END INC. VOL. (cu. ft.)	AVG END TOTAL VOL. (cu. ft.)	CONIC INC. VOL. (cu. ft.)	CONIC TOTAL VOL. (cu. ft.)
757.00	9,147.22	N/A	N/A	0.00	N/A	0.00
758.00	10,251.65	1.00	9699.43	9699.43	9694.19	9694.19
759.00	11,411.34	1.00	10831.49	20530.92	10826.32	20520.50
760.00	12,628.91	1.00	12020.13	32551.05	12014.98	32535.49
761.00	13,904.37	1.00	13266.64	45817.69	13261.53	45797.01
762.00	18,588.55	1.00	16246.46	62064.15	16189.89	61986.90
763.00	20,203.74	1.00	19396.14	81460.29	19390.54	81377.44
764.00	21,870.53	1.00	21037.14	102497.43	21031.63	102409.07

POND B STAGE STORAGE TABLE						
ELEV	AREA (sq. ft.)	DEPT H (ft)	AVG END INC. VOL. (cu. ft.)	AVG END TOTAL VOL. (cu. ft.)	CONIC INC. VOL. (cu. ft.)	CONIC TOTAL VOL. (cu. ft.)
759.00	7,037.20	N/A	N/A	0.00	N/A	0.00
760.00	7,660.49	1.00	7348.84	7348.84	7346.64	7346.64
761.00	2,602.84	1.00	5131.67	12480.51	4909.55	12256.19
762.00	2,909.87	1.00	4154.23	16634.74	4090.65	16346.84
763.00	5,565.91	1.00	5524.32	22159.07	5524.27	21871.11
764.00	1,314.43	1.00	2288.92	24447.98	2216.32	24087.43


IMAGE:	
ISSUE DATE:	01/04/2024
DRAWN BY:	MRM
CHECKED BY:	MRM
SCALE: 1" =	50'
JOB NO.:	11491-002

SHEET NO.:
1
OF 3

 **WESTWARD**
Environmental. Engineering. Natural Resources.
P.O. Box 2205 Boerne, Texas 78006
(830) 249-8284 Fax: (830) 249-0221
TBE REG. NO.: F-4524
TBE REG. NO.: 50112

[illegible]

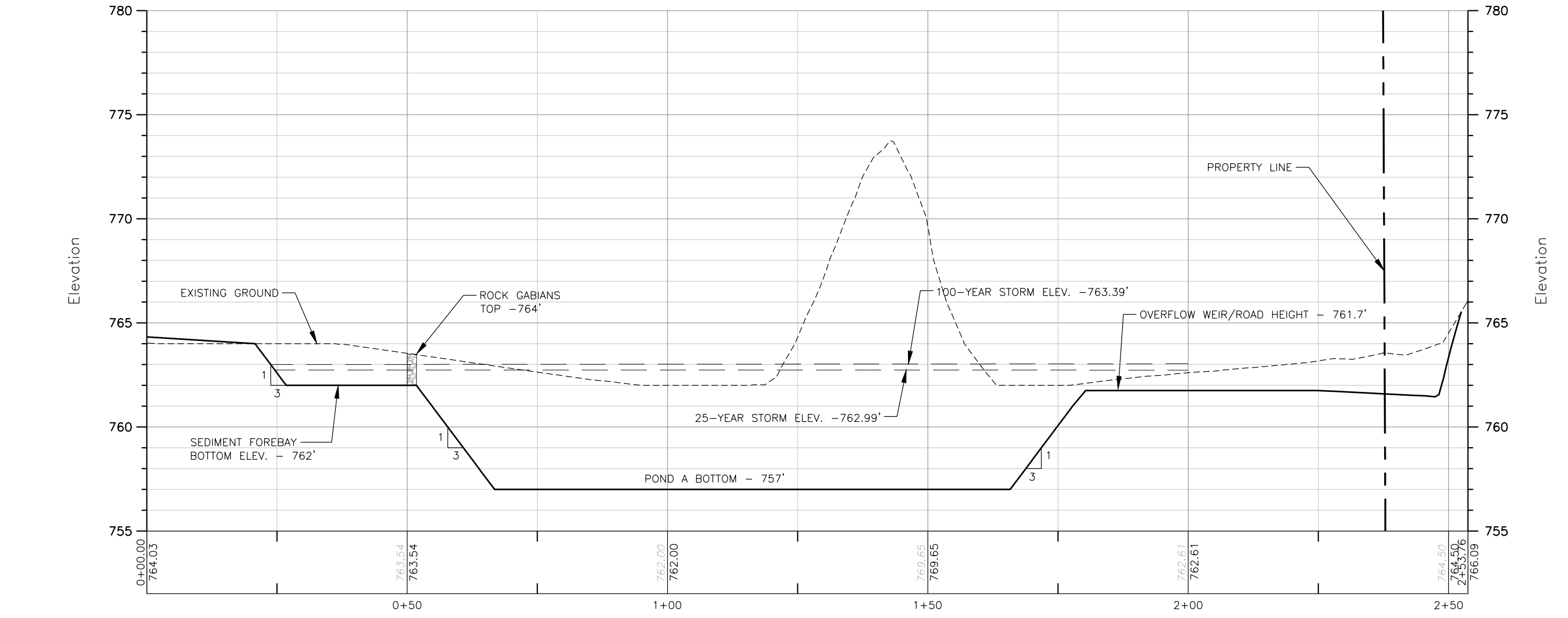
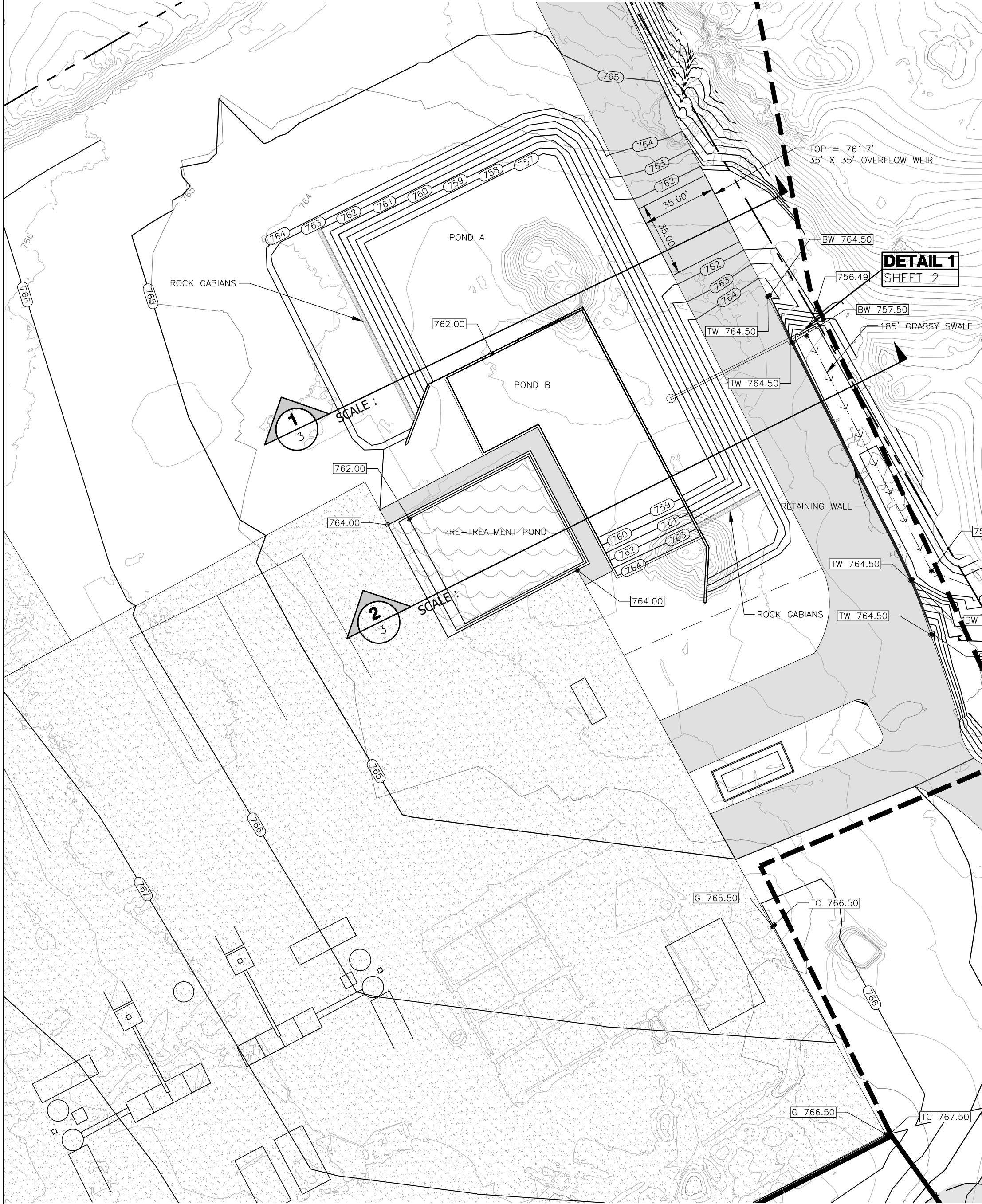
3/16/2024



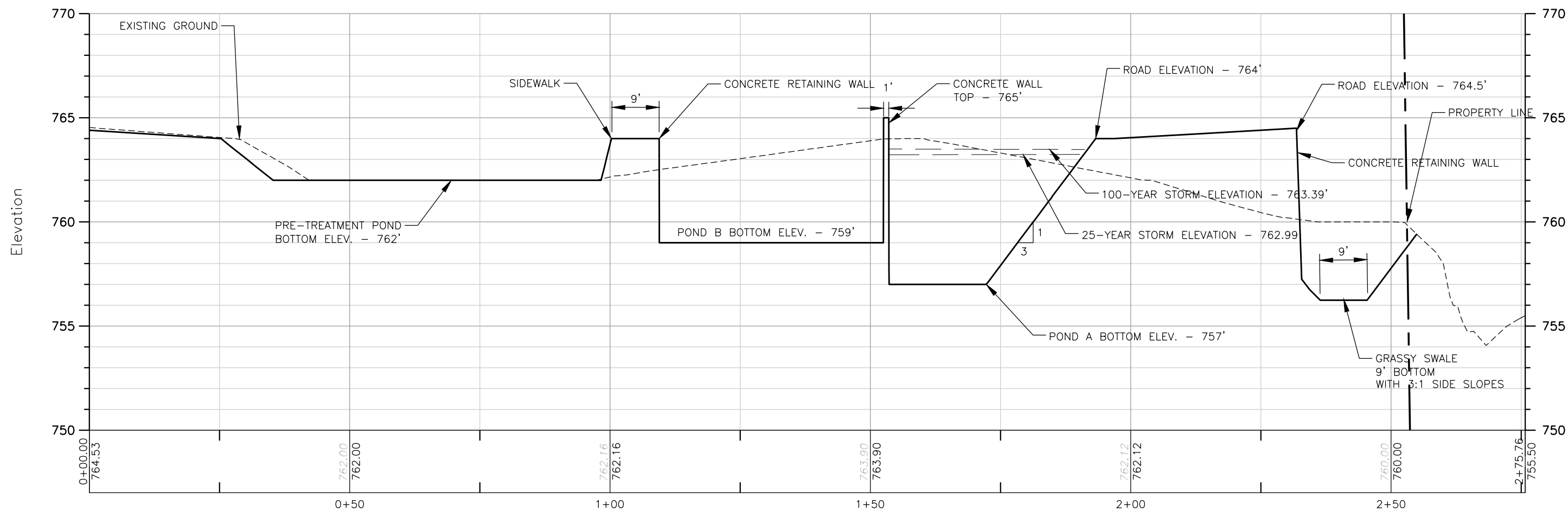
Vance Houy, P.E.
License No. 107401

Vance Houy

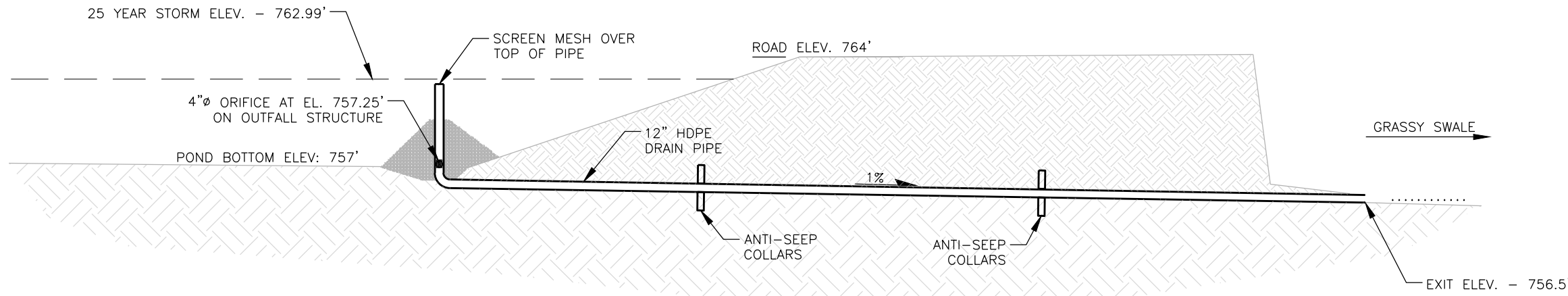
PROPOSED SITE MAP
GUADALUPE READY MIX AST & WPAP
GUADALUPE READY MIX
10 FM 2252, SCHERTZ, TX, 78056



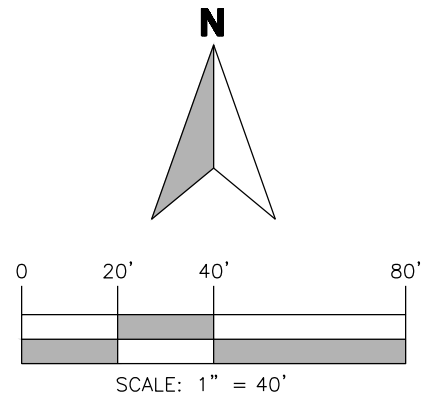
1 **SECTION 1**
SCALE: VERT 1" = 5' - HORZ 1" = 20'



2 **SECTION 2**
SCALE: VERT 1" = 5' - HORZ 1" = 20'



1 **DETAIL 1**
SCALE: NTS



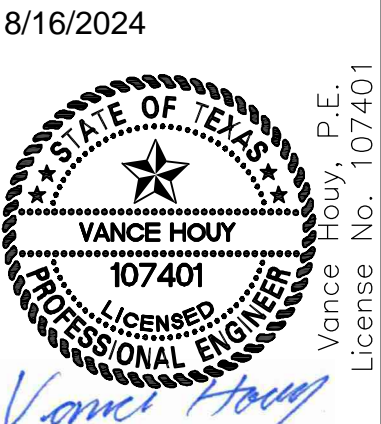
- LEGEND**
- PROPERTY LINE
 - - - EXISTING MAJOR CONTOUR
 - - - EXISTING MINOR CONTOUR
 - - - PROPOSED MAJOR CONTOUR
 - - - PROPOSED MINOR CONTOUR
 - - - PROPOSED FIRE LANE
- PROPOSED**
- ROCK GABIONS
 - ASPHALT AREA
 - BASE AREA
- EXISTING**
- WATER BODY AREA
 - GRASS/VEGETATED BUFFER AREA

IMAGE:	
ISSUE DATE:	07/02/2024
DRAWN BY:	MRM
CHECKED BY:	VH
SCALE: 1" = 40'	
JOB NO.:	11491-002

SHEET NO.:	3
OF 3	

WESTWARD
Environmental Engineering, Natural Resources,
P.O. Box 2205 Boerne, Texas 78006
(830) 249-8284 Fax: (830) 249-0221
TBP REG. NO.: F-4524
TBP REG. NO.: 50112

REV.	DESCRIPTION	BY	DATE



POND DETAILS SHEET
GUADALUPE READY MIX WPAP & AST
GUADALUPE READY MIX
10 FM 2252, SCHERTZ, TX, 78056



Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Additional information is provided for cells with a red triangle in the upper right corner
 Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG
 Characters shown in red are data entry fields.

Characters shown in black (Bold) are calculated fields. Changes to these fields will

1. The Required Load Reduction for the total project:

Calculations from RG-348

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:

$L_{M \text{ TOTAL PROJECT}}$ = Required TSS removal result

A_N = Net increase in impervious area

P = Average annual precipitation

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Comal	
Total project area included in plan *	13.70	acres
Predevelopment impervious area within the limits of the plan *	0.00	acres
Total post-development impervious area within the limits of the plan *	6.26	acres
Total post-development impervious cover fraction *	0.46	
P =	33	inches

$L_{M \text{ TOTAL PROJECT}}$ = 5619 lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 3

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. =	1	
Total drainage basin/outfall area =	8.29	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	4.80	acres
Post-development impervious fraction within drainage basin/outfall area =	0.58	
$L_{M \text{ THIS BASIN}}$ =	4308	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Extended Detention
 Removal efficiency = 75 percent
 Proposed BMP = Grassy Swale

Removal efficiency = **70** percent
Proposed BMP = **None**
Removal efficiency = **0** percent

Etot = 83.75

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times C)$

where:

A_C = Total On-Site drainage area
 A_I = Impervious area proposed in
 A_P = Pervious area remaining in th
 L_R = TSS Load removed from this

A_C = **8.29** acres
 A_I = **4.80** acres
 A_P = **3.49** acres
 L_R = **4642** lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M \text{ THIS BASIN}}$ = **4578** lbs.

F = **0.99**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area.

Rainfall Depth = **3.66** inches
Post Development Runoff Coefficient = **0.41**
On-site Water Quality Volume = **44674** cubic feet

Calculations from RG-348

Off-site area draining to BMP = **12.00** acres
Off-site Impervious cover draining to BMP = **0.00** acres
Impervious fraction of off-site area = **0.00**
Off-site Runoff Coefficient = **0.02**

Off-site Water Quality Volume = **3189** cubic feet

Storage for Sediment = **9572**

Total Capture Volume (required water quality volume(s) x 1.20) = 57435 cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMF
The values for BMP Types not selected in cell C45 will show NA.

7. Retention/Irrigation System

Designed as Required in RG

Required Water Quality Volume for retention basin = **NA** cubic feet

Irrigation Area Calculations:

Soil infiltration/permeability rate = **0.1** in/hr
Irrigation area = **NA** square feet
NA acres

8. Extended Detention Basin System

Designed as Required in RG

Required Water Quality Volume for extended detention basin = **57435** cubic feet

9. Filter area for Sand Filters

Designed as Required in RG

9A. Full Sedimentation and Filtration System

Water Quality Volume for sedimentation basin = **NA** cubic feet

Minimum filter basin area = **NA** square feet

Maximum sedimentation basin area = **NA** square feet

Minimum sedimentation basin area = **NA** square feet

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins = **NA** cubic feet

Minimum filter basin area = **NA** square feet

Maximum sedimentation basin area = **NA** square feet

Minimum sedimentation basin area = **NA** square feet

10. Bioretention System

Designed as Required in RG

Required Water Quality Volume for Bioretention Basin = **NA** cubic feet

11. Wet Basins

Designed as Required in RG

Required capacity of Permanent Pool = **NA** cubic feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009



Additional information is provided for cells with a red triangle in the upper right corner
 Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG
 Characters shown in red are data entry fields.

Characters shown in black (Bold) are calculated fields. Changes to these fields will

1. The Required Load Reduction for the total project:

Calculations from RG-348

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:

 $L_{M \text{ TOTAL PROJECT}}$ = Required TSS removal result A_N = Net increase in impervious area

P = Average annual precipitation

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Comal	
Total project area included in plan *	13.70	acres
Predevelopment impervious area within the limits of the plan *	0.00	acres
Total post-development impervious area within the limits of the plan *	6.26	acres
Total post-development impervious cover fraction *	0.46	
P =	33	inches

 $L_{M \text{ TOTAL PROJECT}}$ = **5619** lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = **3**2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. =	2	
Total drainage basin/outfall area =	3.37	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	1.16	acres
Post-development impervious fraction within drainage basin/outfall area =	0.34	
$L_{M \text{ THIS BASIN}}$ =	1041	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Vegetated Filter Strips**
 Removal efficiency = **80** percent
 Proposed BMP = **None**

Removal efficiency = 0 percent
Proposed BMP = None
Removal efficiency = 0 percent

Etot = 80

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times C)$

where:

A_C = Total On-Site drainage area
 A_I = Impervious area proposed in
 A_P = Pervious area remaining in th
 L_R = TSS Load removed from this

A_C = 3.37 acres
 A_I = 1.16 acres
 A_P = 2.21 acres
 L_R = 1091 lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M \text{ THIS BASIN}}$ = 1091 lbs.

F = 1.00

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area.

Rainfall Depth = 4.00 inches
Post Development Runoff Coefficient = 0.28
On-site Water Quality Volume = 13707 cubic feet

Calculations from RG-348

Off-site area draining to BMP = 0.00 acres
Off-site Impervious cover draining to BMP = 0.00 acres
Impervious fraction of off-site area = 0
Off-site Runoff Coefficient = 0.00



TCEQ Use Only

TCEQ Core Data Form

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission (If other is checked please describe in space provided.) <input checked="" type="checkbox"/> New Permit, Registration or Authorization (Core Data Form should be submitted with the program application.) <input type="checkbox"/> Renewal (Core Data Form should be submitted with the renewal form) <input type="checkbox"/> Other	
2. Customer Reference Number (if issued) CN 605932839	Follow this link to search for CN or RN numbers in Central Registry** 3. Regulated Entity Reference Number (if issued) RN 111984811

SECTION II: Customer Information

4. General Customer Information		5. Effective Date for Customer Information Updates (mm/dd/yyyy)	
<input type="checkbox"/> New Customer <input checked="" type="checkbox"/> Update to Customer Information <input type="checkbox"/> Change in Regulated Entity Ownership <input type="checkbox"/> Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)			
The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).			
6. Customer Legal Name (If an individual, print last name first: eg: Doe, John) Guadalupe Readymix, LLC		If new Customer, enter previous Customer below:	
7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number (if applicable)
11. Type of Customer: <input checked="" type="checkbox"/> Corporation <input type="checkbox"/> Individual Partnership: <input type="checkbox"/> General <input type="checkbox"/> Limited Government: <input type="checkbox"/> City <input type="checkbox"/> County <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> Other <input type="checkbox"/> Sole Proprietorship <input type="checkbox"/> Other:		13. Independently Owned and Operated? <input type="checkbox"/> Yes <input type="checkbox"/> No	
12. Number of Employees <input type="checkbox"/> 0-20 <input checked="" type="checkbox"/> 21-100 <input type="checkbox"/> 101-250 <input type="checkbox"/> 251-500 <input type="checkbox"/> 501 and higher		14. Customer Role (Proposed or Actual) – as it relates to the Regulated Entity listed on this form. Please check one of the following <input type="checkbox"/> Owner <input type="checkbox"/> Operator <input checked="" type="checkbox"/> Owner & Operator <input type="checkbox"/> Occupational Licensee <input type="checkbox"/> Responsible Party <input type="checkbox"/> Voluntary Cleanup Applicant <input type="checkbox"/> Other:	
15. Mailing Address: 6600 Hwy 27 City: Comfort State: TX ZIP: 78013 ZIP + 4: 16. Country Mailing Information (if outside USA)		17. E-Mail Address (if applicable) jeff.shea@j3co.com	
18. Telephone Number (210) 606-4236		19. Extension or Code 20. Fax Number (if applicable) () -	

SECTION III: Regulated Entity Information

21. General Regulated Entity Information (If "New Regulated Entity" is selected below this form should be accompanied by a permit application) <input checked="" type="checkbox"/> New Regulated Entity <input type="checkbox"/> Update to Regulated Entity Name <input type="checkbox"/> Update to Regulated Entity Information The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC).
22. Regulated Entity Name (Enter name of the site where the regulated action is taking place.) Garden Ridge 2

23. Street Address of the Regulated Entity: (No PO Boxes)	10 FM 2252							
	City	Schertz	State	TX	ZIP	78056	ZIP + 4	
24. County	Comal County							

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	From I-35 head 1.78 miles north west on FM 3009; From FM 3009, head 1.79 miles on FM 2252 and site is on your left							
26. Nearest City	Schertz				State	TX	Nearest ZIP Code	
								78056
27. Latitude (N) In Decimal:	29.635258			28. Longitude (W) In Decimal:	98.265028			
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds			
29	38'	6.93"	98	15'	54.10"			
29. Primary SIC Code (4 digits)	30. Secondary SIC Code (4 digits)		31. Primary NAICS Code (5 or 6 digits)		32. Secondary NAICS Code (5 or 6 digits)			
3273			327320					
33. What is the Primary Business of this entity? (Do not repeat the SIC or NAICS description.)								
34. Mailing Address:								
	City		State		ZIP		ZIP + 4	
35. E-Mail Address:								
36. Telephone Number			37. Extension or Code		38. Fax Number (if applicable)			
() -					() -			

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.


<input type="checkbox"/> Dam Safety	<input type="checkbox"/> Districts	<input checked="" type="checkbox"/> Edwards Aquifer	<input type="checkbox"/> Emissions Inventory Air	<input type="checkbox"/> Industrial Hazardous Waste
<input type="checkbox"/> Municipal Solid Waste	<input type="checkbox"/> New Source Review Air	<input type="checkbox"/> OSSF	<input type="checkbox"/> Petroleum Storage Tank	<input type="checkbox"/> PWS
<input type="checkbox"/> Sludge	<input type="checkbox"/> Storm Water	<input type="checkbox"/> Title V Air	<input type="checkbox"/> Tires	<input type="checkbox"/> Used Oil
<input type="checkbox"/> Voluntary Cleanup	<input type="checkbox"/> Waste Water	<input type="checkbox"/> Wastewater Agriculture	<input type="checkbox"/> Water Rights	<input type="checkbox"/> Other:

SECTION IV: Preparer Information

40. Name:	Matthew Morris		41. Title:	Staff Engineer
42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address	
(830) 249-8284		(830) 249-0221	mmorris@westwardenv.com	

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	Guadalupe Readymix, LLC	Job Title:	GENERAL MANAGER
Name (In Print):	JEFF SHEA	Phone:	(210) 606-4236
Signature:		Date:	1-31-24

Agent Authorization Form
For Required Signature
Edwards Aquifer Protection Program
Relating to 30 TAC Chapter 213
Effective June 1, 1999

I _____ Jeff Shea
Print Name

Title - Owner/President/Other

of Guadalupe Readymix, LLC
Corporation/Partnership/Entity Name

have authorized Curt Campbell, PE; Gary Nicholls, PE; Andrea Kidd, PE; Vance Houy, PE; Chelsey Houy, PE
Print Name of Agent/Engineer

of Westward Environmental, Inc.
Print Name of Firm

to represent and act on the behalf of the above named Corporation, Partnership, or Entity for the purpose of preparing and submitting this plan application to the Texas Commission on Environmental Quality (TCEQ) for the review and approval consideration of regulated activities.

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to \$10,000 per day per violation.
2. For those submitting an application who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.
3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.
4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.
5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

SIGNATURE PAGE:

Jeff Shea
Applicant's Signature

1-31-24
Date

THE STATE OF Texas §
County of herv §

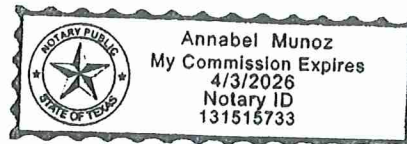
BEFORE ME, the undersigned authority, on this day personally appeared Jeff Shea known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 31st day of Jan, 24.

Annabel Munoz
NOTARY PUBLIC

Annabel Munoz
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 04/03/26



Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: Garden Ridge 2.

Regulated Entity Location: Comal County, Texas

Name of Customer: Guadalupe Readymix, LLC

Contact Person: Jeff Shea

Phone: 210-606-4236

Customer Reference Number (if issued): CN 605932839

Regulated Entity Reference Number (if issued): RN New

Austin Regional Office (3373)

☐ Hays

☐ Travis

☐ Williamson

San Antonio Regional Office (3362)

☐ Bexar

☐ Medina

☐ Uvalde

☒ Comal

☐ Kinney

Application fees must be paid by check, certified check, or money order, payable to the **Texas Commission on Environmental Quality**. Your canceled check will serve as your receipt. **This form must be submitted with your fee payment.** This payment is being submitted to:

☐ Austin Regional Office

☒ San Antonio Regional Office

☐ Mailed to: TCEQ - Cashier

☐ Overnight Delivery to: TCEQ - Cashier

Revenues Section

12100 Park 35 Circle

Mail Code 214

Building A, 3rd Floor

P.O. Box 13088

Austin, TX 78753

Austin, TX 78711-3088

(512)239-0357

Site Location (Check All That Apply):

☒ Recharge Zone

☒ Contributing Zone

☐ Transition Zone

Type of Plan	Size	Fee Due
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	13.7 Acres	\$ 6,500
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	\$
Sewage Collection System	L.F.	\$
Lift Stations without sewer lines	Acres	\$
Underground or Aboveground Storage Tank Facility	1 Tanks	\$650
Piping System(s)(only)	Each	\$
Exception	Each	\$
Extension of Time	Each	\$

Signature: Jeff Shea

Date: 1-31-24

Application Fee Schedule

Texas Commission on Environmental Quality

Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

<i>Project</i>	<i>Project Area in Acres</i>	<i>Fee</i>
One Single Family Residential Dwelling	< 5	\$650
Multiple Single Family Residential and Parks	< 5	\$1,500
	5 < 10	\$3,000
	10 < 40	\$4,000
	40 < 100	\$6,500
	100 < 500	\$8,000
	≥ 500	\$10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1	\$3,000
	1 < 5	\$4,000
	5 < 10	\$5,000
	10 < 40	\$6,500
	40 < 100	\$8,000
	≥ 100	\$10,000

Organized Sewage Collection Systems and Modifications

<i>Project</i>	<i>Cost per Linear Foot</i>	<i>Minimum Fee- Maximum Fee</i>
Sewage Collection Systems	\$0.50	\$650 - \$6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

<i>Project</i>	<i>Cost per Tank or Piping System</i>	<i>Minimum Fee- Maximum Fee</i>
Underground and Aboveground Storage Tank Facility	\$650	\$650 - \$6,500

Exception Requests

<i>Project</i>	<i>Fee</i>
Exception Request	\$500

Extension of Time Requests

<i>Project</i>	<i>Fee</i>
Extension of Time Request	\$150

Owner Authorization Form

Texas Commission on Environmental Quality
for Required Signature
Edwards Aquifer Protection Program
Relating to 30 TAC Chapter 213
Effective June 1, 1999

Land Owner Authorization

I, Timothy L Braden, CFO

Weston Company LLC

Land Owner Signatory Name

Land Owner Name (Legal Entity or Individual)

am the owner of the property located at

Property ID: 74530

Legal description of the property referenced in the application

and am duly authorized in accordance with §213.4(c)(2) and §213.4(d)(1) or §213.23(c)(2) and §213.23(d) relating to the right to submit an application, signatory authority, and proof of authorized signatory.

I do hereby authorize Guadalupe Readymix, LLC

Applicant Name (Legal Entity or Individual)

to conduct Concrete Batch Plant Operations

Description of the proposed regulated activities

29.635397, -98.265047

Precise location of the authorized regulated activities

Land Owner Acknowledgement

I understand that Weston Company LLC

Land Owner Name (Legal Entity or Individual)

Is ultimately responsible for compliance with the approved or conditionally approved Edwards Aquifer protection plan and any special conditions of the approved plan through all phases of plan implementation even if the responsibility for compliance and the right to possess and control the property referenced in the application has been contractually assumed by another legal entity. I further understand that any failure to comply with any condition of the executive director's approval is a violation is subject to administrative rule or orders and penalties as provided under §213.10 (relating to Enforcement). Such violation may also be subject to civil penalties and injunction.

Land Owner Signature

[Signature]

Land Owner Signature

9-5-24

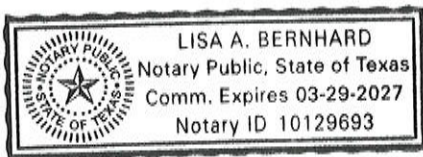
Date

THE STATE OF § TEXAS

County of § KERR

BEFORE ME, the undersigned authority, on this day personally appeared Timothy L Braden known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 5th day of September 2024



[Signature]

NOTARY PUBLIC

Lisa A Bernhard

Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 03-29-2027

Attached: (Mark all that apply)

- ☐ Lease Agreement
- ☐ Signed Contract
- ☐ Deed Recorded Easement
- ☐ Other legally binding document

Applicant Acknowledgement

I, Timothy L Braden, CFO
_____ of _____

Guadalupe Readymix, LLC

Applicant Signatory Name
acknowledge that Weston Company LLC

Applicant Name (Legal Entity or Individual)

_____ Land Owner Name (Legal Entity or Individual)

has provided Guadalupe Readymix, LLC

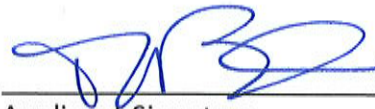
_____ Applicant Name (Legal Entity or Individual)

with the right to possess and control the property referenced in the Edwards Aquifer protection plan.
I understand that Guadalupe Readymix, LLC

_____ Applicant Name (Legal Entity or Individual)

is contractually responsible for compliance with the approved or conditionally approved Edwards Aquifer protection plan and any special conditions of the approved plan through all phases of plan implementation. I further understand that failure to comply with any condition of the executive director's approval is a violation is subject to administrative rule or orders and penalties as provided under §213.10 (relating to Enforcement). Such violation may also be subject to civil penalties and injunction.

Applicant Signature



Applicant Signature

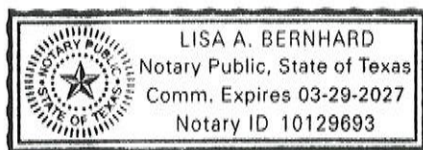
9-5-24
Date

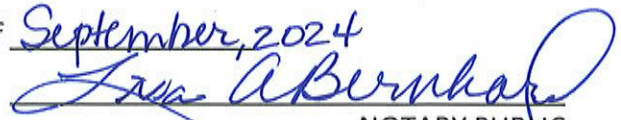
THE STATE OF § TEXAS

County of § KERR

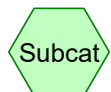
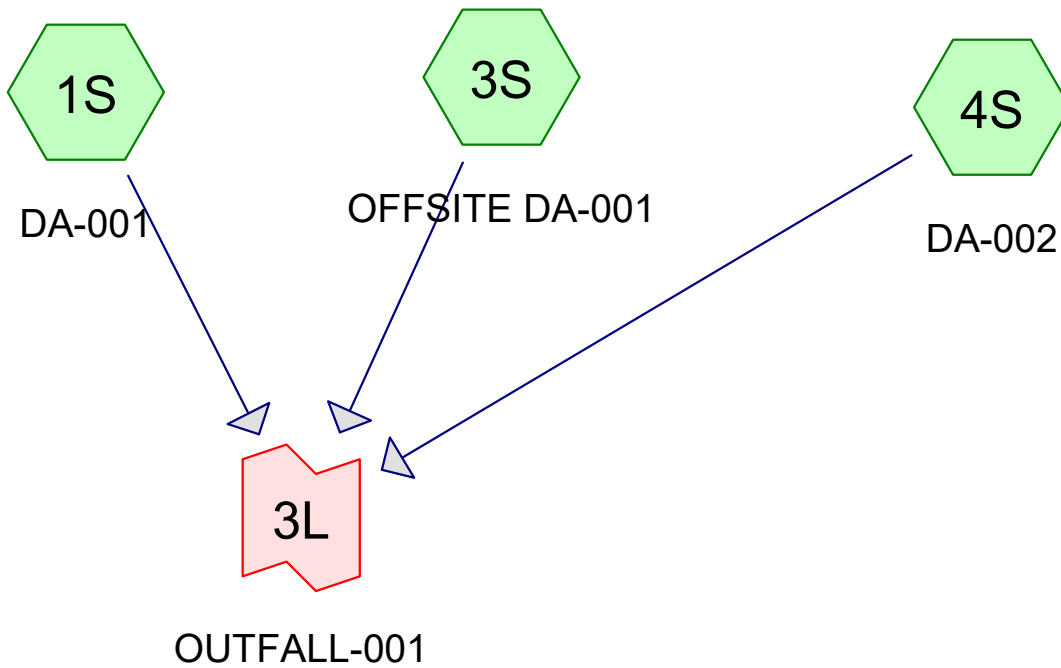
BEFORE ME, the undersigned authority, on this day personally appeared Timothy L. Braden known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 5th day of September, 2024




NOTARY PUBLIC
Lisa A. Bernhard
Typed or Printed Name of Notary

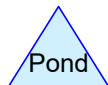
MY COMMISSION EXPIRES: 03-29-2027



Subcat



Reach



Pond



Link

Routing Diagram for 11491.002-Pre Development

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11491.002-Pre Development

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
25.118	84	50-75% Grass cover, Fair, HSG D (1S, 3S, 4S)
25.118	84	TOTAL AREA

11491.002-Pre Development

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Page 3

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
25.118	HSG D	1S, 3S, 4S
0.000	Other	
25.118		TOTAL AREA

11491.002-Pre Development

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	25.118	0.000	25.118	50-75% Grass cover, Fair	1S, 3S, 4S
0.000	0.000	0.000	25.118	0.000	25.118	TOTAL AREA	

11491.002-Pre Development

Type II 24-hr 25 YR Rainfall=8.54"

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

Subcatchment 1S: DA-001

Runoff Area=8.290 ac 0.00% Impervious Runoff Depth>6.19"
Flow Length=570' Tc=14.3 min CN=84 Runoff=69.17 cfs 4.277 af

Subcatchment 3S: OFFSITE DA-001

Runoff Area=12.000 ac 0.00% Impervious Runoff Depth>6.18"
Flow Length=1,200' Slope=0.0100 '/' Tc=21.7 min CN=84 Runoff=81.38 cfs 6.180 af

Subcatchment 4S: DA-002

Runoff Area=4.828 ac 0.00% Impervious Runoff Depth>6.19"
Flow Length=635' Tc=13.5 min CN=84 Runoff=41.29 cfs 2.491 af

Link 3L: OUTFALL-001

Inflow=183.11 cfs 12.948 af
Primary=183.11 cfs 12.948 af

Total Runoff Area = 25.118 ac Runoff Volume = 12.948 af Average Runoff Depth = 6.19"
100.00% Pervious = 25.118 ac 0.00% Impervious = 0.000 ac

11491.002-Pre Development

Type II 24-hr 25 YR Rainfall=8.54"

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Summary for Subcatchment 1S: DA-001

Runoff = 69.17 cfs @ 12.06 hrs, Volume= 4.277 af, Depth> 6.19"

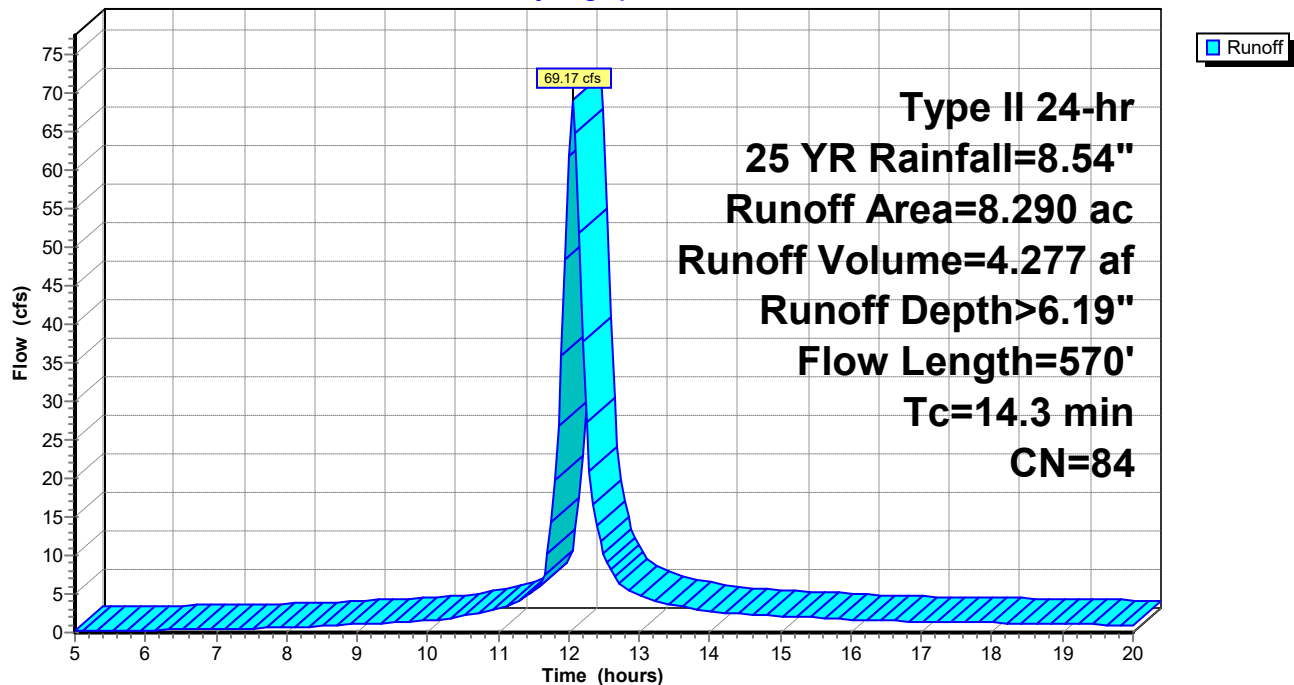
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YR Rainfall=8.54"

Area (ac)	CN	Description
8.290	84	50-75% Grass cover, Fair, HSG D
8.290		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	470	0.0130	1.84		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.0	100	0.0110	0.17		Sheet Flow, SHEET Range n= 0.130 P2= 3.98"
14.3	570	Total			

Subcatchment 1S: DA-001

Hydrograph



11491.002-Pre Development

Type II 24-hr 25 YR Rainfall=8.54"

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Hydrograph for Subcatchment 1S: DA-001

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.54	0.01	0.13	18.00	7.87	5.97	1.27
5.25	0.57	0.02	0.17	18.25	7.90	6.00	1.23
5.50	0.61	0.02	0.21	18.50	7.94	6.04	1.18
5.75	0.65	0.03	0.25	18.75	7.97	6.07	1.14
6.00	0.68	0.04	0.29	19.00	8.01	6.10	1.10
6.25	0.72	0.05	0.33	19.25	8.04	6.13	1.06
6.50	0.76	0.06	0.38	19.50	8.07	6.16	1.01
6.75	0.80	0.08	0.42	19.75	8.10	6.19	0.97
7.00	0.85	0.09	0.46	20.00	8.13	6.22	0.93
7.25	0.89	0.11	0.51				
7.50	0.93	0.12	0.56				
7.75	0.98	0.14	0.60				
8.00	1.02	0.16	0.65				
8.25	1.07	0.19	0.71				
8.50	1.13	0.21	0.82				
8.75	1.19	0.24	0.95				
9.00	1.26	0.28	1.09				
9.25	1.32	0.31	1.21				
9.50	1.39	0.35	1.27				
9.75	1.46	0.39	1.35				
10.00	1.55	0.44	1.55				
10.25	1.64	0.50	1.81				
10.50	1.74	0.57	2.13				
10.75	1.86	0.65	2.54				
11.00	2.01	0.75	3.10				
11.25	2.19	0.88	3.89				
11.50	2.42	1.05	5.23				
11.75	3.30	1.77	14.40				
12.00	5.66	3.88	61.69				
12.25	6.03	4.22	27.37				
12.50	6.28	4.46	10.29				
12.75	6.45	4.62	6.10				
13.00	6.59	4.75	4.90				
13.25	6.72	4.87	4.11				
13.50	6.82	4.97	3.60				
13.75	6.92	5.06	3.16				
14.00	7.00	5.14	2.81				
14.25	7.08	5.22	2.52				
14.50	7.15	5.29	2.38				
14.75	7.22	5.35	2.26				
15.00	7.29	5.41	2.15				
15.25	7.35	5.47	2.03				
15.50	7.41	5.53	1.91				
15.75	7.46	5.58	1.79				
16.00	7.52	5.63	1.67				
16.25	7.56	5.68	1.57				
16.50	7.61	5.72	1.52				
16.75	7.66	5.77	1.48				
17.00	7.70	5.81	1.44				
17.25	7.74	5.85	1.40				
17.50	7.79	5.89	1.35				
17.75	7.83	5.93	1.31				

11491.002-Pre Development

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Type II 24-hr 25 YR Rainfall=8.54"

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Summary for Subcatchment 3S: OFFSITE DA-001

Runoff = 81.38 cfs @ 12.14 hrs, Volume= 6.180 af, Depth> 6.18"

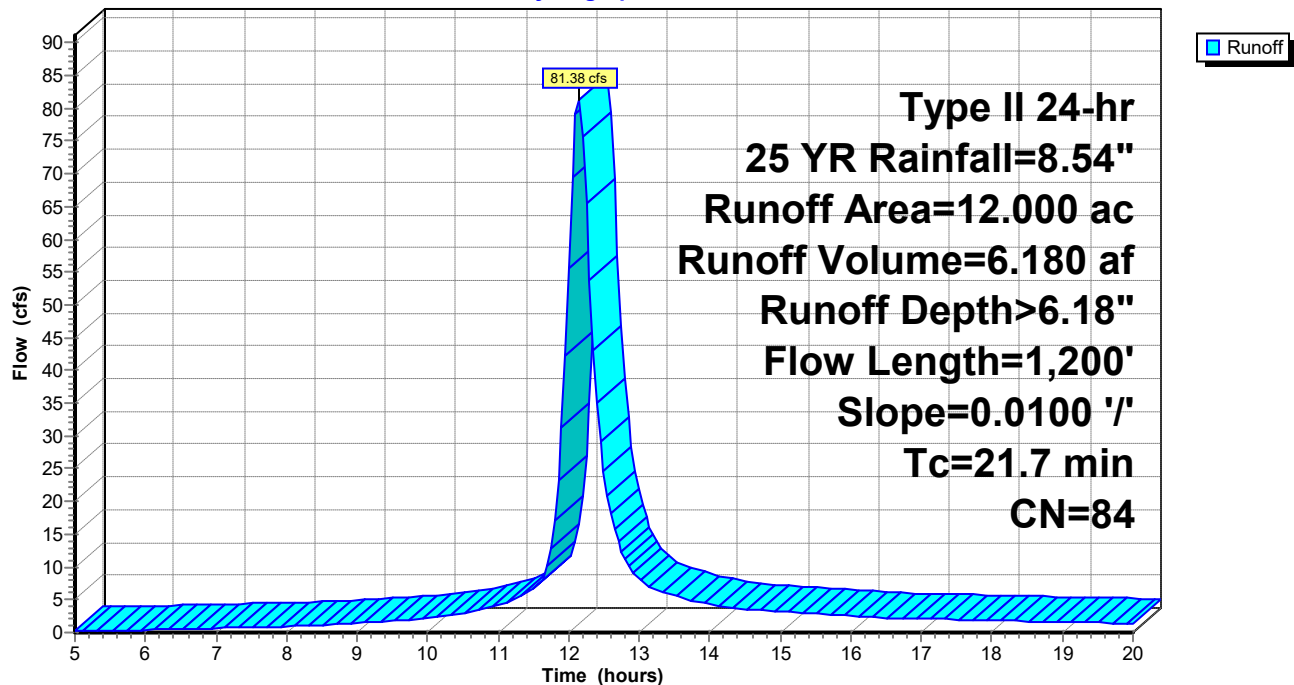
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YR Rainfall=8.54"

Area (ac)	CN	Description
12.000	84	50-75% Grass cover, Fair, HSG D
12.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0100	0.16		Sheet Flow, Range n= 0.130 P2= 3.98"
11.4	1,100	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
21.7	1,200	Total			

Subcatchment 3S: OFFSITE DA-001

Hydrograph



11491.002-Pre Development

Type II 24-hr 25 YR Rainfall=8.54"

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Hydrograph for Subcatchment 3S: OFFSITE DA-001

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.54	0.01	0.17	18.00	7.87	5.97	1.87
5.25	0.57	0.02	0.22	18.25	7.90	6.00	1.80
5.50	0.61	0.02	0.28	18.50	7.94	6.04	1.74
5.75	0.65	0.03	0.34	18.75	7.97	6.07	1.68
6.00	0.68	0.04	0.39	19.00	8.01	6.10	1.62
6.25	0.72	0.05	0.45	19.25	8.04	6.13	1.56
6.50	0.76	0.06	0.52	19.50	8.07	6.16	1.50
6.75	0.80	0.08	0.58	19.75	8.10	6.19	1.44
7.00	0.85	0.09	0.64	20.00	8.13	6.22	1.37
7.25	0.89	0.11	0.71				
7.50	0.93	0.12	0.78				
7.75	0.98	0.14	0.84				
8.00	1.02	0.16	0.91				
8.25	1.07	0.19	0.99				
8.50	1.13	0.21	1.12				
8.75	1.19	0.24	1.29				
9.00	1.26	0.28	1.48				
9.25	1.32	0.31	1.67				
9.50	1.39	0.35	1.79				
9.75	1.46	0.39	1.89				
10.00	1.55	0.44	2.12				
10.25	1.64	0.50	2.44				
10.50	1.74	0.57	2.87				
10.75	1.86	0.65	3.40				
11.00	2.01	0.75	4.12				
11.25	2.19	0.88	5.07				
11.50	2.42	1.05	6.70				
11.75	3.30	1.77	12.87				
12.00	5.66	3.88	55.72				
12.25	6.03	4.22	65.42				
12.50	6.28	4.46	24.48				
12.75	6.45	4.62	12.32				
13.00	6.59	4.75	8.23				
13.25	6.72	4.87	6.49				
13.50	6.82	4.97	5.56				
13.75	6.92	5.06	4.86				
14.00	7.00	5.14	4.30				
14.25	7.08	5.22	3.83				
14.50	7.15	5.29	3.55				
14.75	7.22	5.35	3.36				
15.00	7.29	5.41	3.18				
15.25	7.35	5.47	3.01				
15.50	7.41	5.53	2.84				
15.75	7.46	5.58	2.67				
16.00	7.52	5.63	2.50				
16.25	7.56	5.68	2.34				
16.50	7.61	5.72	2.24				
16.75	7.66	5.77	2.17				
17.00	7.70	5.81	2.11				
17.25	7.74	5.85	2.05				
17.50	7.79	5.89	1.99				
17.75	7.83	5.93	1.93				

11491.002-Pre Development

Type II 24-hr 25 YR Rainfall=8.54"

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Summary for Subcatchment 4S: DA-002

Runoff = 41.29 cfs @ 12.05 hrs, Volume= 2.491 af, Depth> 6.19"

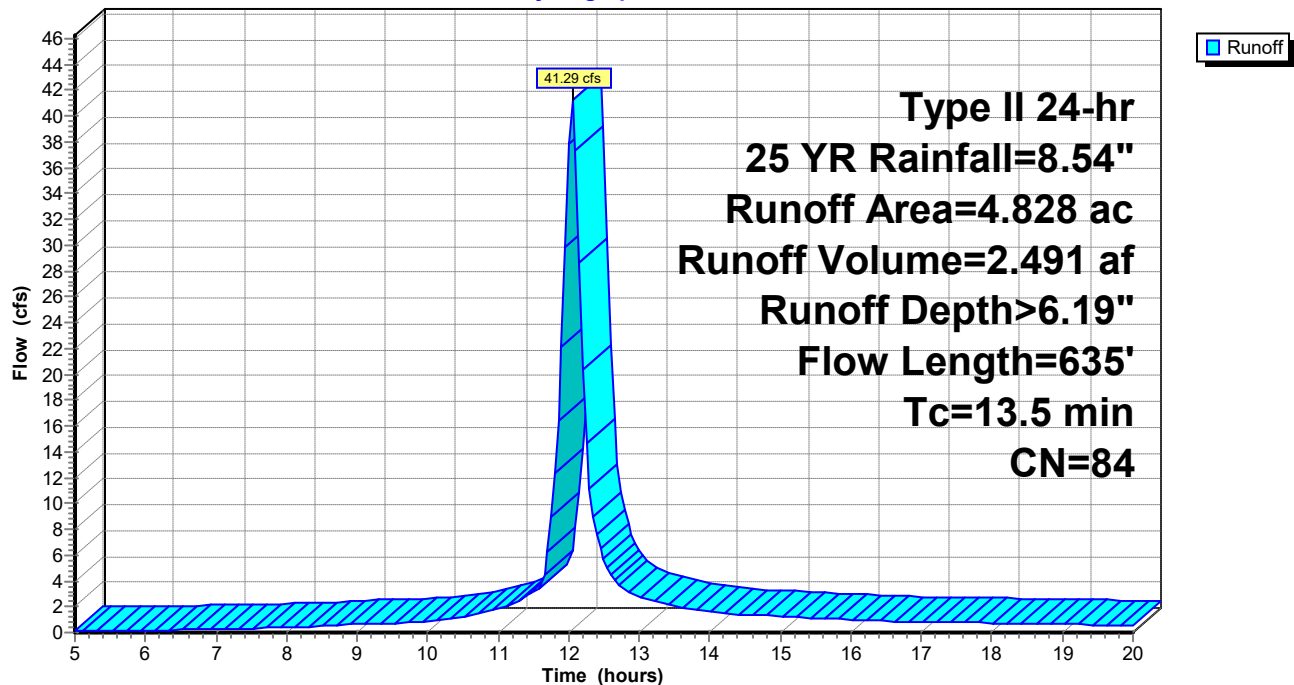
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YR Rainfall=8.54"

Area (ac)	CN	Description
4.828	84	50-75% Grass cover, Fair, HSG D
4.828		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0100	0.16		Sheet Flow, Range n= 0.130 P2= 3.98"
3.2	535	0.0300	2.79		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.5	635	Total			

Subcatchment 4S: DA-002

Hydrograph



11491.002-Pre Development

Type II 24-hr 25 YR Rainfall=8.54"

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Hydrograph for Subcatchment 4S: DA-002

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.54	0.01	0.08	18.00	7.87	5.97	0.74
5.25	0.57	0.02	0.10	18.25	7.90	6.00	0.71
5.50	0.61	0.02	0.12	18.50	7.94	6.04	0.69
5.75	0.65	0.03	0.15	18.75	7.97	6.07	0.66
6.00	0.68	0.04	0.17	19.00	8.01	6.10	0.64
6.25	0.72	0.05	0.20	19.25	8.04	6.13	0.61
6.50	0.76	0.06	0.22	19.50	8.07	6.16	0.59
6.75	0.80	0.08	0.25	19.75	8.10	6.19	0.56
7.00	0.85	0.09	0.27	20.00	8.13	6.22	0.54
7.25	0.89	0.11	0.30				
7.50	0.93	0.12	0.33				
7.75	0.98	0.14	0.35				
8.00	1.02	0.16	0.38				
8.25	1.07	0.19	0.42				
8.50	1.13	0.21	0.48				
8.75	1.19	0.24	0.56				
9.00	1.26	0.28	0.64				
9.25	1.32	0.31	0.71				
9.50	1.39	0.35	0.74				
9.75	1.46	0.39	0.79				
10.00	1.55	0.44	0.91				
10.25	1.64	0.50	1.06				
10.50	1.74	0.57	1.25				
10.75	1.86	0.65	1.49				
11.00	2.01	0.75	1.82				
11.25	2.19	0.88	2.30				
11.50	2.42	1.05	3.09				
11.75	3.30	1.77	8.94				
12.00	5.66	3.88	37.78				
12.25	6.03	4.22	14.62				
12.50	6.28	4.46	5.71				
12.75	6.45	4.62	3.48				
13.00	6.59	4.75	2.83				
13.25	6.72	4.87	2.37				
13.50	6.82	4.97	2.08				
13.75	6.92	5.06	1.83				
14.00	7.00	5.14	1.63				
14.25	7.08	5.22	1.46				
14.50	7.15	5.29	1.38				
14.75	7.22	5.35	1.31				
15.00	7.29	5.41	1.25				
15.25	7.35	5.47	1.18				
15.50	7.41	5.53	1.11				
15.75	7.46	5.58	1.04				
16.00	7.52	5.63	0.97				
16.25	7.56	5.68	0.91				
16.50	7.61	5.72	0.89				
16.75	7.66	5.77	0.86				
17.00	7.70	5.81	0.84				
17.25	7.74	5.85	0.81				
17.50	7.79	5.89	0.79				
17.75	7.83	5.93	0.76				

11491.002-Pre Development

Prepared by {enter your company name here}

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Type II 24-hr 25 YR Rainfall=8.54"

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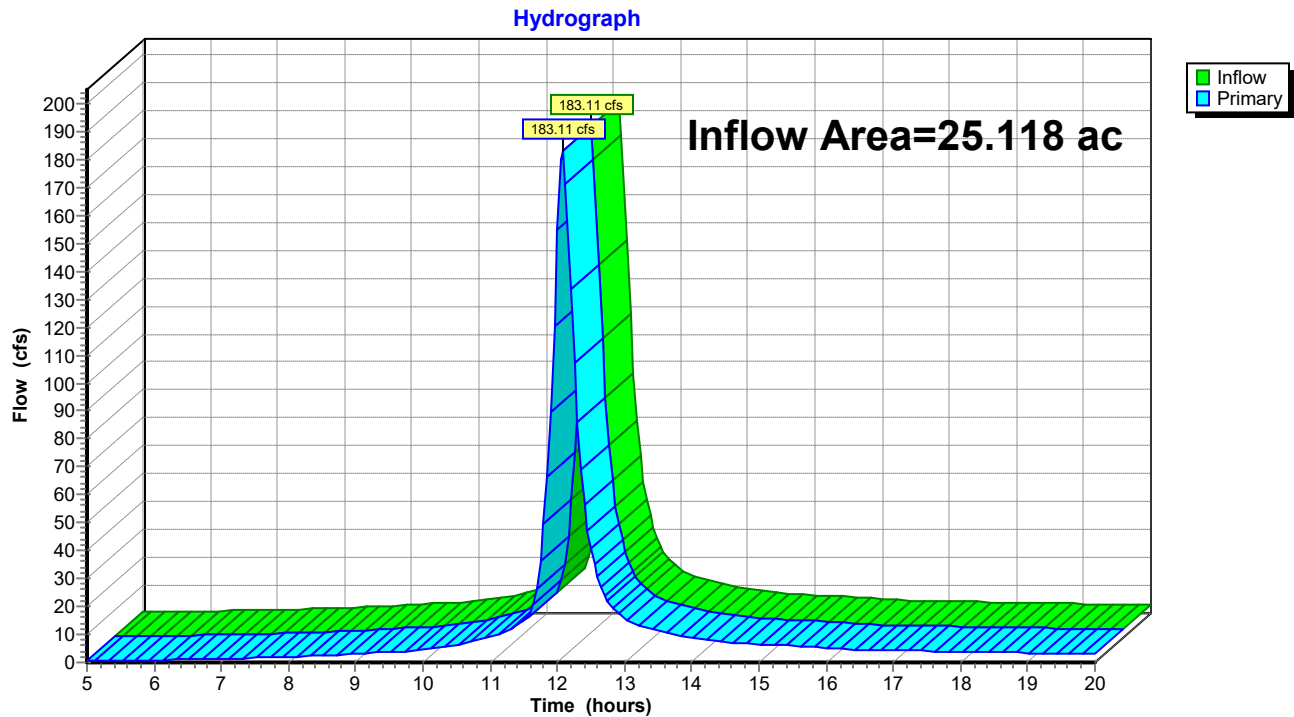
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Summary for Link 3L: OUTFALL-001

Inflow Area = 25.118 ac, 0.00% Impervious, Inflow Depth > 6.19" for 25 YR event
Inflow = 183.11 cfs @ 12.08 hrs, Volume= 12.948 af
Primary = 183.11 cfs @ 12.08 hrs, Volume= 12.948 af, Atten= 0%, Lag= 0.0 min

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

Link 3L: OUTFALL-001



11491.002-Pre Development

Type II 24-hr 25 YR Rainfall=8.54"

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Hydrograph for Link 3L: OUTFALL-001

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	0.39	0.00	0.39	18.00	3.87	0.00	3.87
5.25	0.50	0.00	0.50	18.25	3.74	0.00	3.74
5.50	0.61	0.00	0.61	18.50	3.62	0.00	3.62
5.75	0.73	0.00	0.73	18.75	3.49	0.00	3.49
6.00	0.86	0.00	0.86	19.00	3.36	0.00	3.36
6.25	0.98	0.00	0.98	19.25	3.23	0.00	3.23
6.50	1.11	0.00	1.11	19.50	3.10	0.00	3.10
6.75	1.24	0.00	1.24	19.75	2.97	0.00	2.97
7.00	1.38	0.00	1.38	20.00	2.84	0.00	2.84
7.25	1.52	0.00	1.52				
7.50	1.66	0.00	1.66				
7.75	1.80	0.00	1.80				
8.00	1.94	0.00	1.94				
8.25	2.12	0.00	2.12				
8.50	2.43	0.00	2.43				
8.75	2.80	0.00	2.80				
9.00	3.20	0.00	3.20				
9.25	3.58	0.00	3.58				
9.50	3.80	0.00	3.80				
9.75	4.04	0.00	4.04				
10.00	4.59	0.00	4.59				
10.25	5.31	0.00	5.31				
10.50	6.26	0.00	6.26				
10.75	7.43	0.00	7.43				
11.00	9.05	0.00	9.05				
11.25	11.26	0.00	11.26				
11.50	15.02	0.00	15.02				
11.75	36.21	0.00	36.21				
12.00	155.20	0.00	155.20				
12.25	107.41	0.00	107.41				
12.50	40.48	0.00	40.48				
12.75	21.91	0.00	21.91				
13.00	15.96	0.00	15.96				
13.25	12.97	0.00	12.97				
13.50	11.24	0.00	11.24				
13.75	9.84	0.00	9.84				
14.00	8.73	0.00	8.73				
14.25	7.81	0.00	7.81				
14.50	7.31	0.00	7.31				
14.75	6.93	0.00	6.93				
15.00	6.58	0.00	6.58				
15.25	6.22	0.00	6.22				
15.50	5.86	0.00	5.86				
15.75	5.50	0.00	5.50				
16.00	5.15	0.00	5.15				
16.25	4.83	0.00	4.83				
16.50	4.65	0.00	4.65				
16.75	4.51	0.00	4.51				
17.00	4.38	0.00	4.38				
17.25	4.26	0.00	4.26				
17.50	4.13	0.00	4.13				
17.75	4.00	0.00	4.00				

11491.002-Pre Development

Type II 24-hr 100 YR Rainfall=12.20"

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

Subcatchment 1S: DA-001

Runoff Area=8.290 ac 0.00% Impervious Runoff Depth>9.52"
Flow Length=570' Tc=14.3 min CN=84 Runoff=103.91 cfs 6.578 af

Subcatchment 3S: OFFSITE DA-001

Runoff Area=12.000 ac 0.00% Impervious Runoff Depth>9.51"
Flow Length=1,200' Slope=0.0100 1' Tc=21.7 min CN=84 Runoff=122.56 cfs 9.509 af

Subcatchment 4S: DA-002

Runoff Area=4.828 ac 0.00% Impervious Runoff Depth>9.52"
Flow Length=635' Tc=13.5 min CN=84 Runoff=62.00 cfs 3.832 af

Link 3L: OUTFALL-001

Inflow=275.57 cfs 19.918 af
Primary=275.57 cfs 19.918 af

Total Runoff Area = 25.118 ac Runoff Volume = 19.918 af Average Runoff Depth = 9.52"
100.00% Pervious = 25.118 ac 0.00% Impervious = 0.000 ac

11491.002-Pre Development

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Type II 24-hr 100 YR Rainfall=12.20"

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Summary for Subcatchment 1S: DA-001

Runoff = 103.91 cfs @ 12.06 hrs, Volume= 6.578 af, Depth> 9.52"

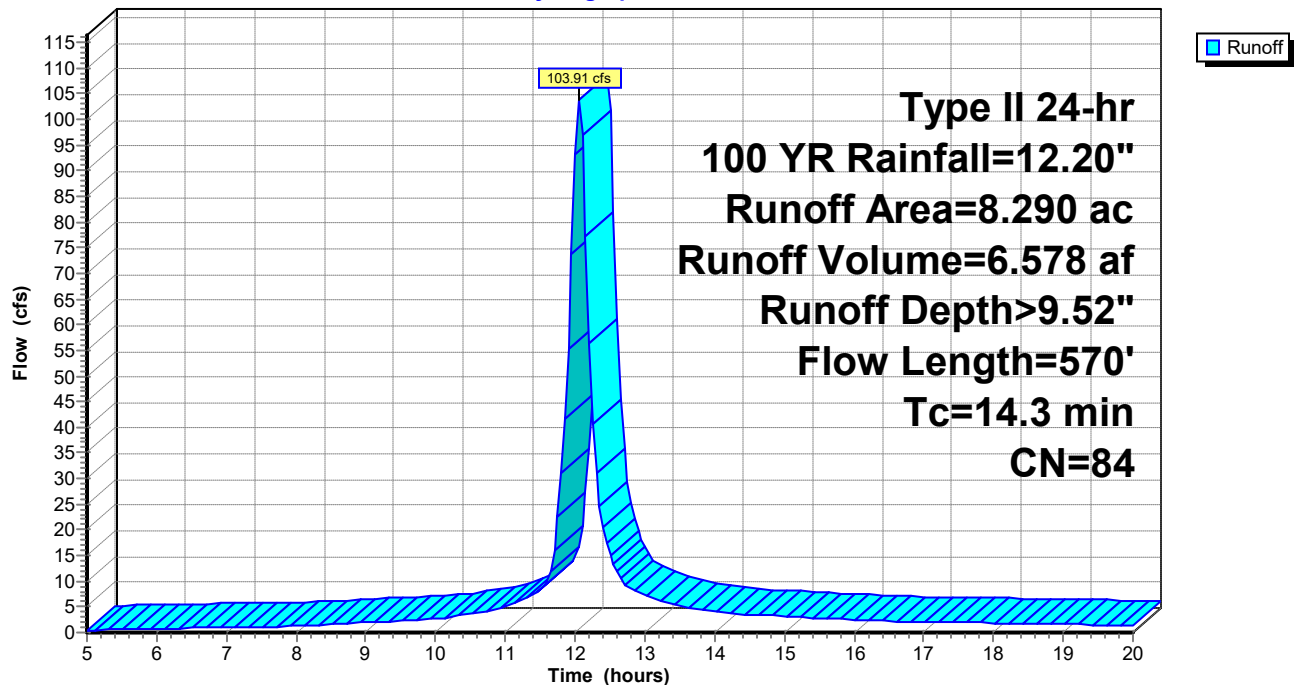
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR Rainfall=12.20"

Area (ac)	CN	Description
8.290	84	50-75% Grass cover, Fair, HSG D
8.290		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	470	0.0130	1.84		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.0	100	0.0110	0.17		Sheet Flow, SHEET Range n= 0.130 P2= 3.98"
14.3	570	Total			

Subcatchment 1S: DA-001

Hydrograph



11491.002-Pre Development

Type II 24-hr 100 YR Rainfall=12.20"

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Hydrograph for Subcatchment 1S: DA-001

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.77	0.07	0.45	18.00	11.24	9.23	1.85
5.25	0.82	0.08	0.51	18.25	11.29	9.29	1.79
5.50	0.87	0.10	0.58	18.50	11.34	9.34	1.73
5.75	0.92	0.12	0.64	18.75	11.39	9.39	1.66
6.00	0.98	0.14	0.71	19.00	11.44	9.43	1.60
6.25	1.03	0.17	0.78	19.25	11.49	9.48	1.54
6.50	1.09	0.19	0.85	19.50	11.53	9.52	1.48
6.75	1.15	0.22	0.92	19.75	11.57	9.57	1.41
7.00	1.21	0.25	0.99	20.00	11.61	9.60	1.35
7.25	1.27	0.28	1.06				
7.50	1.33	0.32	1.13				
7.75	1.40	0.35	1.20				
8.00	1.46	0.39	1.27				
8.25	1.53	0.44	1.37				
8.50	1.61	0.48	1.55				
8.75	1.70	0.54	1.76				
9.00	1.79	0.60	1.99				
9.25	1.89	0.67	2.17				
9.50	1.99	0.74	2.25				
9.75	2.09	0.81	2.38				
10.00	2.21	0.89	2.70				
10.25	2.34	0.99	3.10				
10.50	2.49	1.11	3.62				
10.75	2.66	1.24	4.25				
11.00	2.87	1.41	5.13				
11.25	3.12	1.62	6.35				
11.50	3.45	1.90	8.43				
11.75	4.72	3.02	22.68				
12.00	8.09	6.18	93.31				
12.25	8.61	6.69	40.69				
12.50	8.97	7.03	15.17				
12.75	9.21	7.26	8.97				
13.00	9.42	7.46	7.19				
13.25	9.59	7.63	6.02				
13.50	9.75	7.78	5.27				
13.75	9.88	7.92	4.62				
14.00	10.00	8.03	4.11				
14.25	10.11	8.14	3.69				
14.50	10.22	8.24	3.48				
14.75	10.32	8.34	3.31				
15.00	10.41	8.43	3.13				
15.25	10.50	8.52	2.96				
15.50	10.59	8.60	2.79				
15.75	10.66	8.68	2.62				
16.00	10.74	8.75	2.44				
16.25	10.81	8.81	2.29				
16.50	10.87	8.88	2.22				
16.75	10.94	8.94	2.16				
17.00	11.00	9.01	2.10				
17.25	11.06	9.07	2.04				
17.50	11.12	9.12	1.97				
17.75	11.18	9.18	1.91				

11491.002-Pre Development

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Type II 24-hr 100 YR Rainfall=12.20"

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Summary for Subcatchment 3S: OFFSITE DA-001

Runoff = 122.56 cfs @ 12.14 hrs, Volume= 9.509 af, Depth> 9.51"

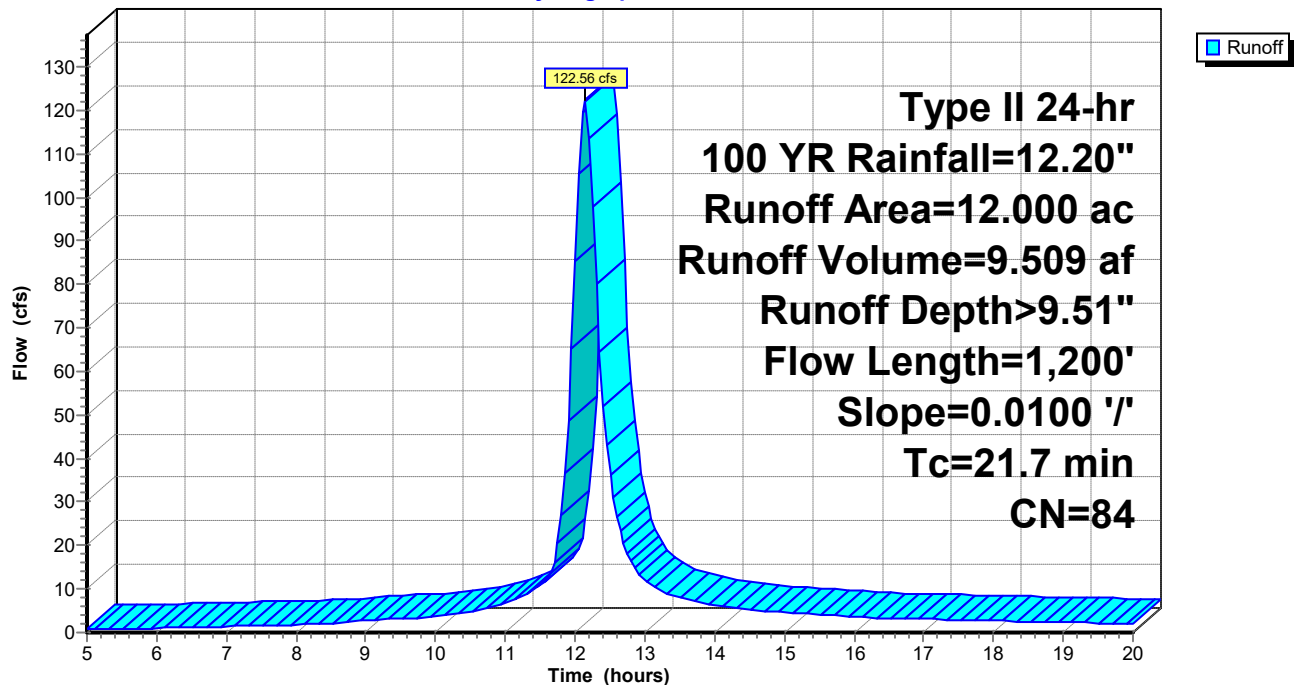
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR Rainfall=12.20"

Area (ac)	CN	Description
12.000	84	50-75% Grass cover, Fair, HSG D
12.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0100	0.16		Sheet Flow, Range n= 0.130 P2= 3.98"
11.4	1,100	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
21.7	1,200	Total			

Subcatchment 3S: OFFSITE DA-001

Hydrograph



11491.002-Pre Development*Type II 24-hr 100 YR Rainfall=12.20"*

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Hydrograph for Subcatchment 3S: OFFSITE DA-001

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.77	0.07	0.61	18.00	11.24	9.23	2.72
5.25	0.82	0.08	0.70	18.25	11.29	9.29	2.63
5.50	0.87	0.10	0.79	18.50	11.34	9.34	2.54
5.75	0.92	0.12	0.89	18.75	11.39	9.39	2.45
6.00	0.98	0.14	0.98	19.00	11.44	9.43	2.36
6.25	1.03	0.17	1.08	19.25	11.49	9.48	2.27
6.50	1.09	0.19	1.18	19.50	11.53	9.52	2.18
6.75	1.15	0.22	1.28	19.75	11.57	9.57	2.09
7.00	1.21	0.25	1.38	20.00	11.61	9.60	2.00
7.25	1.27	0.28	1.48				
7.50	1.33	0.32	1.58				
7.75	1.40	0.35	1.69				
8.00	1.46	0.39	1.79				
8.25	1.53	0.44	1.91				
8.50	1.61	0.48	2.13				
8.75	1.70	0.54	2.42				
9.00	1.79	0.60	2.73				
9.25	1.89	0.67	3.03				
9.50	1.99	0.74	3.21				
9.75	2.09	0.81	3.34				
10.00	2.21	0.89	3.70				
10.25	2.34	0.99	4.21				
10.50	2.49	1.11	4.90				
10.75	2.66	1.24	5.72				
11.00	2.87	1.41	6.85				
11.25	3.12	1.62	8.32				
11.50	3.45	1.90	10.85				
11.75	4.72	3.02	20.43				
12.00	8.09	6.18	85.24				
12.25	8.61	6.69	97.92				
12.50	8.97	7.03	36.35				
12.75	9.21	7.26	18.18				
13.00	9.42	7.46	12.09				
13.25	9.59	7.63	9.51				
13.50	9.75	7.78	8.15				
13.75	9.88	7.92	7.12				
14.00	10.00	8.03	6.29				
14.25	10.11	8.14	5.60				
14.50	10.22	8.24	5.19				
14.75	10.32	8.34	4.91				
15.00	10.41	8.43	4.65				
15.25	10.50	8.52	4.40				
15.50	10.59	8.60	4.15				
15.75	10.66	8.68	3.90				
16.00	10.74	8.75	3.65				
16.25	10.81	8.81	3.41				
16.50	10.87	8.88	3.27				
16.75	10.94	8.94	3.17				
17.00	11.00	9.01	3.08				
17.25	11.06	9.07	2.99				
17.50	11.12	9.12	2.90				
17.75	11.18	9.18	2.81				

11491.002-Pre Development

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Type II 24-hr 100 YR Rainfall=12.20"

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Summary for Subcatchment 4S: DA-002

Runoff = 62.00 cfs @ 12.05 hrs, Volume= 3.832 af, Depth> 9.52"

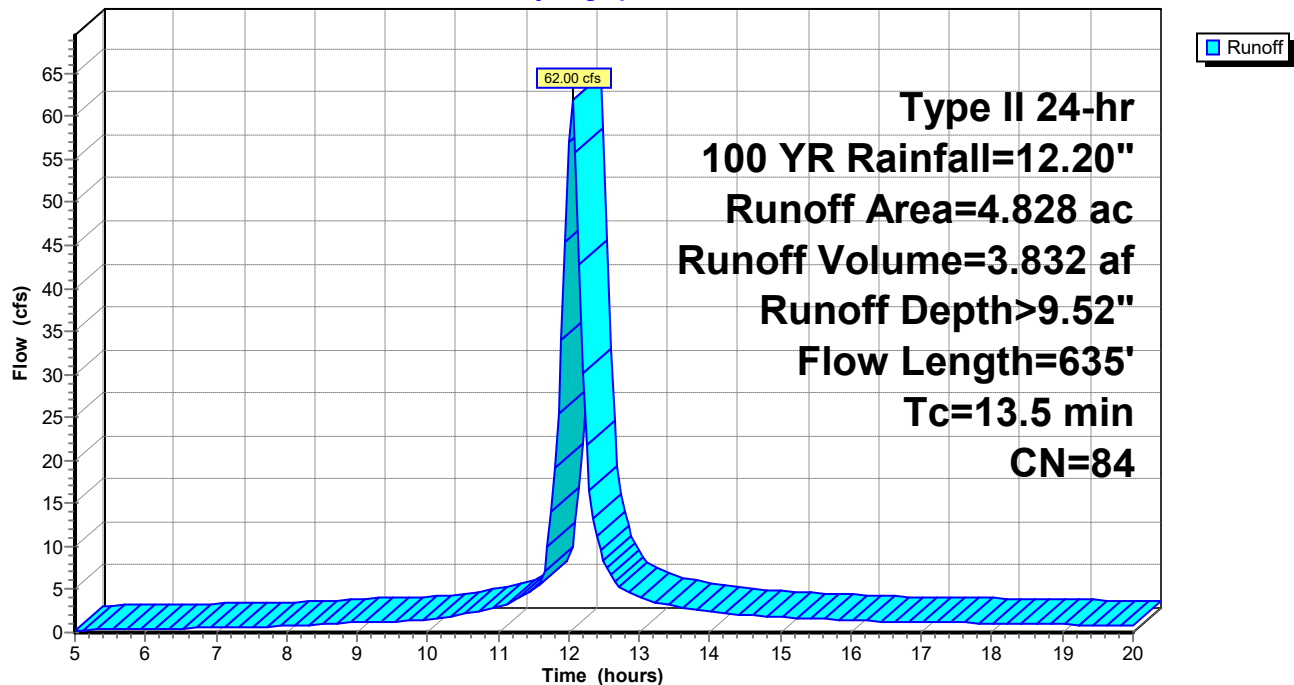
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR Rainfall=12.20"

Area (ac)	CN	Description
4.828	84	50-75% Grass cover, Fair, HSG D
4.828		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	100	0.0100	0.16		Sheet Flow, Range n= 0.130 P2= 3.98"
3.2	535	0.0300	2.79		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.5	635	Total			

Subcatchment 4S: DA-002

Hydrograph



11491.002-Pre Development

Type II 24-hr 100 YR Rainfall=12.20"

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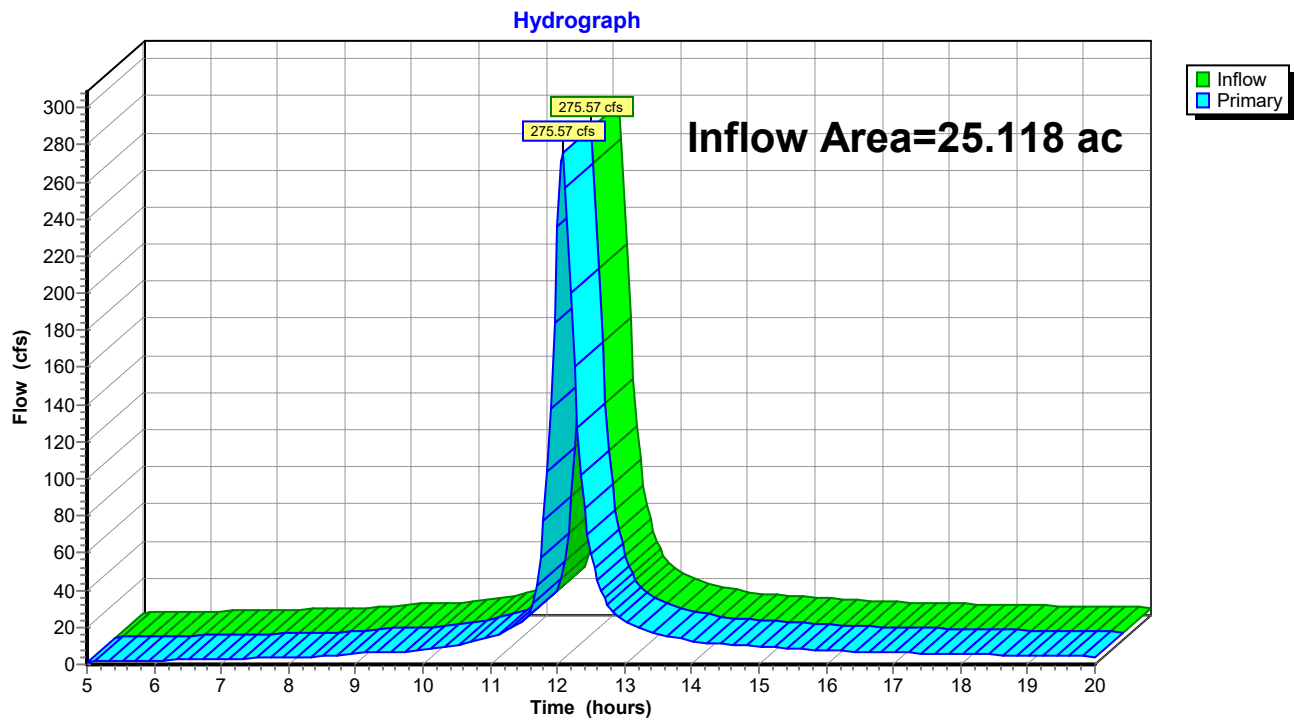
Hydrograph for Subcatchment 4S: DA-002

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
5.00	0.77	0.07	0.26	18.00	11.24	9.23	1.08
5.25	0.82	0.08	0.30	18.25	11.29	9.29	1.04
5.50	0.87	0.10	0.34	18.50	11.34	9.34	1.00
5.75	0.92	0.12	0.38	18.75	11.39	9.39	0.97
6.00	0.98	0.14	0.42	19.00	11.44	9.43	0.93
6.25	1.03	0.17	0.45	19.25	11.49	9.48	0.89
6.50	1.09	0.19	0.49	19.50	11.53	9.52	0.86
6.75	1.15	0.22	0.54	19.75	11.57	9.57	0.82
7.00	1.21	0.25	0.58	20.00	11.61	9.60	0.79
7.25	1.27	0.28	0.62				
7.50	1.33	0.32	0.66				
7.75	1.40	0.35	0.70				
8.00	1.46	0.39	0.74				
8.25	1.53	0.44	0.80				
8.50	1.61	0.48	0.91				
8.75	1.70	0.54	1.03				
9.00	1.79	0.60	1.16				
9.25	1.89	0.67	1.27				
9.50	1.99	0.74	1.31				
9.75	2.09	0.81	1.39				
10.00	2.21	0.89	1.58				
10.25	2.34	0.99	1.82				
10.50	2.49	1.11	2.12				
10.75	2.66	1.24	2.50				
11.00	2.87	1.41	3.01				
11.25	3.12	1.62	3.75				
11.50	3.45	1.90	4.97				
11.75	4.72	3.02	14.07				
12.00	8.09	6.18	57.06				
12.25	8.61	6.69	21.73				
12.50	8.97	7.03	8.41				
12.75	9.21	7.26	5.12				
13.00	9.42	7.46	4.15				
13.25	9.59	7.63	3.48				
13.50	9.75	7.78	3.05				
13.75	9.88	7.92	2.68				
14.00	10.00	8.03	2.38				
14.25	10.11	8.14	2.14				
14.50	10.22	8.24	2.02				
14.75	10.32	8.34	1.92				
15.00	10.41	8.43	1.82				
15.25	10.50	8.52	1.72				
15.50	10.59	8.60	1.62				
15.75	10.66	8.68	1.52				
16.00	10.74	8.75	1.42				
16.25	10.81	8.81	1.33				
16.50	10.87	8.88	1.29				
16.75	10.94	8.94	1.26				
17.00	11.00	9.01	1.22				
17.25	11.06	9.07	1.18				
17.50	11.12	9.12	1.15				
17.75	11.18	9.18	1.11				

Summary for Link 3L: OUTFALL-001

Inflow Area = 25.118 ac, 0.00% Impervious, Inflow Depth > 9.52" for 100 YR event
Inflow = 275.57 cfs @ 12.08 hrs, Volume= 19.918 af
Primary = 275.57 cfs @ 12.08 hrs, Volume= 19.918 af, Atten= 0%, Lag= 0.0 min

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

Link 3L: OUTFALL-001

11491.002-Pre Development*Type II 24-hr 100 YR Rainfall=12.20"*

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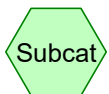
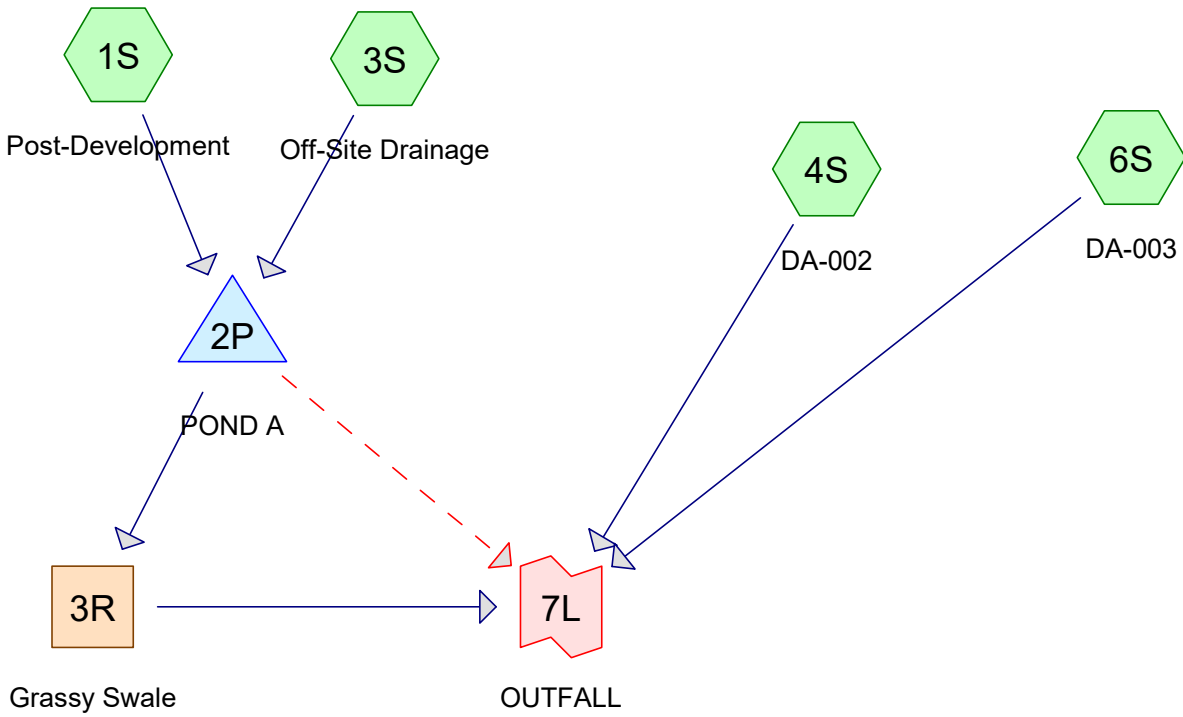
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Hydrograph for Link 3L: OUTFALL-001

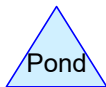
Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
5.00	1.32	0.00	1.32	18.00	5.64	0.00	5.64
5.25	1.51	0.00	1.51	18.25	5.46	0.00	5.46
5.50	1.71	0.00	1.71	18.50	5.27	0.00	5.27
5.75	1.91	0.00	1.91	18.75	5.08	0.00	5.08
6.00	2.11	0.00	2.11	19.00	4.89	0.00	4.89
6.25	2.31	0.00	2.31	19.25	4.70	0.00	4.70
6.50	2.52	0.00	2.52	19.50	4.52	0.00	4.52
6.75	2.73	0.00	2.73	19.75	4.33	0.00	4.33
7.00	2.94	0.00	2.94	20.00	4.14	0.00	4.14
7.25	3.16	0.00	3.16				
7.50	3.37	0.00	3.37				
7.75	3.58	0.00	3.58				
8.00	3.80	0.00	3.80				
8.25	4.08	0.00	4.08				
8.50	4.60	0.00	4.60				
8.75	5.21	0.00	5.21				
9.00	5.87	0.00	5.87				
9.25	6.48	0.00	6.48				
9.50	6.77	0.00	6.77				
9.75	7.11	0.00	7.11				
10.00	7.98	0.00	7.98				
10.25	9.13	0.00	9.13				
10.50	10.64	0.00	10.64				
10.75	12.47	0.00	12.47				
11.00	14.99	0.00	14.99				
11.25	18.42	0.00	18.42				
11.50	24.25	0.00	24.25				
11.75	57.19	0.00	57.19				
12.00	235.61	0.00	235.61				
12.25	160.34	0.00	160.34				
12.50	59.93	0.00	59.93				
12.75	32.26	0.00	32.26				
13.00	23.43	0.00	23.43				
13.25	19.02	0.00	19.02				
13.50	16.47	0.00	16.47				
13.75	14.41	0.00	14.41				
14.00	12.78	0.00	12.78				
14.25	11.43	0.00	11.43				
14.50	10.69	0.00	10.69				
14.75	10.13	0.00	10.13				
15.00	9.61	0.00	9.61				
15.25	9.08	0.00	9.08				
15.50	8.56	0.00	8.56				
15.75	8.03	0.00	8.03				
16.00	7.51	0.00	7.51				
16.25	7.04	0.00	7.04				
16.50	6.78	0.00	6.78				
16.75	6.58	0.00	6.58				
17.00	6.39	0.00	6.39				
17.25	6.21	0.00	6.21				
17.50	6.02	0.00	6.02				
17.75	5.83	0.00	5.83				



Subcat



Reach



Pond



Link

Routing Diagram for 11491.002- Post Development

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
7.440	84	50-75% Grass cover, Fair, HSG D (1S, 4S, 6S)
1.160	98	Paved parking, HSG A (4S)
0.300	98	Paved parking, HSG D (6S)
4.800	98	Unconnected pavement, HSG B (1S)
12.000	82	Woods/grass comb., Fair, HSG D (3S)
25.700	86	TOTAL AREA

11491.002- Post Development

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.160	HSG A	4S
4.800	HSG B	1S
0.000	HSG C	
19.740	HSG D	1S, 3S, 4S, 6S
0.000	Other	
25.700		TOTAL AREA

11491.002- Post Development

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	7.440	0.000	7.440	50-75% Grass cover, Fair	1S, 4S, 6S
1.160	0.000	0.000	0.300	0.000	1.460	Paved parking	4S, 6S
0.000	4.800	0.000	0.000	0.000	4.800	Unconnected pavement	1S
0.000	0.000	0.000	12.000	0.000	12.000	Woods/grass comb., Fair	3S
1.160	4.800	0.000	19.740	0.000	25.700	TOTAL AREA	

11491.002- Post Development*Type II 24-hr 25 YR Rainfall=8.54"*

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

Subcatchment 1S: Post-Development Runoff Area=8.290 ac 57.90% Impervious Runoff Depth=7.58"
Flow Length=570' Slope=0.0087 '/' Tc=5.6 min CN=92 Runoff=97.21 cfs 5.235 af

Subcatchment 3S: Off-Site Drainage Runoff Area=12.000 ac 0.00% Impervious Runoff Depth=6.37"
Flow Length=1,200' Slope=0.0100 '/' Tc=21.7 min CN=82 Runoff=79.04 cfs 6.374 af

Subcatchment 4S: DA-002 Runoff Area=3.370 ac 34.42% Impervious Runoff Depth=7.22"
Flow Length=450' Tc=12.1 min CN=89 Runoff=31.79 cfs 2.027 af

Subcatchment 6S: DA-003 Runoff Area=2.040 ac 14.71% Impervious Runoff Depth=6.86"
Flow Length=375' Tc=5.0 min CN=86 Runoff=23.22 cfs 1.165 af

Reach 3R: Grassy Swale Avg. Flow Depth=0.13' Max Vel=0.79 fps Inflow=0.99 cfs 2.438 af
n=0.035 L=185.0' S=0.0054 '/' Capacity=31.82 cfs Outflow=0.99 cfs 2.438 af

Pond 2P: POND A Peak Elev=762.99' Storage=81,159 cf Inflow=142.37 cfs 11.609 af
Primary=0.99 cfs 2.438 af Secondary=135.16 cfs 9.106 af Outflow=136.15 cfs 11.545 af

Link 7L: OUTFALL Inflow=185.32 cfs 14.737 af
Primary=185.32 cfs 14.737 af

Total Runoff Area = 25.700 ac Runoff Volume = 14.802 af Average Runoff Depth = 6.91"
75.64% Pervious = 19.440 ac 24.36% Impervious = 6.260 ac

11491.002- Post Development

Type II 24-hr 25 YR Rainfall=8.54"

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Summary for Subcatchment 1S: Post-Development[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 97.21 cfs @ 11.96 hrs, Volume= 5.235 af, Depth= 7.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, $dt=0.05$ hrs

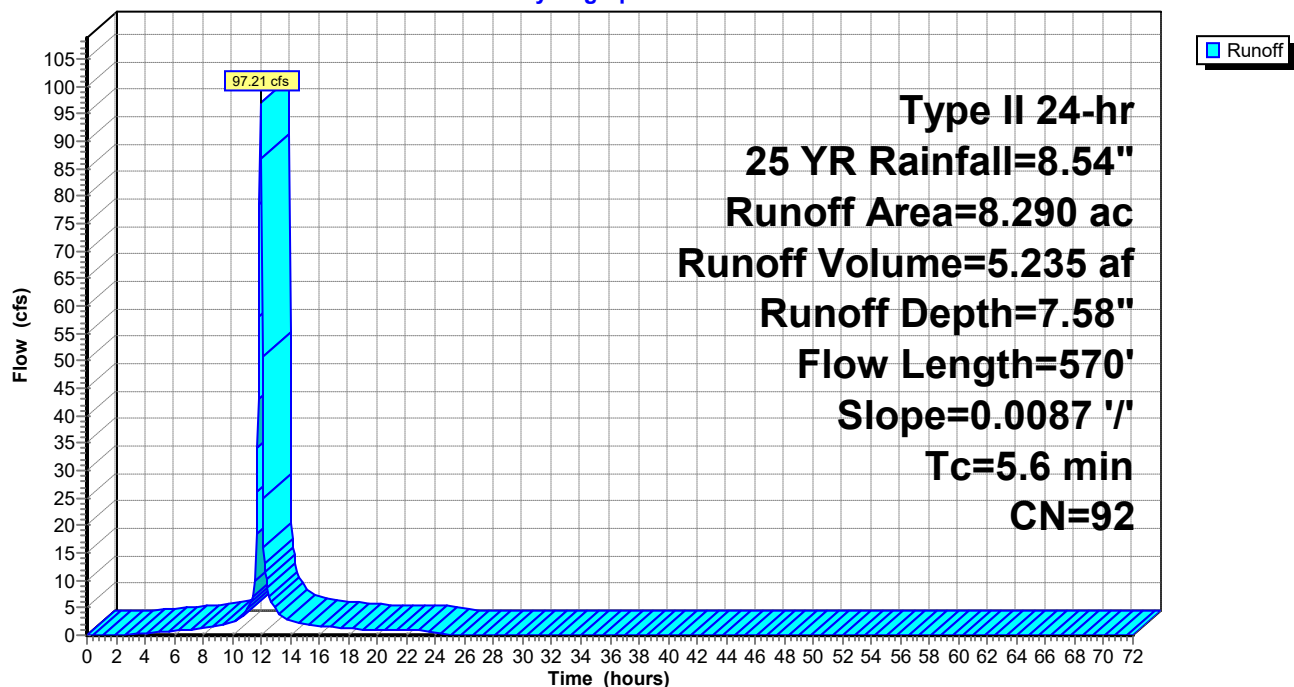
Type II 24-hr 25 YR Rainfall=8.54"

Area (ac)	CN	Description
3.490	84	50-75% Grass cover, Fair, HSG D
4.800	98	Unconnected pavement, HSG B
8.290	92	Weighted Average
3.490		42.10% Pervious Area
4.800		57.90% Impervious Area
4.800		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	470	0.0087	1.89		Shallow Concentrated Flow, Shallow Concentrated Paved $K_v=20.3$ fps
1.5	100	0.0087	1.10		Sheet Flow, Smooth surfaces $n=0.011$ $P_2=3.98"$
5.6	570	Total			

Subcatchment 1S: Post-Development

Hydrograph



11491.002- Post Development

Type II 24-hr 25 YR Rainfall=8.54"

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Hydrograph for Subcatchment 1S: Post-Development

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	8.54	7.58	0.00
1.00	0.09	0.00	0.00	53.00	8.54	7.58	0.00
2.00	0.19	0.00	0.01	54.00	8.54	7.58	0.00
3.00	0.29	0.01	0.20	55.00	8.54	7.58	0.00
4.00	0.41	0.05	0.37	56.00	8.54	7.58	0.00
5.00	0.54	0.11	0.56	57.00	8.54	7.58	0.00
6.00	0.68	0.19	0.76	58.00	8.54	7.58	0.00
7.00	0.85	0.29	0.96	59.00	8.54	7.58	0.00
8.00	1.02	0.42	1.15	60.00	8.54	7.58	0.00
9.00	1.26	0.60	1.77	61.00	8.54	7.58	0.00
10.00	1.55	0.84	2.33	62.00	8.54	7.58	0.00
11.00	2.01	1.24	4.37	63.00	8.54	7.58	0.00
12.00	5.66	4.74	86.84	64.00	8.54	7.58	0.00
13.00	6.59	5.65	4.61	65.00	8.54	7.58	0.00
14.00	7.00	6.06	2.73	66.00	8.54	7.58	0.00
15.00	7.29	6.34	2.16	67.00	8.54	7.58	0.00
16.00	7.52	6.56	1.67	68.00	8.54	7.58	0.00
17.00	7.70	6.75	1.46	69.00	8.54	7.58	0.00
18.00	7.87	6.91	1.29	70.00	8.54	7.58	0.00
19.00	8.01	7.05	1.11	71.00	8.54	7.58	0.00
20.00	8.13	7.17	0.93	72.00	8.54	7.58	0.00
21.00	8.24	7.28	0.89				
22.00	8.34	7.38	0.85				
23.00	8.44	7.48	0.82				
24.00	8.54	7.58	0.78				
25.00	8.54	7.58	0.00				
26.00	8.54	7.58	0.00				
27.00	8.54	7.58	0.00				
28.00	8.54	7.58	0.00				
29.00	8.54	7.58	0.00				
30.00	8.54	7.58	0.00				
31.00	8.54	7.58	0.00				
32.00	8.54	7.58	0.00				
33.00	8.54	7.58	0.00				
34.00	8.54	7.58	0.00				
35.00	8.54	7.58	0.00				
36.00	8.54	7.58	0.00				
37.00	8.54	7.58	0.00				
38.00	8.54	7.58	0.00				
39.00	8.54	7.58	0.00				
40.00	8.54	7.58	0.00				
41.00	8.54	7.58	0.00				
42.00	8.54	7.58	0.00				
43.00	8.54	7.58	0.00				
44.00	8.54	7.58	0.00				
45.00	8.54	7.58	0.00				
46.00	8.54	7.58	0.00				
47.00	8.54	7.58	0.00				
48.00	8.54	7.58	0.00				
49.00	8.54	7.58	0.00				
50.00	8.54	7.58	0.00				
51.00	8.54	7.58	0.00				

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Type II 24-hr 25 YR Rainfall=8.54"

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Summary for Subcatchment 3S: Off-Site Drainage

Runoff = 79.04 cfs @ 12.14 hrs, Volume= 6.374 af, Depth= 6.37"

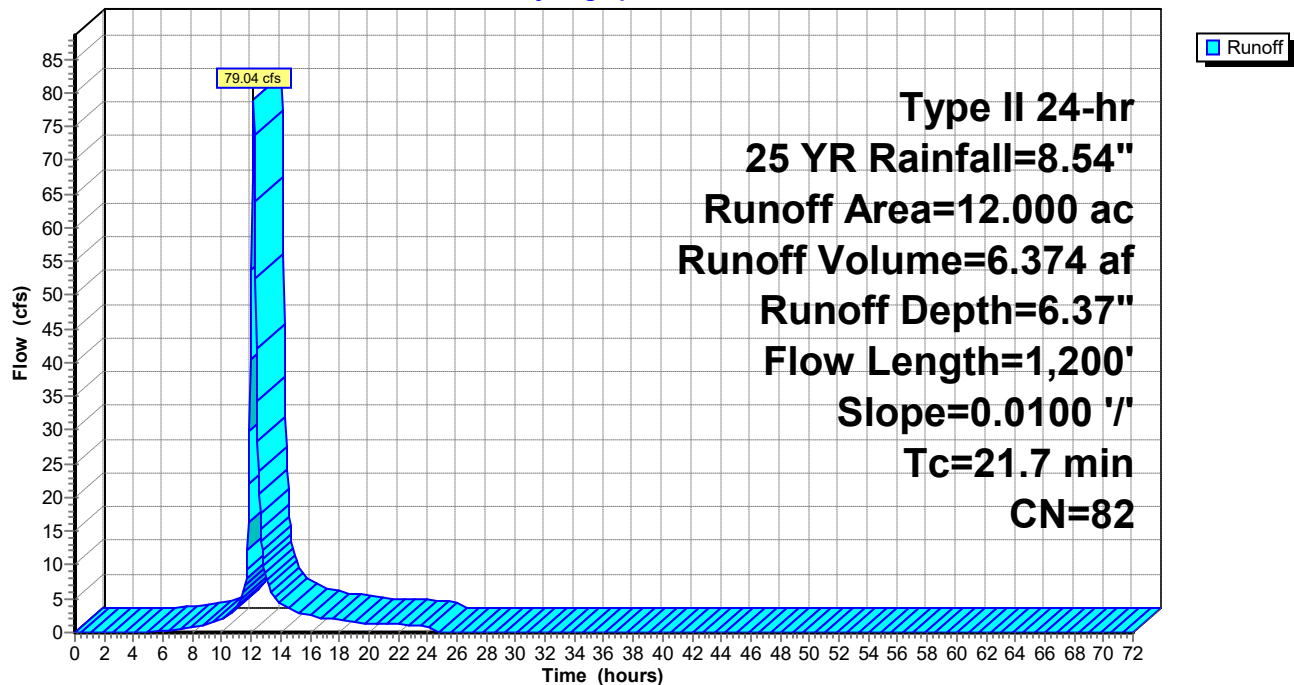
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YR Rainfall=8.54"

Area (ac)	CN	Description
12.000	82	Woods/grass comb., Fair, HSG D
12.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	1,100	0.0100	1.61		Shallow Concentrated Flow, SHALLOW CONCENTRATED
					Unpaved Kv= 16.1 fps
10.3	100	0.0100	0.16		Sheet Flow, SHEET
					Range n= 0.130 P2= 3.98"
21.7	1,200	Total			

Subcatchment 3S: Off-Site Drainage

Hydrograph



11491.002- Post Development*Type II 24-hr 25 YR Rainfall=8.54"*

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Hydrograph for Subcatchment 3S: Off-Site Drainage

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	8.54	6.37	0.00
1.00	0.09	0.00	0.00	53.00	8.54	6.37	0.00
2.00	0.19	0.00	0.00	54.00	8.54	6.37	0.00
3.00	0.29	0.00	0.00	55.00	8.54	6.37	0.00
4.00	0.41	0.00	0.00	56.00	8.54	6.37	0.00
5.00	0.54	0.00	0.08	57.00	8.54	6.37	0.00
6.00	0.68	0.02	0.28	58.00	8.54	6.37	0.00
7.00	0.85	0.06	0.51	59.00	8.54	6.37	0.00
8.00	1.02	0.12	0.77	60.00	8.54	6.37	0.00
9.00	1.26	0.22	1.30	61.00	8.54	6.37	0.00
10.00	1.55	0.37	1.91	62.00	8.54	6.37	0.00
11.00	2.01	0.65	3.80	63.00	8.54	6.37	0.00
12.00	5.66	3.68	53.67	64.00	8.54	6.37	0.00
13.00	6.59	4.54	8.10	65.00	8.54	6.37	0.00
14.00	7.00	4.92	4.24	66.00	8.54	6.37	0.00
15.00	7.29	5.19	3.14	67.00	8.54	6.37	0.00
16.00	7.52	5.40	2.47	68.00	8.54	6.37	0.00
17.00	7.70	5.58	2.08	69.00	8.54	6.37	0.00
18.00	7.87	5.73	1.84	70.00	8.54	6.37	0.00
19.00	8.01	5.87	1.60	71.00	8.54	6.37	0.00
20.00	8.13	5.98	1.36	72.00	8.54	6.37	0.00
21.00	8.24	6.09	1.25				
22.00	8.34	6.19	1.20				
23.00	8.44	6.28	1.15				
24.00	8.54	6.37	1.10				
25.00	8.54	6.37	0.00				
26.00	8.54	6.37	0.00				
27.00	8.54	6.37	0.00				
28.00	8.54	6.37	0.00				
29.00	8.54	6.37	0.00				
30.00	8.54	6.37	0.00				
31.00	8.54	6.37	0.00				
32.00	8.54	6.37	0.00				
33.00	8.54	6.37	0.00				
34.00	8.54	6.37	0.00				
35.00	8.54	6.37	0.00				
36.00	8.54	6.37	0.00				
37.00	8.54	6.37	0.00				
38.00	8.54	6.37	0.00				
39.00	8.54	6.37	0.00				
40.00	8.54	6.37	0.00				
41.00	8.54	6.37	0.00				
42.00	8.54	6.37	0.00				
43.00	8.54	6.37	0.00				
44.00	8.54	6.37	0.00				
45.00	8.54	6.37	0.00				
46.00	8.54	6.37	0.00				
47.00	8.54	6.37	0.00				
48.00	8.54	6.37	0.00				
49.00	8.54	6.37	0.00				
50.00	8.54	6.37	0.00				
51.00	8.54	6.37	0.00				

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Type II 24-hr 25 YR Rainfall=8.54"

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Summary for Subcatchment 4S: DA-002

Runoff = 31.79 cfs @ 12.03 hrs, Volume= 2.027 af, Depth= 7.22"

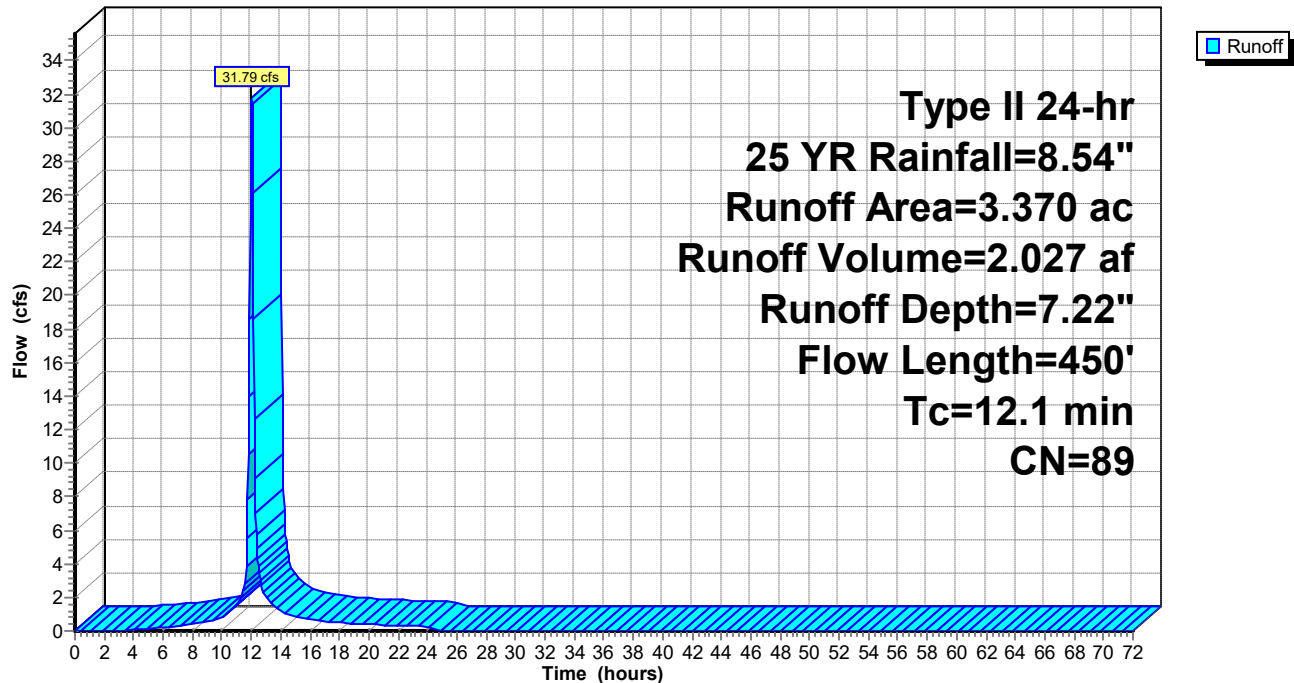
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 25 YR Rainfall=8.54"

Area (ac)	CN	Description
2.210	84	50-75% Grass cover, Fair, HSG D
1.160	98	Paved parking, HSG A
3.370	89	Weighted Average
2.210		65.58% Pervious Area
1.160		34.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0120	0.17		Sheet Flow, Range n= 0.130 P2= 3.98"
2.2	315	0.0220	2.39		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	35	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
12.1	450	Total			

Subcatchment 4S: DA-002

Hydrograph



11491.002- Post Development*Type II 24-hr 25 YR Rainfall=8.54"*

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Hydrograph for Subcatchment 4S: DA-002

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	8.54	7.22	0.00
1.00	0.09	0.00	0.00	53.00	8.54	7.22	0.00
2.00	0.19	0.00	0.00	54.00	8.54	7.22	0.00
3.00	0.29	0.00	0.02	55.00	8.54	7.22	0.00
4.00	0.41	0.02	0.08	56.00	8.54	7.22	0.00
5.00	0.54	0.06	0.15	57.00	8.54	7.22	0.00
6.00	0.68	0.11	0.22	58.00	8.54	7.22	0.00
7.00	0.85	0.20	0.30	59.00	8.54	7.22	0.00
8.00	1.02	0.30	0.38	60.00	8.54	7.22	0.00
9.00	1.26	0.45	0.60	61.00	8.54	7.22	0.00
10.00	1.55	0.67	0.81	62.00	8.54	7.22	0.00
11.00	2.01	1.03	1.53	63.00	8.54	7.22	0.00
12.00	5.66	4.41	30.48	64.00	8.54	7.22	0.00
13.00	6.59	5.31	2.00	65.00	8.54	7.22	0.00
14.00	7.00	5.71	1.15	66.00	8.54	7.22	0.00
15.00	7.29	5.99	0.89	67.00	8.54	7.22	0.00
16.00	7.52	6.21	0.69	68.00	8.54	7.22	0.00
17.00	7.70	6.39	0.60	69.00	8.54	7.22	0.00
18.00	7.87	6.55	0.53	70.00	8.54	7.22	0.00
19.00	8.01	6.70	0.45	71.00	8.54	7.22	0.00
20.00	8.13	6.81	0.38	72.00	8.54	7.22	0.00
21.00	8.24	6.92	0.36				
22.00	8.34	7.02	0.34				
23.00	8.44	7.12	0.33				
24.00	8.54	7.22	0.32				
25.00	8.54	7.22	0.00				
26.00	8.54	7.22	0.00				
27.00	8.54	7.22	0.00				
28.00	8.54	7.22	0.00				
29.00	8.54	7.22	0.00				
30.00	8.54	7.22	0.00				
31.00	8.54	7.22	0.00				
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33.00	8.54	7.22	0.00				
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37.00	8.54	7.22	0.00				
38.00	8.54	7.22	0.00				
39.00	8.54	7.22	0.00				
40.00	8.54	7.22	0.00				
41.00	8.54	7.22	0.00				
42.00	8.54	7.22	0.00				
43.00	8.54	7.22	0.00				
44.00	8.54	7.22	0.00				
45.00	8.54	7.22	0.00				
46.00	8.54	7.22	0.00				
47.00	8.54	7.22	0.00				
48.00	8.54	7.22	0.00				
49.00	8.54	7.22	0.00				
50.00	8.54	7.22	0.00				
51.00	8.54	7.22	0.00				

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Type II 24-hr 25 YR Rainfall=8.54"

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Summary for Subcatchment 6S: DA-003[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 23.22 cfs @ 11.95 hrs, Volume= 1.165 af, Depth= 6.86"

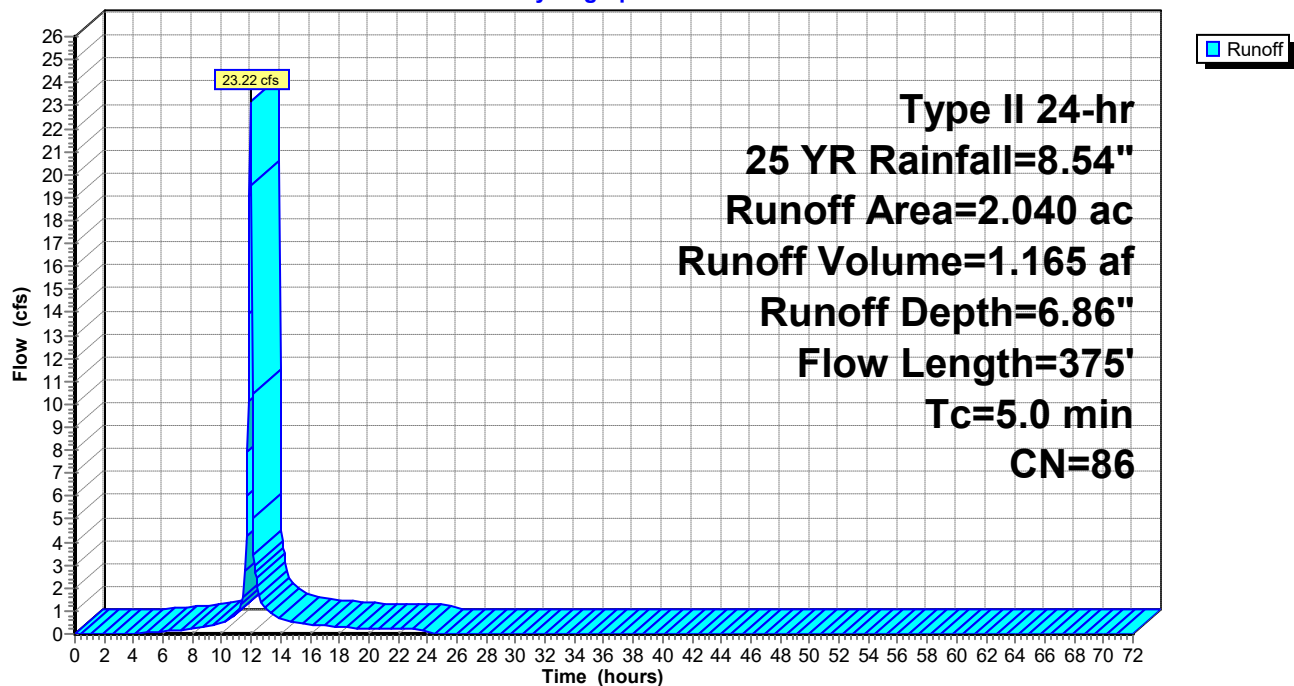
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, $dt=0.05$ hrs
Type II 24-hr 25 YR Rainfall=8.54"

Area (ac)	CN	Description
0.300	98	Paved parking, HSG D
1.740	84	50-75% Grass cover, Fair, HSG D
2.040	86	Weighted Average
1.740		85.29% Pervious Area
0.300		14.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0300	1.80		Sheet Flow, Smooth surfaces $n=0.011$ $P2=3.98"$
1.0	275	0.0500	4.54		Shallow Concentrated Flow, Paved $K_v=20.3$ fps
1.9	375	Total, Increased to minimum $T_c = 5.0$ min			

Subcatchment 6S: DA-003

Hydrograph



11491.002- Post Development*Type II 24-hr 25 YR Rainfall=8.54"*

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Hydrograph for Subcatchment 6S: DA-003

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	8.54	6.86	0.00
1.00	0.09	0.00	0.00	53.00	8.54	6.86	0.00
2.00	0.19	0.00	0.00	54.00	8.54	6.86	0.00
3.00	0.29	0.00	0.00	55.00	8.54	6.86	0.00
4.00	0.41	0.00	0.02	56.00	8.54	6.86	0.00
5.00	0.54	0.02	0.06	57.00	8.54	6.86	0.00
6.00	0.68	0.06	0.10	58.00	8.54	6.86	0.00
7.00	0.85	0.13	0.15	59.00	8.54	6.86	0.00
8.00	1.02	0.21	0.19	60.00	8.54	6.86	0.00
9.00	1.26	0.34	0.32	61.00	8.54	6.86	0.00
10.00	1.55	0.52	0.45	62.00	8.54	6.86	0.00
11.00	2.01	0.85	0.91	63.00	8.54	6.86	0.00
12.00	5.66	4.09	19.56	64.00	8.54	6.86	0.00
13.00	6.59	4.98	1.09	65.00	8.54	6.86	0.00
14.00	7.00	5.37	0.65	66.00	8.54	6.86	0.00
15.00	7.29	5.64	0.52	67.00	8.54	6.86	0.00
16.00	7.52	5.86	0.40	68.00	8.54	6.86	0.00
17.00	7.70	6.04	0.35	69.00	8.54	6.86	0.00
18.00	7.87	6.20	0.31	70.00	8.54	6.86	0.00
19.00	8.01	6.34	0.27	71.00	8.54	6.86	0.00
20.00	8.13	6.46	0.22	72.00	8.54	6.86	0.00
21.00	8.24	6.56	0.21				
22.00	8.34	6.66	0.21				
23.00	8.44	6.76	0.20				
24.00	8.54	6.86	0.19				
25.00	8.54	6.86	0.00				
26.00	8.54	6.86	0.00				
27.00	8.54	6.86	0.00				
28.00	8.54	6.86	0.00				
29.00	8.54	6.86	0.00				
30.00	8.54	6.86	0.00				
31.00	8.54	6.86	0.00				
32.00	8.54	6.86	0.00				
33.00	8.54	6.86	0.00				
34.00	8.54	6.86	0.00				
35.00	8.54	6.86	0.00				
36.00	8.54	6.86	0.00				
37.00	8.54	6.86	0.00				
38.00	8.54	6.86	0.00				
39.00	8.54	6.86	0.00				
40.00	8.54	6.86	0.00				
41.00	8.54	6.86	0.00				
42.00	8.54	6.86	0.00				
43.00	8.54	6.86	0.00				
44.00	8.54	6.86	0.00				
45.00	8.54	6.86	0.00				
46.00	8.54	6.86	0.00				
47.00	8.54	6.86	0.00				
48.00	8.54	6.86	0.00				
49.00	8.54	6.86	0.00				
50.00	8.54	6.86	0.00				
51.00	8.54	6.86	0.00				

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Type II 24-hr 25 YR Rainfall=8.54"

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Summary for Reach 3R: Grassy Swale

Inflow Area = 20.290 ac, 23.66% Impervious, Inflow Depth > 1.44" for 25 YR event
Inflow = 0.99 cfs @ 12.02 hrs, Volume= 2.438 af
Outflow = 0.99 cfs @ 12.12 hrs, Volume= 2.438 af, Atten= 1%, Lag= 6.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.79 fps, Min. Travel Time= 3.9 min

Avg. Velocity= 0.50 fps, Avg. Travel Time= 6.1 min

Peak Storage= 231 cf @ 12.06 hrs

Average Depth at Peak Storage= 0.13'

Bank-Full Depth= 1.00' Flow Area= 12.0 sf, Capacity= 31.82 cfs

9.00' x 1.00' deep channel, n= 0.035 High grass

Side Slope Z-value= 3.0 '/' Top Width= 15.00'

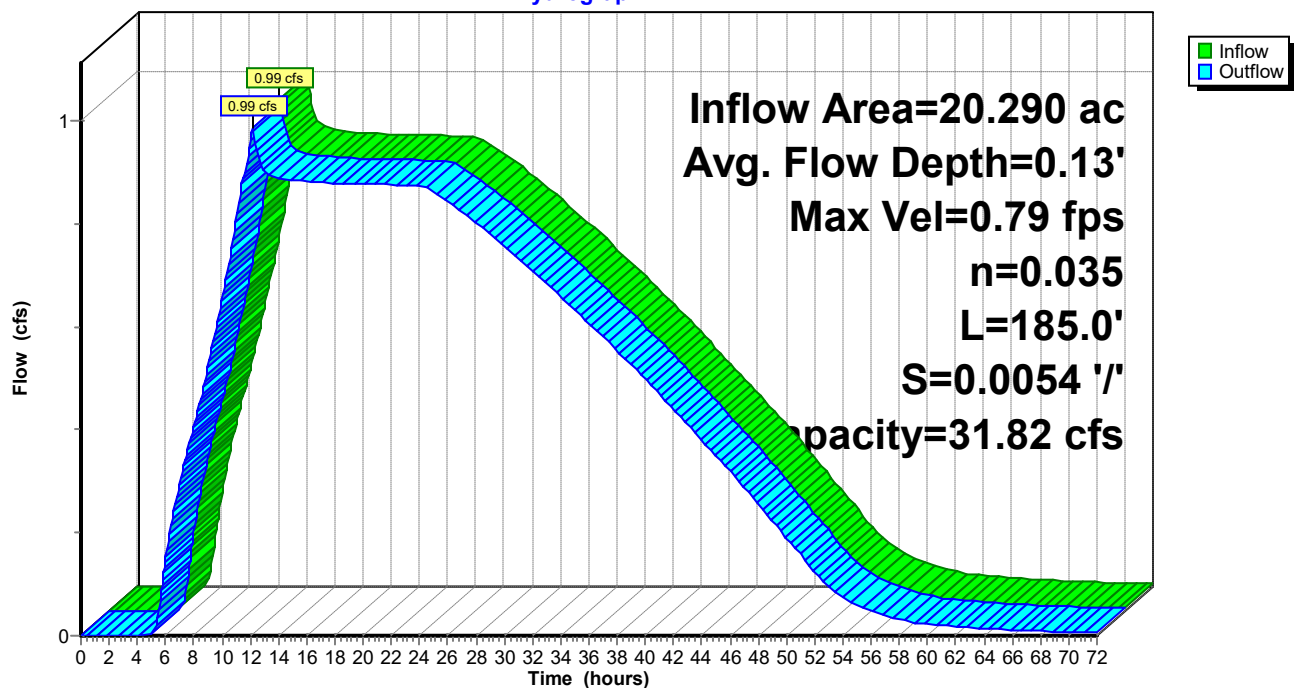
Length= 185.0' Slope= 0.0054 '/'

Inlet Invert= 756.50', Outlet Invert= 755.50'

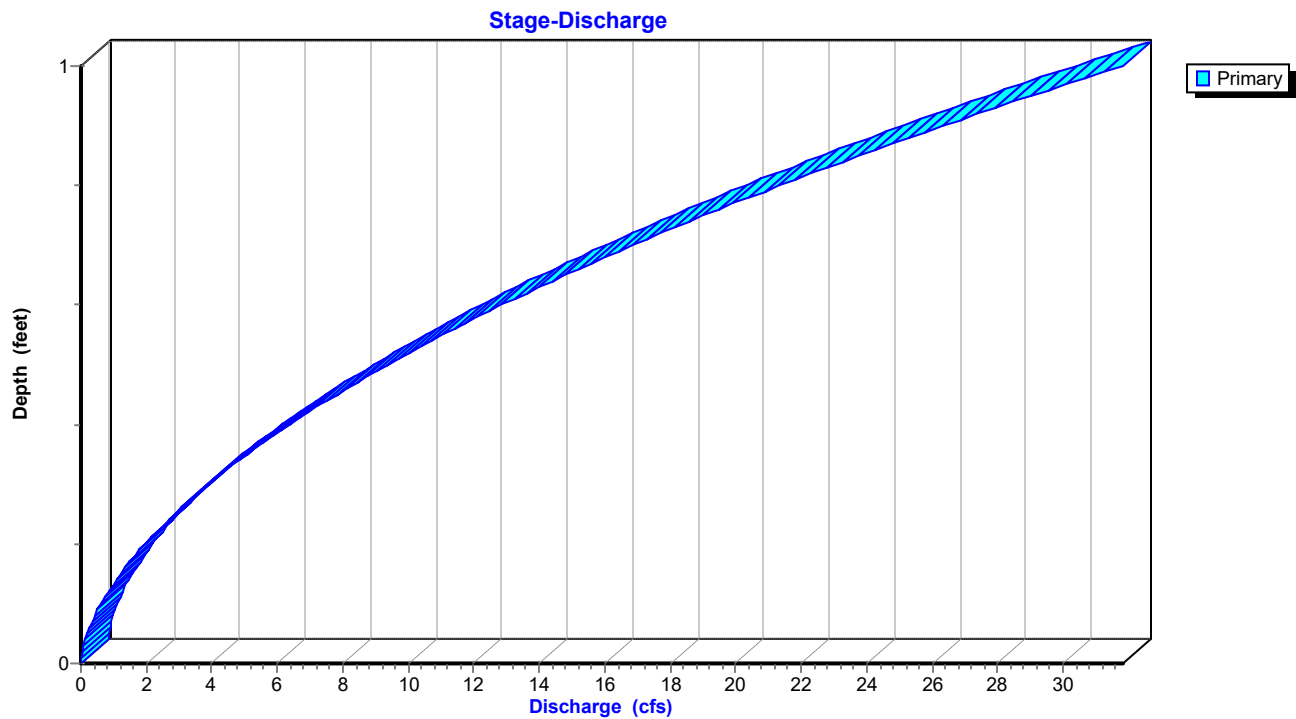


Reach 3R: Grassy Swale

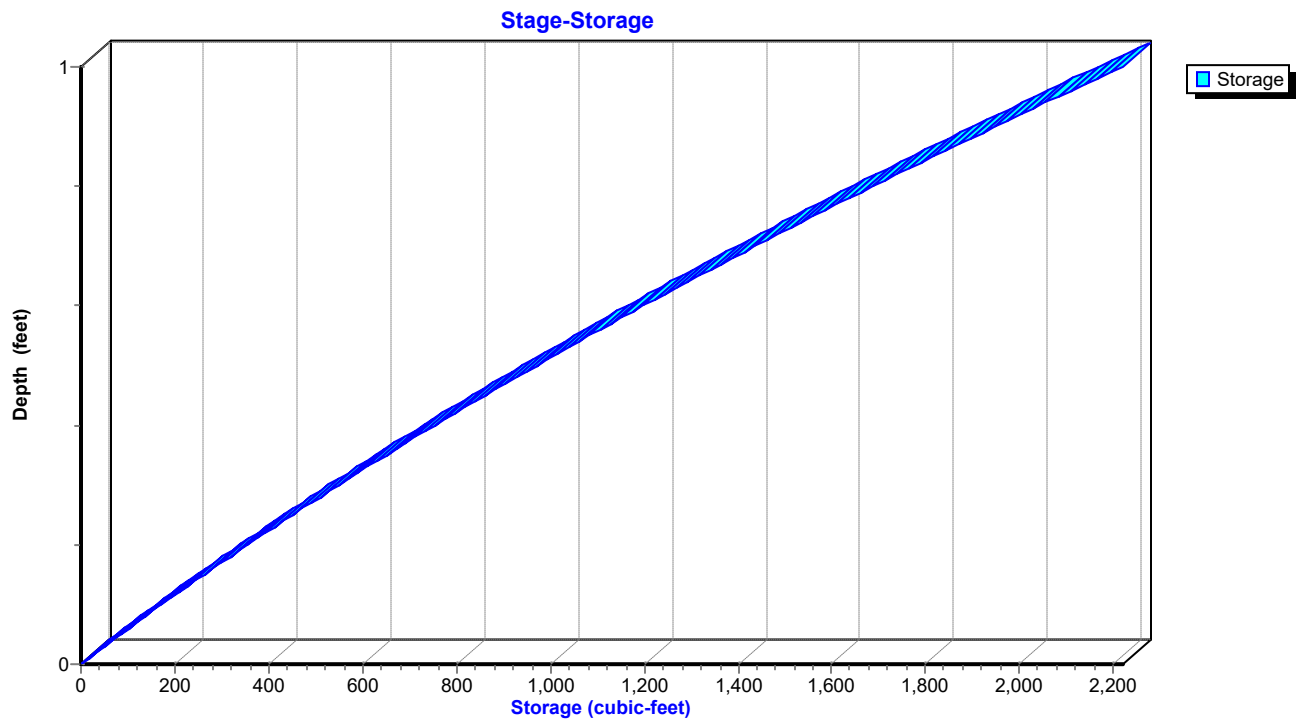
Hydrograph



Reach 3R: Grassy Swale



Reach 3R: Grassy Swale



11491.002- Post Development*Type II 24-hr 25 YR Rainfall=8.54"*

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Hydrograph for Reach 3R: Grassy Swale

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	756.50	0.00
2.50	0.00	0	756.50	0.00
5.00	0.02	5	756.50	0.00
7.50	0.37	124	756.57	0.35
10.00	0.67	180	756.60	0.65
12.50	0.92	223	756.63	0.94
15.00	0.88	216	756.62	0.88
17.50	0.88	215	756.62	0.88
20.00	0.88	215	756.62	0.88
22.50	0.87	215	756.62	0.87
25.00	0.86	212	756.62	0.86
27.50	0.81	205	756.62	0.81
30.00	0.75	196	756.61	0.76
32.50	0.69	186	756.61	0.70
35.00	0.63	175	756.60	0.63
37.50	0.56	164	756.60	0.57
40.00	0.49	151	756.59	0.50
42.50	0.42	137	756.58	0.42
45.00	0.35	122	756.57	0.35
47.50	0.27	104	756.56	0.27
50.00	0.19	84	756.55	0.19
52.50	0.10	59	756.53	0.11
55.00	0.06	40	756.52	0.06
57.50	0.03	29	756.52	0.03
60.00	0.02	22	756.51	0.02
62.50	0.02	19	756.51	0.02
65.00	0.01	16	756.51	0.01
67.50	0.01	12	756.51	0.01
70.00	0.01	9	756.51	0.01

11491.002- Post Development

Type II 24-hr 25 YR Rainfall=8.54"

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Stage-Discharge for Reach 3R: Grassy Swale

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)	Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
756.50	0.00	0.00	757.02	1.82	10.02
756.51	0.14	0.01	757.03	1.84	10.36
756.52	0.23	0.04	757.04	1.87	10.70
756.53	0.30	0.08	757.05	1.89	11.04
756.54	0.36	0.13	757.06	1.91	11.40
756.55	0.42	0.19	757.07	1.93	11.75
756.56	0.47	0.26	757.08	1.94	12.11
756.57	0.52	0.34	757.09	1.96	12.48
756.58	0.57	0.42	757.10	1.98	12.85
756.59	0.61	0.51	757.11	2.00	13.23
756.60	0.66	0.61	757.12	2.02	13.61
756.61	0.70	0.72	757.13	2.04	14.00
756.62	0.74	0.83	757.14	2.06	14.39
756.63	0.78	0.95	757.15	2.08	14.78
756.64	0.81	1.07	757.16	2.10	15.19
756.65	0.85	1.21	757.17	2.11	15.59
756.66	0.89	1.35	757.18	2.13	16.00
756.67	0.92	1.49	757.19	2.15	16.42
756.68	0.96	1.64	757.20	2.17	16.84
756.69	0.99	1.80	757.21	2.19	17.27
756.70	1.02	1.96	757.22	2.20	17.70
756.71	1.05	2.13	757.23	2.22	18.14
756.72	1.08	2.30	757.24	2.24	18.58
756.73	1.11	2.48	757.25	2.25	19.03
756.74	1.14	2.67	757.26	2.27	19.48
756.75	1.17	2.86	757.27	2.29	19.93
756.76	1.20	3.06	757.28	2.31	20.39
756.77	1.23	3.26	757.29	2.32	20.86
756.78	1.26	3.47	757.30	2.34	21.33
756.79	1.29	3.68	757.31	2.36	21.81
756.80	1.31	3.90	757.32	2.37	22.29
756.81	1.34	4.12	757.33	2.39	22.78
756.82	1.36	4.35	757.34	2.40	23.27
756.83	1.39	4.58	757.35	2.42	23.77
756.84	1.42	4.82	757.36	2.44	24.27
756.85	1.44	5.07	757.37	2.45	24.77
756.86	1.47	5.32	757.38	2.47	25.29
756.87	1.49	5.57	757.39	2.48	25.80
756.88	1.51	5.84	757.40	2.50	26.32
756.89	1.54	6.10	757.41	2.52	26.85
756.90	1.56	6.37	757.42	2.53	27.38
756.91	1.58	6.65	757.43	2.55	27.92
756.92	1.61	6.93	757.44	2.56	28.46
756.93	1.63	7.21	757.45	2.58	29.01
756.94	1.65	7.51	757.46	2.59	29.56
756.95	1.68	7.80	757.47	2.61	30.12
756.96	1.70	8.10	757.48	2.62	30.68
756.97	1.72	8.41	757.49	2.64	31.25
756.98	1.74	8.72	757.50	2.65	31.82
756.99	1.76	9.04			
757.00	1.78	9.36			
757.01	1.80	9.69			

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Type II 24-hr 25 YR Rainfall=8.54"

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Stage-Area-Storage for Reach 3R: Grassy Swale

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
756.50	0.0	0	757.02	5.5	1,016
756.51	0.1	17	757.03	5.6	1,038
756.52	0.2	34	757.04	5.7	1,061
756.53	0.3	50	757.05	5.9	1,084
756.54	0.4	67	757.06	6.0	1,106
756.55	0.5	85	757.07	6.1	1,129
756.56	0.6	102	757.08	6.2	1,152
756.57	0.6	119	757.09	6.4	1,176
756.58	0.7	137	757.10	6.5	1,199
756.59	0.8	154	757.11	6.6	1,222
756.60	0.9	172	757.12	6.7	1,246
756.61	1.0	190	757.13	6.9	1,269
756.62	1.1	208	757.14	7.0	1,293
756.63	1.2	226	757.15	7.1	1,317
756.64	1.3	244	757.16	7.2	1,341
756.65	1.4	262	757.17	7.4	1,365
756.66	1.5	281	757.18	7.5	1,389
756.67	1.6	299	757.19	7.6	1,413
756.68	1.7	318	757.20	7.8	1,437
756.69	1.8	336	757.21	7.9	1,462
756.70	1.9	355	757.22	8.0	1,487
756.71	2.0	374	757.23	8.2	1,511
756.72	2.1	393	757.24	8.3	1,536
756.73	2.2	412	757.25	8.4	1,561
756.74	2.3	432	757.26	8.6	1,586
756.75	2.4	451	757.27	8.7	1,611
756.76	2.5	470	757.28	8.8	1,636
756.77	2.6	490	757.29	9.0	1,662
756.78	2.8	510	757.30	9.1	1,687
756.79	2.9	530	757.31	9.3	1,713
756.80	3.0	549	757.32	9.4	1,738
756.81	3.1	569	757.33	9.5	1,764
756.82	3.2	590	757.34	9.7	1,790
756.83	3.3	610	757.35	9.8	1,816
756.84	3.4	630	757.36	10.0	1,842
756.85	3.5	651	757.37	10.1	1,869
756.86	3.6	671	757.38	10.2	1,895
756.87	3.7	692	757.39	10.4	1,921
756.88	3.9	713	757.40	10.5	1,948
756.89	4.0	734	757.41	10.7	1,975
756.90	4.1	755	757.42	10.8	2,002
756.91	4.2	776	757.43	11.0	2,028
756.92	4.3	797	757.44	11.1	2,055
756.93	4.4	819	757.45	11.3	2,083
756.94	4.5	840	757.46	11.4	2,110
756.95	4.7	862	757.47	11.6	2,137
756.96	4.8	883	757.48	11.7	2,165
756.97	4.9	905	757.49	11.9	2,192
756.98	5.0	927	757.50	12.0	2,220
756.99	5.1	949			
757.00	5.3	971			
757.01	5.4	994			

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Type II 24-hr 25 YR Rainfall=8.54"

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Summary for Pond 2P: POND A

Inflow Area = 20.290 ac, 23.66% Impervious, Inflow Depth = 6.87" for 25 YR event
 Inflow = 142.37 cfs @ 11.98 hrs, Volume= 11.609 af
 Outflow = 136.15 cfs @ 12.02 hrs, Volume= 11.545 af, Atten= 4%, Lag= 2.0 min
 Primary = 0.99 cfs @ 12.02 hrs, Volume= 2.438 af
 Secondary = 135.16 cfs @ 12.02 hrs, Volume= 9.106 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 762.99' @ 12.02 hrs Surf.Area= 0 sf Storage= 81,159 cf

Plug-Flow detention time= 180.3 min calculated for 11.537 af (99% of inflow)
 Center-of-Mass det. time= 178.3 min (965.7 - 787.4)

Volume	Invert	Avail.Storage	Storage Description
#1	757.00'	102,409 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
757.00	0
758.00	9,694
759.00	20,520
760.00	32,535
761.00	45,797
762.00	61,986
763.00	81,377
764.00	102,409

Device	Routing	Invert	Outlet Devices
#1	Primary	757.25'	4.0" Vert. Orifice/Grate C= 0.600
#2	Secondary	761.70'	35.0' long x 35.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.99 cfs @ 12.02 hrs HW=762.97' (Free Discharge)↑ **1=Orifice/Grate** (Orifice Controls 0.99 cfs @ 11.35 fps)**Secondary OutFlow** Max=132.58 cfs @ 12.02 hrs HW=762.97' (Free Discharge)↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 132.58 cfs @ 2.98 fps)

11491.002- Post Development

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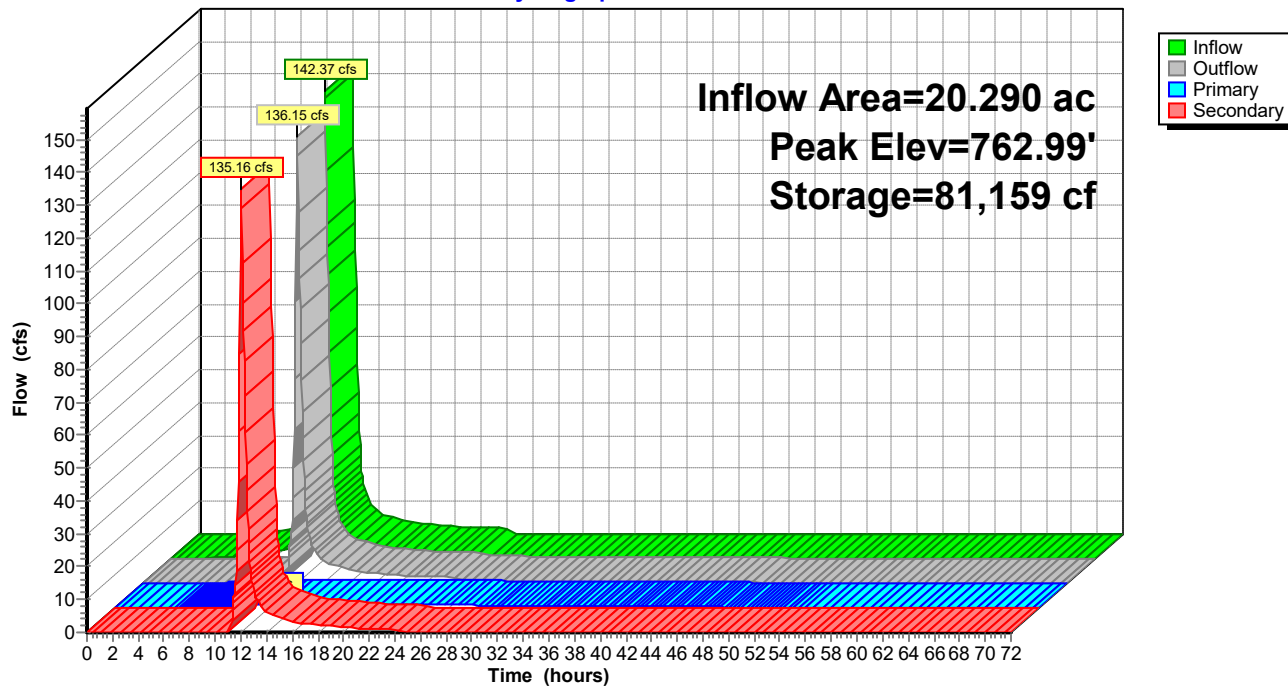
Type II 24-hr 25 YR Rainfall=8.54"

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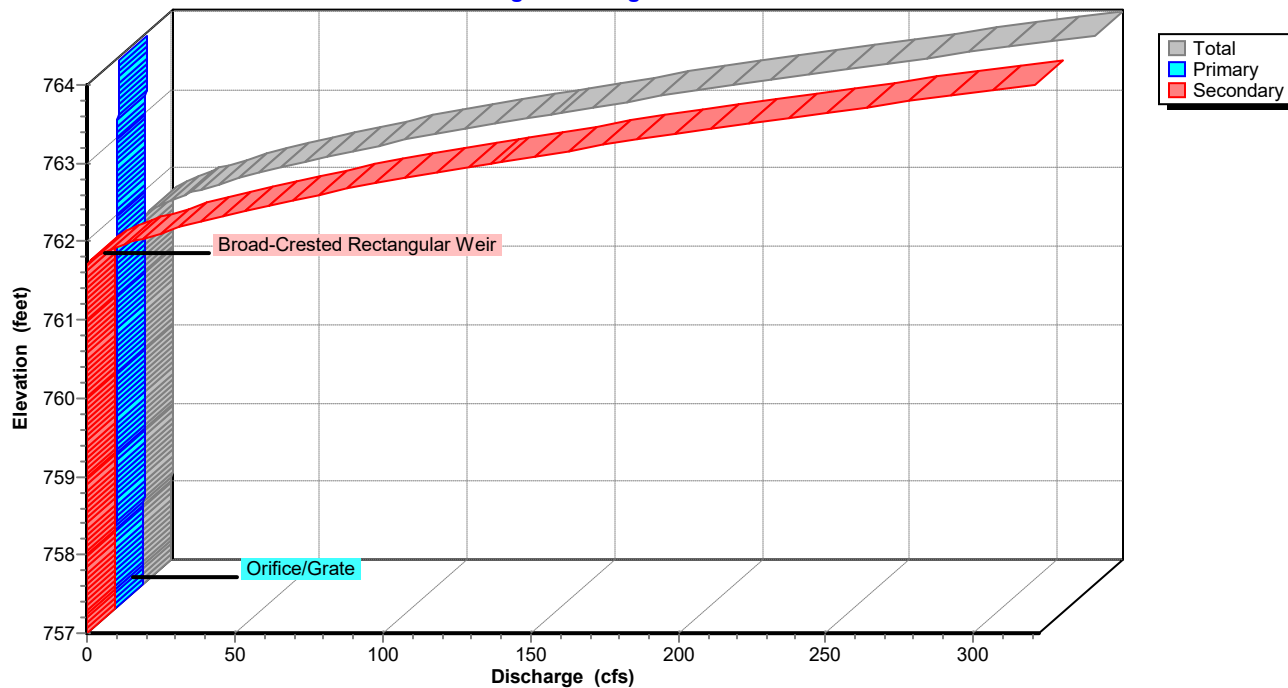
Pond 2P: POND A

Hydrograph

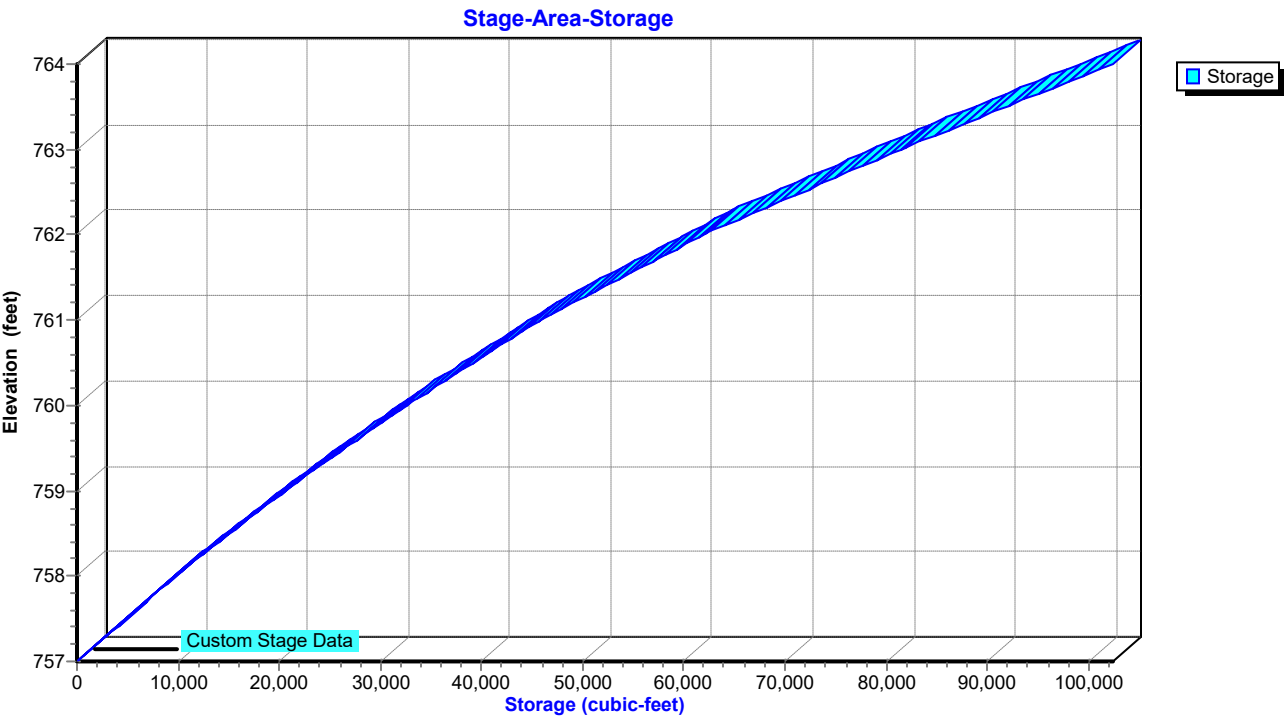


Pond 2P: POND A

Stage-Discharge



Pond 2P: POND A



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Hydrograph for Pond 2P: POND A

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	757.00	0.00	0.00	0.00
2.50	0.11	107	757.01	0.00	0.00	0.00
5.00	0.63	3,117	757.32	0.02	0.02	0.00
7.50	1.69	11,630	758.18	0.37	0.37	0.00
10.00	4.24	31,790	759.94	0.67	0.67	0.00
12.50	31.46	66,454	762.23	37.48	0.92	36.55
15.00	5.30	59,266	761.83	5.39	0.88	4.51
17.50	3.34	58,523	761.79	3.38	0.88	2.50
20.00	2.29	58,132	761.76	2.34	0.88	1.46
22.50	2.01	57,939	761.75	2.02	0.87	1.15
25.00	0.00	55,422	761.59	0.86	0.86	0.00
27.50	0.00	47,914	761.13	0.81	0.81	0.00
30.00	0.00	40,871	760.63	0.75	0.75	0.00
32.50	0.00	34,363	760.14	0.69	0.69	0.00
35.00	0.00	28,409	759.66	0.63	0.63	0.00
37.50	0.00	23,047	759.21	0.56	0.56	0.00
40.00	0.00	18,287	758.79	0.49	0.49	0.00
42.50	0.00	14,180	758.41	0.42	0.42	0.00
45.00	0.00	10,733	758.10	0.35	0.35	0.00
47.50	0.00	7,964	757.82	0.27	0.27	0.00
50.00	0.00	5,929	757.61	0.19	0.19	0.00
52.50	0.00	4,635	757.48	0.10	0.10	0.00
55.00	0.00	3,947	757.41	0.06	0.06	0.00
57.50	0.00	3,557	757.37	0.03	0.03	0.00
60.00	0.00	3,321	757.34	0.02	0.02	0.00
62.50	0.00	3,153	757.33	0.02	0.02	0.00
65.00	0.00	3,027	757.31	0.01	0.01	0.00
67.50	0.00	2,931	757.30	0.01	0.01	0.00
70.00	0.00	2,860	757.30	0.01	0.01	0.00

11491.002- Post Development

Type II 24-hr 25 YR Rainfall=8.54"

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Stage-Discharge for Pond 2P: POND A

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
757.00	0.00	0.00	0.00	762.20	34.33	0.92	33.41
757.10	0.00	0.00	0.00	762.30	44.85	0.93	43.92
757.20	0.00	0.00	0.00	762.40	55.67	0.94	54.73
757.30	0.01	0.01	0.00	762.50	67.06	0.95	66.12
757.40	0.05	0.05	0.00	762.60	79.70	0.96	78.74
757.50	0.12	0.12	0.00	762.70	93.02	0.97	92.05
757.60	0.18	0.18	0.00	762.80	107.37	0.97	106.40
757.70	0.22	0.22	0.00	762.90	122.45	0.98	121.46
757.80	0.26	0.26	0.00	763.00	137.95	0.99	136.96
757.90	0.29	0.29	0.00	763.10	154.06	1.00	153.06
758.00	0.32	0.32	0.00	763.20	170.44	1.01	169.43
758.10	0.35	0.35	0.00	763.30	187.32	1.02	186.30
758.20	0.37	0.37	0.00	763.40	205.06	1.03	204.03
758.30	0.39	0.39	0.00	763.50	223.33	1.04	222.30
758.40	0.42	0.42	0.00	763.60	242.12	1.04	241.08
758.50	0.44	0.44	0.00	763.70	261.41	1.05	260.36
758.60	0.46	0.46	0.00	763.80	281.19	1.06	280.13
758.70	0.48	0.48	0.00	763.90	301.44	1.07	300.37
758.80	0.49	0.49	0.00	764.00	322.16	1.08	321.08
758.90	0.51	0.51	0.00				
759.00	0.53	0.53	0.00				
759.10	0.55	0.55	0.00				
759.20	0.56	0.56	0.00				
759.30	0.58	0.58	0.00				
759.40	0.59	0.59	0.00				
759.50	0.61	0.61	0.00				
759.60	0.62	0.62	0.00				
759.70	0.63	0.63	0.00				
759.80	0.65	0.65	0.00				
759.90	0.66	0.66	0.00				
760.00	0.68	0.68	0.00				
760.10	0.69	0.69	0.00				
760.20	0.70	0.70	0.00				
760.30	0.71	0.71	0.00				
760.40	0.73	0.73	0.00				
760.50	0.74	0.74	0.00				
760.60	0.75	0.75	0.00				
760.70	0.76	0.76	0.00				
760.80	0.77	0.77	0.00				
760.90	0.78	0.78	0.00				
761.00	0.80	0.80	0.00				
761.10	0.81	0.81	0.00				
761.20	0.82	0.82	0.00				
761.30	0.83	0.83	0.00				
761.40	0.84	0.84	0.00				
761.50	0.85	0.85	0.00				
761.60	0.86	0.86	0.00				
761.70	0.87	0.87	0.00				
761.80	3.85	0.88	2.97				
761.90	9.28	0.89	8.39				
762.00	16.37	0.90	15.47				
762.10	24.82	0.91	23.91				

11491.002- Post Development*Type II 24-hr 25 YR Rainfall=8.54"*

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Stage-Area-Storage for Pond 2P: POND A

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
757.00	0	762.20	65,864
757.10	969	762.30	67,803
757.20	1,939	762.40	69,742
757.30	2,908	762.50	71,682
757.40	3,878	762.60	73,621
757.50	4,847	762.70	75,560
757.60	5,816	762.80	77,499
757.70	6,786	762.90	79,438
757.80	7,755	763.00	81,377
757.90	8,725	763.10	83,480
758.00	9,694	763.20	85,583
758.10	10,777	763.30	87,687
758.20	11,859	763.40	89,790
758.30	12,942	763.50	91,893
758.40	14,024	763.60	93,996
758.50	15,107	763.70	96,099
758.60	16,190	763.80	98,203
758.70	17,272	763.90	100,306
758.80	18,355	764.00	102,409
758.90	19,437		
759.00	20,520		
759.10	21,722		
759.20	22,923		
759.30	24,124		
759.40	25,326		
759.50	26,528		
759.60	27,729		
759.70	28,931		
759.80	30,132		
759.90	31,333		
760.00	32,535		
760.10	33,861		
760.20	35,187		
760.30	36,514		
760.40	37,840		
760.50	39,166		
760.60	40,492		
760.70	41,818		
760.80	43,145		
760.90	44,471		
761.00	45,797		
761.10	47,416		
761.20	49,035		
761.30	50,654		
761.40	52,273		
761.50	53,892		
761.60	55,510		
761.70	57,129		
761.80	58,748		
761.90	60,367		
762.00	61,986		
762.10	63,925		

11491.002- Post Development

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Type II 24-hr 25 YR Rainfall=8.54"

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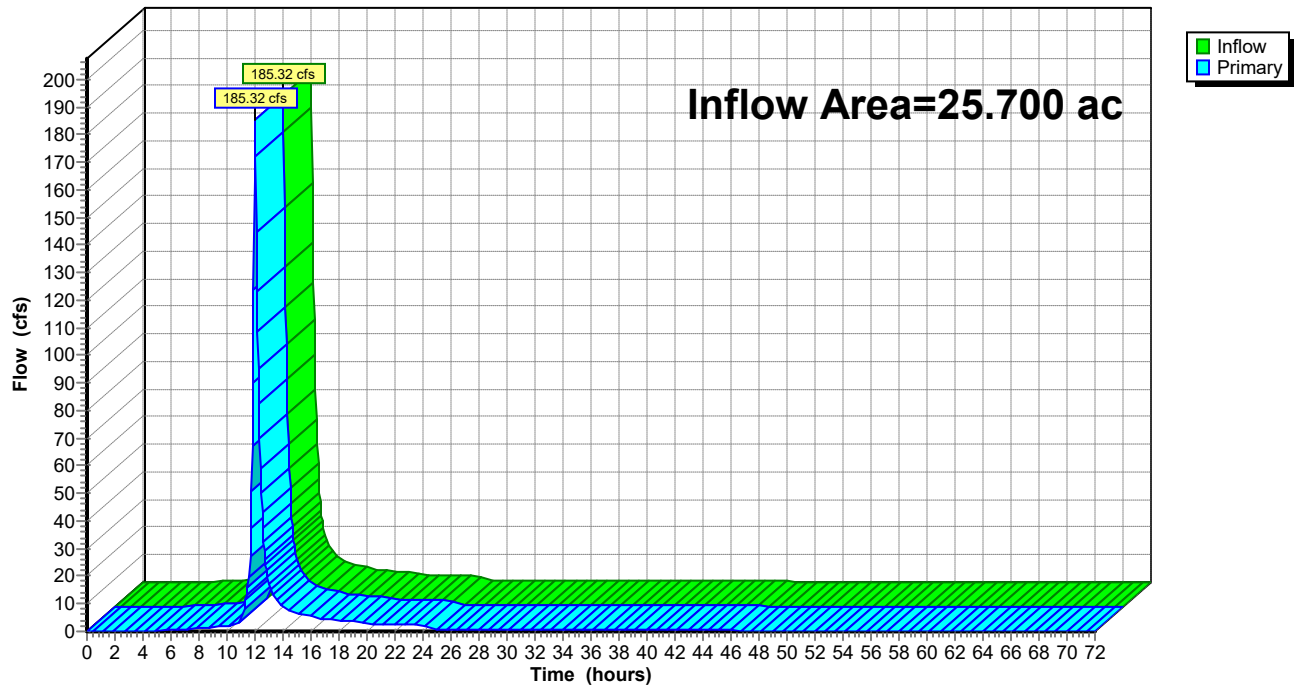
Summary for Link 7L: OUTFALL

Inflow Area = 25.700 ac, 24.36% Impervious, Inflow Depth = 6.88" for 25 YR event
Inflow = 185.32 cfs @ 12.01 hrs, Volume= 14.737 af
Primary = 185.32 cfs @ 12.01 hrs, Volume= 14.737 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 7L: OUTFALL

Hydrograph



11491.002- Post Development

Type II 24-hr 25 YR Rainfall=8.54"

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Hydrograph for Link 7L: OUTFALL

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.12	0.00	0.12
1.00	0.00	0.00	0.00	53.00	0.09	0.00	0.09
2.00	0.00	0.00	0.00	54.00	0.07	0.00	0.07
3.00	0.02	0.00	0.02	55.00	0.06	0.00	0.06
4.00	0.10	0.00	0.10	56.00	0.05	0.00	0.05
5.00	0.21	0.00	0.21	57.00	0.04	0.00	0.04
6.00	0.48	0.00	0.48	58.00	0.03	0.00	0.03
7.00	0.74	0.00	0.74	59.00	0.03	0.00	0.03
8.00	0.98	0.00	0.98	60.00	0.02	0.00	0.02
9.00	1.44	0.00	1.44	61.00	0.02	0.00	0.02
10.00	1.91	0.00	1.91	62.00	0.02	0.00	0.02
11.00	3.25	0.00	3.25	63.00	0.02	0.00	0.02
12.00	185.06	0.00	185.06	64.00	0.01	0.00	0.01
13.00	16.78	0.00	16.78	65.00	0.01	0.00	0.01
14.00	9.05	0.00	9.05	66.00	0.01	0.00	0.01
15.00	6.80	0.00	6.80	67.00	0.01	0.00	0.01
16.00	5.35	0.00	5.35	68.00	0.01	0.00	0.01
17.00	4.54	0.00	4.54	69.00	0.01	0.00	0.01
18.00	4.01	0.00	4.01	70.00	0.01	0.00	0.01
19.00	3.48	0.00	3.48	71.00	0.01	0.00	0.01
20.00	2.95	0.00	2.95	72.00	0.01	0.00	0.01
21.00	2.72	0.00	2.72				
22.00	2.62	0.00	2.62				
23.00	2.51	0.00	2.51				
24.00	2.40	0.00	2.40				
25.00	0.86	0.00	0.86				
26.00	0.84	0.00	0.84				
27.00	0.82	0.00	0.82				
28.00	0.80	0.00	0.80				
29.00	0.78	0.00	0.78				
30.00	0.76	0.00	0.76				
31.00	0.73	0.00	0.73				
32.00	0.71	0.00	0.71				
33.00	0.68	0.00	0.68				
34.00	0.66	0.00	0.66				
35.00	0.63	0.00	0.63				
36.00	0.61	0.00	0.61				
37.00	0.58	0.00	0.58				
38.00	0.55	0.00	0.55				
39.00	0.53	0.00	0.53				
40.00	0.50	0.00	0.50				
41.00	0.47	0.00	0.47				
42.00	0.44	0.00	0.44				
43.00	0.41	0.00	0.41				
44.00	0.38	0.00	0.38				
45.00	0.35	0.00	0.35				
46.00	0.32	0.00	0.32				
47.00	0.29	0.00	0.29				
48.00	0.26	0.00	0.26				
49.00	0.22	0.00	0.22				
50.00	0.19	0.00	0.19				
51.00	0.16	0.00	0.16				

11491.002- Post Development*Type II 24-hr 100 YR Rainfall=12.20"*

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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Post-Development Runoff Area=8.290 ac 57.90% Impervious Runoff Depth=11.22"
Flow Length=570' Slope=0.0087 '/' Tc=5.6 min CN=92 Runoff=140.77 cfs 7.748 af

Subcatchment 3S: Off-Site Drainage Runoff Area=12.000 ac 0.00% Impervious Runoff Depth=9.91"
Flow Length=1,200' Slope=0.0100 '/' Tc=21.7 min CN=82 Runoff=120.39 cfs 9.911 af

Subcatchment 4S: DA-002 Runoff Area=3.370 ac 34.42% Impervious Runoff Depth=10.83"
Flow Length=450' Tc=12.1 min CN=89 Runoff=46.60 cfs 3.042 af

Subcatchment 6S: DA-003 Runoff Area=2.040 ac 14.71% Impervious Runoff Depth=10.44"
Flow Length=375' Tc=5.0 min CN=86 Runoff=34.40 cfs 1.775 af

Reach 3R: Grassy Swale Avg. Flow Depth=0.14' Max Vel=0.80 fps Inflow=1.03 cfs 2.569 af
n=0.035 L=185.0' S=0.0054 '/' Capacity=31.82 cfs Outflow=1.02 cfs 2.569 af

Pond 2P: POND A Peak Elev=763.39' Storage=89,552 cf Inflow=211.30 cfs 17.659 af
Primary=1.03 cfs 2.569 af Secondary=201.93 cfs 15.025 af Outflow=202.95 cfs 17.594 af

Link 7L: OUTFALL Inflow=275.38 cfs 22.412 af
Primary=275.38 cfs 22.412 af

Total Runoff Area = 25.700 ac Runoff Volume = 22.476 af Average Runoff Depth = 10.49"
75.64% Pervious = 19.440 ac 24.36% Impervious = 6.260 ac

11491.002- Post Development

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Type II 24-hr 100 YR Rainfall=12.20"

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Summary for Subcatchment 1S: Post-Development[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 140.77 cfs @ 11.96 hrs, Volume= 7.748 af, Depth=11.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, $dt=0.05$ hrs

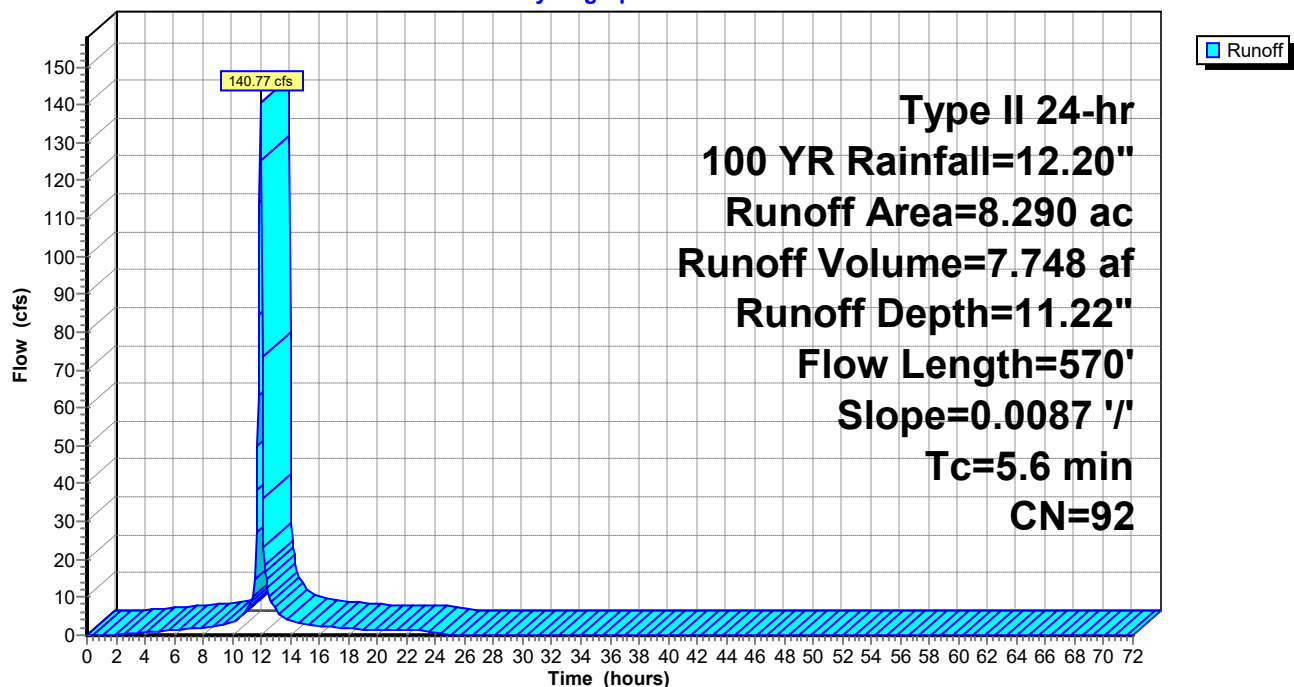
Type II 24-hr 100 YR Rainfall=12.20"

Area (ac)	CN	Description
3.490	84	50-75% Grass cover, Fair, HSG D
4.800	98	Unconnected pavement, HSG B
8.290	92	Weighted Average
3.490		42.10% Pervious Area
4.800		57.90% Impervious Area
4.800		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	470	0.0087	1.89		Shallow Concentrated Flow, Shallow Concentrated Paved $K_v=20.3$ fps
1.5	100	0.0087	1.10		Sheet Flow, Smooth surfaces $n=0.011$ $P2=3.98"$
5.6	570	Total			

Subcatchment 1S: Post-Development

Hydrograph



11491.002- Post Development*Type II 24-hr 100 YR Rainfall=12.20"*

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Hydrograph for Subcatchment 1S: Post-Development

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	12.20	11.22	0.00
1.00	0.13	0.00	0.00	53.00	12.20	11.22	0.00
2.00	0.27	0.01	0.20	54.00	12.20	11.22	0.00
3.00	0.42	0.05	0.50	55.00	12.20	11.22	0.00
4.00	0.59	0.13	0.75	56.00	12.20	11.22	0.00
5.00	0.77	0.24	1.03	57.00	12.20	11.22	0.00
6.00	0.98	0.38	1.31	58.00	12.20	11.22	0.00
7.00	1.21	0.56	1.59	59.00	12.20	11.22	0.00
8.00	1.46	0.77	1.86	60.00	12.20	11.22	0.00
9.00	1.79	1.05	2.78	61.00	12.20	11.22	0.00
10.00	2.21	1.43	3.57	62.00	12.20	11.22	0.00
11.00	2.87	2.04	6.56	63.00	12.20	11.22	0.00
12.00	8.09	7.13	125.53	64.00	12.20	11.22	0.00
13.00	9.42	8.45	6.63	65.00	12.20	11.22	0.00
14.00	10.00	9.03	3.92	66.00	12.20	11.22	0.00
15.00	10.41	9.44	3.10	67.00	12.20	11.22	0.00
16.00	10.74	9.76	2.39	68.00	12.20	11.22	0.00
17.00	11.00	10.02	2.10	69.00	12.20	11.22	0.00
18.00	11.24	10.26	1.85	70.00	12.20	11.22	0.00
19.00	11.44	10.46	1.59	71.00	12.20	11.22	0.00
20.00	11.61	10.63	1.34	72.00	12.20	11.22	0.00
21.00	11.77	10.79	1.27				
22.00	11.92	10.94	1.22				
23.00	12.06	11.08	1.17				
24.00	12.20	11.22	1.12				
25.00	12.20	11.22	0.00				
26.00	12.20	11.22	0.00				
27.00	12.20	11.22	0.00				
28.00	12.20	11.22	0.00				
29.00	12.20	11.22	0.00				
30.00	12.20	11.22	0.00				
31.00	12.20	11.22	0.00				
32.00	12.20	11.22	0.00				
33.00	12.20	11.22	0.00				
34.00	12.20	11.22	0.00				
35.00	12.20	11.22	0.00				
36.00	12.20	11.22	0.00				
37.00	12.20	11.22	0.00				
38.00	12.20	11.22	0.00				
39.00	12.20	11.22	0.00				
40.00	12.20	11.22	0.00				
41.00	12.20	11.22	0.00				
42.00	12.20	11.22	0.00				
43.00	12.20	11.22	0.00				
44.00	12.20	11.22	0.00				
45.00	12.20	11.22	0.00				
46.00	12.20	11.22	0.00				
47.00	12.20	11.22	0.00				
48.00	12.20	11.22	0.00				
49.00	12.20	11.22	0.00				
50.00	12.20	11.22	0.00				
51.00	12.20	11.22	0.00				

11491.002- Post Development

Type II 24-hr 100 YR Rainfall=12.20"

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Summary for Subcatchment 3S: Off-Site Drainage

Runoff = 120.39 cfs @ 12.14 hrs, Volume= 9.911 af, Depth= 9.91"

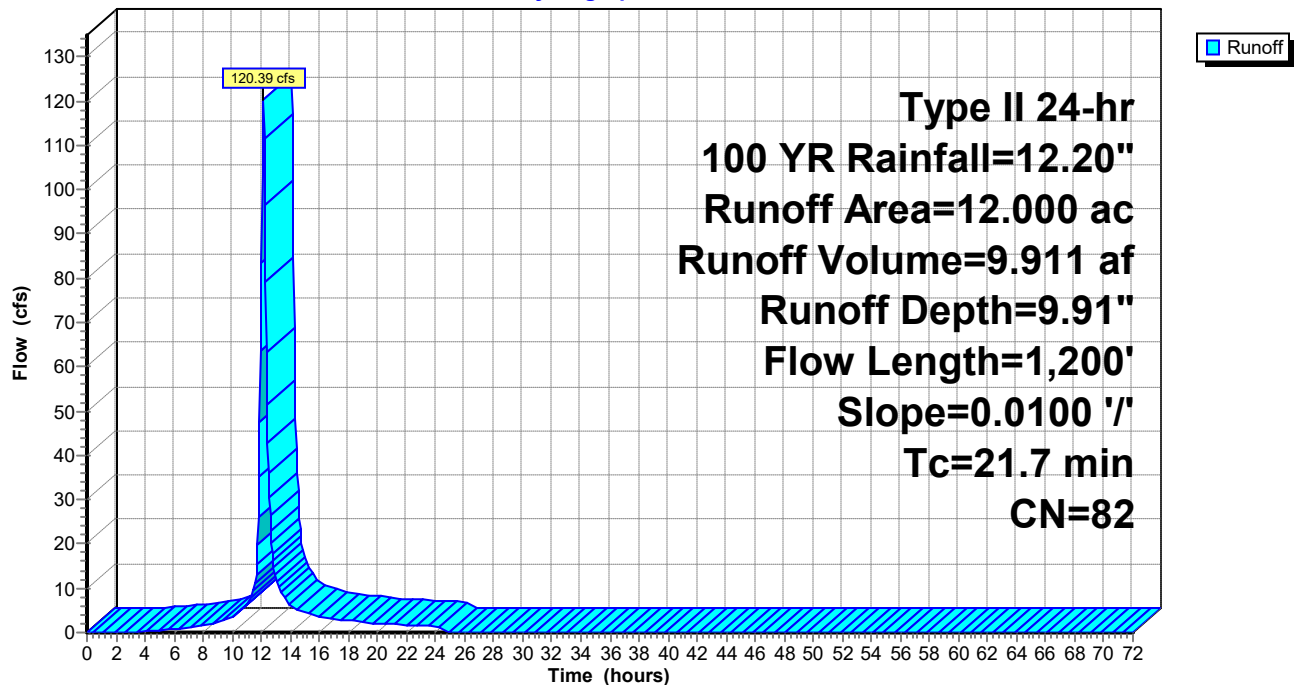
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR Rainfall=12.20"

Area (ac)	CN	Description
12.000	82	Woods/grass comb., Fair, HSG D
12.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	1,100	0.0100	1.61		Shallow Concentrated Flow, SHALLOW CONCENTRATED
					Unpaved Kv= 16.1 fps
10.3	100	0.0100	0.16		Sheet Flow, SHEET
					Range n= 0.130 P2= 3.98"
21.7	1,200	Total			

Subcatchment 3S: Off-Site Drainage

Hydrograph



11491.002- Post Development*Type II 24-hr 100 YR Rainfall=12.20"*

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Hydrograph for Subcatchment 3S: Off-Site Drainage

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	12.20	9.91	0.00
1.00	0.13	0.00	0.00	53.00	12.20	9.91	0.00
2.00	0.27	0.00	0.00	54.00	12.20	9.91	0.00
3.00	0.42	0.00	0.00	55.00	12.20	9.91	0.00
4.00	0.59	0.01	0.16	56.00	12.20	9.91	0.00
5.00	0.77	0.04	0.46	57.00	12.20	9.91	0.00
6.00	0.98	0.11	0.82	58.00	12.20	9.91	0.00
7.00	1.21	0.20	1.20	59.00	12.20	9.91	0.00
8.00	1.46	0.33	1.60	60.00	12.20	9.91	0.00
9.00	1.79	0.52	2.50	61.00	12.20	9.91	0.00
10.00	2.21	0.79	3.45	62.00	12.20	9.91	0.00
11.00	2.87	1.28	6.50	63.00	12.20	9.91	0.00
12.00	8.09	5.94	83.27	64.00	12.20	9.91	0.00
13.00	9.42	7.22	11.98	65.00	12.20	9.91	0.00
14.00	10.00	7.78	6.24	66.00	12.20	9.91	0.00
15.00	10.41	8.17	4.62	67.00	12.20	9.91	0.00
16.00	10.74	8.49	3.62	68.00	12.20	9.91	0.00
17.00	11.00	8.74	3.06	69.00	12.20	9.91	0.00
18.00	11.24	8.97	2.70	70.00	12.20	9.91	0.00
19.00	11.44	9.17	2.34	71.00	12.20	9.91	0.00
20.00	11.61	9.34	1.99	72.00	12.20	9.91	0.00
21.00	11.77	9.49	1.82				
22.00	11.92	9.64	1.75				
23.00	12.06	9.78	1.68				
24.00	12.20	9.91	1.61				
25.00	12.20	9.91	0.01				
26.00	12.20	9.91	0.00				
27.00	12.20	9.91	0.00				
28.00	12.20	9.91	0.00				
29.00	12.20	9.91	0.00				
30.00	12.20	9.91	0.00				
31.00	12.20	9.91	0.00				
32.00	12.20	9.91	0.00				
33.00	12.20	9.91	0.00				
34.00	12.20	9.91	0.00				
35.00	12.20	9.91	0.00				
36.00	12.20	9.91	0.00				
37.00	12.20	9.91	0.00				
38.00	12.20	9.91	0.00				
39.00	12.20	9.91	0.00				
40.00	12.20	9.91	0.00				
41.00	12.20	9.91	0.00				
42.00	12.20	9.91	0.00				
43.00	12.20	9.91	0.00				
44.00	12.20	9.91	0.00				
45.00	12.20	9.91	0.00				
46.00	12.20	9.91	0.00				
47.00	12.20	9.91	0.00				
48.00	12.20	9.91	0.00				
49.00	12.20	9.91	0.00				
50.00	12.20	9.91	0.00				
51.00	12.20	9.91	0.00				

11491.002- Post Development

Type II 24-hr 100 YR Rainfall=12.20"

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Summary for Subcatchment 4S: DA-002

Runoff = 46.60 cfs @ 12.03 hrs, Volume= 3.042 af, Depth=10.83"

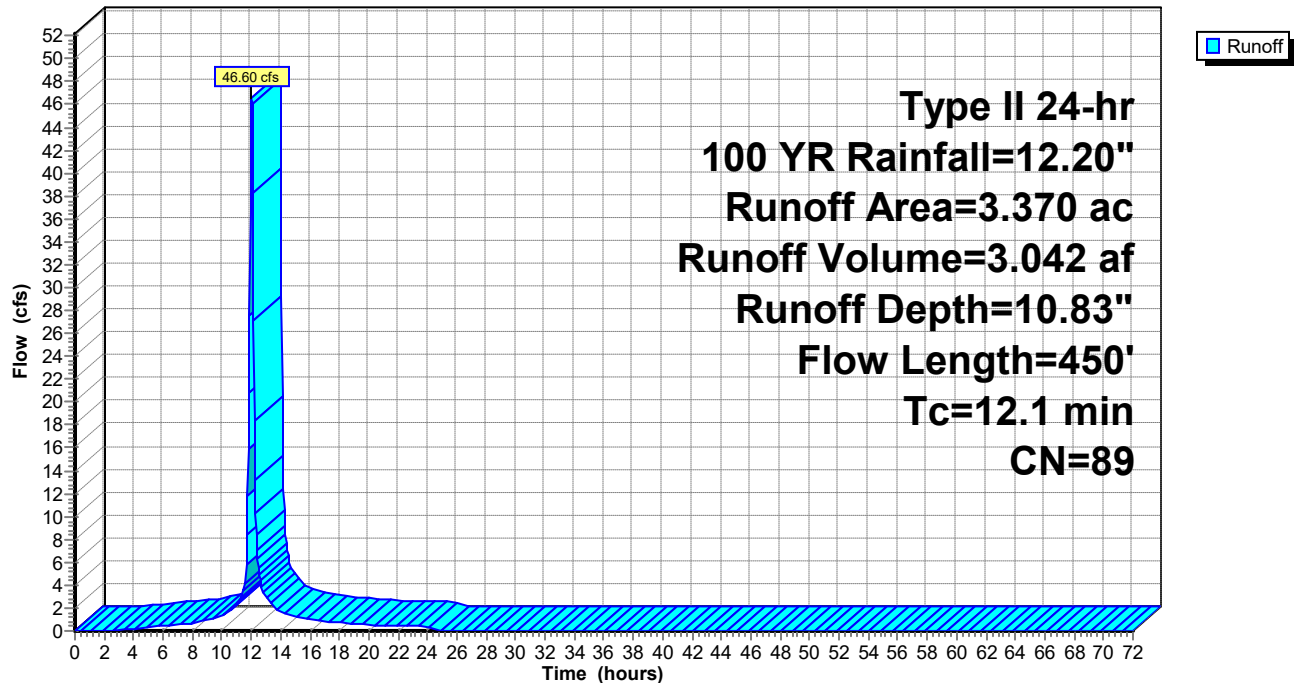
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type II 24-hr 100 YR Rainfall=12.20"

Area (ac)	CN	Description
2.210	84	50-75% Grass cover, Fair, HSG D
1.160	98	Paved parking, HSG A
3.370	89	Weighted Average
2.210		65.58% Pervious Area
1.160		34.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0120	0.17		Sheet Flow, Range n= 0.130 P2= 3.98"
2.2	315	0.0220	2.39		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	35	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
12.1	450	Total			

Subcatchment 4S: DA-002

Hydrograph



11491.002- Post Development*Type II 24-hr 100 YR Rainfall=12.20"*

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Hydrograph for Subcatchment 4S: DA-002

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	12.20	10.83	0.00
1.00	0.13	0.00	0.00	53.00	12.20	10.83	0.00
2.00	0.27	0.00	0.00	54.00	12.20	10.83	0.00
3.00	0.42	0.02	0.11	55.00	12.20	10.83	0.00
4.00	0.59	0.07	0.21	56.00	12.20	10.83	0.00
5.00	0.77	0.15	0.31	57.00	12.20	10.83	0.00
6.00	0.98	0.27	0.43	58.00	12.20	10.83	0.00
7.00	1.21	0.42	0.55	59.00	12.20	10.83	0.00
8.00	1.46	0.60	0.66	60.00	12.20	10.83	0.00
9.00	1.79	0.86	0.99	61.00	12.20	10.83	0.00
10.00	2.21	1.20	1.29	62.00	12.20	10.83	0.00
11.00	2.87	1.78	2.38	63.00	12.20	10.83	0.00
12.00	8.09	6.77	44.78	64.00	12.20	10.83	0.00
13.00	9.42	8.08	2.89	65.00	12.20	10.83	0.00
14.00	10.00	8.66	1.67	66.00	12.20	10.83	0.00
15.00	10.41	9.06	1.28	67.00	12.20	10.83	0.00
16.00	10.74	9.38	1.00	68.00	12.20	10.83	0.00
17.00	11.00	9.65	0.86	69.00	12.20	10.83	0.00
18.00	11.24	9.88	0.76	70.00	12.20	10.83	0.00
19.00	11.44	10.08	0.66	71.00	12.20	10.83	0.00
20.00	11.61	10.25	0.55	72.00	12.20	10.83	0.00
21.00	11.77	10.41	0.52				
22.00	11.92	10.55	0.50				
23.00	12.06	10.70	0.48				
24.00	12.20	10.83	0.46				
25.00	12.20	10.83	0.00				
26.00	12.20	10.83	0.00				
27.00	12.20	10.83	0.00				
28.00	12.20	10.83	0.00				
29.00	12.20	10.83	0.00				
30.00	12.20	10.83	0.00				
31.00	12.20	10.83	0.00				
32.00	12.20	10.83	0.00				
33.00	12.20	10.83	0.00				
34.00	12.20	10.83	0.00				
35.00	12.20	10.83	0.00				
36.00	12.20	10.83	0.00				
37.00	12.20	10.83	0.00				
38.00	12.20	10.83	0.00				
39.00	12.20	10.83	0.00				
40.00	12.20	10.83	0.00				
41.00	12.20	10.83	0.00				
42.00	12.20	10.83	0.00				
43.00	12.20	10.83	0.00				
44.00	12.20	10.83	0.00				
45.00	12.20	10.83	0.00				
46.00	12.20	10.83	0.00				
47.00	12.20	10.83	0.00				
48.00	12.20	10.83	0.00				
49.00	12.20	10.83	0.00				
50.00	12.20	10.83	0.00				
51.00	12.20	10.83	0.00				

11491.002- Post Development

Type II 24-hr 100 YR Rainfall=12.20"

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Summary for Subcatchment 6S: DA-003[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 34.40 cfs @ 11.95 hrs, Volume= 1.775 af, Depth=10.44"

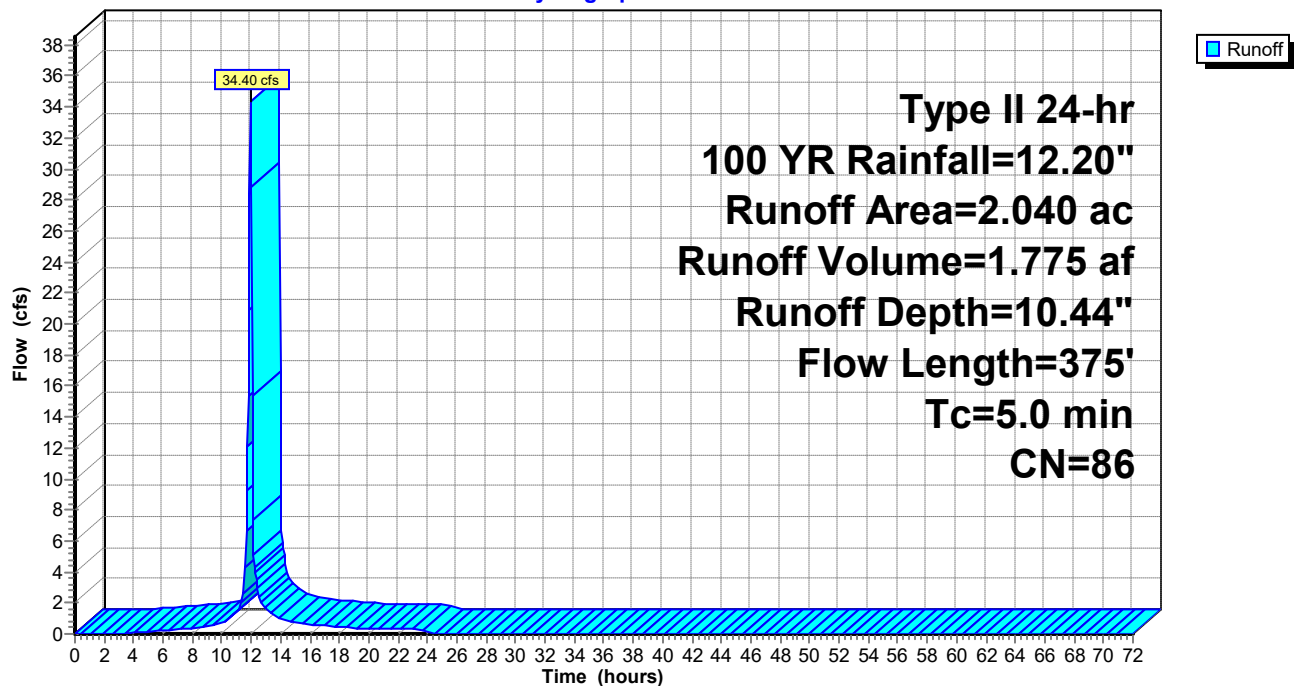
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, $dt=0.05$ hrs
Type II 24-hr 100 YR Rainfall=12.20"

Area (ac)	CN	Description
0.300	98	Paved parking, HSG D
1.740	84	50-75% Grass cover, Fair, HSG D
2.040	86	Weighted Average
1.740		85.29% Pervious Area
0.300		14.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0300	1.80		Sheet Flow, Smooth surfaces $n=0.011$ $P2=3.98"$
1.0	275	0.0500	4.54		Shallow Concentrated Flow, Paved $K_v=20.3$ fps
1.9	375	Total, Increased to minimum $T_c = 5.0$ min			

Subcatchment 6S: DA-003

Hydrograph



11491.002- Post Development*Type II 24-hr 100 YR Rainfall=12.20"*

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Hydrograph for Subcatchment 6S: DA-003

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	12.20	10.44	0.00
1.00	0.13	0.00	0.00	53.00	12.20	10.44	0.00
2.00	0.27	0.00	0.00	54.00	12.20	10.44	0.00
3.00	0.42	0.01	0.03	55.00	12.20	10.44	0.00
4.00	0.59	0.04	0.09	56.00	12.20	10.44	0.00
5.00	0.77	0.09	0.15	57.00	12.20	10.44	0.00
6.00	0.98	0.19	0.22	58.00	12.20	10.44	0.00
7.00	1.21	0.31	0.29	59.00	12.20	10.44	0.00
8.00	1.46	0.47	0.36	60.00	12.20	10.44	0.00
9.00	1.79	0.70	0.56	61.00	12.20	10.44	0.00
10.00	2.21	1.01	0.76	62.00	12.20	10.44	0.00
11.00	2.87	1.55	1.46	63.00	12.20	10.44	0.00
12.00	8.09	6.42	28.83	64.00	12.20	10.44	0.00
13.00	9.42	7.71	1.59	65.00	12.20	10.44	0.00
14.00	10.00	8.28	0.95	66.00	12.20	10.44	0.00
15.00	10.41	8.69	0.75	67.00	12.20	10.44	0.00
16.00	10.74	9.00	0.58	68.00	12.20	10.44	0.00
17.00	11.00	9.26	0.51	69.00	12.20	10.44	0.00
18.00	11.24	9.49	0.45	70.00	12.20	10.44	0.00
19.00	11.44	9.70	0.39	71.00	12.20	10.44	0.00
20.00	11.61	9.87	0.33	72.00	12.20	10.44	0.00
21.00	11.77	10.02	0.31				
22.00	11.92	10.17	0.30				
23.00	12.06	10.31	0.29				
24.00	12.20	10.44	0.27				
25.00	12.20	10.44	0.00				
26.00	12.20	10.44	0.00				
27.00	12.20	10.44	0.00				
28.00	12.20	10.44	0.00				
29.00	12.20	10.44	0.00				
30.00	12.20	10.44	0.00				
31.00	12.20	10.44	0.00				
32.00	12.20	10.44	0.00				
33.00	12.20	10.44	0.00				
34.00	12.20	10.44	0.00				
35.00	12.20	10.44	0.00				
36.00	12.20	10.44	0.00				
37.00	12.20	10.44	0.00				
38.00	12.20	10.44	0.00				
39.00	12.20	10.44	0.00				
40.00	12.20	10.44	0.00				
41.00	12.20	10.44	0.00				
42.00	12.20	10.44	0.00				
43.00	12.20	10.44	0.00				
44.00	12.20	10.44	0.00				
45.00	12.20	10.44	0.00				
46.00	12.20	10.44	0.00				
47.00	12.20	10.44	0.00				
48.00	12.20	10.44	0.00				
49.00	12.20	10.44	0.00				
50.00	12.20	10.44	0.00				
51.00	12.20	10.44	0.00				

11491.002- Post Development

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Type II 24-hr 100 YR Rainfall=12.20"

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Summary for Reach 3R: Grassy Swale

Inflow Area = 20.290 ac, 23.66% Impervious, Inflow Depth > 1.52" for 100 YR event
Inflow = 1.03 cfs @ 12.01 hrs, Volume= 2.569 af
Outflow = 1.02 cfs @ 12.12 hrs, Volume= 2.569 af, Atten= 1%, Lag= 6.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.80 fps, Min. Travel Time= 3.9 min

Avg. Velocity= 0.51 fps, Avg. Travel Time= 6.0 min

Peak Storage= 236 cf @ 12.06 hrs

Average Depth at Peak Storage= 0.14'

Bank-Full Depth= 1.00' Flow Area= 12.0 sf, Capacity= 31.82 cfs

9.00' x 1.00' deep channel, n= 0.035 High grass

Side Slope Z-value= 3.0 '/' Top Width= 15.00'

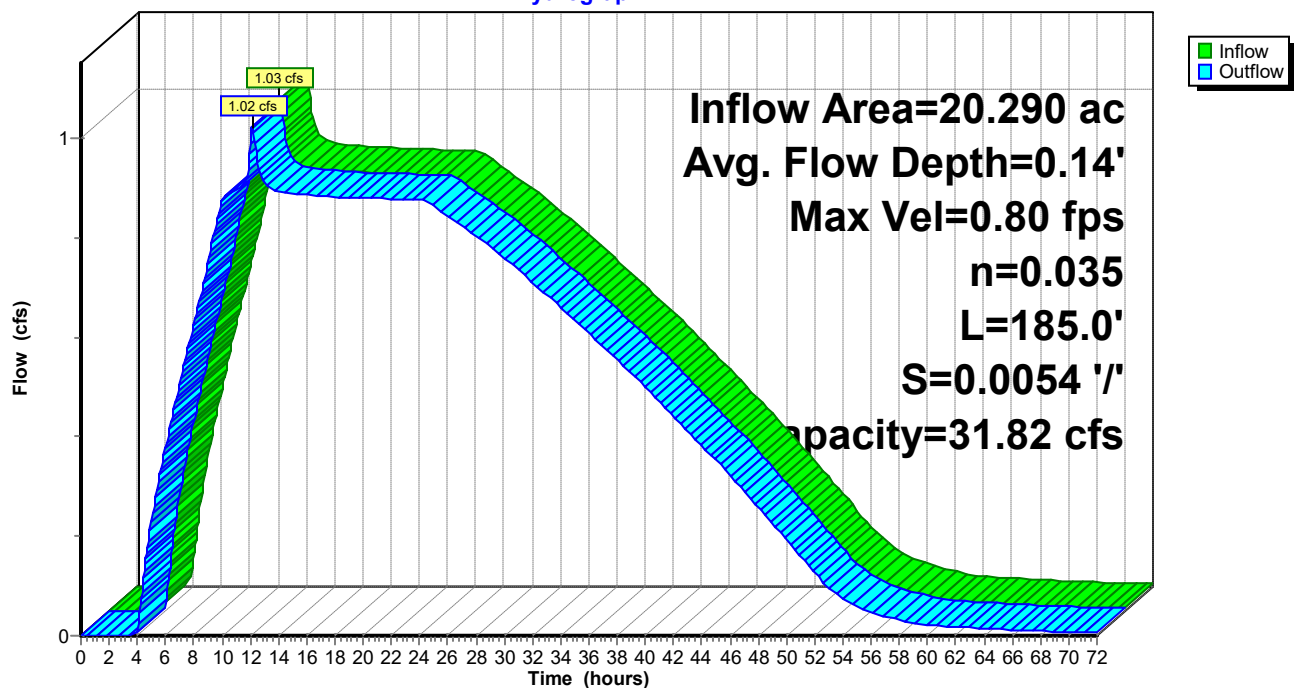
Length= 185.0' Slope= 0.0054 '/'

Inlet Invert= 756.50', Outlet Invert= 755.50'

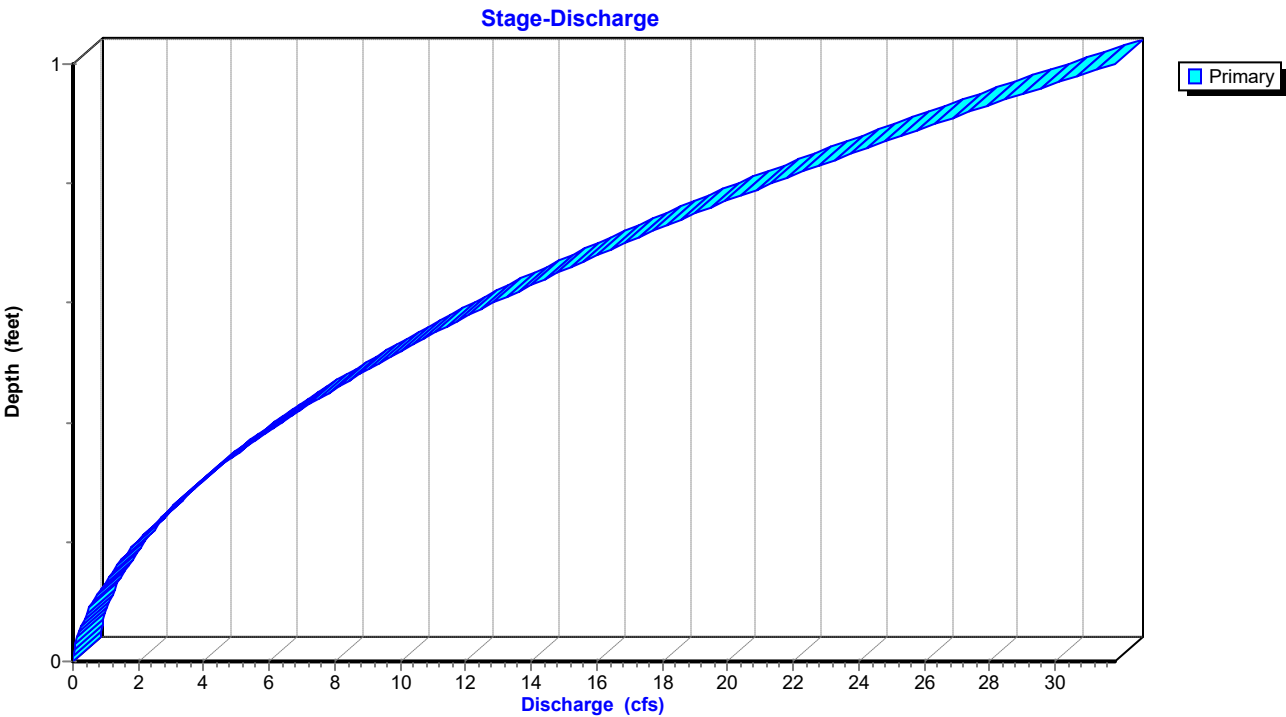


Reach 3R: Grassy Swale

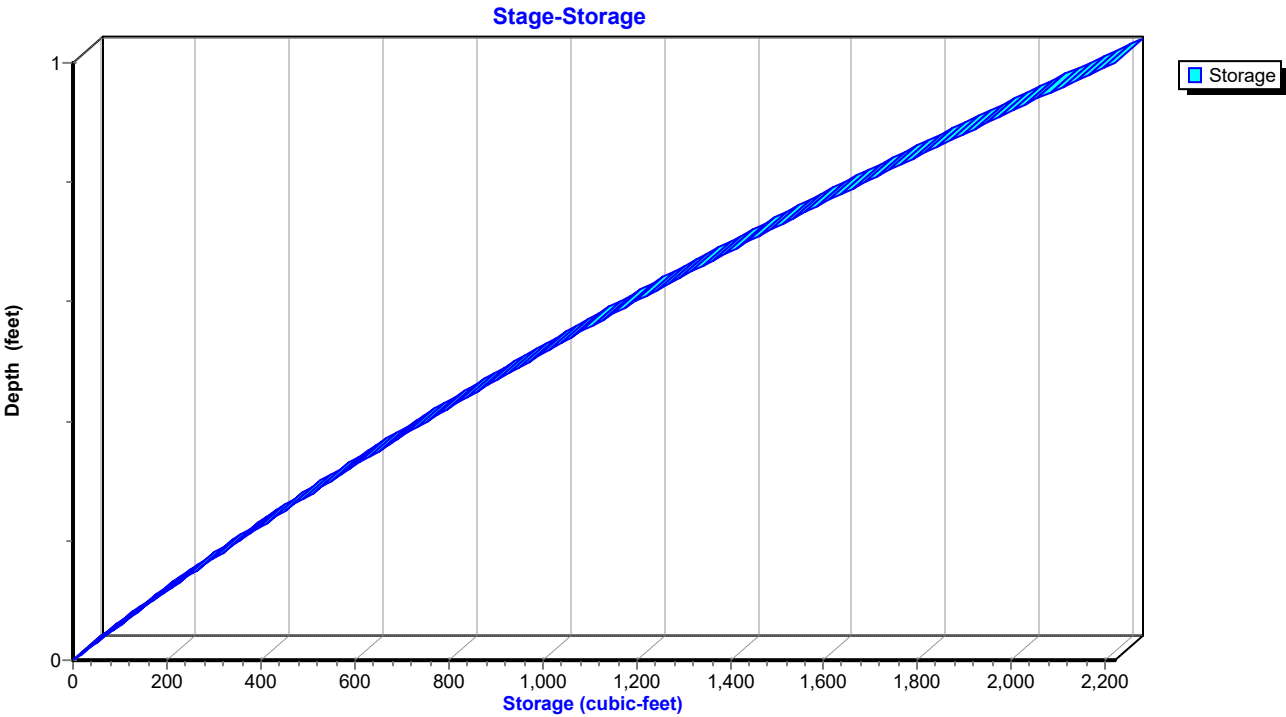
Hydrograph



Reach 3R: Grassy Swale



Reach 3R: Grassy Swale



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Hydrograph for Reach 3R: Grassy Swale

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	756.50	0.00
2.50	0.00	0	756.50	0.00
5.00	0.25	98	756.56	0.23
7.50	0.58	166	756.60	0.57
10.00	0.88	215	756.62	0.88
12.50	0.94	225	756.63	0.96
15.00	0.89	217	756.62	0.89
17.50	0.88	216	756.62	0.88
20.00	0.88	215	756.62	0.88
22.50	0.88	215	756.62	0.88
25.00	0.86	213	756.62	0.86
27.50	0.81	205	756.62	0.81
30.00	0.76	196	756.61	0.76
32.50	0.70	186	756.61	0.70
35.00	0.63	176	756.60	0.63
37.50	0.56	164	756.60	0.57
40.00	0.50	151	756.59	0.50
42.50	0.42	137	756.58	0.43
45.00	0.35	122	756.57	0.35
47.50	0.27	105	756.56	0.27
50.00	0.19	84	756.55	0.19
52.50	0.11	60	756.54	0.11
55.00	0.06	41	756.52	0.06
57.50	0.03	30	756.52	0.04
60.00	0.02	22	756.51	0.02
62.50	0.02	19	756.51	0.02
65.00	0.01	16	756.51	0.01
67.50	0.01	12	756.51	0.01
70.00	0.01	9	756.51	0.01

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Type II 24-hr 100 YR Rainfall=12.20"

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Stage-Discharge for Reach 3R: Grassy Swale

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)	Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
756.50	0.00	0.00	757.02	1.82	10.02
756.51	0.14	0.01	757.03	1.84	10.36
756.52	0.23	0.04	757.04	1.87	10.70
756.53	0.30	0.08	757.05	1.89	11.04
756.54	0.36	0.13	757.06	1.91	11.40
756.55	0.42	0.19	757.07	1.93	11.75
756.56	0.47	0.26	757.08	1.94	12.11
756.57	0.52	0.34	757.09	1.96	12.48
756.58	0.57	0.42	757.10	1.98	12.85
756.59	0.61	0.51	757.11	2.00	13.23
756.60	0.66	0.61	757.12	2.02	13.61
756.61	0.70	0.72	757.13	2.04	14.00
756.62	0.74	0.83	757.14	2.06	14.39
756.63	0.78	0.95	757.15	2.08	14.78
756.64	0.81	1.07	757.16	2.10	15.19
756.65	0.85	1.21	757.17	2.11	15.59
756.66	0.89	1.35	757.18	2.13	16.00
756.67	0.92	1.49	757.19	2.15	16.42
756.68	0.96	1.64	757.20	2.17	16.84
756.69	0.99	1.80	757.21	2.19	17.27
756.70	1.02	1.96	757.22	2.20	17.70
756.71	1.05	2.13	757.23	2.22	18.14
756.72	1.08	2.30	757.24	2.24	18.58
756.73	1.11	2.48	757.25	2.25	19.03
756.74	1.14	2.67	757.26	2.27	19.48
756.75	1.17	2.86	757.27	2.29	19.93
756.76	1.20	3.06	757.28	2.31	20.39
756.77	1.23	3.26	757.29	2.32	20.86
756.78	1.26	3.47	757.30	2.34	21.33
756.79	1.29	3.68	757.31	2.36	21.81
756.80	1.31	3.90	757.32	2.37	22.29
756.81	1.34	4.12	757.33	2.39	22.78
756.82	1.36	4.35	757.34	2.40	23.27
756.83	1.39	4.58	757.35	2.42	23.77
756.84	1.42	4.82	757.36	2.44	24.27
756.85	1.44	5.07	757.37	2.45	24.77
756.86	1.47	5.32	757.38	2.47	25.29
756.87	1.49	5.57	757.39	2.48	25.80
756.88	1.51	5.84	757.40	2.50	26.32
756.89	1.54	6.10	757.41	2.52	26.85
756.90	1.56	6.37	757.42	2.53	27.38
756.91	1.58	6.65	757.43	2.55	27.92
756.92	1.61	6.93	757.44	2.56	28.46
756.93	1.63	7.21	757.45	2.58	29.01
756.94	1.65	7.51	757.46	2.59	29.56
756.95	1.68	7.80	757.47	2.61	30.12
756.96	1.70	8.10	757.48	2.62	30.68
756.97	1.72	8.41	757.49	2.64	31.25
756.98	1.74	8.72	757.50	2.65	31.82
756.99	1.76	9.04			
757.00	1.78	9.36			
757.01	1.80	9.69			

11491.002- Post Development

Type II 24-hr 100 YR Rainfall=12.20"

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Stage-Area-Storage for Reach 3R: Grassy Swale

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
756.50	0.0	0	757.02	5.5	1,016
756.51	0.1	17	757.03	5.6	1,038
756.52	0.2	34	757.04	5.7	1,061
756.53	0.3	50	757.05	5.9	1,084
756.54	0.4	67	757.06	6.0	1,106
756.55	0.5	85	757.07	6.1	1,129
756.56	0.6	102	757.08	6.2	1,152
756.57	0.6	119	757.09	6.4	1,176
756.58	0.7	137	757.10	6.5	1,199
756.59	0.8	154	757.11	6.6	1,222
756.60	0.9	172	757.12	6.7	1,246
756.61	1.0	190	757.13	6.9	1,269
756.62	1.1	208	757.14	7.0	1,293
756.63	1.2	226	757.15	7.1	1,317
756.64	1.3	244	757.16	7.2	1,341
756.65	1.4	262	757.17	7.4	1,365
756.66	1.5	281	757.18	7.5	1,389
756.67	1.6	299	757.19	7.6	1,413
756.68	1.7	318	757.20	7.8	1,437
756.69	1.8	336	757.21	7.9	1,462
756.70	1.9	355	757.22	8.0	1,487
756.71	2.0	374	757.23	8.2	1,511
756.72	2.1	393	757.24	8.3	1,536
756.73	2.2	412	757.25	8.4	1,561
756.74	2.3	432	757.26	8.6	1,586
756.75	2.4	451	757.27	8.7	1,611
756.76	2.5	470	757.28	8.8	1,636
756.77	2.6	490	757.29	9.0	1,662
756.78	2.8	510	757.30	9.1	1,687
756.79	2.9	530	757.31	9.3	1,713
756.80	3.0	549	757.32	9.4	1,738
756.81	3.1	569	757.33	9.5	1,764
756.82	3.2	590	757.34	9.7	1,790
756.83	3.3	610	757.35	9.8	1,816
756.84	3.4	630	757.36	10.0	1,842
756.85	3.5	651	757.37	10.1	1,869
756.86	3.6	671	757.38	10.2	1,895
756.87	3.7	692	757.39	10.4	1,921
756.88	3.9	713	757.40	10.5	1,948
756.89	4.0	734	757.41	10.7	1,975
756.90	4.1	755	757.42	10.8	2,002
756.91	4.2	776	757.43	11.0	2,028
756.92	4.3	797	757.44	11.1	2,055
756.93	4.4	819	757.45	11.3	2,083
756.94	4.5	840	757.46	11.4	2,110
756.95	4.7	862	757.47	11.6	2,137
756.96	4.8	883	757.48	11.7	2,165
756.97	4.9	905	757.49	11.9	2,192
756.98	5.0	927	757.50	12.0	2,220
756.99	5.1	949			
757.00	5.3	971			
757.01	5.4	994			

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Type II 24-hr 100 YR Rainfall=12.20"

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Summary for Pond 2P: POND A

Inflow Area = 20.290 ac, 23.66% Impervious, Inflow Depth = 10.44" for 100 YR event
 Inflow = 211.30 cfs @ 11.98 hrs, Volume= 17.659 af
 Outflow = 202.95 cfs @ 12.01 hrs, Volume= 17.594 af, Atten= 4%, Lag= 2.0 min
 Primary = 1.03 cfs @ 12.01 hrs, Volume= 2.569 af
 Secondary = 201.93 cfs @ 12.01 hrs, Volume= 15.025 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 763.39' @ 12.01 hrs Surf.Area= 0 sf Storage= 89,552 cf

Plug-Flow detention time= 126.8 min calculated for 17.582 af (100% of inflow)
 Center-of-Mass det. time= 126.0 min (903.3 - 777.3)

Volume	Invert	Avail.Storage	Storage Description
#1	757.00'	102,409 cf	Custom Stage Data Listed below

Elevation (feet)	Cum.Store (cubic-feet)
757.00	0
758.00	9,694
759.00	20,520
760.00	32,535
761.00	45,797
762.00	61,986
763.00	81,377
764.00	102,409

Device	Routing	Invert	Outlet Devices
#1	Primary	757.25'	4.0" Vert. Orifice/Grate C= 0.600
#2	Secondary	761.70'	35.0' long x 35.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.03 cfs @ 12.01 hrs HW=763.37' (Free Discharge)↑ **1=Orifice/Grate** (Orifice Controls 1.03 cfs @ 11.75 fps)**Secondary OutFlow** Max=198.33 cfs @ 12.01 hrs HW=763.37' (Free Discharge)↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 198.33 cfs @ 3.40 fps)

11491.002- Post Development

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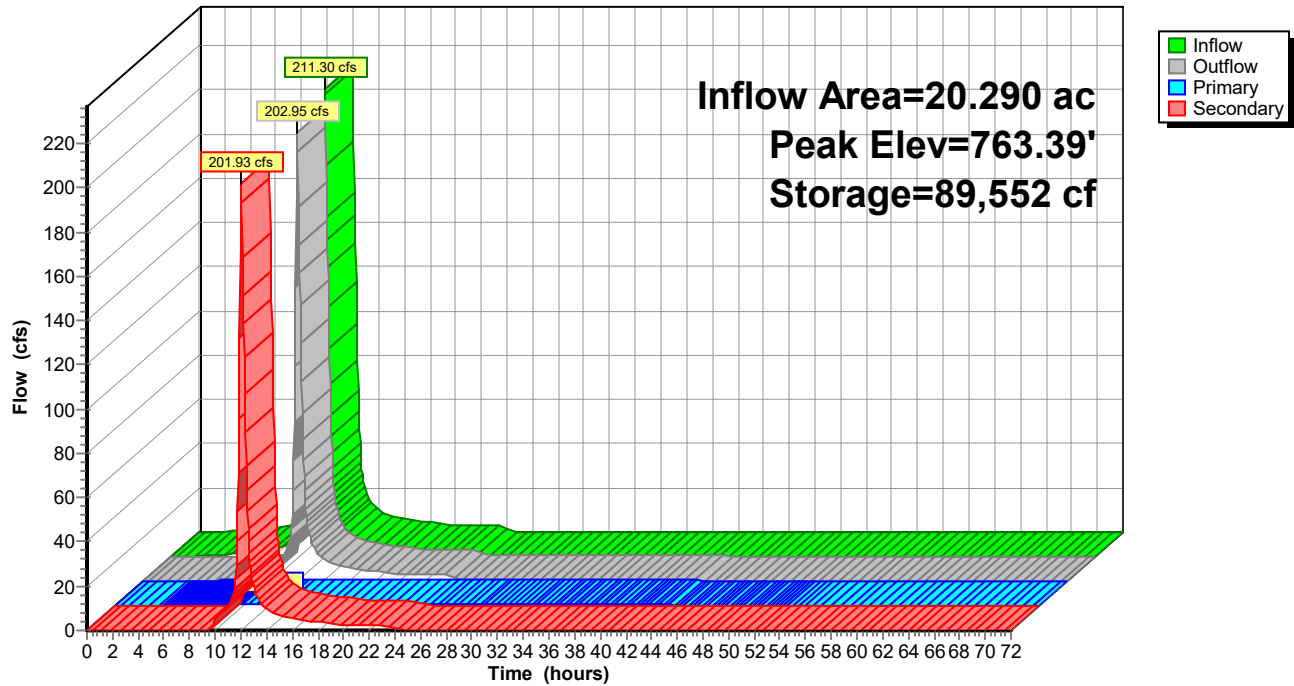
Type II 24-hr 100 YR Rainfall=12.20"

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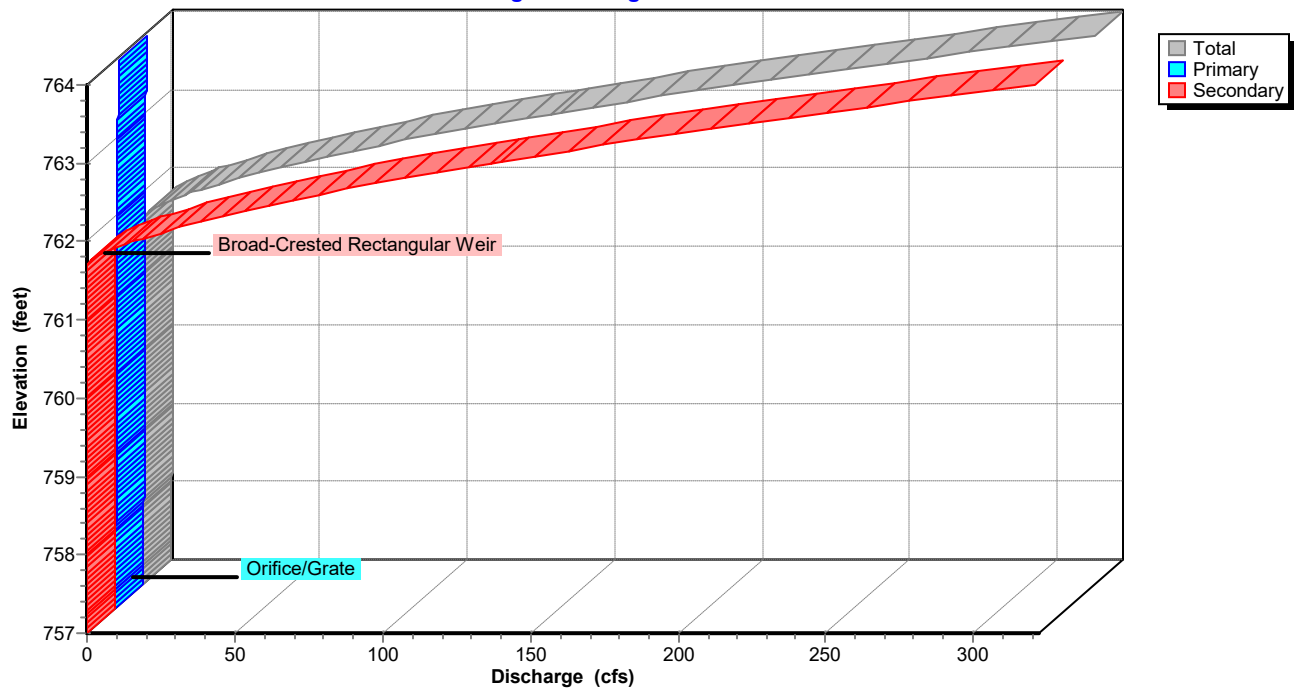
Pond 2P: POND A

Hydrograph

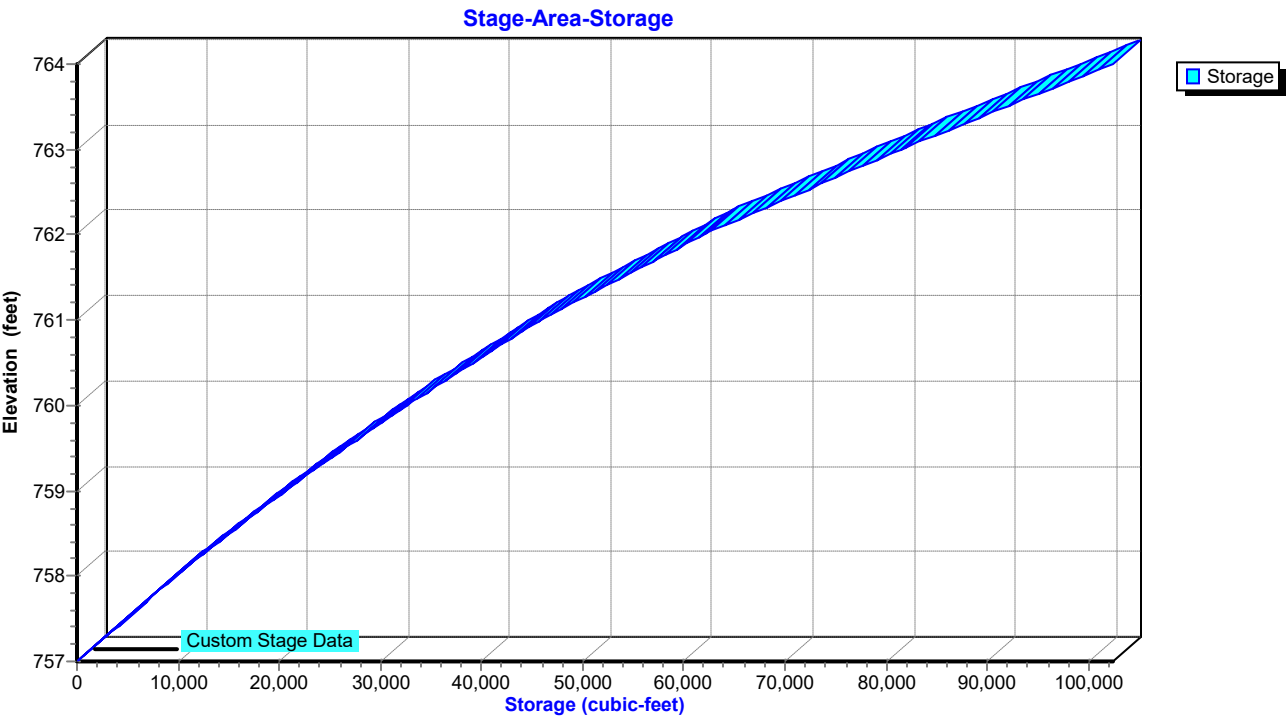


Pond 2P: POND A

Stage-Discharge



Pond 2P: POND A



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Hydrograph for Pond 2P: POND A

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	757.00	0.00	0.00	0.00
2.50	0.36	716	757.07	0.00	0.00	0.00
5.00	1.49	7,597	757.78	0.25	0.25	0.00
7.50	3.12	24,465	759.33	0.58	0.58	0.00
10.00	7.03	59,246	761.83	5.32	0.88	4.44
12.50	46.67	69,579	762.39	54.73	0.94	53.80
15.00	7.72	59,963	761.88	7.85	0.89	6.97
17.50	4.85	59,098	761.82	4.92	0.88	4.03
20.00	3.33	58,527	761.79	3.39	0.88	2.51
22.50	2.91	58,351	761.78	2.92	0.88	2.05
25.00	0.01	55,674	761.61	0.86	0.86	0.00
27.50	0.00	48,152	761.15	0.81	0.81	0.00
30.00	0.00	41,093	760.65	0.76	0.76	0.00
32.50	0.00	34,568	760.15	0.70	0.70	0.00
35.00	0.00	28,594	759.67	0.63	0.63	0.00
37.50	0.00	23,212	759.22	0.56	0.56	0.00
40.00	0.00	18,433	758.81	0.50	0.50	0.00
42.50	0.00	14,304	758.43	0.42	0.42	0.00
45.00	0.00	10,836	758.11	0.35	0.35	0.00
47.50	0.00	8,043	757.83	0.27	0.27	0.00
50.00	0.00	5,983	757.62	0.19	0.19	0.00
52.50	0.00	4,666	757.48	0.11	0.11	0.00
55.00	0.00	3,964	757.41	0.06	0.06	0.00
57.50	0.00	3,566	757.37	0.03	0.03	0.00
60.00	0.00	3,327	757.34	0.02	0.02	0.00
62.50	0.00	3,158	757.33	0.02	0.02	0.00
65.00	0.00	3,030	757.31	0.01	0.01	0.00
67.50	0.00	2,934	757.30	0.01	0.01	0.00
70.00	0.00	2,862	757.30	0.01	0.01	0.00

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Stage-Discharge for Pond 2P: POND A

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
757.00	0.00	0.00	0.00	762.20	34.33	0.92	33.41
757.10	0.00	0.00	0.00	762.30	44.85	0.93	43.92
757.20	0.00	0.00	0.00	762.40	55.67	0.94	54.73
757.30	0.01	0.01	0.00	762.50	67.06	0.95	66.12
757.40	0.05	0.05	0.00	762.60	79.70	0.96	78.74
757.50	0.12	0.12	0.00	762.70	93.02	0.97	92.05
757.60	0.18	0.18	0.00	762.80	107.37	0.97	106.40
757.70	0.22	0.22	0.00	762.90	122.45	0.98	121.46
757.80	0.26	0.26	0.00	763.00	137.95	0.99	136.96
757.90	0.29	0.29	0.00	763.10	154.06	1.00	153.06
758.00	0.32	0.32	0.00	763.20	170.44	1.01	169.43
758.10	0.35	0.35	0.00	763.30	187.32	1.02	186.30
758.20	0.37	0.37	0.00	763.40	205.06	1.03	204.03
758.30	0.39	0.39	0.00	763.50	223.33	1.04	222.30
758.40	0.42	0.42	0.00	763.60	242.12	1.04	241.08
758.50	0.44	0.44	0.00	763.70	261.41	1.05	260.36
758.60	0.46	0.46	0.00	763.80	281.19	1.06	280.13
758.70	0.48	0.48	0.00	763.90	301.44	1.07	300.37
758.80	0.49	0.49	0.00	764.00	322.16	1.08	321.08
758.90	0.51	0.51	0.00				
759.00	0.53	0.53	0.00				
759.10	0.55	0.55	0.00				
759.20	0.56	0.56	0.00				
759.30	0.58	0.58	0.00				
759.40	0.59	0.59	0.00				
759.50	0.61	0.61	0.00				
759.60	0.62	0.62	0.00				
759.70	0.63	0.63	0.00				
759.80	0.65	0.65	0.00				
759.90	0.66	0.66	0.00				
760.00	0.68	0.68	0.00				
760.10	0.69	0.69	0.00				
760.20	0.70	0.70	0.00				
760.30	0.71	0.71	0.00				
760.40	0.73	0.73	0.00				
760.50	0.74	0.74	0.00				
760.60	0.75	0.75	0.00				
760.70	0.76	0.76	0.00				
760.80	0.77	0.77	0.00				
760.90	0.78	0.78	0.00				
761.00	0.80	0.80	0.00				
761.10	0.81	0.81	0.00				
761.20	0.82	0.82	0.00				
761.30	0.83	0.83	0.00				
761.40	0.84	0.84	0.00				
761.50	0.85	0.85	0.00				
761.60	0.86	0.86	0.00				
761.70	0.87	0.87	0.00				
761.80	3.85	0.88	2.97				
761.90	9.28	0.89	8.39				
762.00	16.37	0.90	15.47				
762.10	24.82	0.91	23.91				

11491.002- Post Development*Type II 24-hr 100 YR Rainfall=12.20"*

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Stage-Area-Storage for Pond 2P: POND A

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
757.00	0	762.20	65,864
757.10	969	762.30	67,803
757.20	1,939	762.40	69,742
757.30	2,908	762.50	71,682
757.40	3,878	762.60	73,621
757.50	4,847	762.70	75,560
757.60	5,816	762.80	77,499
757.70	6,786	762.90	79,438
757.80	7,755	763.00	81,377
757.90	8,725	763.10	83,480
758.00	9,694	763.20	85,583
758.10	10,777	763.30	87,687
758.20	11,859	763.40	89,790
758.30	12,942	763.50	91,893
758.40	14,024	763.60	93,996
758.50	15,107	763.70	96,099
758.60	16,190	763.80	98,203
758.70	17,272	763.90	100,306
758.80	18,355	764.00	102,409
758.90	19,437		
759.00	20,520		
759.10	21,722		
759.20	22,923		
759.30	24,124		
759.40	25,326		
759.50	26,528		
759.60	27,729		
759.70	28,931		
759.80	30,132		
759.90	31,333		
760.00	32,535		
760.10	33,861		
760.20	35,187		
760.30	36,514		
760.40	37,840		
760.50	39,166		
760.60	40,492		
760.70	41,818		
760.80	43,145		
760.90	44,471		
761.00	45,797		
761.10	47,416		
761.20	49,035		
761.30	50,654		
761.40	52,273		
761.50	53,892		
761.60	55,510		
761.70	57,129		
761.80	58,748		
761.90	60,367		
762.00	61,986		
762.10	63,925		

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Type II 24-hr 100 YR Rainfall=12.20"

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Summary for Link 7L: OUTFALL

Inflow Area = 25.700 ac, 24.36% Impervious, Inflow Depth = 10.46" for 100 YR event

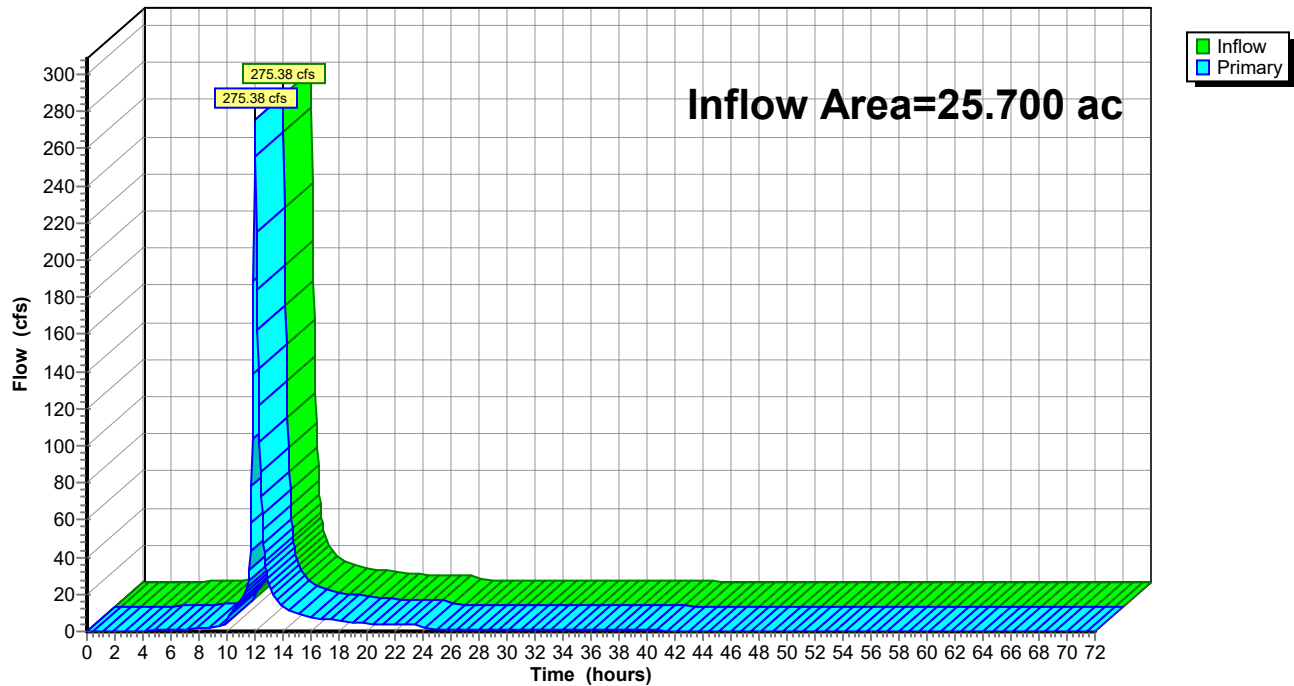
Inflow = 275.38 cfs @ 12.01 hrs, Volume= 22.412 af

Primary = 275.38 cfs @ 12.01 hrs, Volume= 22.412 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 7L: OUTFALL

Hydrograph



11491.002- Post Development*Type II 24-hr 100 YR Rainfall=12.20"*

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Hydrograph for Link 7L: OUTFALL

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.13	0.00	0.13
1.00	0.00	0.00	0.00	53.00	0.10	0.00	0.10
2.00	0.00	0.00	0.00	54.00	0.08	0.00	0.08
3.00	0.14	0.00	0.14	55.00	0.06	0.00	0.06
4.00	0.31	0.00	0.31	56.00	0.05	0.00	0.05
5.00	0.69	0.00	0.69	57.00	0.04	0.00	0.04
6.00	1.02	0.00	1.02	58.00	0.03	0.00	0.03
7.00	1.34	0.00	1.34	59.00	0.03	0.00	0.03
8.00	1.64	0.00	1.64	60.00	0.02	0.00	0.02
9.00	2.30	0.00	2.30	61.00	0.02	0.00	0.02
10.00	7.37	0.00	7.37	62.00	0.02	0.00	0.02
11.00	16.32	0.00	16.32	63.00	0.02	0.00	0.02
12.00	275.10	0.00	275.10	64.00	0.01	0.00	0.01
13.00	24.53	0.00	24.53	65.00	0.01	0.00	0.01
14.00	13.12	0.00	13.12	66.00	0.01	0.00	0.01
15.00	9.89	0.00	9.89	67.00	0.01	0.00	0.01
16.00	7.73	0.00	7.73	68.00	0.01	0.00	0.01
17.00	6.59	0.00	6.59	69.00	0.01	0.00	0.01
18.00	5.82	0.00	5.82	70.00	0.01	0.00	0.01
19.00	5.05	0.00	5.05	71.00	0.01	0.00	0.01
20.00	4.27	0.00	4.27	72.00	0.01	0.00	0.01
21.00	3.93	0.00	3.93				
22.00	3.78	0.00	3.78				
23.00	3.62	0.00	3.62				
24.00	3.47	0.00	3.47				
25.00	0.86	0.00	0.86				
26.00	0.84	0.00	0.84				
27.00	0.82	0.00	0.82				
28.00	0.80	0.00	0.80				
29.00	0.78	0.00	0.78				
30.00	0.76	0.00	0.76				
31.00	0.73	0.00	0.73				
32.00	0.71	0.00	0.71				
33.00	0.69	0.00	0.69				
34.00	0.66	0.00	0.66				
35.00	0.63	0.00	0.63				
36.00	0.61	0.00	0.61				
37.00	0.58	0.00	0.58				
38.00	0.55	0.00	0.55				
39.00	0.53	0.00	0.53				
40.00	0.50	0.00	0.50				
41.00	0.47	0.00	0.47				
42.00	0.44	0.00	0.44				
43.00	0.41	0.00	0.41				
44.00	0.38	0.00	0.38				
45.00	0.35	0.00	0.35				
46.00	0.32	0.00	0.32				
47.00	0.29	0.00	0.29				
48.00	0.26	0.00	0.26				
49.00	0.23	0.00	0.23				
50.00	0.19	0.00	0.19				
51.00	0.16	0.00	0.16				

11491.002- Post Development*Constant Intensity 1.00 hrs WQV Rainfall=1.10"*

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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Post-Development Runoff Area=8.290 ac 57.90% Impervious Runoff Depth=0.48"
Flow Length=570' Slope=0.0087 '/' Tc=5.6 min CN=92 Runoff=6.87 cfs 0.330 af

Subcatchment 3S: Off-Site Drainage Runoff Area=12.000 ac 0.00% Impervious Runoff Depth=0.15"
Flow Length=1,200' Slope=0.0100 '/' Tc=21.7 min CN=82 Runoff=3.67 cfs 0.153 af

Subcatchment 4S: DA-002 Runoff Area=3.370 ac 34.42% Impervious Runoff Depth=0.35"
Flow Length=450' Tc=12.1 min CN=89 Runoff=2.17 cfs 0.098 af

Subcatchment 6S: DA-003 Runoff Area=2.040 ac 14.71% Impervious Runoff Depth=0.25"
Flow Length=375' Tc=5.0 min CN=86 Runoff=1.16 cfs 0.042 af

Reach 3R: Grassy Swale Avg. Flow Depth=0.09' Max Vel=0.61 fps Inflow=0.51 cfs 0.424 af
n=0.035 L=185.0' S=0.0054 '/' Capacity=31.82 cfs Outflow=0.51 cfs 0.424 af

Pond 2P: POND A Peak Elev=758.90' Storage=19,479 cf Inflow=9.68 cfs 0.483 af
Primary=0.51 cfs 0.424 af Secondary=0.00 cfs 0.000 af Outflow=0.51 cfs 0.424 af

Link 7L: OUTFALL Inflow=3.55 cfs 0.565 af
Primary=3.55 cfs 0.565 af

Total Runoff Area = 25.700 ac Runoff Volume = 0.623 af Average Runoff Depth = 0.29"
75.64% Pervious = 19.440 ac 24.36% Impervious = 6.260 ac

11491.002- Post Development

Constant Intensity 1.00 hrs WQV Rainfall=1.10"

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Summary for Subcatchment 1S: Post-Development[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 6.87 cfs @ 0.98 hrs, Volume= 0.330 af, Depth= 0.48"

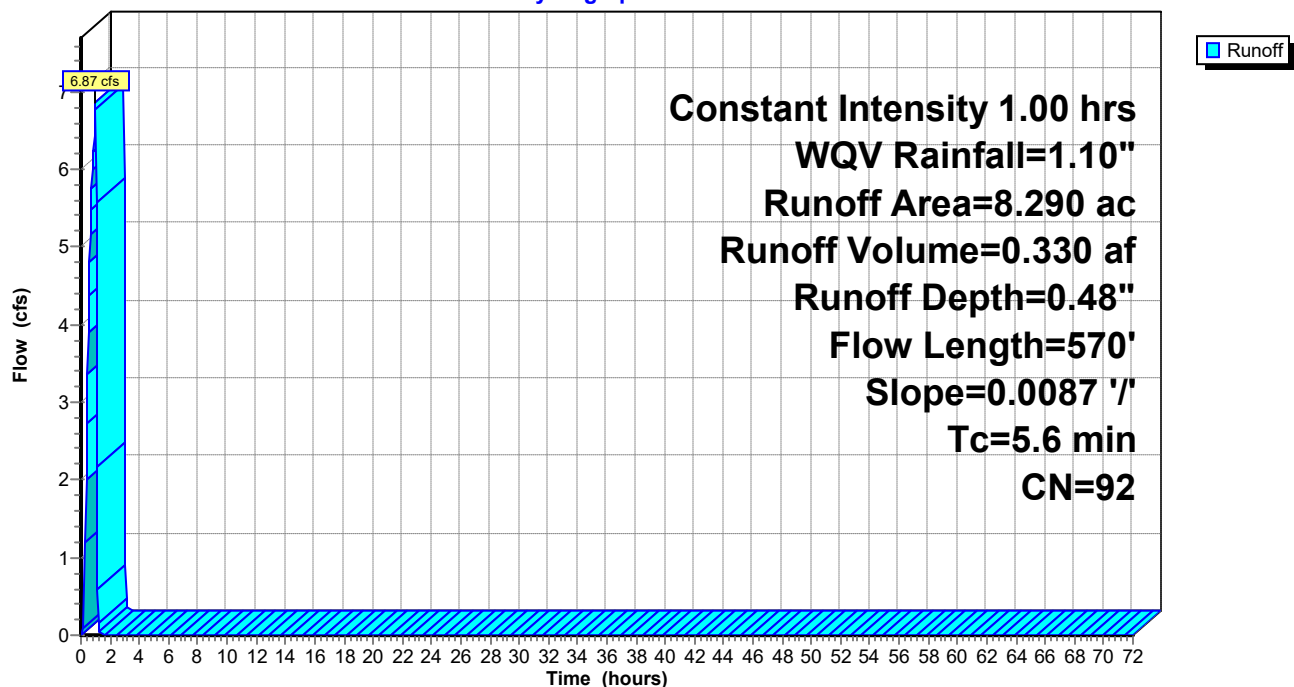
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, $dt=0.05$ hrs
Constant Intensity 1.00 hrs WQV Rainfall=1.10"

Area (ac)	CN	Description
3.490	84	50-75% Grass cover, Fair, HSG D
4.800	98	Unconnected pavement, HSG B
8.290	92	Weighted Average
3.490		42.10% Pervious Area
4.800		57.90% Impervious Area
4.800		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	470	0.0087	1.89		Shallow Concentrated Flow, Shallow Concentrated Paved Kv= 20.3 fps
1.5	100	0.0087	1.10		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.98"
5.6	570	Total			

Subcatchment 1S: Post-Development

Hydrograph



11491.002- Post Development*Constant Intensity 1.00 hrs WQV Rainfall=1.10"*

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Hydrograph for Subcatchment 1S: Post-Development

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	1.10	0.48	0.00
1.00	1.10	0.48	6.77	53.00	1.10	0.48	0.00
2.00	1.10	0.48	0.00	54.00	1.10	0.48	0.00
3.00	1.10	0.48	0.00	55.00	1.10	0.48	0.00
4.00	1.10	0.48	0.00	56.00	1.10	0.48	0.00
5.00	1.10	0.48	0.00	57.00	1.10	0.48	0.00
6.00	1.10	0.48	0.00	58.00	1.10	0.48	0.00
7.00	1.10	0.48	0.00	59.00	1.10	0.48	0.00
8.00	1.10	0.48	0.00	60.00	1.10	0.48	0.00
9.00	1.10	0.48	0.00	61.00	1.10	0.48	0.00
10.00	1.10	0.48	0.00	62.00	1.10	0.48	0.00
11.00	1.10	0.48	0.00	63.00	1.10	0.48	0.00
12.00	1.10	0.48	0.00	64.00	1.10	0.48	0.00
13.00	1.10	0.48	0.00	65.00	1.10	0.48	0.00
14.00	1.10	0.48	0.00	66.00	1.10	0.48	0.00
15.00	1.10	0.48	0.00	67.00	1.10	0.48	0.00
16.00	1.10	0.48	0.00	68.00	1.10	0.48	0.00
17.00	1.10	0.48	0.00	69.00	1.10	0.48	0.00
18.00	1.10	0.48	0.00	70.00	1.10	0.48	0.00
19.00	1.10	0.48	0.00	71.00	1.10	0.48	0.00
20.00	1.10	0.48	0.00	72.00	1.10	0.48	0.00
21.00	1.10	0.48	0.00				
22.00	1.10	0.48	0.00				
23.00	1.10	0.48	0.00				
24.00	1.10	0.48	0.00				
25.00	1.10	0.48	0.00				
26.00	1.10	0.48	0.00				
27.00	1.10	0.48	0.00				
28.00	1.10	0.48	0.00				
29.00	1.10	0.48	0.00				
30.00	1.10	0.48	0.00				
31.00	1.10	0.48	0.00				
32.00	1.10	0.48	0.00				
33.00	1.10	0.48	0.00				
34.00	1.10	0.48	0.00				
35.00	1.10	0.48	0.00				
36.00	1.10	0.48	0.00				
37.00	1.10	0.48	0.00				
38.00	1.10	0.48	0.00				
39.00	1.10	0.48	0.00				
40.00	1.10	0.48	0.00				
41.00	1.10	0.48	0.00				
42.00	1.10	0.48	0.00				
43.00	1.10	0.48	0.00				
44.00	1.10	0.48	0.00				
45.00	1.10	0.48	0.00				
46.00	1.10	0.48	0.00				
47.00	1.10	0.48	0.00				
48.00	1.10	0.48	0.00				
49.00	1.10	0.48	0.00				
50.00	1.10	0.48	0.00				
51.00	1.10	0.48	0.00				

11491.002- Post Development

Constant Intensity 1.00 hrs WQV Rainfall=1.10"

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Summary for Subcatchment 3S: Off-Site Drainage

Runoff = 3.67 cfs @ 1.13 hrs, Volume= 0.153 af, Depth= 0.15"

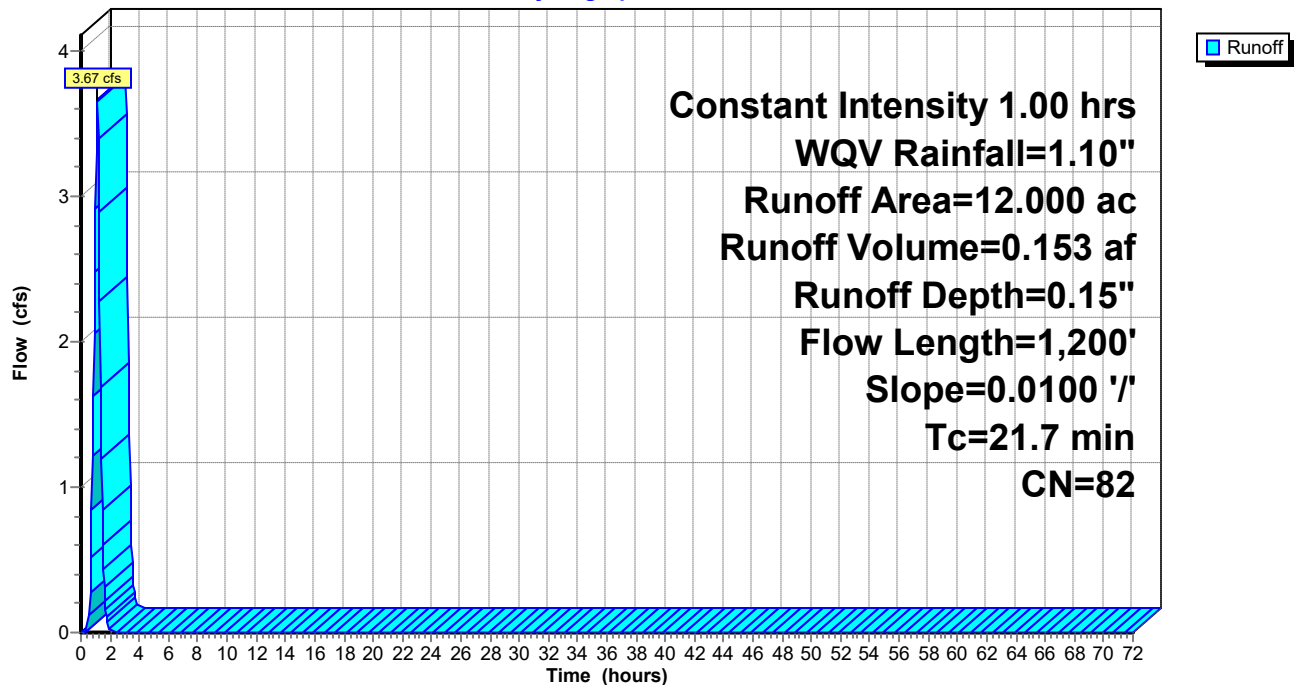
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Constant Intensity 1.00 hrs WQV Rainfall=1.10"

Area (ac)	CN	Description
12.000	82	Woods/grass comb., Fair, HSG D
12.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	1,100	0.0100	1.61		Shallow Concentrated Flow, SHALLOW CONCENTRATED
					Unpaved Kv= 16.1 fps
10.3	100	0.0100	0.16		Sheet Flow, SHEET
					Range n= 0.130 P2= 3.98"
21.7	1,200	Total			

Subcatchment 3S: Off-Site Drainage

Hydrograph



11491.002- Post Development*Constant Intensity 1.00 hrs WQV Rainfall=1.10"*

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Hydrograph for Subcatchment 3S: Off-Site Drainage

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	1.10	0.15	0.00
1.00	1.10	0.15	2.91	53.00	1.10	0.15	0.00
2.00	1.10	0.15	0.02	54.00	1.10	0.15	0.00
3.00	1.10	0.15	0.00	55.00	1.10	0.15	0.00
4.00	1.10	0.15	0.00	56.00	1.10	0.15	0.00
5.00	1.10	0.15	0.00	57.00	1.10	0.15	0.00
6.00	1.10	0.15	0.00	58.00	1.10	0.15	0.00
7.00	1.10	0.15	0.00	59.00	1.10	0.15	0.00
8.00	1.10	0.15	0.00	60.00	1.10	0.15	0.00
9.00	1.10	0.15	0.00	61.00	1.10	0.15	0.00
10.00	1.10	0.15	0.00	62.00	1.10	0.15	0.00
11.00	1.10	0.15	0.00	63.00	1.10	0.15	0.00
12.00	1.10	0.15	0.00	64.00	1.10	0.15	0.00
13.00	1.10	0.15	0.00	65.00	1.10	0.15	0.00
14.00	1.10	0.15	0.00	66.00	1.10	0.15	0.00
15.00	1.10	0.15	0.00	67.00	1.10	0.15	0.00
16.00	1.10	0.15	0.00	68.00	1.10	0.15	0.00
17.00	1.10	0.15	0.00	69.00	1.10	0.15	0.00
18.00	1.10	0.15	0.00	70.00	1.10	0.15	0.00
19.00	1.10	0.15	0.00	71.00	1.10	0.15	0.00
20.00	1.10	0.15	0.00	72.00	1.10	0.15	0.00
21.00	1.10	0.15	0.00				
22.00	1.10	0.15	0.00				
23.00	1.10	0.15	0.00				
24.00	1.10	0.15	0.00				
25.00	1.10	0.15	0.00				
26.00	1.10	0.15	0.00				
27.00	1.10	0.15	0.00				
28.00	1.10	0.15	0.00				
29.00	1.10	0.15	0.00				
30.00	1.10	0.15	0.00				
31.00	1.10	0.15	0.00				
32.00	1.10	0.15	0.00				
33.00	1.10	0.15	0.00				
34.00	1.10	0.15	0.00				
35.00	1.10	0.15	0.00				
36.00	1.10	0.15	0.00				
37.00	1.10	0.15	0.00				
38.00	1.10	0.15	0.00				
39.00	1.10	0.15	0.00				
40.00	1.10	0.15	0.00				
41.00	1.10	0.15	0.00				
42.00	1.10	0.15	0.00				
43.00	1.10	0.15	0.00				
44.00	1.10	0.15	0.00				
45.00	1.10	0.15	0.00				
46.00	1.10	0.15	0.00				
47.00	1.10	0.15	0.00				
48.00	1.10	0.15	0.00				
49.00	1.10	0.15	0.00				
50.00	1.10	0.15	0.00				
51.00	1.10	0.15	0.00				

11491.002- Post Development

Constant Intensity 1.00 hrs WQV Rainfall=1.10"

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Summary for Subcatchment 4S: DA-002

Runoff = 2.17 cfs @ 1.03 hrs, Volume= 0.098 af, Depth= 0.35"

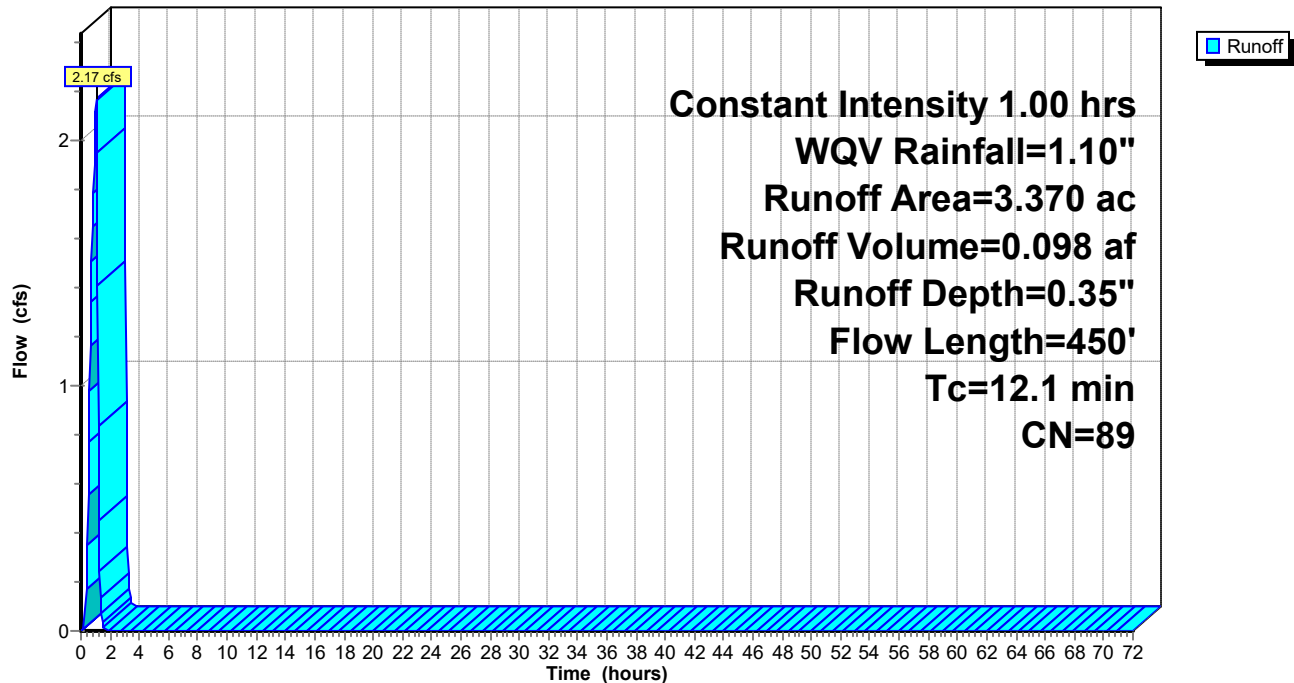
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Constant Intensity 1.00 hrs WQV Rainfall=1.10"

Area (ac)	CN	Description
2.210	84	50-75% Grass cover, Fair, HSG D
1.160	98	Paved parking, HSG A
3.370	89	Weighted Average
2.210		65.58% Pervious Area
1.160		34.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0120	0.17		Sheet Flow, Range n= 0.130 P2= 3.98"
2.2	315	0.0220	2.39		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	35	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
12.1	450	Total			

Subcatchment 4S: DA-002

Hydrograph



11491.002- Post Development*Constant Intensity 1.00 hrs WQV Rainfall=1.10"*

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Hydrograph for Subcatchment 4S: DA-002

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	1.10	0.35	0.00
1.00	1.10	0.35	2.11	53.00	1.10	0.35	0.00
2.00	1.10	0.35	0.00	54.00	1.10	0.35	0.00
3.00	1.10	0.35	0.00	55.00	1.10	0.35	0.00
4.00	1.10	0.35	0.00	56.00	1.10	0.35	0.00
5.00	1.10	0.35	0.00	57.00	1.10	0.35	0.00
6.00	1.10	0.35	0.00	58.00	1.10	0.35	0.00
7.00	1.10	0.35	0.00	59.00	1.10	0.35	0.00
8.00	1.10	0.35	0.00	60.00	1.10	0.35	0.00
9.00	1.10	0.35	0.00	61.00	1.10	0.35	0.00
10.00	1.10	0.35	0.00	62.00	1.10	0.35	0.00
11.00	1.10	0.35	0.00	63.00	1.10	0.35	0.00
12.00	1.10	0.35	0.00	64.00	1.10	0.35	0.00
13.00	1.10	0.35	0.00	65.00	1.10	0.35	0.00
14.00	1.10	0.35	0.00	66.00	1.10	0.35	0.00
15.00	1.10	0.35	0.00	67.00	1.10	0.35	0.00
16.00	1.10	0.35	0.00	68.00	1.10	0.35	0.00
17.00	1.10	0.35	0.00	69.00	1.10	0.35	0.00
18.00	1.10	0.35	0.00	70.00	1.10	0.35	0.00
19.00	1.10	0.35	0.00	71.00	1.10	0.35	0.00
20.00	1.10	0.35	0.00	72.00	1.10	0.35	0.00
21.00	1.10	0.35	0.00				
22.00	1.10	0.35	0.00				
23.00	1.10	0.35	0.00				
24.00	1.10	0.35	0.00				
25.00	1.10	0.35	0.00				
26.00	1.10	0.35	0.00				
27.00	1.10	0.35	0.00				
28.00	1.10	0.35	0.00				
29.00	1.10	0.35	0.00				
30.00	1.10	0.35	0.00				
31.00	1.10	0.35	0.00				
32.00	1.10	0.35	0.00				
33.00	1.10	0.35	0.00				
34.00	1.10	0.35	0.00				
35.00	1.10	0.35	0.00				
36.00	1.10	0.35	0.00				
37.00	1.10	0.35	0.00				
38.00	1.10	0.35	0.00				
39.00	1.10	0.35	0.00				
40.00	1.10	0.35	0.00				
41.00	1.10	0.35	0.00				
42.00	1.10	0.35	0.00				
43.00	1.10	0.35	0.00				
44.00	1.10	0.35	0.00				
45.00	1.10	0.35	0.00				
46.00	1.10	0.35	0.00				
47.00	1.10	0.35	0.00				
48.00	1.10	0.35	0.00				
49.00	1.10	0.35	0.00				
50.00	1.10	0.35	0.00				
51.00	1.10	0.35	0.00				

11491.002- Post Development

Constant Intensity 1.00 hrs WQV Rainfall=1.10"

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Summary for Subcatchment 6S: DA-003[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 1.16 cfs @ 0.98 hrs, Volume= 0.042 af, Depth= 0.25"

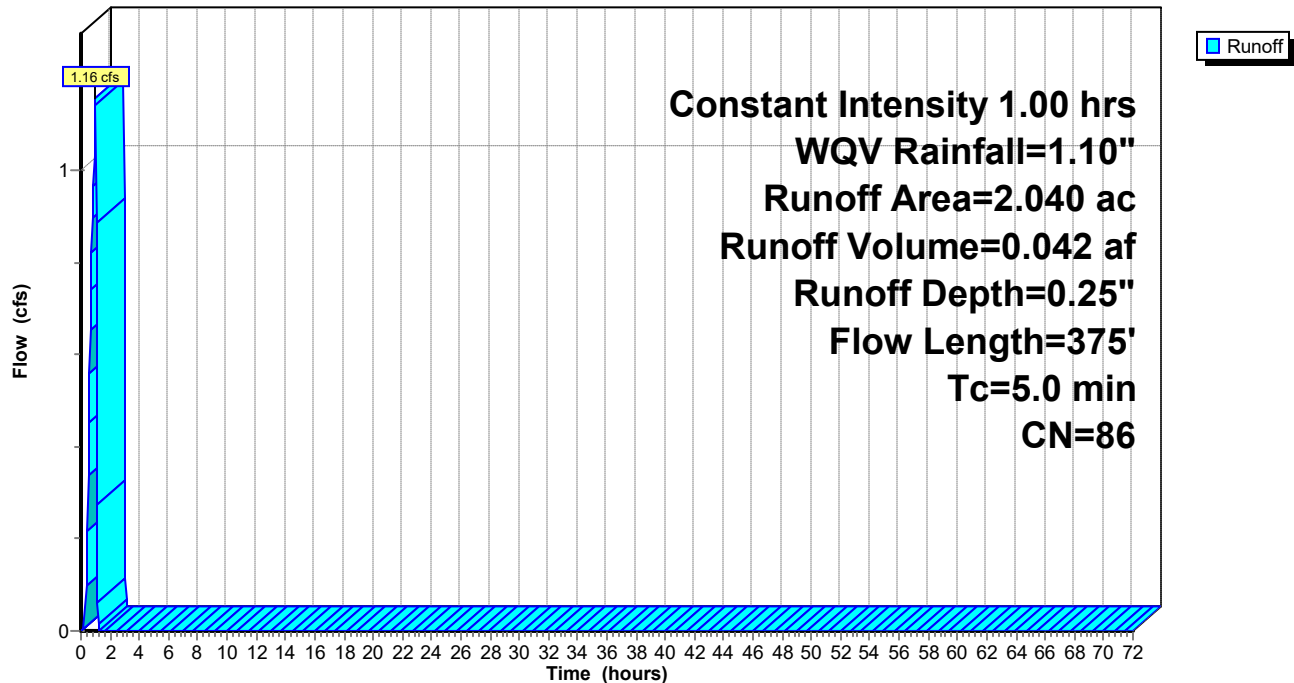
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, $dt=0.05$ hrs
Constant Intensity 1.00 hrs WQV Rainfall=1.10"

Area (ac)	CN	Description
0.300	98	Paved parking, HSG D
1.740	84	50-75% Grass cover, Fair, HSG D
2.040	86	Weighted Average
1.740		85.29% Pervious Area
0.300		14.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	100	0.0300	1.80		Sheet Flow, Smooth surfaces $n=0.011$ $P2=3.98"$
1.0	275	0.0500	4.54		Shallow Concentrated Flow, Paved $K_v=20.3$ fps
1.9	375	Total, Increased to minimum $T_c = 5.0$ min			

Subcatchment 6S: DA-003

Hydrograph



11491.002- Post Development*Constant Intensity 1.00 hrs WQV Rainfall=1.10"*

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Hydrograph for Subcatchment 6S: DA-003

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	52.00	1.10	0.25	0.00
1.00	1.10	0.25	1.14	53.00	1.10	0.25	0.00
2.00	1.10	0.25	0.00	54.00	1.10	0.25	0.00
3.00	1.10	0.25	0.00	55.00	1.10	0.25	0.00
4.00	1.10	0.25	0.00	56.00	1.10	0.25	0.00
5.00	1.10	0.25	0.00	57.00	1.10	0.25	0.00
6.00	1.10	0.25	0.00	58.00	1.10	0.25	0.00
7.00	1.10	0.25	0.00	59.00	1.10	0.25	0.00
8.00	1.10	0.25	0.00	60.00	1.10	0.25	0.00
9.00	1.10	0.25	0.00	61.00	1.10	0.25	0.00
10.00	1.10	0.25	0.00	62.00	1.10	0.25	0.00
11.00	1.10	0.25	0.00	63.00	1.10	0.25	0.00
12.00	1.10	0.25	0.00	64.00	1.10	0.25	0.00
13.00	1.10	0.25	0.00	65.00	1.10	0.25	0.00
14.00	1.10	0.25	0.00	66.00	1.10	0.25	0.00
15.00	1.10	0.25	0.00	67.00	1.10	0.25	0.00
16.00	1.10	0.25	0.00	68.00	1.10	0.25	0.00
17.00	1.10	0.25	0.00	69.00	1.10	0.25	0.00
18.00	1.10	0.25	0.00	70.00	1.10	0.25	0.00
19.00	1.10	0.25	0.00	71.00	1.10	0.25	0.00
20.00	1.10	0.25	0.00	72.00	1.10	0.25	0.00
21.00	1.10	0.25	0.00				
22.00	1.10	0.25	0.00				
23.00	1.10	0.25	0.00				
24.00	1.10	0.25	0.00				
25.00	1.10	0.25	0.00				
26.00	1.10	0.25	0.00				
27.00	1.10	0.25	0.00				
28.00	1.10	0.25	0.00				
29.00	1.10	0.25	0.00				
30.00	1.10	0.25	0.00				
31.00	1.10	0.25	0.00				
32.00	1.10	0.25	0.00				
33.00	1.10	0.25	0.00				
34.00	1.10	0.25	0.00				
35.00	1.10	0.25	0.00				
36.00	1.10	0.25	0.00				
37.00	1.10	0.25	0.00				
38.00	1.10	0.25	0.00				
39.00	1.10	0.25	0.00				
40.00	1.10	0.25	0.00				
41.00	1.10	0.25	0.00				
42.00	1.10	0.25	0.00				
43.00	1.10	0.25	0.00				
44.00	1.10	0.25	0.00				
45.00	1.10	0.25	0.00				
46.00	1.10	0.25	0.00				
47.00	1.10	0.25	0.00				
48.00	1.10	0.25	0.00				
49.00	1.10	0.25	0.00				
50.00	1.10	0.25	0.00				
51.00	1.10	0.25	0.00				

11491.002- Post Development

Constant Intensity 1.00 hrs WQV Rainfall=1.10"

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Summary for Reach 3R: Grassy Swale

Inflow Area = 20.290 ac, 23.66% Impervious, Inflow Depth > 0.25" for WQV event
Inflow = 0.51 cfs @ 1.53 hrs, Volume= 0.424 af
Outflow = 0.51 cfs @ 1.68 hrs, Volume= 0.424 af, Atten= 0%, Lag= 9.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.61 fps, Min. Travel Time= 5.0 min

Avg. Velocity= 0.23 fps, Avg. Travel Time= 13.6 min

Peak Storage= 154 cf @ 1.59 hrs

Average Depth at Peak Storage= 0.09'

Bank-Full Depth= 1.00' Flow Area= 12.0 sf, Capacity= 31.82 cfs

9.00' x 1.00' deep channel, n= 0.035 High grass

Side Slope Z-value= 3.0 '/' Top Width= 15.00'

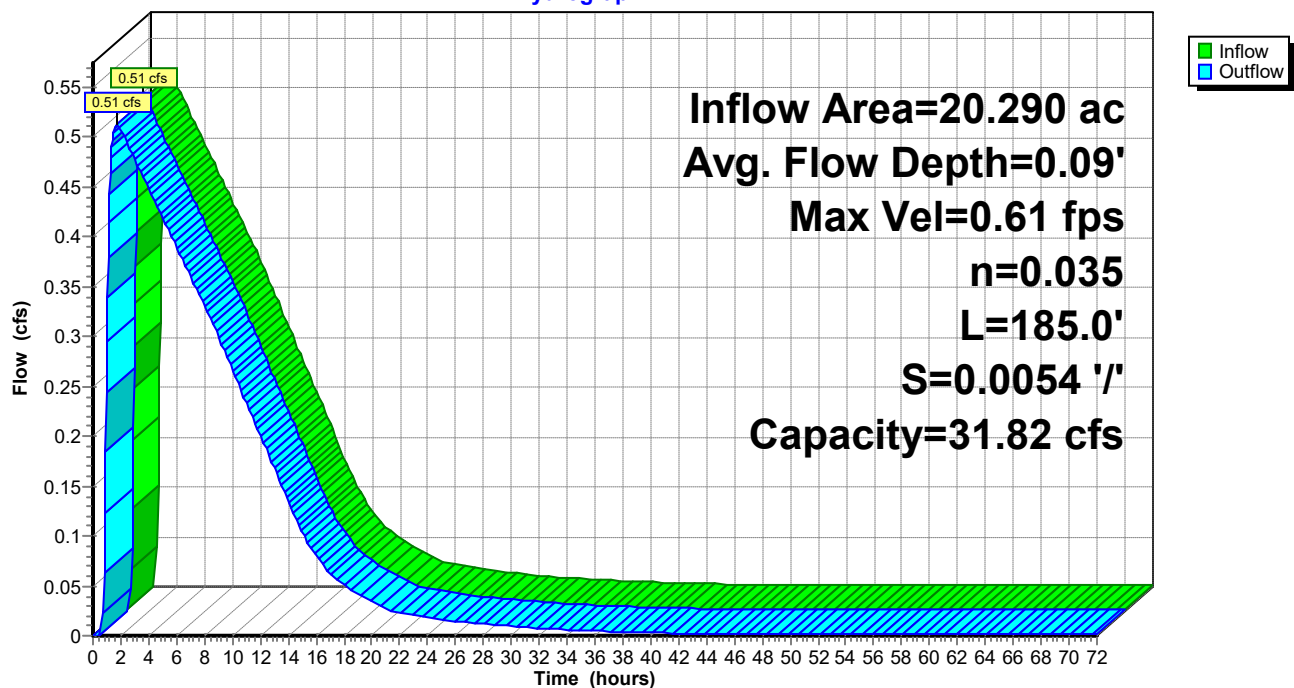
Length= 185.0' Slope= 0.0054 '/'

Inlet Invert= 756.50', Outlet Invert= 755.50'

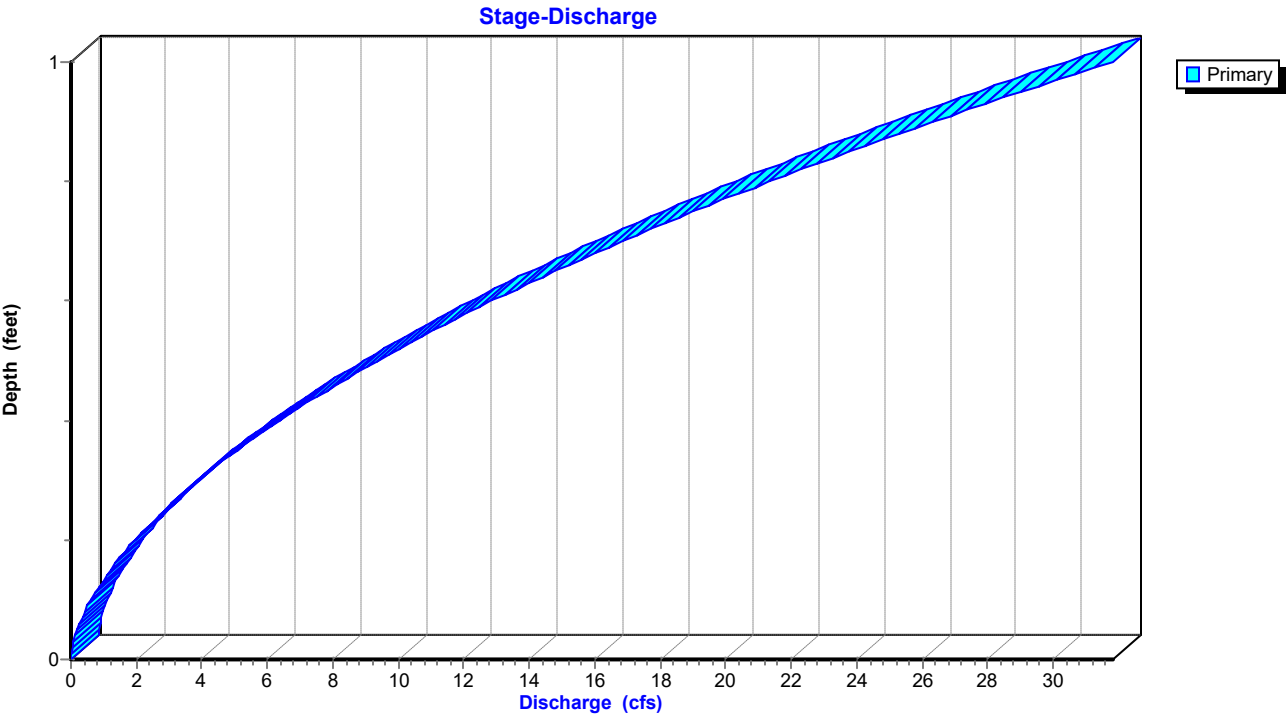


Reach 3R: Grassy Swale

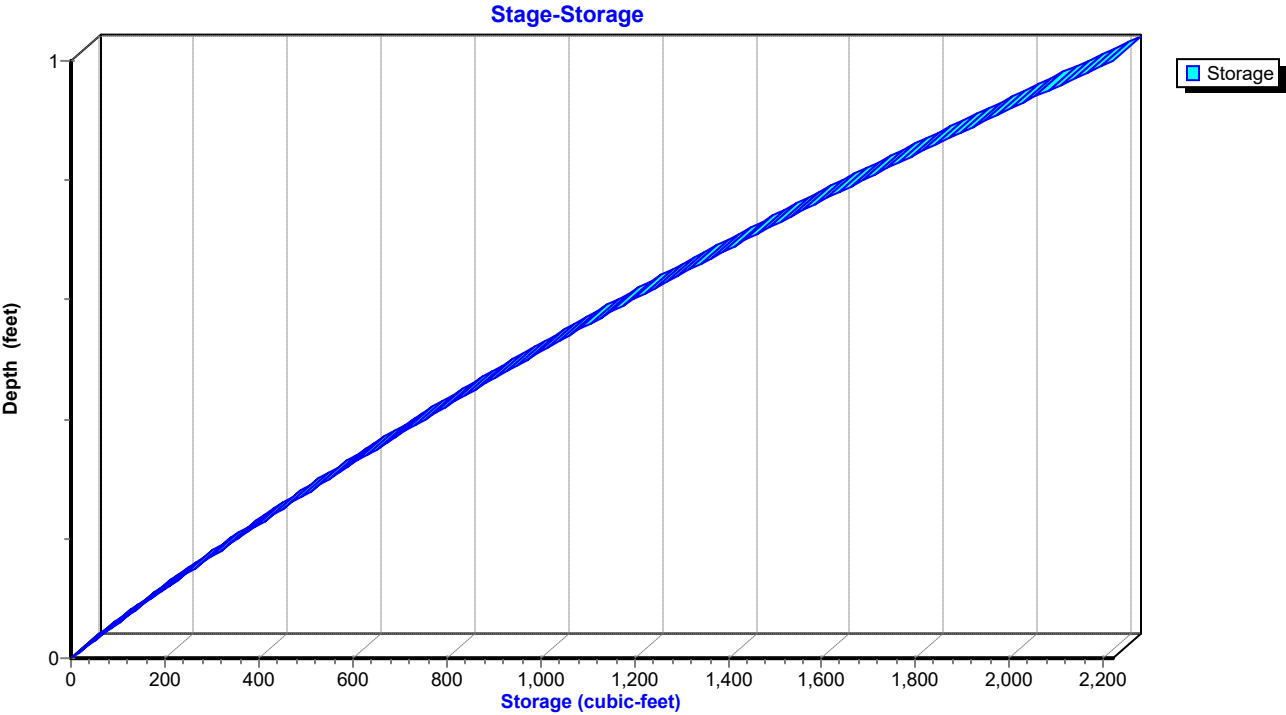
Hydrograph



Reach 3R: Grassy Swale



Reach 3R: Grassy Swale



11491.002- Post Development*Constant Intensity 1.00 hrs WQV Rainfall=1.10"*

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Hydrograph for Reach 3R: Grassy Swale

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	756.50	0.00
2.50	0.49	150	756.59	0.49
5.00	0.41	136	756.58	0.42
7.50	0.34	121	756.57	0.35
10.00	0.26	103	756.56	0.27
12.50	0.18	82	756.55	0.18
15.00	0.10	57	756.53	0.10
17.50	0.05	39	756.52	0.06
20.00	0.03	29	756.52	0.03
22.50	0.02	22	756.51	0.02
25.00	0.02	19	756.51	0.02
27.50	0.01	16	756.51	0.01
30.00	0.01	12	756.51	0.01
32.50	0.01	9	756.51	0.01
35.00	0.01	7	756.50	0.01
37.50	0.00	5	756.50	0.00
40.00	0.00	4	756.50	0.00
42.50	0.00	3	756.50	0.00
45.00	0.00	3	756.50	0.00
47.50	0.00	3	756.50	0.00
50.00	0.00	2	756.50	0.00
52.50	0.00	2	756.50	0.00
55.00	0.00	2	756.50	0.00
57.50	0.00	2	756.50	0.00
60.00	0.00	2	756.50	0.00
62.50	0.00	2	756.50	0.00
65.00	0.00	2	756.50	0.00
67.50	0.00	1	756.50	0.00
70.00	0.00	1	756.50	0.00

11491.002- Post Development*Constant Intensity 1.00 hrs WQV Rainfall=1.10"*

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Stage-Discharge for Reach 3R: Grassy Swale

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)	Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
756.50	0.00	0.00	757.02	1.82	10.02
756.51	0.14	0.01	757.03	1.84	10.36
756.52	0.23	0.04	757.04	1.87	10.70
756.53	0.30	0.08	757.05	1.89	11.04
756.54	0.36	0.13	757.06	1.91	11.40
756.55	0.42	0.19	757.07	1.93	11.75
756.56	0.47	0.26	757.08	1.94	12.11
756.57	0.52	0.34	757.09	1.96	12.48
756.58	0.57	0.42	757.10	1.98	12.85
756.59	0.61	0.51	757.11	2.00	13.23
756.60	0.66	0.61	757.12	2.02	13.61
756.61	0.70	0.72	757.13	2.04	14.00
756.62	0.74	0.83	757.14	2.06	14.39
756.63	0.78	0.95	757.15	2.08	14.78
756.64	0.81	1.07	757.16	2.10	15.19
756.65	0.85	1.21	757.17	2.11	15.59
756.66	0.89	1.35	757.18	2.13	16.00
756.67	0.92	1.49	757.19	2.15	16.42
756.68	0.96	1.64	757.20	2.17	16.84
756.69	0.99	1.80	757.21	2.19	17.27
756.70	1.02	1.96	757.22	2.20	17.70
756.71	1.05	2.13	757.23	2.22	18.14
756.72	1.08	2.30	757.24	2.24	18.58
756.73	1.11	2.48	757.25	2.25	19.03
756.74	1.14	2.67	757.26	2.27	19.48
756.75	1.17	2.86	757.27	2.29	19.93
756.76	1.20	3.06	757.28	2.31	20.39
756.77	1.23	3.26	757.29	2.32	20.86
756.78	1.26	3.47	757.30	2.34	21.33
756.79	1.29	3.68	757.31	2.36	21.81
756.80	1.31	3.90	757.32	2.37	22.29
756.81	1.34	4.12	757.33	2.39	22.78
756.82	1.36	4.35	757.34	2.40	23.27
756.83	1.39	4.58	757.35	2.42	23.77
756.84	1.42	4.82	757.36	2.44	24.27
756.85	1.44	5.07	757.37	2.45	24.77
756.86	1.47	5.32	757.38	2.47	25.29
756.87	1.49	5.57	757.39	2.48	25.80
756.88	1.51	5.84	757.40	2.50	26.32
756.89	1.54	6.10	757.41	2.52	26.85
756.90	1.56	6.37	757.42	2.53	27.38
756.91	1.58	6.65	757.43	2.55	27.92
756.92	1.61	6.93	757.44	2.56	28.46
756.93	1.63	7.21	757.45	2.58	29.01
756.94	1.65	7.51	757.46	2.59	29.56
756.95	1.68	7.80	757.47	2.61	30.12
756.96	1.70	8.10	757.48	2.62	30.68
756.97	1.72	8.41	757.49	2.64	31.25
756.98	1.74	8.72	757.50	2.65	31.82
756.99	1.76	9.04			
757.00	1.78	9.36			
757.01	1.80	9.69			

11491.002- Post Development*Constant Intensity 1.00 hrs WQV Rainfall=1.10"*

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Stage-Area-Storage for Reach 3R: Grassy Swale

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
756.50	0.0	0	757.02	5.5	1,016
756.51	0.1	17	757.03	5.6	1,038
756.52	0.2	34	757.04	5.7	1,061
756.53	0.3	50	757.05	5.9	1,084
756.54	0.4	67	757.06	6.0	1,106
756.55	0.5	85	757.07	6.1	1,129
756.56	0.6	102	757.08	6.2	1,152
756.57	0.6	119	757.09	6.4	1,176
756.58	0.7	137	757.10	6.5	1,199
756.59	0.8	154	757.11	6.6	1,222
756.60	0.9	172	757.12	6.7	1,246
756.61	1.0	190	757.13	6.9	1,269
756.62	1.1	208	757.14	7.0	1,293
756.63	1.2	226	757.15	7.1	1,317
756.64	1.3	244	757.16	7.2	1,341
756.65	1.4	262	757.17	7.4	1,365
756.66	1.5	281	757.18	7.5	1,389
756.67	1.6	299	757.19	7.6	1,413
756.68	1.7	318	757.20	7.8	1,437
756.69	1.8	336	757.21	7.9	1,462
756.70	1.9	355	757.22	8.0	1,487
756.71	2.0	374	757.23	8.2	1,511
756.72	2.1	393	757.24	8.3	1,536
756.73	2.2	412	757.25	8.4	1,561
756.74	2.3	432	757.26	8.6	1,586
756.75	2.4	451	757.27	8.7	1,611
756.76	2.5	470	757.28	8.8	1,636
756.77	2.6	490	757.29	9.0	1,662
756.78	2.8	510	757.30	9.1	1,687
756.79	2.9	530	757.31	9.3	1,713
756.80	3.0	549	757.32	9.4	1,738
756.81	3.1	569	757.33	9.5	1,764
756.82	3.2	590	757.34	9.7	1,790
756.83	3.3	610	757.35	9.8	1,816
756.84	3.4	630	757.36	10.0	1,842
756.85	3.5	651	757.37	10.1	1,869
756.86	3.6	671	757.38	10.2	1,895
756.87	3.7	692	757.39	10.4	1,921
756.88	3.9	713	757.40	10.5	1,948
756.89	4.0	734	757.41	10.7	1,975
756.90	4.1	755	757.42	10.8	2,002
756.91	4.2	776	757.43	11.0	2,028
756.92	4.3	797	757.44	11.1	2,055
756.93	4.4	819	757.45	11.3	2,083
756.94	4.5	840	757.46	11.4	2,110
756.95	4.7	862	757.47	11.6	2,137
756.96	4.8	883	757.48	11.7	2,165
756.97	4.9	905	757.49	11.9	2,192
756.98	5.0	927	757.50	12.0	2,220
756.99	5.1	949			
757.00	5.3	971			
757.01	5.4	994			

11491.002- Post Development

Constant Intensity 1.00 hrs WQV Rainfall=1.10"

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Summary for Pond 2P: POND A

Inflow Area = 20.290 ac, 23.66% Impervious, Inflow Depth = 0.29" for WQV event
 Inflow = 9.68 cfs @ 1.00 hrs, Volume= 0.483 af
 Outflow = 0.51 cfs @ 1.53 hrs, Volume= 0.424 af, Atten= 95%, Lag= 31.9 min
 Primary = 0.51 cfs @ 1.53 hrs, Volume= 0.424 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Peak Elev= 758.90' @ 1.53 hrs Surf.Area= 0 sf Storage= 19,479 cf

Plug-Flow detention time= 444.7 min calculated for 0.424 af (88% of inflow)
 Center-of-Mass det. time= 443.5 min (496.0 - 52.5)

Volume	Invert	Avail.Storage	Storage Description
#1	757.00'	102,409 cf	Custom Stage Data Listed below

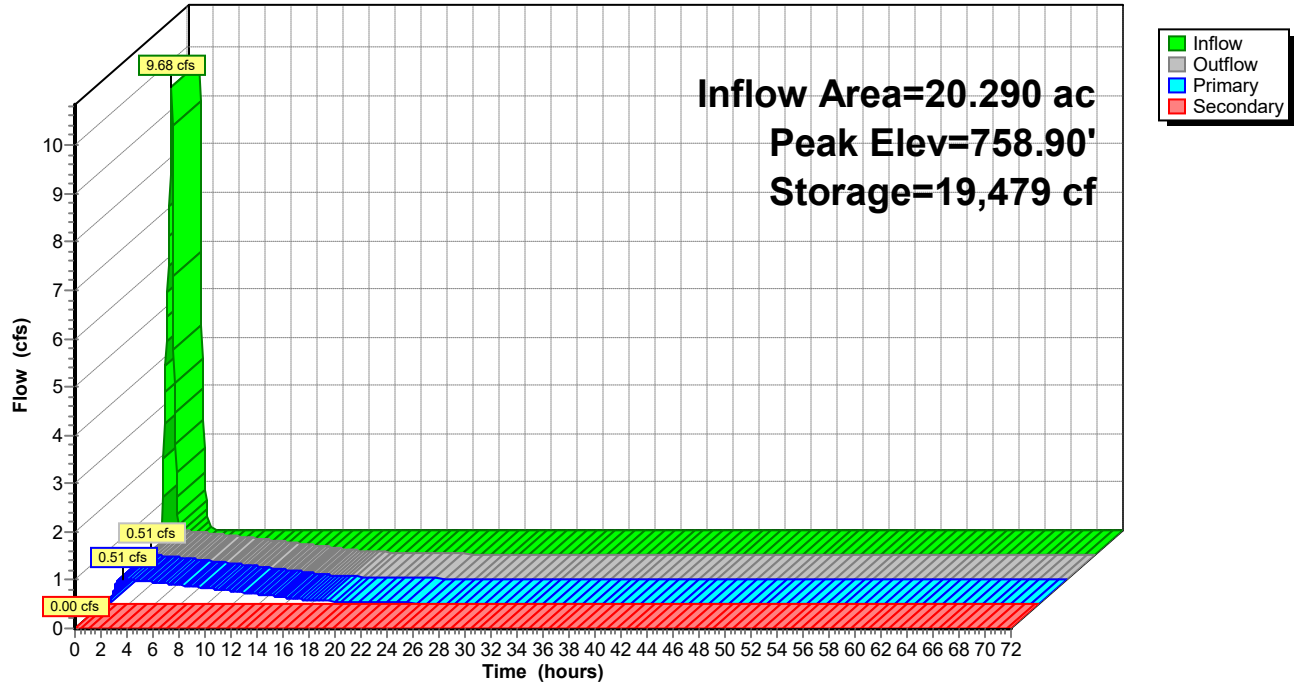
Elevation (feet)	Cum.Store (cubic-feet)
757.00	0
758.00	9,694
759.00	20,520
760.00	32,535
761.00	45,797
762.00	61,986
763.00	81,377
764.00	102,409

Device	Routing	Invert	Outlet Devices
#1	Primary	757.25'	4.0" Vert. Orifice/Grate C= 0.600
#2	Secondary	761.70'	35.0' long x 35.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.51 cfs @ 1.53 hrs HW=758.90' (Free Discharge)↑ **1=Orifice/Grate** (Orifice Controls 0.51 cfs @ 5.87 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=757.00' (Free Discharge)↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

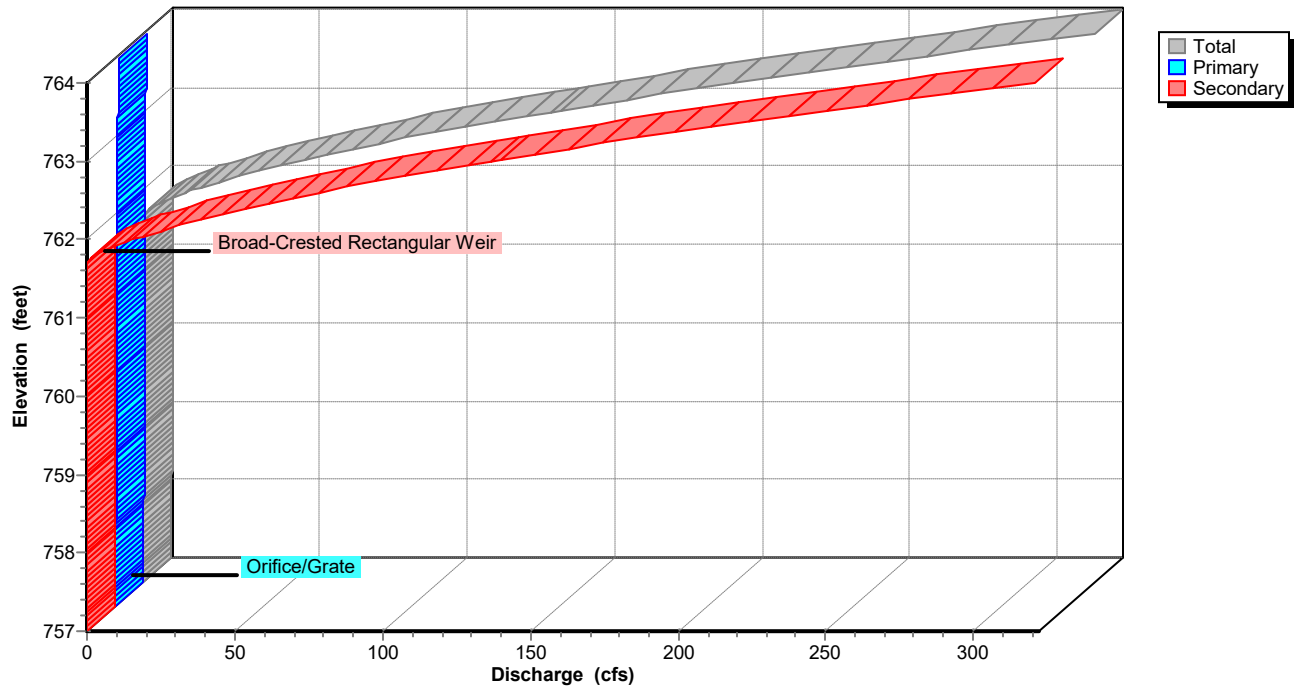
Pond 2P: POND A

Hydrograph

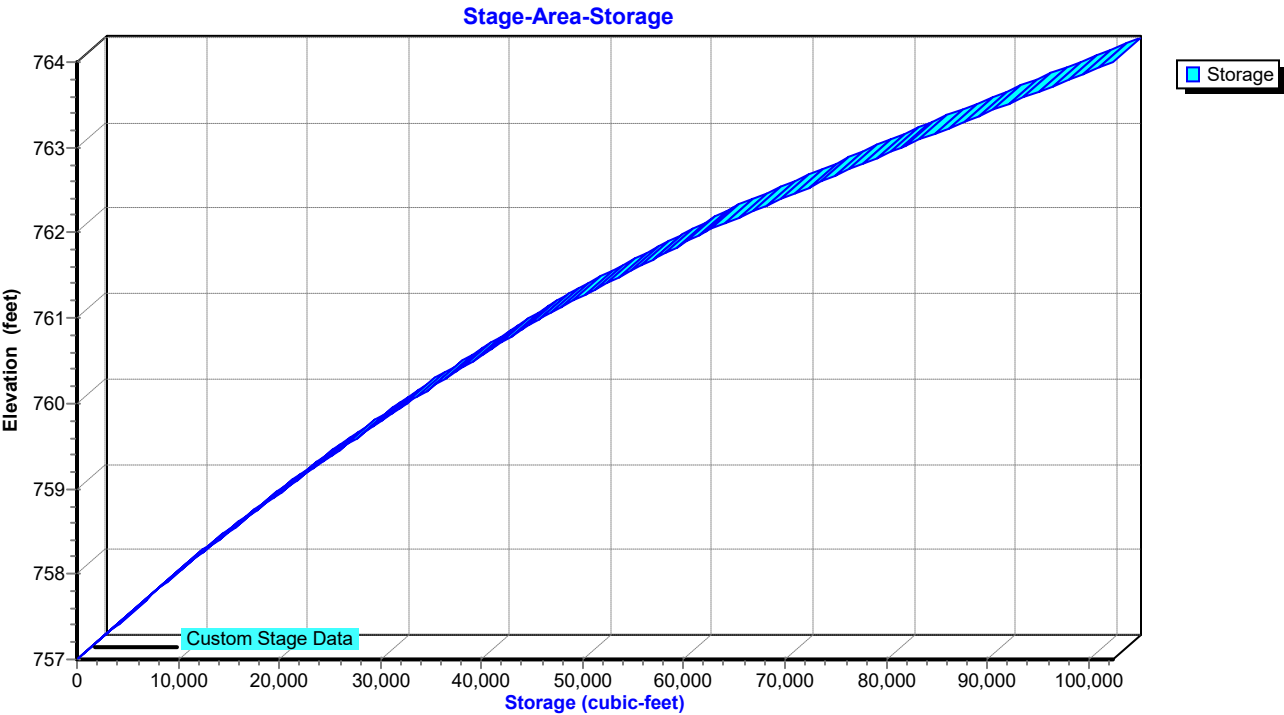


Pond 2P: POND A

Stage-Discharge



Pond 2P: POND A



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Hydrograph for Pond 2P: POND A

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	757.00	0.00	0.00	0.00
2.50	0.00	17,985	758.77	0.49	0.49	0.00
5.00	0.00	13,923	758.39	0.41	0.41	0.00
7.50	0.00	10,522	758.08	0.34	0.34	0.00
10.00	0.00	7,801	757.80	0.26	0.26	0.00
12.50	0.00	5,816	757.60	0.18	0.18	0.00
15.00	0.00	4,572	757.47	0.10	0.10	0.00
17.50	0.00	3,914	757.40	0.05	0.05	0.00
20.00	0.00	3,536	757.36	0.03	0.03	0.00
22.50	0.00	3,308	757.34	0.02	0.02	0.00
25.00	0.00	3,143	757.32	0.02	0.02	0.00
27.50	0.00	3,019	757.31	0.01	0.01	0.00
30.00	0.00	2,926	757.30	0.01	0.01	0.00
32.50	0.00	2,856	757.29	0.01	0.01	0.00
35.00	0.00	2,803	757.29	0.01	0.01	0.00
37.50	0.00	2,763	757.29	0.00	0.00	0.00
40.00	0.00	2,733	757.28	0.00	0.00	0.00
42.50	0.00	2,710	757.28	0.00	0.00	0.00
45.00	0.00	2,691	757.28	0.00	0.00	0.00
47.50	0.00	2,672	757.28	0.00	0.00	0.00
50.00	0.00	2,655	757.27	0.00	0.00	0.00
52.50	0.00	2,639	757.27	0.00	0.00	0.00
55.00	0.00	2,625	757.27	0.00	0.00	0.00
57.50	0.00	2,611	757.27	0.00	0.00	0.00
60.00	0.00	2,598	757.27	0.00	0.00	0.00
62.50	0.00	2,586	757.27	0.00	0.00	0.00
65.00	0.00	2,575	757.27	0.00	0.00	0.00
67.50	0.00	2,564	757.26	0.00	0.00	0.00
70.00	0.00	2,555	757.26	0.00	0.00	0.00

11491.002- Post Development*Constant Intensity 1.00 hrs WQV Rainfall=1.10"*

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Stage-Discharge for Pond 2P: POND A

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
757.00	0.00	0.00	0.00	762.20	34.33	0.92	33.41
757.10	0.00	0.00	0.00	762.30	44.85	0.93	43.92
757.20	0.00	0.00	0.00	762.40	55.67	0.94	54.73
757.30	0.01	0.01	0.00	762.50	67.06	0.95	66.12
757.40	0.05	0.05	0.00	762.60	79.70	0.96	78.74
757.50	0.12	0.12	0.00	762.70	93.02	0.97	92.05
757.60	0.18	0.18	0.00	762.80	107.37	0.97	106.40
757.70	0.22	0.22	0.00	762.90	122.45	0.98	121.46
757.80	0.26	0.26	0.00	763.00	137.95	0.99	136.96
757.90	0.29	0.29	0.00	763.10	154.06	1.00	153.06
758.00	0.32	0.32	0.00	763.20	170.44	1.01	169.43
758.10	0.35	0.35	0.00	763.30	187.32	1.02	186.30
758.20	0.37	0.37	0.00	763.40	205.06	1.03	204.03
758.30	0.39	0.39	0.00	763.50	223.33	1.04	222.30
758.40	0.42	0.42	0.00	763.60	242.12	1.04	241.08
758.50	0.44	0.44	0.00	763.70	261.41	1.05	260.36
758.60	0.46	0.46	0.00	763.80	281.19	1.06	280.13
758.70	0.48	0.48	0.00	763.90	301.44	1.07	300.37
758.80	0.49	0.49	0.00	764.00	322.16	1.08	321.08
758.90	0.51	0.51	0.00				
759.00	0.53	0.53	0.00				
759.10	0.55	0.55	0.00				
759.20	0.56	0.56	0.00				
759.30	0.58	0.58	0.00				
759.40	0.59	0.59	0.00				
759.50	0.61	0.61	0.00				
759.60	0.62	0.62	0.00				
759.70	0.63	0.63	0.00				
759.80	0.65	0.65	0.00				
759.90	0.66	0.66	0.00				
760.00	0.68	0.68	0.00				
760.10	0.69	0.69	0.00				
760.20	0.70	0.70	0.00				
760.30	0.71	0.71	0.00				
760.40	0.73	0.73	0.00				
760.50	0.74	0.74	0.00				
760.60	0.75	0.75	0.00				
760.70	0.76	0.76	0.00				
760.80	0.77	0.77	0.00				
760.90	0.78	0.78	0.00				
761.00	0.80	0.80	0.00				
761.10	0.81	0.81	0.00				
761.20	0.82	0.82	0.00				
761.30	0.83	0.83	0.00				
761.40	0.84	0.84	0.00				
761.50	0.85	0.85	0.00				
761.60	0.86	0.86	0.00				
761.70	0.87	0.87	0.00				
761.80	3.85	0.88	2.97				
761.90	9.28	0.89	8.39				
762.00	16.37	0.90	15.47				
762.10	24.82	0.91	23.91				

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Stage-Area-Storage for Pond 2P: POND A

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
757.00	0	762.20	65,864
757.10	969	762.30	67,803
757.20	1,939	762.40	69,742
757.30	2,908	762.50	71,682
757.40	3,878	762.60	73,621
757.50	4,847	762.70	75,560
757.60	5,816	762.80	77,499
757.70	6,786	762.90	79,438
757.80	7,755	763.00	81,377
757.90	8,725	763.10	83,480
758.00	9,694	763.20	85,583
758.10	10,777	763.30	87,687
758.20	11,859	763.40	89,790
758.30	12,942	763.50	91,893
758.40	14,024	763.60	93,996
758.50	15,107	763.70	96,099
758.60	16,190	763.80	98,203
758.70	17,272	763.90	100,306
758.80	18,355	764.00	102,409
758.90	19,437		
759.00	20,520		
759.10	21,722		
759.20	22,923		
759.30	24,124		
759.40	25,326		
759.50	26,528		
759.60	27,729		
759.70	28,931		
759.80	30,132		
759.90	31,333		
760.00	32,535		
760.10	33,861		
760.20	35,187		
760.30	36,514		
760.40	37,840		
760.50	39,166		
760.60	40,492		
760.70	41,818		
760.80	43,145		
760.90	44,471		
761.00	45,797		
761.10	47,416		
761.20	49,035		
761.30	50,654		
761.40	52,273		
761.50	53,892		
761.60	55,510		
761.70	57,129		
761.80	58,748		
761.90	60,367		
762.00	61,986		
762.10	63,925		

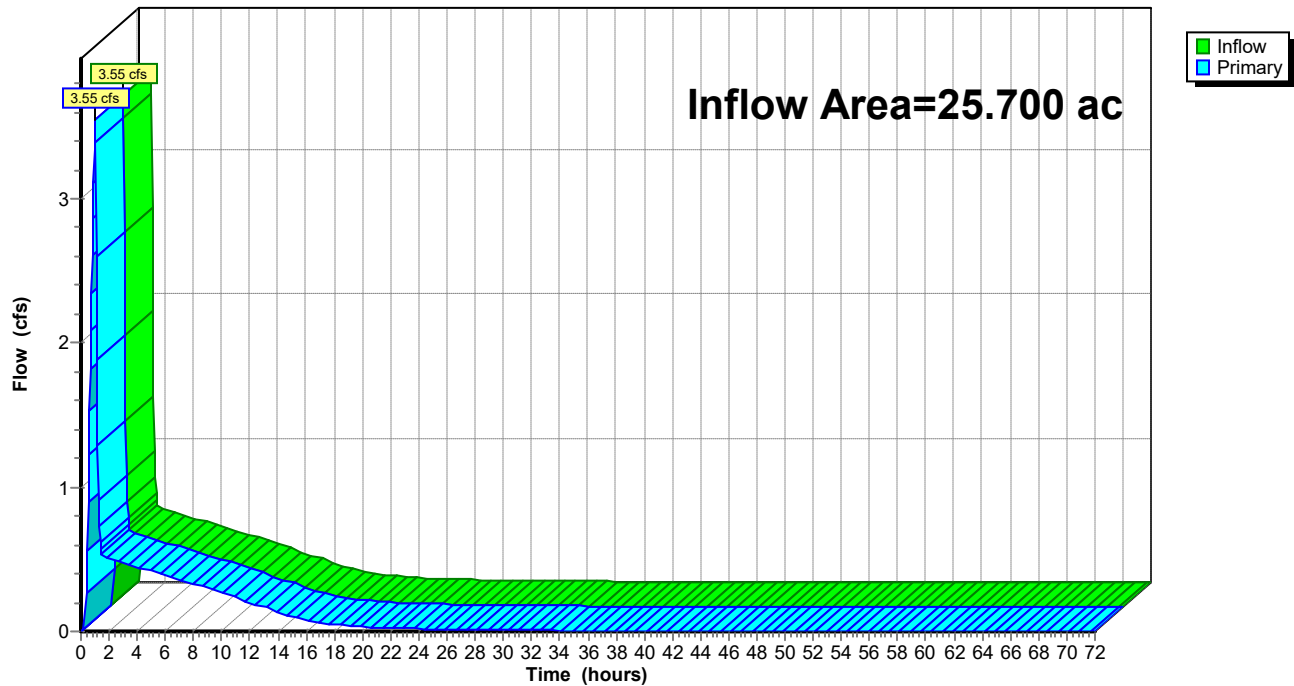
Summary for Link 7L: OUTFALL

Inflow Area = 25.700 ac, 24.36% Impervious, Inflow Depth > 0.26" for WQV event
Inflow = 3.55 cfs @ 1.00 hrs, Volume= 0.565 af
Primary = 3.55 cfs @ 1.00 hrs, Volume= 0.565 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Link 7L: OUTFALL

Hydrograph



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Hydrograph for Link 7L: OUTFALL

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	52.00	0.00	0.00	0.00
1.00	3.55	0.00	3.55	53.00	0.00	0.00	0.00
2.00	0.51	0.00	0.51	54.00	0.00	0.00	0.00
3.00	0.48	0.00	0.48	55.00	0.00	0.00	0.00
4.00	0.45	0.00	0.45	56.00	0.00	0.00	0.00
5.00	0.42	0.00	0.42	57.00	0.00	0.00	0.00
6.00	0.39	0.00	0.39	58.00	0.00	0.00	0.00
7.00	0.36	0.00	0.36	59.00	0.00	0.00	0.00
8.00	0.33	0.00	0.33	60.00	0.00	0.00	0.00
9.00	0.30	0.00	0.30	61.00	0.00	0.00	0.00
10.00	0.27	0.00	0.27	62.00	0.00	0.00	0.00
11.00	0.23	0.00	0.23	63.00	0.00	0.00	0.00
12.00	0.20	0.00	0.20	64.00	0.00	0.00	0.00
13.00	0.17	0.00	0.17	65.00	0.00	0.00	0.00
14.00	0.13	0.00	0.13	66.00	0.00	0.00	0.00
15.00	0.10	0.00	0.10	67.00	0.00	0.00	0.00
16.00	0.08	0.00	0.08	68.00	0.00	0.00	0.00
17.00	0.06	0.00	0.06	69.00	0.00	0.00	0.00
18.00	0.05	0.00	0.05	70.00	0.00	0.00	0.00
19.00	0.04	0.00	0.04	71.00	0.00	0.00	0.00
20.00	0.03	0.00	0.03	72.00	0.00	0.00	0.00
21.00	0.03	0.00	0.03				
22.00	0.02	0.00	0.02				
23.00	0.02	0.00	0.02				
24.00	0.02	0.00	0.02				
25.00	0.02	0.00	0.02				
26.00	0.01	0.00	0.01				
27.00	0.01	0.00	0.01				
28.00	0.01	0.00	0.01				
29.00	0.01	0.00	0.01				
30.00	0.01	0.00	0.01				
31.00	0.01	0.00	0.01				
32.00	0.01	0.00	0.01				
33.00	0.01	0.00	0.01				
34.00	0.01	0.00	0.01				
35.00	0.01	0.00	0.01				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				