STORM WATER MANAGEMENT PLAN AND EROSION CONTROL PLANS
& MAINTENANCE/OPERATION PLAN
FOR

Maple Ridge Addition
Town of Medary

BACKGROUND & GENERAL INFORMATION

This project is located along CTH "F" and off of Shady Maple Drive in the Town of Medary. The property was previously used for agricultural purposes but has not been planted for a few years. The parcel contains approximately 8.85 acres. No groundwater was encountered at the site. There are not believed to be any identified wetlands or wetland indicators within the project limits.

Existing Drainage Conditions:

The property has a ridge splitting the drainage. The southern portion drains to the CTH "F" ditch, while the north drains to a wooded area.

Existing Drainage Calculations Summary:

The existing drainage calculations are included at the end of this report. (S1)

Existing Off-site Drainage:

There is no off-site drainage entering onto this project site.

Proposed Drainage Conditions:

The proposed drainage patterns follow the pre-development drainage patterns. As stated above, the site drainage is split. The drainage areas have been designated on the attached site plan. All drainage areas will utilize a biofiltration area that will have 2 feet of fine filter sand. The discharges for each area will be a stand pipe, with the exception of the south area. All ponds will have an emergency overflow swale.

The proposed town road will have a ditch along the south side of the road and will discharge directly to the north ponding area via an 8" pvc pipe. All slopes created shall be no steeper than 3:1 and all will be covered with Class II. Type B erosion matting.

Post-Development Runoff Summary

Proposed drainage calculations for the 1, 2, 5, 10, and 25-year design storms have been included with this plan. with the summary as follows:

Pre-development to Post-development Comparison

Area	Event	Pre (cfs)	Post (cfs)
Shady N	1 yr.	0.04	0.03
	2 yr.	0.17	0.04
	5 yr.	1.12	0.21
	10 yr.	1.92	0.66
	25 yr.	3.08	2.12
Shady S	1 yr.	0.01	0.01
	2 yr.	0.09	0.01
	5 yr.	0.62	0.01
	10 yr.	1.05	0.01
	25 yr.	1.64	0.08
East	1 yr.	0.01	0.00
	2 yr.	0.07	0.03
	5 yr.	0.48	0.08
	10 yr.	0.81	0.15
	25 yr.	1.28	0.37
Lot 9	1 yr.	0.01	0.02
	2 yr.	0.08	0.05
	5 yr.	0.56	0.25
	10 yr.	0.96	0.98
	25 yr.	1.50	2.47
Total	1 yr.	0.07	0.06
	2 yr.	0.41	0.13
	5 yr.	2.78	0.55
	10 yr.	4.740	1.80
	25 yr.	7.50	5.04

Sequence:

The initial construction will consist of grading the proposed town road and constructing the bio-fitration areas. All erosion control devices shall be in place prior to commencement of work. Construction will begin in the Spring of 2016, as weather and soil conditions permit.

Maintenance:

During construction, the erosion control and maintenance of the property will be the responsibility of J-J Hengel. The maintenance will transfer to the home owner's association once all properties have been transferred and all areas are established.

DEPARTMENT OF LAND CONSERVATION

Erosion Control Permit Application

LA CROSSE COUNTY, WISCONSIN

608-785-9867

Site Visit Date _____

REQUIRED: Parcel No. 9-1401-4 Contact Zoning, Planning & Land Information Dept. at 785-9722 for parcel number. In order for an application to be processed, the applicant shall provide the parcel # of the site where all land disturbance activities will occur.

DAN & JULIA GERKE _____
(Landowner Name) *(Telephone)*

W5394 COUNTY ROAD F
(Address)

LA CROSSE, WI 54601
(City) *(Zip Code)*

Person Responsible for Erosion Control:

JOE HENGEL - J-J HENGEL (608) 788-8080
(Landowner Name) *(Telephone)*

2302 S. AVE
(Address)

LA CROSSE, WI 54601
(City) *(Zip Code)*

Description of Activity: SUBDIVISION

For Office Use Only

Amount of area to be disturbed: Square Feet_____ (or) Acres_____

Distance between disturbed area and perennial waters, streams, lakes, etc.
(Check one) 0-100' ____, 101-300' ____, Within ¼ mile ____, Over ¼ mile ____

Slope of site where land disturbance will occur: _____% Fee received $_____

Category _____ erosion control plan required. Date ___/___/___

Revised 4/6/2005

La Crosse County Department of Land Conservation
400 N 4th Street, Administration Building Room 3270
LA CROSSE, WI 54601
Phone: (608) 785-9867 FAX: (608) 789-7849

Storm Water Permit Application Form

Project Name: MAPLE RIDGE ADDITION

Project Type: 1 or 2 Family Residence ☐ Subdivision ☒ Commercial/Multifamily ☐

Other

Impervious Area: 73529 ft² INCLUDING ASSUMED HOUSING, DRIVEWAYS & ACCESSORY BLDGS

Tax Parcel ID #(s): 9-1401-4

The following contacts are required at the time of application: (Enter information on 2nd page)

- **Responsible Party:** The person or entity holding fee title to the property or the person acting as the owner's representative, as delegated on page 2 of this form. 1) In the case of a corporation, by a principal executive officer of at least the level of vice-president or by the officer's authorized representative having overall responsibility for the operation of the site for which a permit is sought; 2) In the case of a limited liability company, by a member or manager; 3) In the case of a partnership, by the general partner; 4) In the case of a sole proprietorship, by the proprietor, or; 5) For a unit of government, by a principal executive officer, ranking elected official or other duly authorized representative.

- **Engineer or Designer:** The primary contact for the preparation of the storm water management plan. All plan review comments will be addressed to this contact. For all storm water plans and other engineering, this person must number and sign all plans submitted. If the designer is a licensed professional they shall stamp and sign all plans submitted as part of the permit. The designer or their designee shall oversee and verify construction of all practices.

If a pre-construction conference is required, contractor contact information will be required prior to issuing a permit.

Please indicate which one you wish to apply for: (Preliminary Review may be required by code.)

☐ Preliminary Review Letter
Items needed:

1. Signed Permit Application form
2. Application Fee
3. Site Plan Map (Checklist #1)
4. Storm Water Managment Plan (Checklist #2)
5. Preliminary Maintenance Agreement

☒ Storm Water Permit
Items needed:

1. Signed Permit Application form and General Requirements Agreement form
2. Application Fee
3. Site Plan Map (Checklist #1)
4. Final Erosion Control Plan (see Chapter 21)
5. Final Storm Water Mgt. Plan (including construction inspection plan - Checklist #3)
6. Preliminary Maintenance Agreement
7. Financial Assurance
8. Copy of Preliminary Review Letter (if applicable)

Storm Water Management Application (Page 2)

Responsible Party Contact Information: (owner information required to process application)

Name:	Joe Hengel		**Company:**	J-J Hengel	
Mailing Address:	2302 S. Ave.				
City:	La Crosse	**State:** WI		**Zip Code:**	54601
Daytime Phone:	(608) 788-8080	**Cell Phone:**		**Fax:**	
E-mail Address:					

I hereby certify that I meet the definition of "Responsible Party: on page 1 of this form. I understand that I will become the permit holder once a permit is issued. I also understand by submitting this application, County staff may enter upon the subject site to obtain information necessary to administer the storm water ordinance (Chapter 29 County Code of Ordinances).

I hereby authorize Joe Hengel (name) to serve as my representative for purposes of this application

Signature of Applicant – Responsible Party: [signature] Date: 5-2-12

Designer Contact information: (required to process application)

Name:	Philip Haase		**Company:**	La Crosse Engineering & Surveying Co.	
Mailing Address:	1212 S. 3rd St.				
City:	La Crosse	**State:** WI		**Zip Code:**	54601
Daytime Phone:	(608) 782-3423	**Cell Phone:**		**Fax:** (608)	782-3452
E-mail Address:	Philip@laxengineering.com				

If pre-construction conference is required, additional contact information is required prior to a permit being issued.

Preliminary Review Fee: $ 100

Base Permit Fee: $ 500

Additional Fee: (MAX-0.5ac.) $ 518.36
(+$.01 / ft² for impervious area over .5 acres)

Total Fee: $ 1118.36

Office use only
☐ Double Fee
☐ Fee Exemption
DATE RECEIVED

Maple Ridge Addition – Hwy F & Shady Maple Ridge Road
Long-term Stormwater Management
Maintenance Provisions

SITE NAME
Maple Ridge Addition – Hwy F & Shady Maple Ridge Road

PROPERTY LEGAL DESCRIPTION
Part of the SE ¼ of the SE ¼ of Section 35, T16N, R7W, Town of Medary, La Crosse County, WI.

RESPONSIBLE PARTY
The facility owner is responsible for satisfying the provisions of this agreement. A Homeowner's Association shall be created to take responsible charge of requirements below once developer is a minority owner and devices are stable.

PERMANENT COMPONENTS OF THE STORMWATER SYSTEM
The stormwater system consists of the following components:

+ *Stormwater drainage ways and swales*
+ *Infiltration areas*

The locations of all permanent stormwater system components are shown in Figure 1, attached.

INSPECTION AND MAINTENANCE
All components of the stormwater system shall be inspected at least semiannually in early Spring and early Autumn. Repairs will be made whenever the performance of a stormwater control structure is compromised.

MOWING / FERTILIZER & CHEMICAL APPLICATION
Mowing in buffer areas, pond banks and drainage ways will be minimized in order to maximize filtration of runoff. If occasional mowing is necessary, the mowing height will be no shorter than three inches.

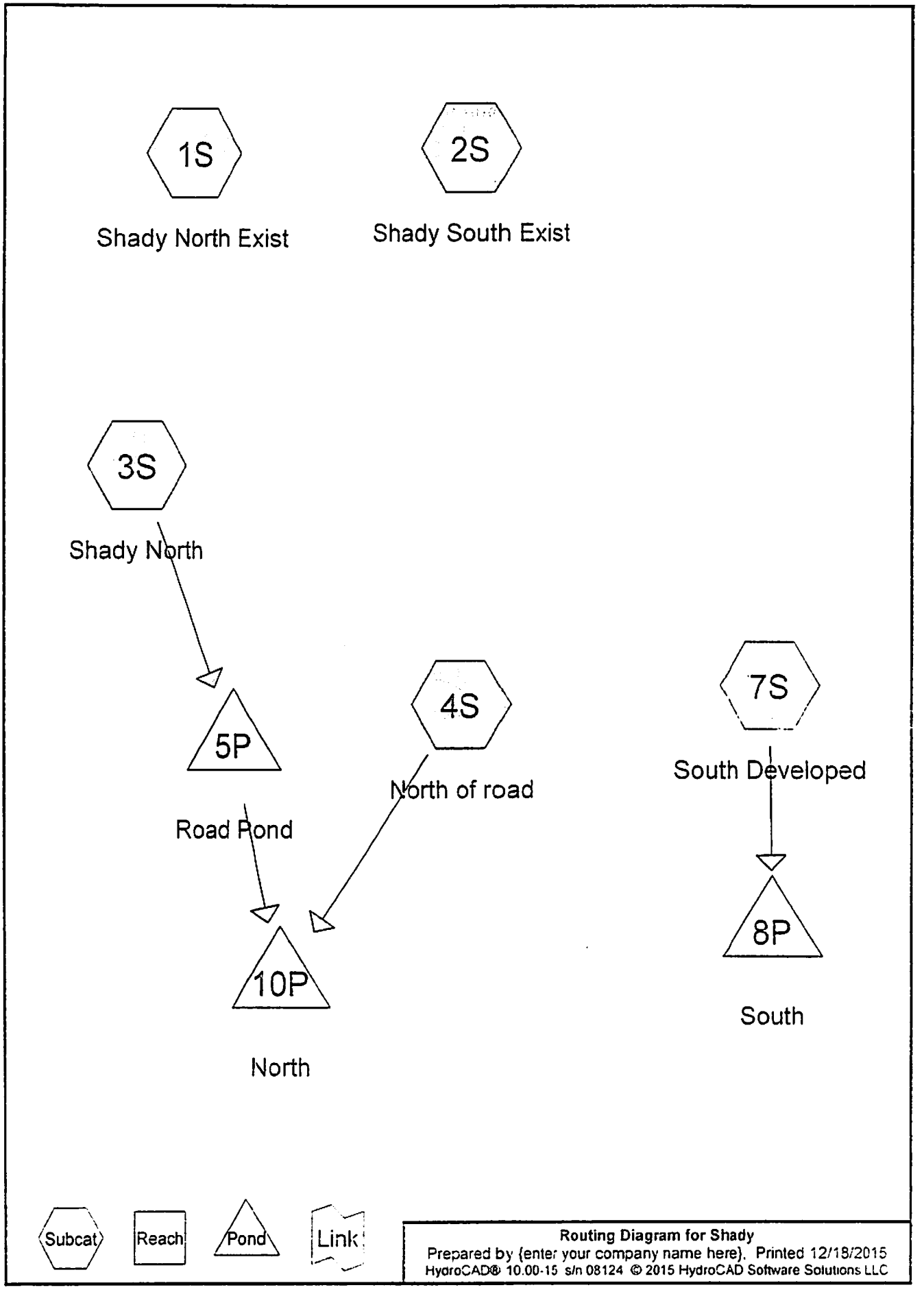
Applications of fertilizers, herbicides, pesticide or other chemical applications are prohibited in buffer areas, on pond banks and along drainage ways.

DUTY TO PROVIDE MAINTENANCE
It is the responsibility of the *facility owner* to maintain inspection and maintenance records, and to submit to the Town *of Medary* an annual report documenting the inspection and maintenance of the stormwater system. Proof of maintenance is required with each annual report.

In the event the facility owner fails to perform its obligations under this agreement, the Town *of Medary* shall have the authority to inspect and maintain all components of the stormwater system. In such an event, all associated costs will be assessed back as a special charge against the property pursuant to Sec. 66.0627 Wis. Stats. Said charge shall be a lien on the property and shall be collected with the real estate taxes.

SIGNATURES
The undersigned agrees to the provision set forth in this agreement.

Signature or Authorized Agent for Responsible Party	MEMBER *Title*
JOSEPH HENGEL *Legal name of Responsible Party*	2302 SOUTH AVE LACROSSE, WI *Street address, City, State, Zip Code*
(608) 788-8080 *Contact information (phone, email, etc.)*	12/22/15 *Date*


1S
Shady North Exist
2S
Shady South Exist
3S
Shady North
5P
Road Pond
4S
North of road
7S
South Developed
8P
South
10P
North
Subcat
Reach
Pond
Link
Routing Diagram for Shady
Prepared by {enter your company name here}. Printed 12/18/2015
HydroCAD® 10.00-15 s/n 08124 © 2015 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.700	55	(1S, 2S)
3.469	61	>75% Grass cover, Good, HSG B (3S, 4S, 7S)
0.587	89	Paved roads w/open ditches, 50% imp, HSG B (3S, 4S, 7S)
0.565	98	Roofs, HSG B (3S, 4S, 7S)
9.321	62	TOTAL AREA

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
4.621	HSG B	3S, 4S, 7S
0.000	HSG C	
0.000	HSG D	
4.700	Other	1S, 2S
9.321		TOTAL AREA

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Sub Num
0.000	0.000	0.000	0.000	4.700	4.700		
0.000	3.469	0.000	0.000	0.000	3.469	>75% Grass cover, Good	
0.000	0.587	0.000	0.000	0.000	0.587	Paved roads w/open ditches, 50% imp	
0.000	0.565	0.000	0.000	0.000	0.565	Roofs	
0.000	**4.621**	**0.000**	**0.000**	**4.700**	**9.321**	TOTAL AREA	

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: Shady North Exist Runoff Area=3.500 ac 0.00% Impervious Runoff Depth>0.06"
Flow Length=160' Tc=17.8 min CN=55 Runoff=0.04 cfs 0.018 af

Subcatchment 2S: Shady South Exist Runoff Area=1.200 ac 0.00% Impervious Runoff Depth>0.06"
Flow Length=190' Tc=7.5 min CN=55 Runoff=0.01 cfs 0.006 af

Subcatchment 3S: Shady North Runoff Area=1.280 ac 26.17% Impervious Runoff Depth>0.46"
Flow Length=160' Tc=17.1 min CN=72 Runoff=0.69 cfs 0.049 af

Subcatchment 4S: North of road Runoff Area=2.140 ac 20.02% Impervious Runoff Depth>0.40"
Flow Length=350' Tc=11.8 min CN=70 Runoff=1.16 cfs 0.071 af

Subcatchment 7S: South Developed Runoff Area=1.201 ac 7.91% Impervious Runoff Depth>0.23"
Flow Length=190' Tc=8.8 min CN=64 Runoff=0.32 cfs 0.023 af

Pond 5P: Road Pond Peak Elev=1,265.80' Storage=1,048 cf Inflow=0.69 cfs 0.049 af
Discarded=0.01 cfs 0.004 af Primary=0.08 cfs 0.023 af Outflow=0.09 cfs 0.027 af

Pond 8P: South Peak Elev=1,266.08' Storage=822 cf Inflow=0.32 cfs 0.023 af
Outflow=0.01 cfs 0.004 af

Pond 10P: North Peak Elev=1,243.71' Storage=3,382 cf Inflow=1.16 cfs 0.094 af
Outflow=0.03 cfs 0.016 af

Total Runoff Area = 9.321 ac Runoff Volume = 0.167 af Average Runoff Depth = 0.21"
90.79% Pervious = 8.462 ac 9.21% Impervious = 0.858 ac

Summary for Subcatchment 1S: Shady North Exist

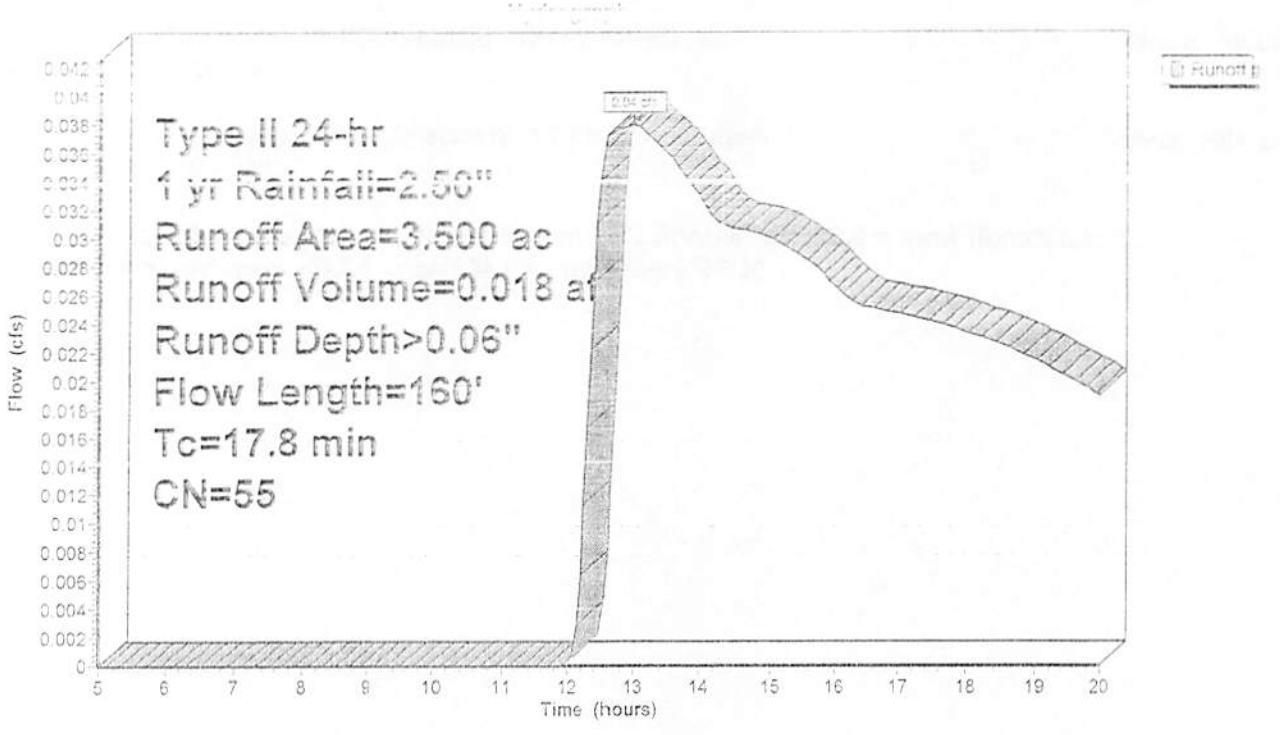
Runoff = 0.04 cfs @ 12.99 hrs, Volume= 0.018 af, Depth> 0.06"

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 1 yr Rainfall=2.50"

	Area (ac)	CN	Description
*	3.500	55	
	3.500		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	80	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
1.3	80	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
17.8	160	Total			

Subcatchment 1S: Shady North Exist



Summary for Subcatchment 2S: Shady South Exist

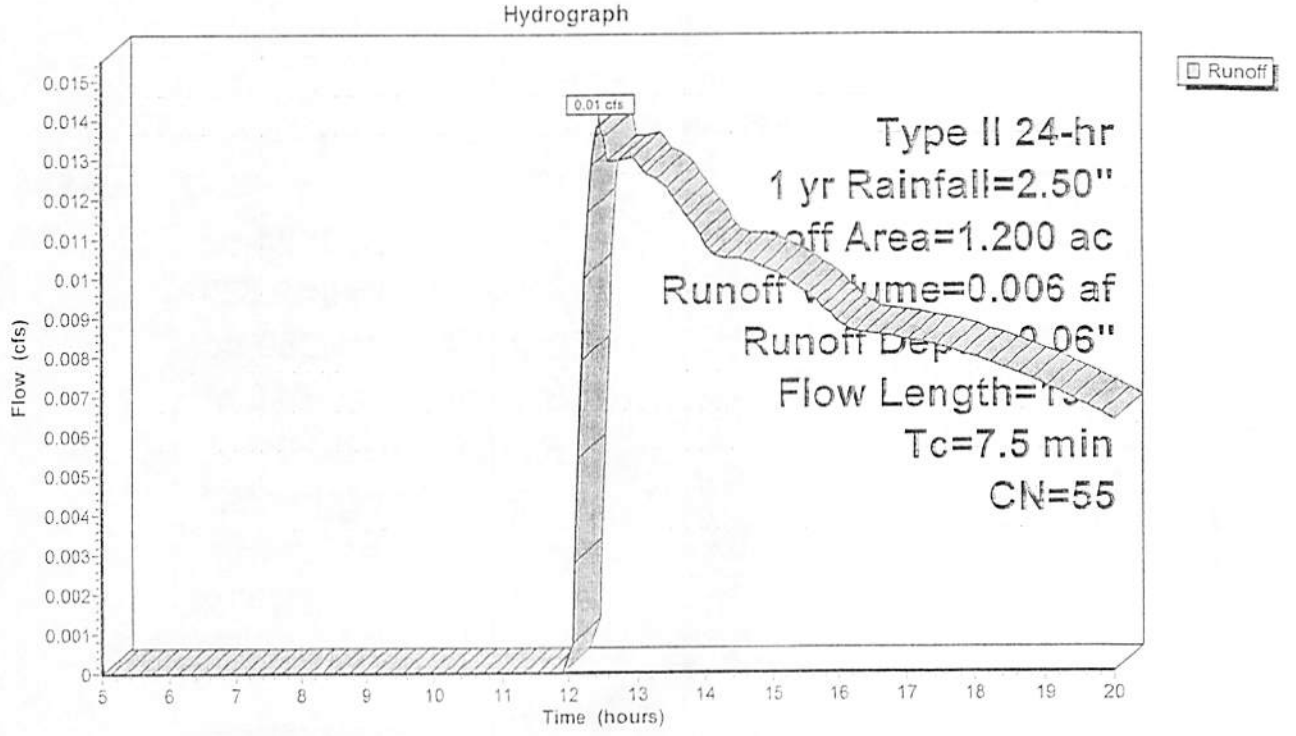
Runoff = 0.01 cfs @ 12.46 hrs, Volume= 0.006 af, Depth> 0.06"

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 1 yr Rainfall=2.50"

	Area (ac)	CN	Description
*	1.200	55	
	1.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	60	0.0330	0.16		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 2.90"
1.3	130	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.5	190	Total			

Subcatchment 2S: Shady South Exist



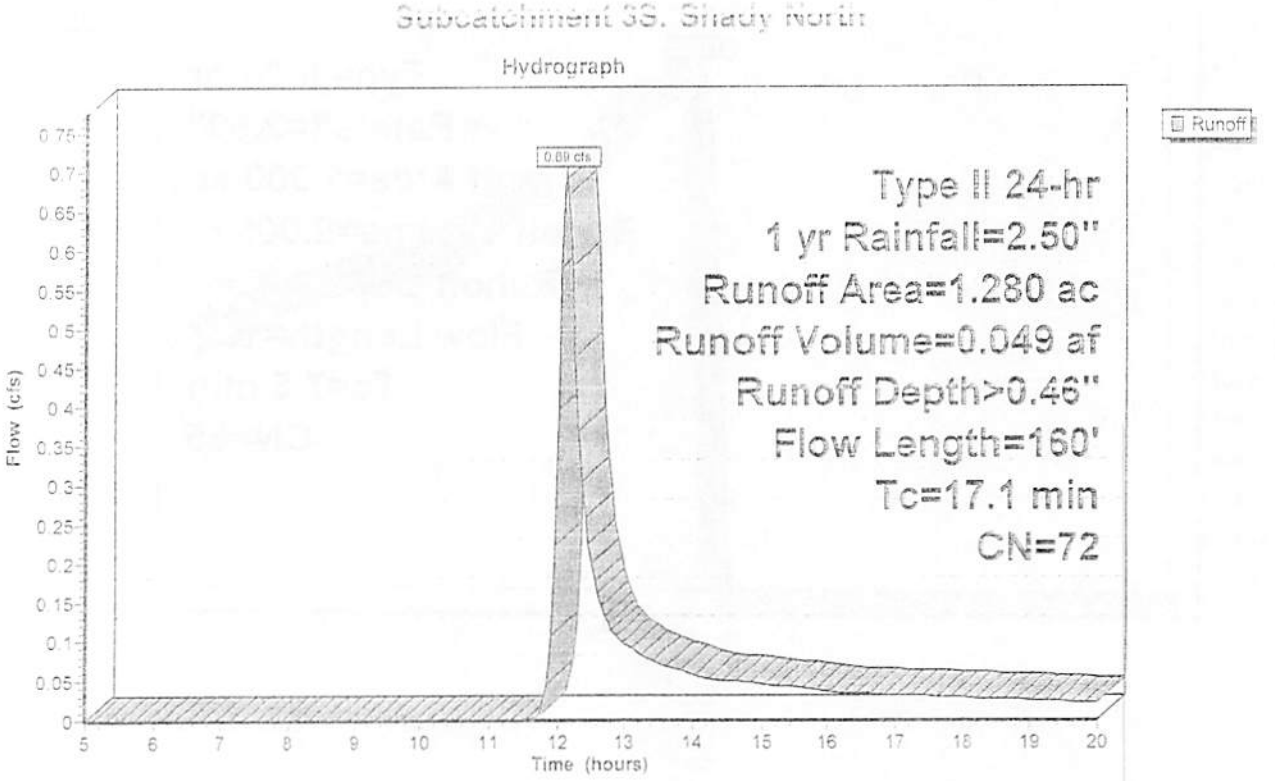
Summary for Subcatchment 3S: Shady North

Runoff = 0.69 cfs @ 12.12 hrs, Volume= 0.049 af, Depth> 0.46"

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 1 yr Rainfall=2.50"

Area (ac)	CN	Description
0.250	98	Roofs, HSG B
0.170	89	Paved roads w/open ditches, 50% imp, HSG B
0.860	61	>75% Grass cover, Good, HSG B
1.280	72	Weighted Average
0.945		73.83% Pervious Area
0.335		26.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	80	0.0100	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
0.6	80	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps



Summary for Subcatchment 4S: North of road

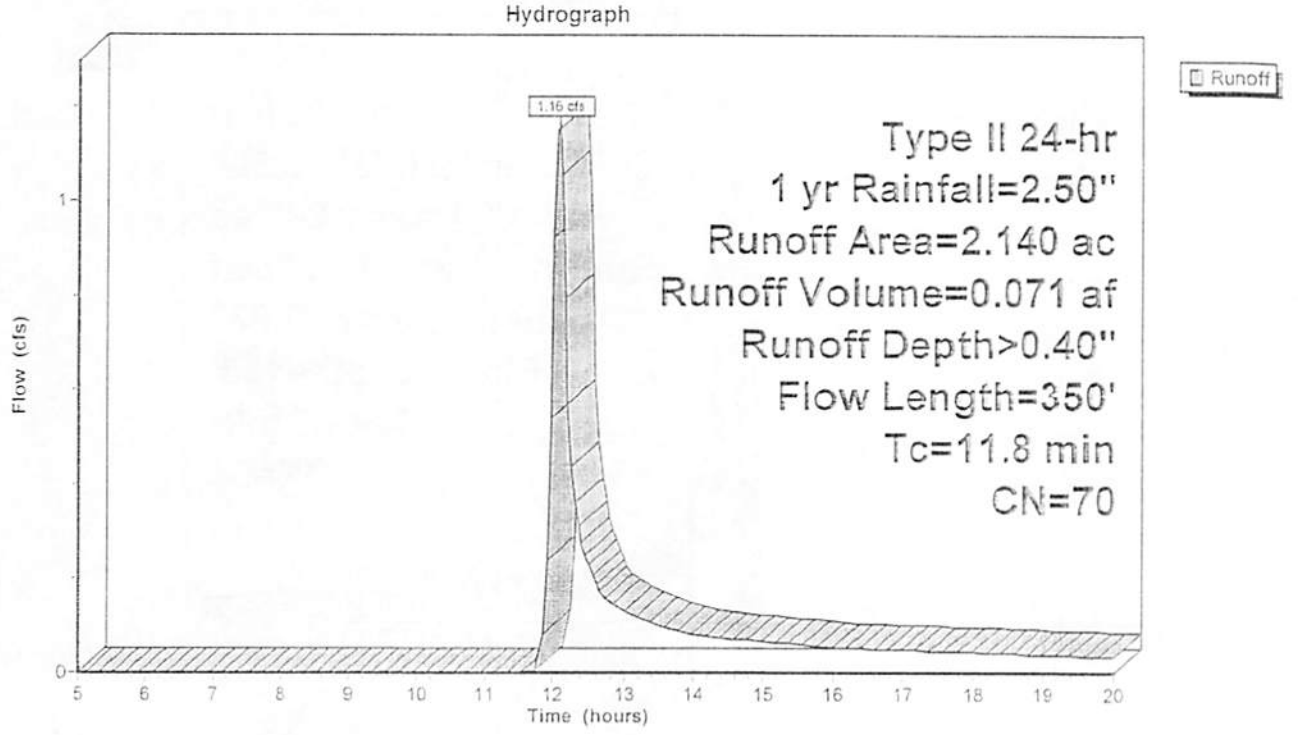
Runoff = 1.16 cfs @ 12.06 hrs, Volume= 0.071 af, Depth> 0.40"

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 1 yr Rainfall=2.50"

Area (ac)	CN	Description
0.239	98	Roofs, HSG B
0.379	89	Paved roads w/open ditches, 50% imp, HSG B
1.522	61	>75% Grass cover, Good, HSG B
2.140	70	Weighted Average
1.711		79.98% Pervious Area
0.428		20.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	100	0.0600	0.17		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
2.1	250	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.8	350	Total			

Subcatchment 4S: North of road



Summary for Subcatchment 7S: South Developed

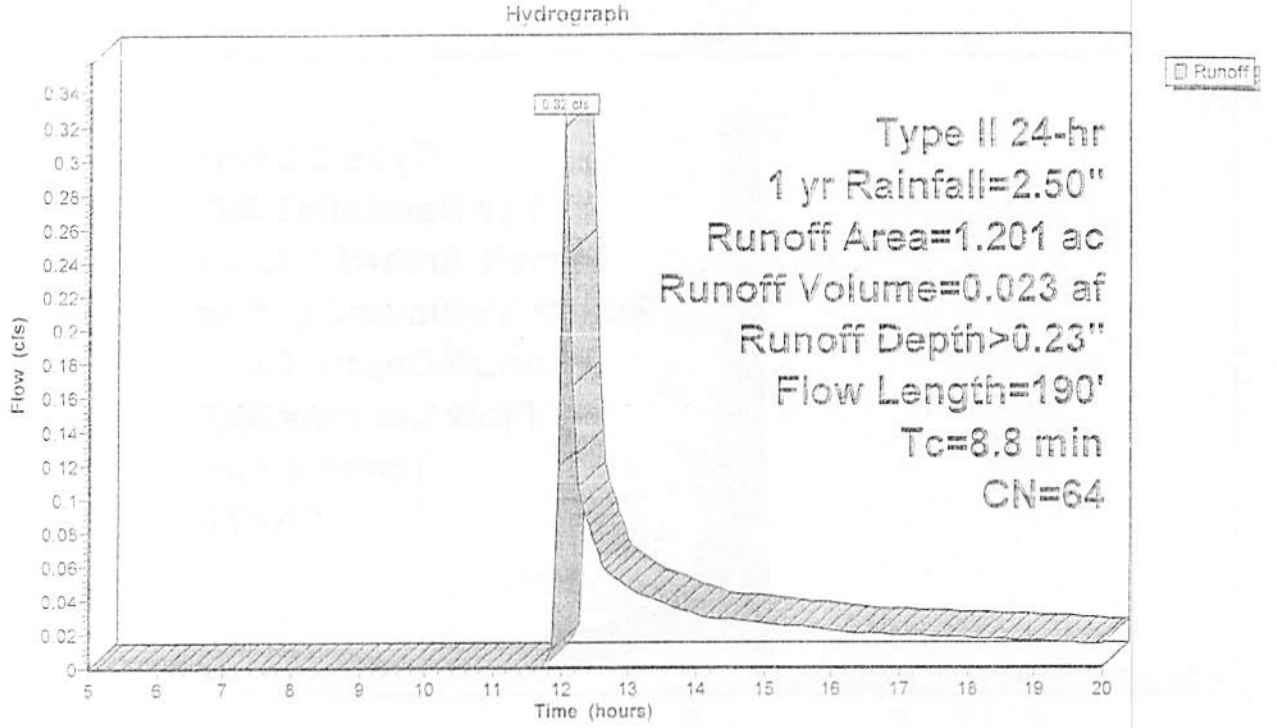
Runoff = 0.32 cfs @ 12.05 hrs, Volume= 0.023 af, Depth> 0.23"

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 1 yr Rainfall=2.50"

Area (ac)	CN	Description
0.076	98	Roofs, HSG B
0.038	89	Paved roads w/open ditches, 50% imp, HSG B
1.087	61	>75% Grass cover, Good, HSG B
1.201	64	Weighted Average
1.106		92.09% Pervious Area
0.095		7.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	60	0.0330	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 2.90"
0.6	130	0.0600	3.67		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps

Subcatchment 7S: South Developed



Summary for Pond 5P: Road Pond

Inflow Area = 1.280 ac, 26.17% Impervious, Inflow Depth > 0.46" for 1 yr event
Inflow = 0.69 cfs @ 12.12 hrs, Volume= 0.049 af
Outflow = 0.09 cfs @ 13.12 hrs, Volume= 0.027 af, Atten= 87%, Lag= 60.2 min
Discarded = 0.01 cfs @ 13.12 hrs, Volume= 0.004 af
Primary = 0.08 cfs @ 13.12 hrs, Volume= 0.023 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,265.80' @ 13.12 hrs Surf.Area= 1,886 sf Storage= 1,048 cf

Plug-Flow detention time= 191.5 min calculated for 0.027 af (54% of inflow)
Center-of-Mass det. time= 94.7 min (929.8 - 835.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,265.00'	1,449 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

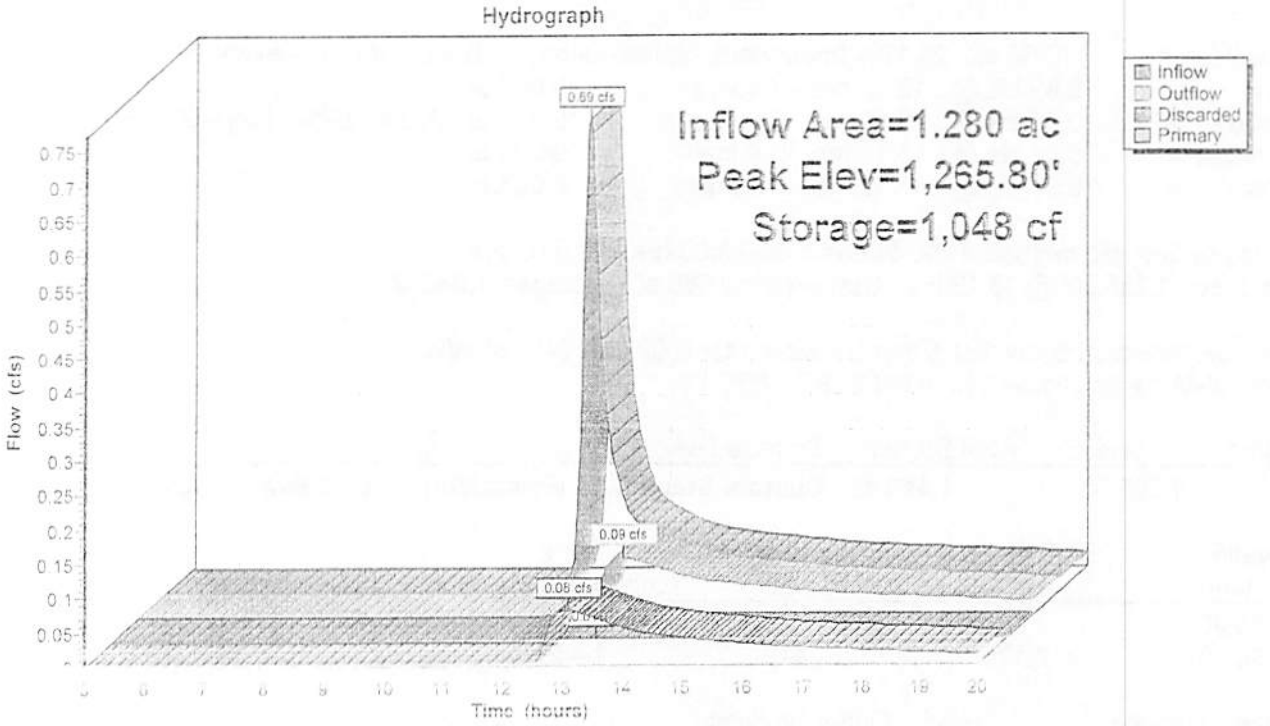
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,265.00	726	0	0
1,266.00	2,171	1,449	1,449

Device	Routing	Invert	Outlet Devices
#1	Primary	1,265.90'	**10.0' long x 6.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Discarded	1,265.00'	**0.130 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#3	Primary	1,265.75'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 13.12 hrs HW=1,265.80' (Free Discharge)
└**2=Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=0.08 cfs @ 13.12 hrs HW=1,265.80' (Free Discharge)
├**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Weir Controls 0.08 cfs @ 0.75 fps)

Pond 5P: Road Pond



Summary for Pond 8P: South

Inflow Area = 1.201 ac, 7.91% Impervious, Inflow Depth > 0.23" for 1 yr event
Inflow = 0.32 cfs @ 12.05 hrs, Volume= 0.023 af
Outflow = 0.01 cfs @ 20.00 hrs, Volume= 0.004 af, Atten= 98%, Lag= 477.3 min
Primary = 0.01 cfs @ 20.00 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,266.08' @ 20.00 hrs Surf.Area= 2,010 sf Storage= 822 cf

Plug-Flow detention time= 245.8 min calculated for 0.004 af (17% of inflow)
Center-of-Mass det. time= 106.0 min (967.7 - 861.7)

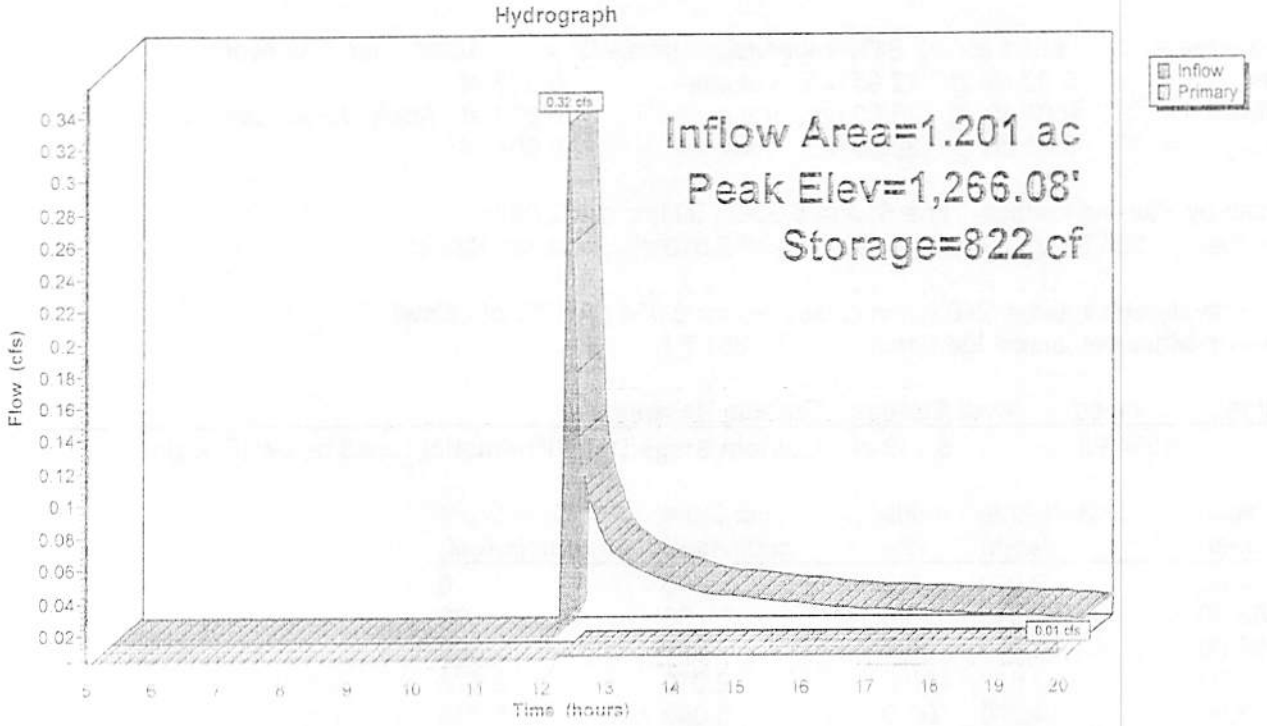
Volume	Invert	Avail.Storage	Storage Description
#1	1,264.90'	5,713 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,264.90	2,010	0.0	0	0
1,265.00	2,010	30.0	60	60
1,266.00	2,010	30.0	603	663
1,267.00	2,010	100.0	2,010	2,673
1,268.00	4,070	100.0	3,040	5,713

Device	Routing	Invert	Outlet Devices
#1	Device 3	1,264.90'	**0.130 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	1,267.75'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Primary	1,265.25'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.01 cfs @ 20.00 hrs HW=1,266.08' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**3=Orifice/Grate** (Passes 0.01 cfs of 0.72 cfs potential flow)
└─**1=Exfiltration** (Controls 0.01 cfs)

Pond 8P: South



Summary for Pond 10P: North

Inflow Area = 3.420 ac, 22.32% Impervious, Inflow Depth > 0.33" for 1 yr event
Inflow = 1.16 cfs @ 12.06 hrs, Volume= 0.094 af
Outflow = 0.03 cfs @ 20.00 hrs, Volume= 0.016 af, Atten= 97%, Lag= 476.4 min
Primary = 0.03 cfs @ 20.00 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,243.71' @ 20.00 hrs Surf.Area= 2,621 sf Storage= 3,382 cf

Plug-Flow detention time= 265.6 min calculated for 0.016 af (17% of inflow)
Center-of-Mass det. time= 127.5 min (986.9 - 859.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,240.90'	11,014 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

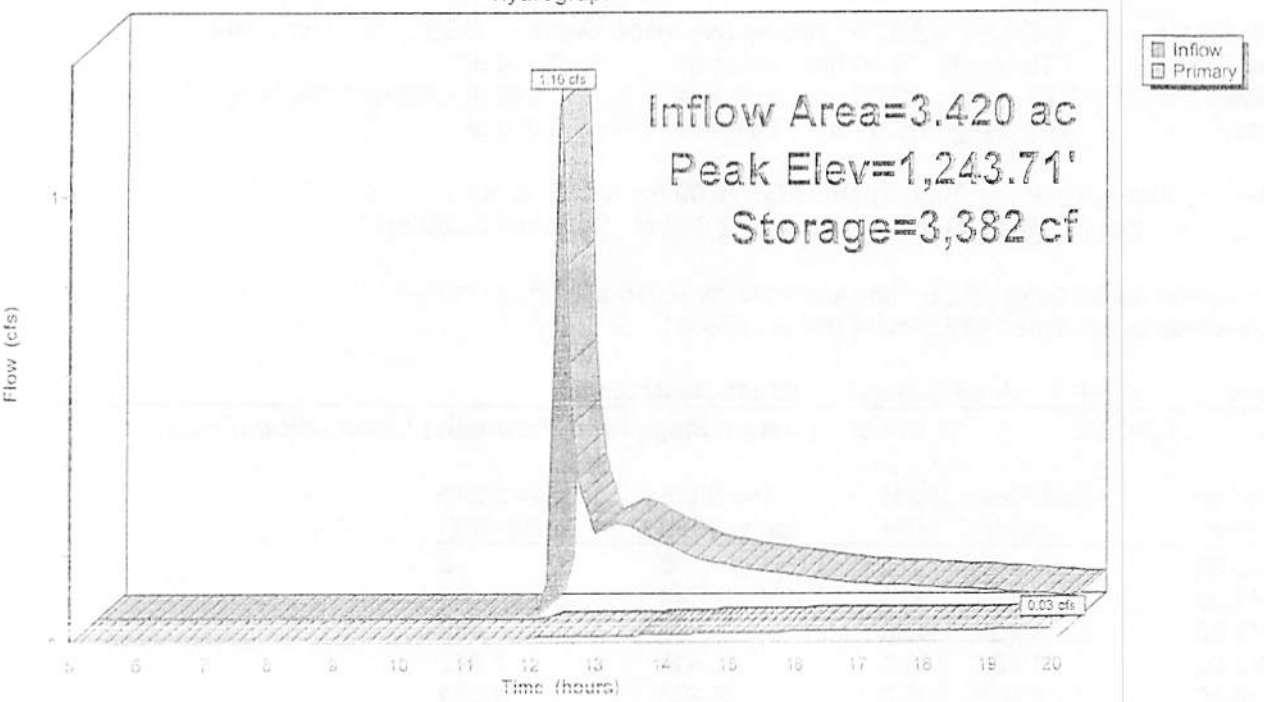
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,240.90	1,460	0.0	0	0
1,241.00	1,460	30.0	44	44
1,242.00	1,460	30.0	438	482
1,243.00	1,460	100.0	1,460	1,942
1,244.00	3,105	100.0	2,283	4,224
1,245.00	5,010	100.0	4,058	8,282
1,245.50	5,920	100.0	2,733	11,014

Device	Routing	Invert	Outlet Devices
#1	Primary	1,245.10'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Device 5	1,240.90'	**0.500 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#3	Primary	1,244.45'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 3	1,244.00'	**1.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#5	Primary	1,241.25'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.03 cfs @ 20.00 hrs HW=1,243.71' (Free Discharge)
- **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)
  - **4=Orifice/Grate** (Controls 0.00 cfs)
- **5=Orifice/Grate** (Passes 0.03 cfs of 1.48 cfs potential flow)
  - **2=Exfiltration** (Controls 0.03 cfs)

Pond 10P: North

Hydrograph



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: Shady North Exist Runoff Area=3.500 ac 0.00% Impervious Runoff Depth>0.13"
Flow Length=160' Tc=17.8 min CN=55 Runoff=0.17 cfs 0.039 af

Subcatchment 2S: Shady South Exist Runoff Area=1.200 ac 0.00% Impervious Runoff Depth>0.14"
Flow Length=190' Tc=7.5 min CN=55 Runoff=0.09 cfs 0.014 af

Subcatchment 3S: Shady North Runoff Area=1.280 ac 26.17% Impervious Runoff Depth>0.66"
Flow Length=160' Tc=17.1 min CN=72 Runoff=1.05 cfs 0.071 af

Subcatchment 4S: North of road Runoff Area=2.140 ac 20.02% Impervious Runoff Depth>0.58"
Flow Length=350' Tc=11.8 min CN=70 Runoff=1.82 cfs 0.104 af

Subcatchment 7S: South Developed Runoff Area=1.201 ac 7.91% Impervious Runoff Depth>0.37"
Flow Length=190' Tc=8.8 min CN=64 Runoff=0.62 cfs 0.037 af

Pond 5P: Road Pond Peak Elev=1,265.87' Storage=1,188 cf Inflow=1.05 cfs 0.071 af
Discarded=0.01 cfs 0.004 af Primary=0.30 cfs 0.044 af Outflow=0.31 cfs 0.048 af

Pond 8P: South Peak Elev=1,266.38' Storage=1,424 cf Inflow=0.62 cfs 0.037 af
Outflow=0.01 cfs 0.004 af

Pond 10P: North Peak Elev=1,244.34' Storage=5,392 cf Inflow=1.82 cfs 0.148 af
Outflow=0.04 cfs 0.024 af

Total Runoff Area = 9.321 ac Runoff Volume = 0.264 af Average Runoff Depth = 0.34"
90.79% Pervious = 8.462 ac 9.21% Impervious = 0.858 ac

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: Shady North Exist Runoff Area=3.500 ac 0.00% Impervious Runoff Depth>0.38"
Flow Length=160' Tc=17.8 min CN=55 Runoff=1.12 cfs 0.111 af

Subcatchment 2S: Shady South Exist Runoff Area=1.200 ac 0.00% Impervious Runoff Depth>0.38"
Flow Length=190' Tc=7.5 min CN=55 Runoff=0.62 cfs 0.038 af

Subcatchment 3S: Shady North Runoff Area=1.280 ac 26.17% Impervious Runoff Depth>1.19"
Flow Length=160' Tc=17.1 min CN=72 Runoff=1.97 cfs 0.127 af

Subcatchment 4S: North of road Runoff Area=2.140 ac 20.02% Impervious Runoff Depth>1.08"
Flow Length=350' Tc=11.8 min CN=70 Runoff=3.55 cfs 0.192 af

Subcatchment 7S: South Developed Runoff Area=1.201 ac 7.91% Impervious Runoff Depth>0.76"
Flow Length=190' Tc=8.8 min CN=64 Runoff=1.51 cfs 0.076 af

Pond 5P: Road Pond Peak Elev=1,266.00' Storage=1,449 cf Inflow=1.97 cfs 0.127 af
Discarded=0.01 cfs 0.004 af Primary=1.65 cfs 0.100 af Outflow=1.66 cfs 0.104 af

Outflow=0.01 cfs 0.004 af

Pond 10P: North Peak Elev=1,245.10' Storage=6,927 cf Inflow=3.58 cfs 0.292 af
Outflow=0.21 cfs 0.089 af

Total Runoff Area = 9.321 ac Runoff Volume = 0.545 af Average Runoff Depth = 0.70"
90.79% Pervious = 8.462 ac 9.21% Impervious = 0.858 ac

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: Shady North Exist Runoff Area=3.500 ac 0.00% Impervious Runoff Depth>0.56"
Flow Length=160' Tc=17.8 min CN=55 Runoff=1.92 cfs 0.164 af

Subcatchment 2S: Shady South Exist Runoff Area=1.200 ac 0.00% Impervious Runoff Depth>0.57"
Flow Length=190' Tc=7.5 min CN=55 Runoff=1.05 cfs 0.057 af

Subcatchment 3S: Shady North Runoff Area=1.280 ac 26.17% Impervious Runoff Depth>1.52"
Flow Length=160' Tc=17.1 min CN=72 Runoff=2.53 cfs 0.162 af

Subcatchment 4S: North of road Runoff Area=2.140 ac 20.02% Impervious Runoff Depth>1.39"
Flow Length=350' Tc=11.8 min CN=70 Runoff=4.61 cfs 0.247 af

Subcatchment 7S: South Developed Runoff Area=1.201 ac 7.91% Impervious Runoff Depth>1.02"
Flow Length=190' Tc=8.8 min CN=64 Runoff=2.07 cfs 0.102 af

Pond 5P: Road Pond Peak Elev=1,266.07' Storage=1,449 cf Inflow=2.53 cfs 0.162 af
Discarded=0.01 cfs 0.004 af Primary=2.55 cfs 0.134 af Outflow=2.55 cfs 0.138 af

Pond 8P: South Peak Elev=1,267.59' Storage=4,215 cf Inflow=2.07 cfs 0.102 af
Outflow=0.01 cfs 0.005 af

Pond 10P: North Peak Elev=1,245.18' Storage=9,217 cf Inflow=6.35 cfs 0.381 af
Outflow=0.66 cfs 0.178 af

Total Runoff Area = 9.321 ac Runoff Volume = 0.732 af Average Runoff Depth = 0.94"
90.79% Pervious = 8.462 ac 9.21% Impervious = 0.858 ac

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: Shady North Exist Runoff Area=3.500 ac 0.00% Impervious Runoff Depth>0.81"
Flow Length=160' Tc=17.8 min CN=55 Runoff=3.08 cfs 0.236 af

Subcatchment 2S: Shady South Exist Runoff Area=1.200 ac 0.00% Impervious Runoff Depth>0.82"
Flow Length=190' Tc=7.5 min CN=55 Runoff=1.54 cfs 0.082 af

Subcatchment 3S: Shady North Runoff Area=1.280 ac 26.17% Impervious Runoff Depth>1.93"
Flow Length=160' Tc=17.1 min CN=72 Runoff=3.24 cfs 0.205 af

Subcatchment 4S: North of road Runoff Area=2.140 ac 20.02% Impervious Runoff Depth>1.78"
Flow Length=350' Tc=11.8 min CN=70 Runoff=5.96 cfs 0.318 af

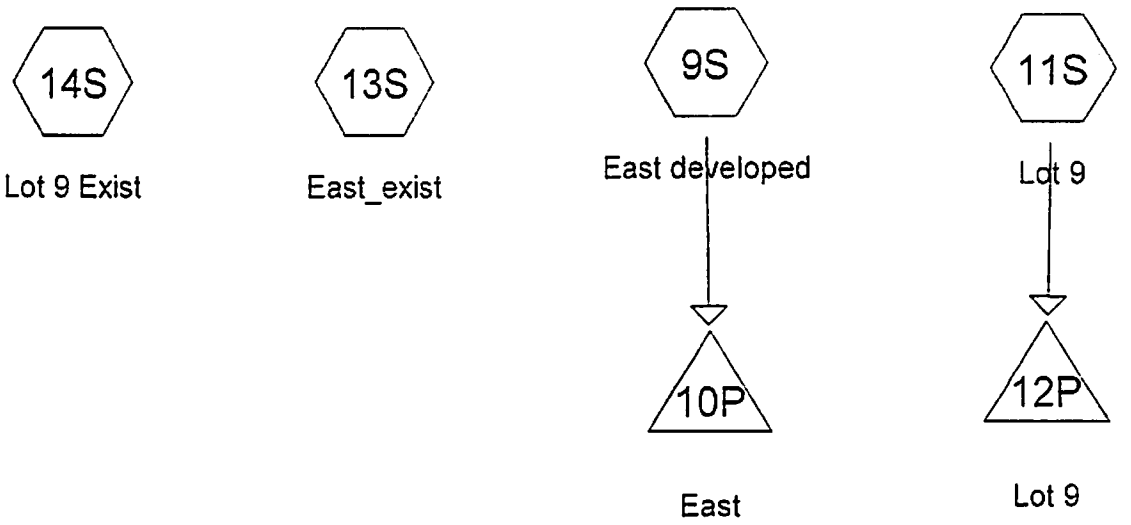
Subcatchment 7S: South Developed Runoff Area=1.201 ac 7.91% Impervious Runoff Depth>1.36"
Flow Length=190' Tc=8.8 min CN=64 Runoff=2.81 cfs 0.136 af

Pond 5P: Road Pond Peak Elev=1,266.10' Storage=1,449 cf Inflow=3.24 cfs 0.206 af
Discarded=0.01 cfs 0.004 af Primary=3.18 cfs 0.178 af Outflow=3.19 cfs 0.182 af

[illegible] Outflow=0.08 cfs 0.026 af

Pond 10P: North Peak Elev=1,245.29' Storage=9,819 cf Inflow=9.23 cfs 0.496 af
Outflow=2.12 cfs 0.292 af

Total Runoff Area = 9.321 ac Runoff Volume = 0.978 af Average Runoff Depth = 1.26"
90.79% Pervious = 8.462 ac 9.21% Impervious = 0.858 ac



Subcat Reach Pond Link

Routing Diagram for Shady_East
Prepared by {enter your company name here}. Printed 12/18/2015
HydroCAD® 10.00-15 s/n 08124 © 2015 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.190	55	(13S, 14S)
0.010	98	(14S)
1.956	61	>75% Grass cover, Good, HSG B (9S, 11S)
0.217	89	Paved roads w/open ditches, 50% imp, HSG B (9S, 11S)
0.257	98	Roofs, HSG B (9S, 11S)
4.630	62	TOTAL AREA

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.430	HSG B	9S, 11S
0.000	HSG C	
0.000	HSG D	
2.200	Other	13S, 14S
4.630		TOTAL AREA

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Sub Num
0.000	0.000	0.000	0.000	2.200	2.200		
0.000	1.956	0.000	0.000	0.000	1.956	>75% Grass cover, Good	
0.000	0.217	0.000	0.000	0.000	0.217	Paved roads w/open ditches, 50% imp	
0.000	0.257	0.000	0.000	0.000	0.257	Roofs	
0.000	**2.430**	**0.000**	**0.000**	**2.200**	**4.630**	**TOTAL AREA**	

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 9S: East developed Runoff Area=1.060 ac 18.44% Impervious Runoff Depth>0.37"
Flow Length=320' Tc=9.3 min CN=69 Runoff=0.57 cfs 0.032 af

Subcatchment 11S: Lot 9 Runoff Area=1.370 ac 12.41% Impervious Runoff Depth>0.28"
Flow Length=270' Tc=7.9 min CN=66 Runoff=0.53 cfs 0.032 af

Subcatchment 13S: East_exist Runoff Area=1.060 ac 0.00% Impervious Runoff Depth>0.06"
Flow Length=320' Tc=10.2 min CN=55 Runoff=0.01 cfs 0.005 af

Subcatchment 14S: Lot 9 Exist Runoff Area=1.140 ac 0.88% Impervious Runoff Depth>0.06"
Flow Length=270' Tc=8.2 min CN=55 Runoff=0.01 cfs 0.006 af

Pond 10P: East Peak Elev=1,243.08' Storage=1,325 cf Inflow=0.57 cfs 0.032 af
Outflow=0.00 cfs 0.002 af

Pond 12P: Lot 9 Peak Elev=1,234.28' Storage=1,151 cf Inflow=0.53 cfs 0.032 af
Outflow=0.02 cfs 0.005 af

Total Runoff Area = 4.630 ac Runoff Volume = 0.075 af Average Runoff Depth = 0.20"
91.89% Pervious = 4.255 ac 8.11% Impervious = 0.376 ac

Summary for Subcatchment 9S: East developed

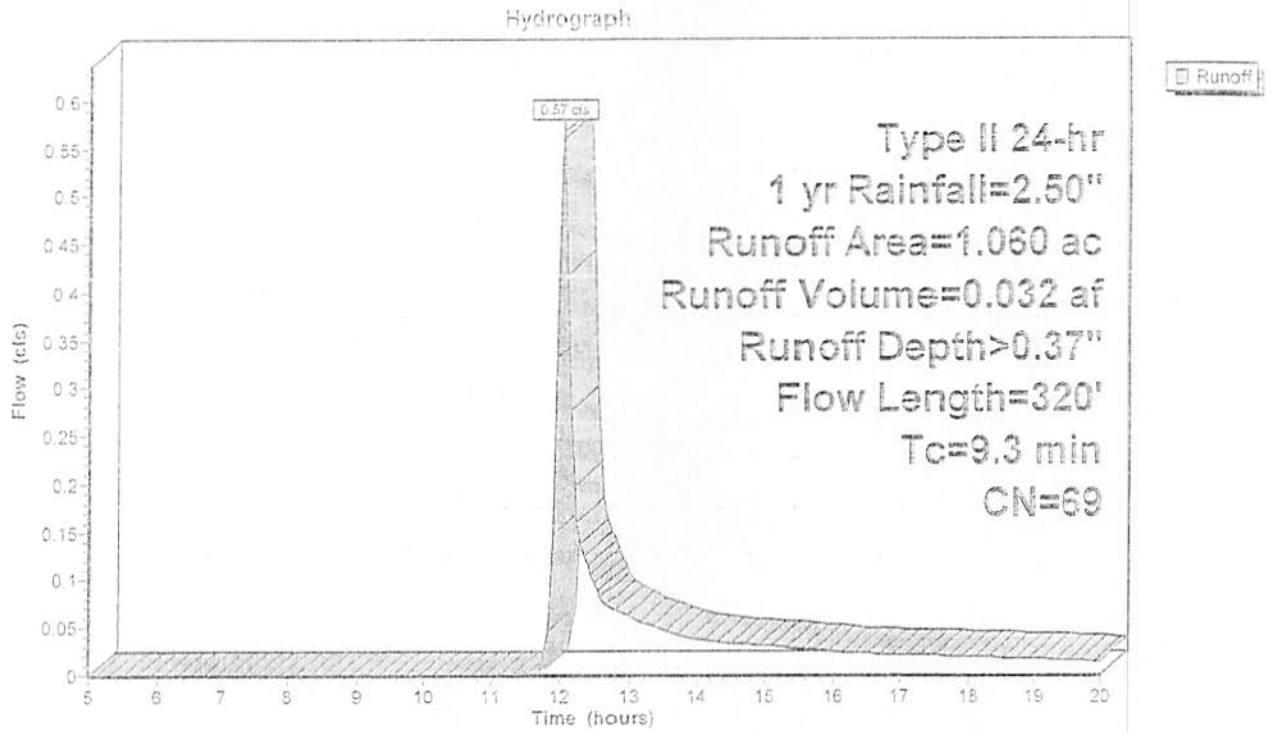
Runoff = 0.57 cfs @ 12.03 hrs, Volume= 0.032 af, Depth> 0.37"

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 1 yr Rainfall=2.50"

Area (ac)	CN	Description
0.147	98	Roofs, HSG B
0.097	89	Paved roads w/open ditches, 50% imp, HSG B
0.816	61	>75% Grass cover, Good, HSG B
1.060	69	Weighted Average
0.864		81.56% Pervious Area
0.195		18.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	70	0.0400	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 2.90"
0.4	100	0.1000	4.74		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.4	150	0.1700	5.73		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
9.3	320	Total			

Subcatchment 9S: East developed



Summary for Subcatchment 11S: Lot 9

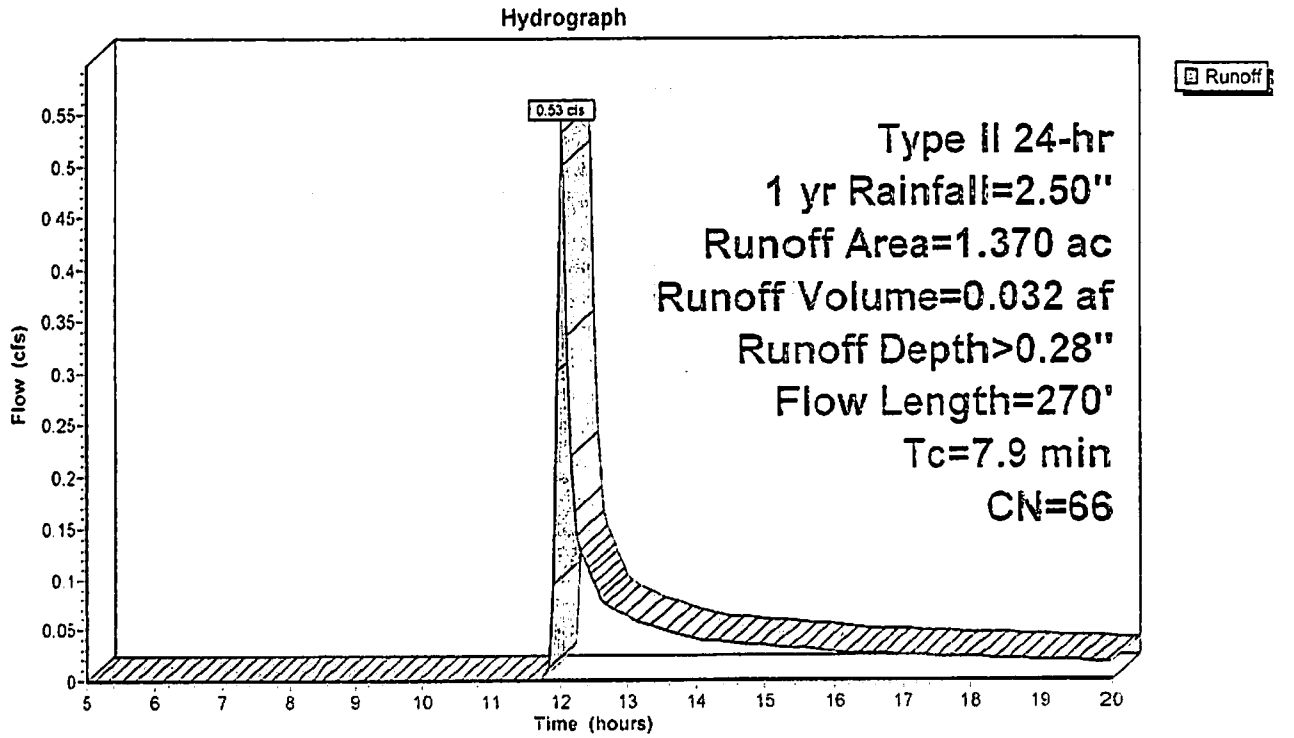
Runoff = 0.53 cfs @ 12.02 hrs, Volume= 0.032 af, Depth> 0.28"

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 1 yr Rainfall=2.50"

Area (ac)	CN	Description
0.110	98	Roofs, HSG B
0.120	89	Paved roads w/open ditches, 50% imp, HSG B
1.140	61	>75% Grass cover, Good, HSG B
1.370	66	Weighted Average
1.200		87.59% Pervious Area
0.170		12.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	50	0.0300	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
0.4	120	0.1000	4.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.2	100	0.2000	6.71		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
7.9	270	Total			

Subcatchment 11S: Lot 9



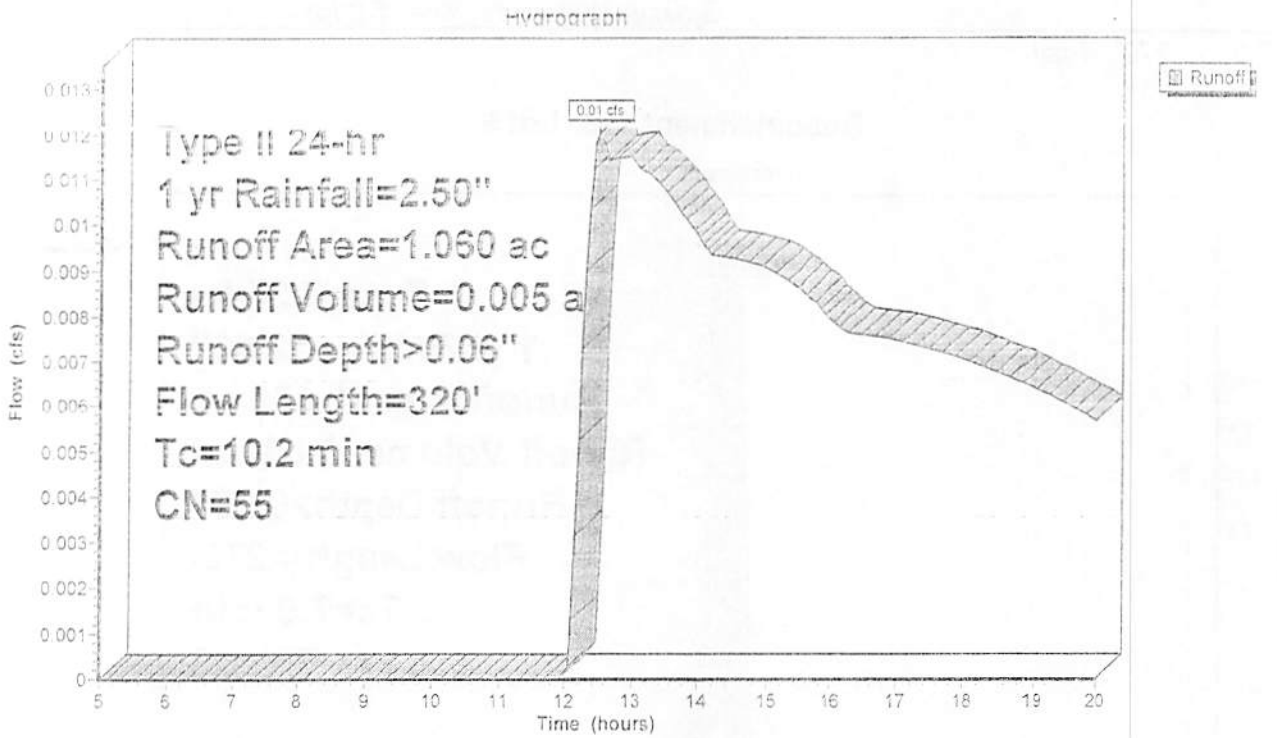
Summary for Subcatchment 13S: East_exist

Runoff = 0.01 cfs @ 12.51 hrs, Volume= 0.005 af, Depth> 0.06"

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 1 yr Rainfall=2.50"

	Area (ac)	CN	Description
*	1.060	55	
	1.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	70	0.0400	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 2.90"
0.8	100	0.1000	2.21		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.9	150	0.1700	2.89		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
10.2	320	Total			



Summary for Subcatchment 14S: Lot 9 Exist

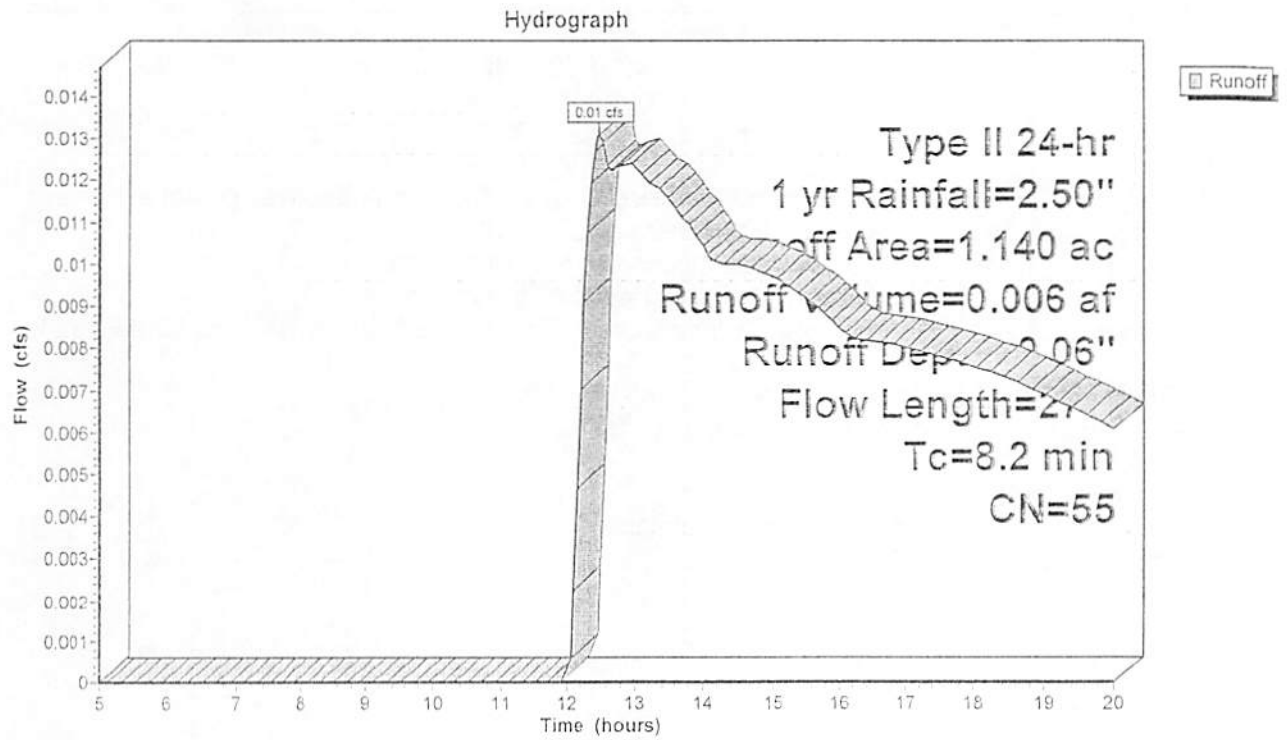
Runoff = 0.01 cfs @ 12.47 hrs, Volume= 0.006 af, Depth> 0.06"

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 1 yr Rainfall=2.50"

	Area (ac)	CN	Description
*	0.010	98	
*	1.130	55	
	1.140	55	Weighted Average
	1.130		99.12% Pervious Area
	0.010		0.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	50	0.0300	0.11		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.90"
0.4	120	0.1000	4.74		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.5	100	0.2000	3.13		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.2	270	Total			

Subcatchment 14S: Lot 9 Exist



Summary for Pond 10P: East

Inflow Area = 1.060 ac, 18.44% Impervious, Inflow Depth > 0.37" for 1 yr event
Inflow = 0.57 cfs @ 12.03 hrs, Volume= 0.032 af
Outflow = 0.00 cfs @ 20.00 hrs, Volume= 0.002 af, Atten= 99%, Lag= 478.0 min
Primary = 0.00 cfs @ 20.00 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,243.08' @ 20.00 hrs Surf.Area= 1,166 sf Storage= 1,325 cf

Plug-Flow detention time= 273.7 min calculated for 0.002 af (6% of inflow)
Center-of-Mass det. time= 148.8 min (988.7 - 839.9)

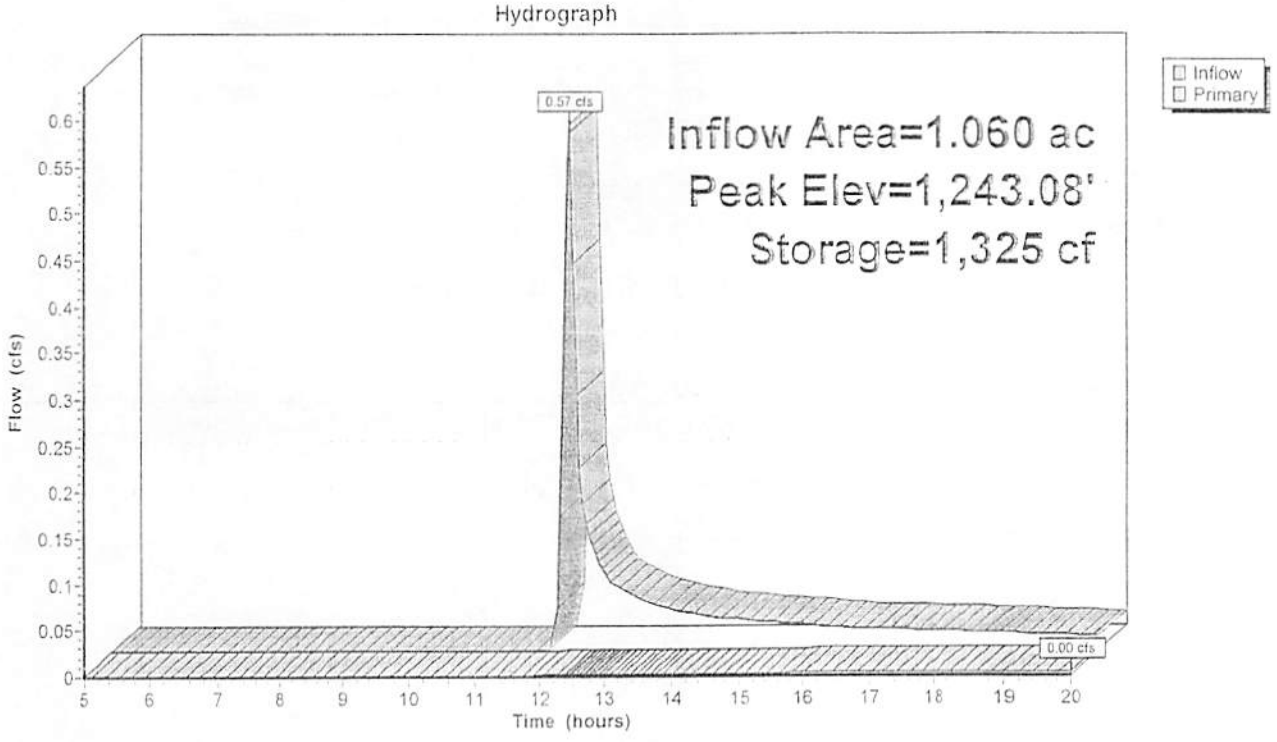
Volume	Invert	Avail.Storage	Storage Description
#1	1,239.90'	5,372 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,239.90	376	0.0	0	0
1,240.00	376	30.0	11	11
1,241.00	376	30.0	113	124
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1,243.00	1,090	100.0	733	1,233
1,244.00	2,025	100.0	1,556	2,791
1,245.00	3,135	100.0	2,581	5,372

Device	Routing	Invert	Outlet Devices
#1	Primary	1,244.60'	**8.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Primary	1,243.25'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	1,243.90'	**6.0" Vert. Orifice/Grate** C= 0.600
#4	Device 5	1,239.90'	**0.130 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#5	Primary	1,240.25'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 20.00 hrs HW=1,243.08' (Free Discharge)
- 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
- 2=Orifice/Grate (Controls 0.00 cfs)
- 3=Orifice/Grate (Controls 0.00 cfs)
- 5=Orifice/Grate (Passes 0.00 cfs of 1.59 cfs potential flow)
  - 4=Exfiltration (Controls 0.00 cfs)

Pond 10P: East



Summary for Pond 12P: Lot 9

Inflow Area = 1.370 ac, 12.41% Impervious, Inflow Depth > 0.28" for 1 yr event
Inflow = 0.53 cfs @ 12.02 hrs, Volume= 0.032 af
Outflow = 0.02 cfs @ 19.21 hrs, Volume= 0.005 af, Atten= 96%, Lag= 431.5 min
Primary = 0.02 cfs @ 19.21 hrs, Volume= 0.005 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 1,234.28' @ 19.21 hrs Surf.Area= 1,314 sf Storage= 1,151 cf

Plug-Flow detention time= 343.8 min calculated for 0.005 af (17% of inflow)
Center-of-Mass det. time= 212.6 min (1,063.9 - 851.3)

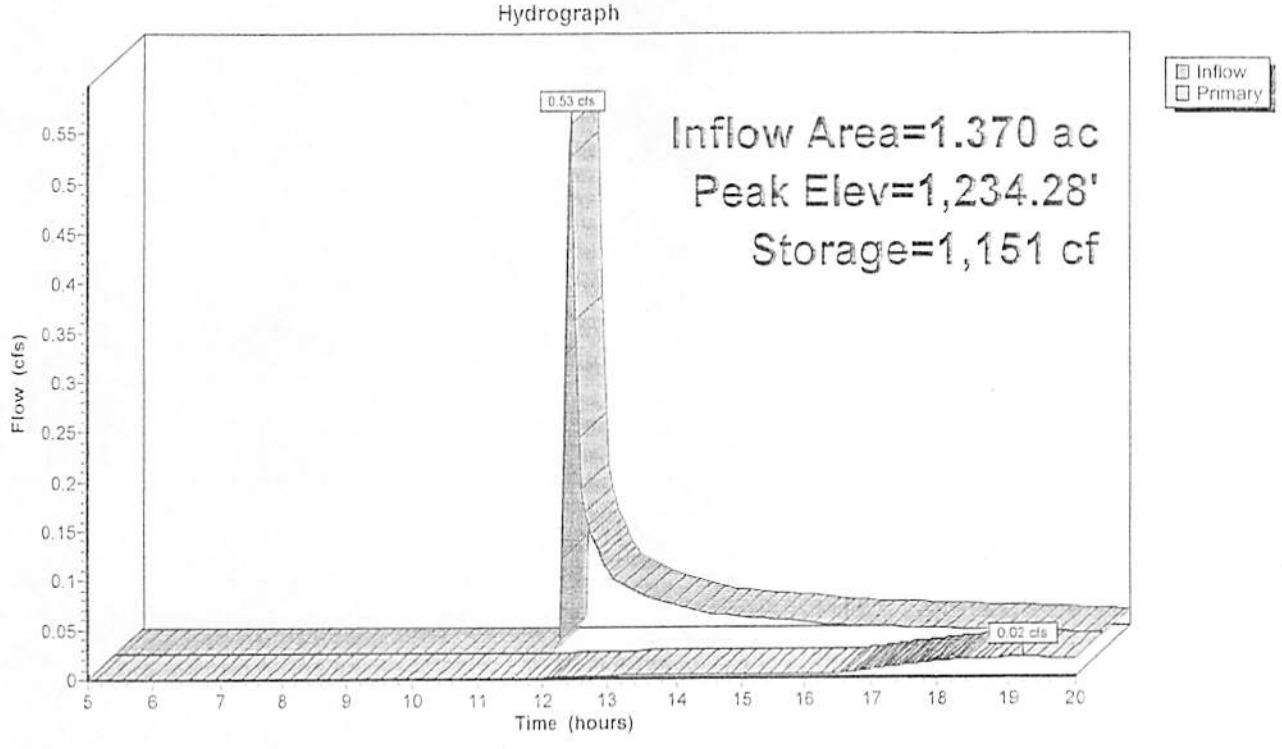
Volume	Invert	Avail.Storage	Storage Description
#1	1,230.90'	2,348 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

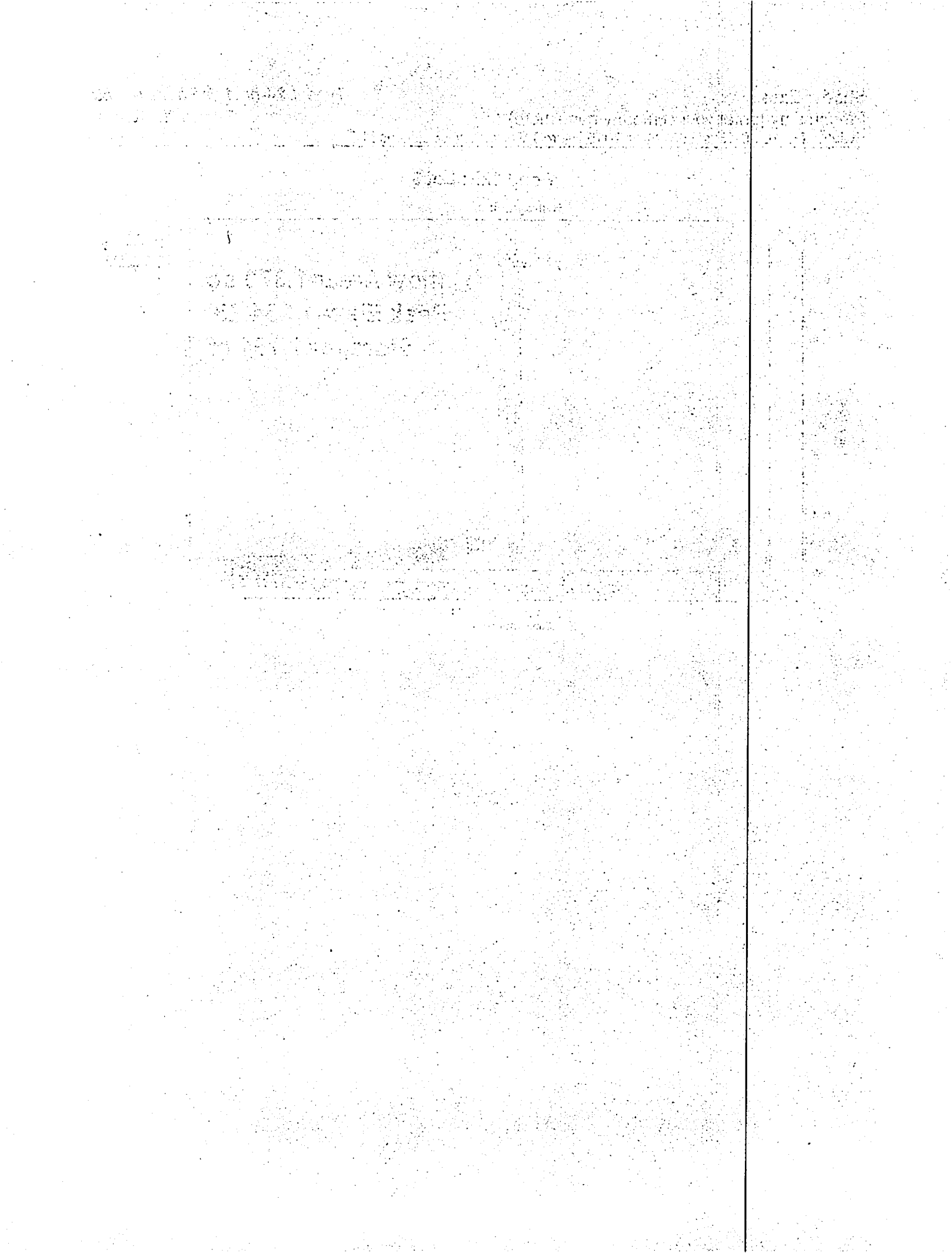
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,230.90	163	0.0	0	0
1,231.00	163	30.0	5	5
1,232.00	163	30.0	49	54
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1,234.00	1,050	100.0	607	825
1,235.00	2,000	100.0	1,525	2,348

Device	Routing	Invert	Outlet Devices
#1	Device 4	1,230.90'	0.130 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 0.00'
#2	Primary	1,234.75'	**8.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Primary	1,234.20'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Primary	1,231.25'	**6.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.02 cfs @ 19.21 hrs HW=1,234.28' (Free Discharge)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Orifice Controls 0.01 cfs @ 0.95 fps)
- **4=Orifice/Grate** (Passes 0.00 cfs of 1.58 cfs potential flow)
  - **1=Exfiltration** (Controls 0.00 cfs)

Pond 12P: Lot 9





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 9S: East developed Runoff Area=1.060 ac 18.44% Impervious Runoff Depth>0.54"
Flow Length=320' Tc=9.3 min CN=69 Runoff=0.91 cfs 0.048 af

Subcatchment 11S: Lot 9 Runoff Area=1.370 ac 12.41% Impervious Runoff Depth>0.43"
Flow Length=270' Tc=7.9 min CN=66 Runoff=0.94 cfs 0.049 af

Subcatchment 13S: East_exist Runoff Area=1.060 ac 0.00% Impervious Runoff Depth>0.13"
Flow Length=320' Tc=10.2 min CN=55 Runoff=0.07 cfs 0.012 af

Subcatchment 14S: Lot 9 Exist Runoff Area=1.140 ac 0.88% Impervious Runoff Depth>0.13"
Flow Length=270' Tc=8.2 min CN=55 Runoff=0.08 cfs 0.013 af

Pond 10P: East Peak Elev=1,243.31' Storage=1,622 cf Inflow=0.91 cfs 0.048 af
Outflow=0.03 cfs 0.011 af

Pond 12P: Lot 9 Peak Elev=1,234.35' Storage=1,243 cf Inflow=0.94 cfs 0.049 af
Outflow=0.05 cfs 0.022 af

Total Runoff Area = 4.630 ac Runoff Volume = 0.122 af Average Runoff Depth = 0.32"
91.89% Pervious = 4.255 ac 8.11% Impervious = 0.376 ac

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 9S: East developed Runoff Area=1.060 ac 18.44% Impervious Runoff Depth>1.02"
Flow Length=320' Tc=9.3 min CN=69 Runoff=1.81 cfs 0.090 af

Subcatchment 11S: Lot 9 Runoff Area=1.370 ac 12.41% Impervious Runoff Depth>0.86"
Flow Length=270' Tc=7.9 min CN=66 Runoff=2.07 cfs 0.098 af

Subcatchment 13S: East_exist Runoff Area=1.060 ac 0.00% Impervious Runoff Depth>0.38"
Flow Length=320' Tc=10.2 min CN=55 Runoff=0.48 cfs 0.034 af

Subcatchment 14S: Lot 9 Exist Runoff Area=1.140 ac 0.88% Impervious Runoff Depth>0.38"
Flow Length=270' Tc=8.2 min CN=55 Runoff=0.56 cfs 0.037 af

Pond 10P: East Peak Elev=1,243.75' Storage=2,311 cf Inflow=1.81 cfs 0.090 af
Outflow=0.08 cfs 0.045 af

Pond 12P: Lot 9 Peak Elev=1,234.69' Storage=1,782 cf Inflow=2.07 cfs 0.098 af
Outflow=0.25 cfs 0.070 af

[illegible] Runoff Volume = [illegible] Average Runoff Depth = [illegible]
91.89% Pervious = 4.255 ac 8.11% Impervious = 0.376 ac

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 9S: East developed Runoff Area=1.060 ac 18.44% Impervious Runoff Depth>1.32"
Flow Length=320' Tc=9.3 min CN=69 Runoff=2.38 cfs 0.117 af

Subcatchment 11S: Lot 9 Runoff Area=1.370 ac 12.41% Impervious Runoff Depth>1.14"
Flow Length=270' Tc=7.9 min CN=66 Runoff=2.78 cfs 0.130 af

Subcatchment 13S: East_exist Runoff Area=1.060 ac 0.00% Impervious Runoff Depth>0.56"
Flow Length=320' Tc=10.2 min CN=55 Runoff=0.81 cfs 0.050 af

Subcatchment 14S: Lot 9 Exist Runoff Area=1.140 ac 0.88% Impervious Runoff Depth>0.57"
Flow Length=270' Tc=8.2 min CN=55 Runoff=0.96 cfs 0.054 af

Pond 10P: East Peak Elev=1,244.03' Storage=2,848 cf Inflow=2.38 cfs 0.117 af
Outflow=0.15 cfs 0.066 af

Pond 12P: Lot 9 Peak Elev=1,234.86' Storage=2,075 cf Inflow=2.78 cfs 0.130 af
Outflow=0.98 cfs 0.101 af

Total Runoff Area = 4.630 ac Runoff Volume = 0.350 af Average Runoff Depth = 0.91"
91.89% Pervious = 4.255 ac 8.11% Impervious = 0.376 ac

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 9S: East developed Runoff Area=1.060 ac 18.44% Impervious Runoff Depth>1.71"
Flow Length=320' Tc=9.3 min CN=69 Runoff=3.09 cfs 0.151 af

Subcatchment 11S: Lot 9 Runoff Area=1.370 ac 12.41% Impervious Runoff Depth>1.50"
Flow Length=270' Tc=7.9 min CN=66 Runoff=3.69 cfs 0.171 af

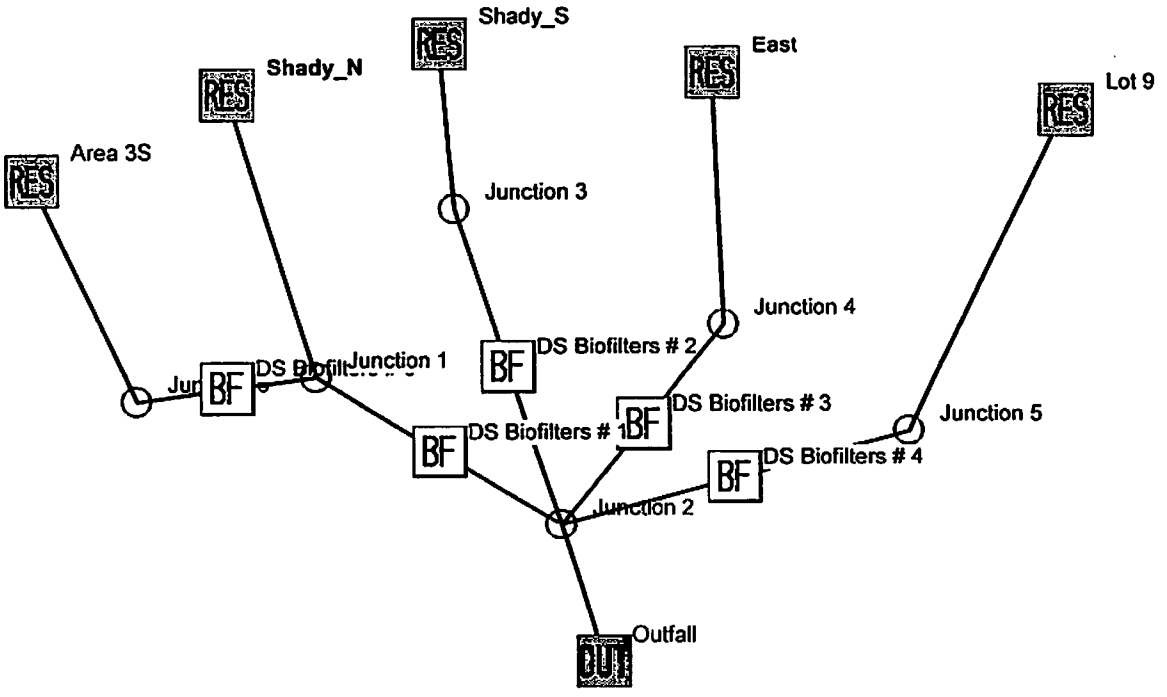
Subcatchment 13S: East_exist Runoff Area=1.060 ac 0.00% Impervious Runoff Depth>0.81"
Flow Length=320' Tc=10.2 min CN=55 Runoff=1.28 cfs 0.072 af

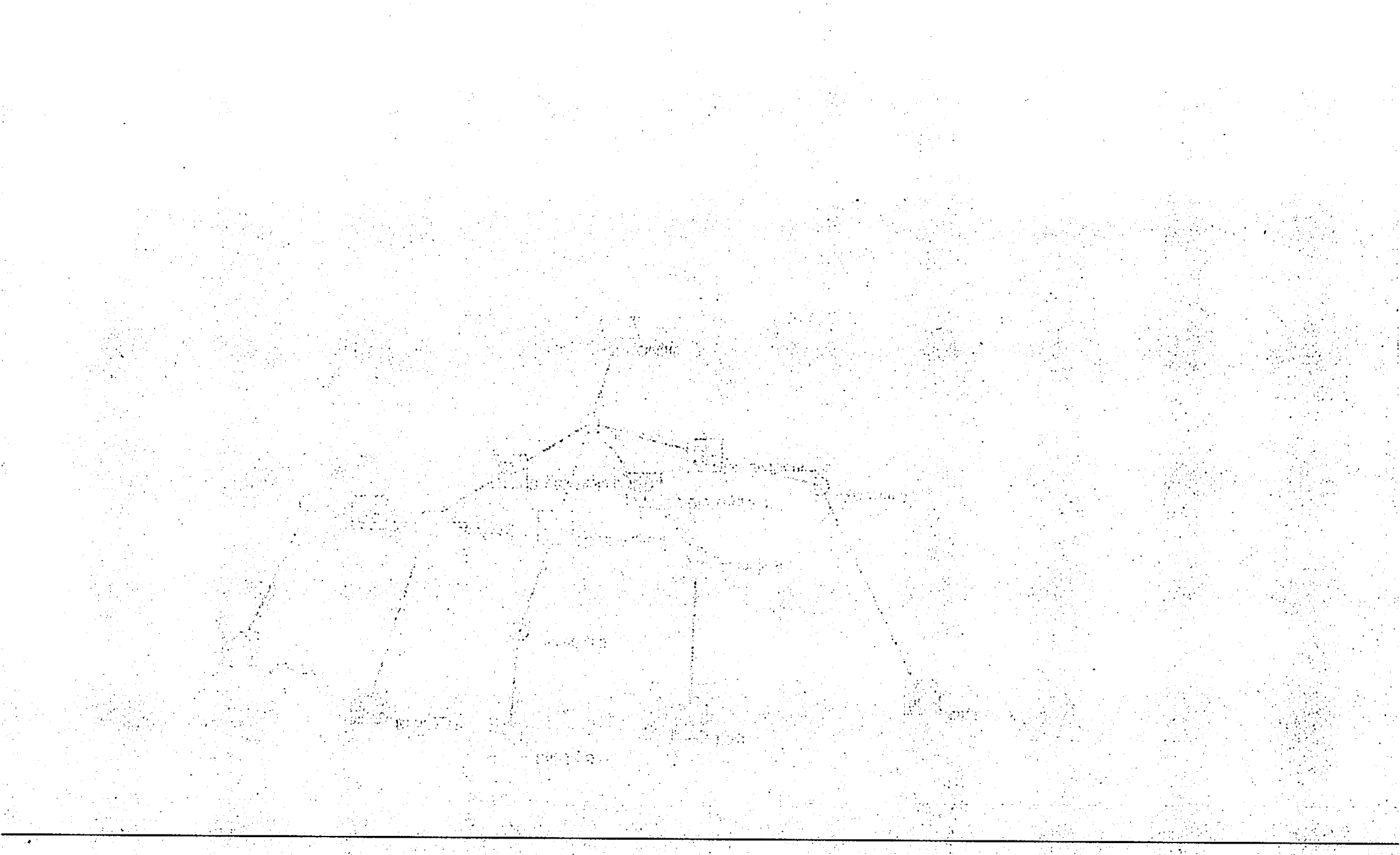
Subcatchment 14S: Lot 9 Exist Runoff Area=1.140 ac 0.88% Impervious Runoff Depth>0.82"
Flow Length=270' Tc=8.2 min CN=55 Runoff=1.50 cfs 0.077 af

Pond 10P: East Peak Elev=1,244.22' Storage=3,274 cf Inflow=3.09 cfs 0.151 af
Outflow=0.37 cfs 0.097 af

Pond 12P: Lot 9 Peak Elev=1,234.98' Storage=2,315 cf Inflow=3.69 cfs 0.171 af
Outflow=2.47 cfs 0.142 af

Total Runoff Area = 4.630 ac Runoff Volume = 0.472 af Average Runoff Depth = 1.22"
91.89% Pervious = 4.255 ac 8.11% Impervious = 0.376 ac


Shady_S
Shady_N
East
Lot 9
Area 3S
Junction 3
Junction 4
DS Biofilters # 2
Junction 1
DS Biofilters # 3
DS Biofilters # 1
Junction 5
DS Biofilters # 4
Junction 2
Outfall



Data file name: C:\Program Files (x86)\WinSLAMM v10\Shady Maple.mdb
WinSLAMM Version 10.1.6
Rain file name: C:\WinSLAMM Files\Rain Files\MN Minneapolis 59.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 03/13/59 Study period ending date: 11/04/59
Date: 12-18-2015 Time: 13:29:31
Site information:

LU# 1 - Residential: Shady_N Total area (ac): 2.140
1 - Roofs 1: 0.239 ac. Pitched Disconnected Normal Silty
25 - Driveways 1: 0.079 ac. Disconnected Normal Silty
37 - Streets 1: 0.300 ac. Intermediate Street Length = 0.308 curb-mi Default St. Dirt Accum.
45 - Large Landscaped Areas 1: 1.522 ac. Normal Silty

LU# 2 - Residential: Shady_S Total area (ac): 1.201
1 - Roofs 1: 0.076 ac. Pitched Disconnected Normal Silty
37 - Streets 1: 0.038 ac. Intermediate Street Length = 0.057 curb-mi Default St. Dirt Accum.
45 - Large Landscaped Areas 1: 1.087 ac. Normal Silty

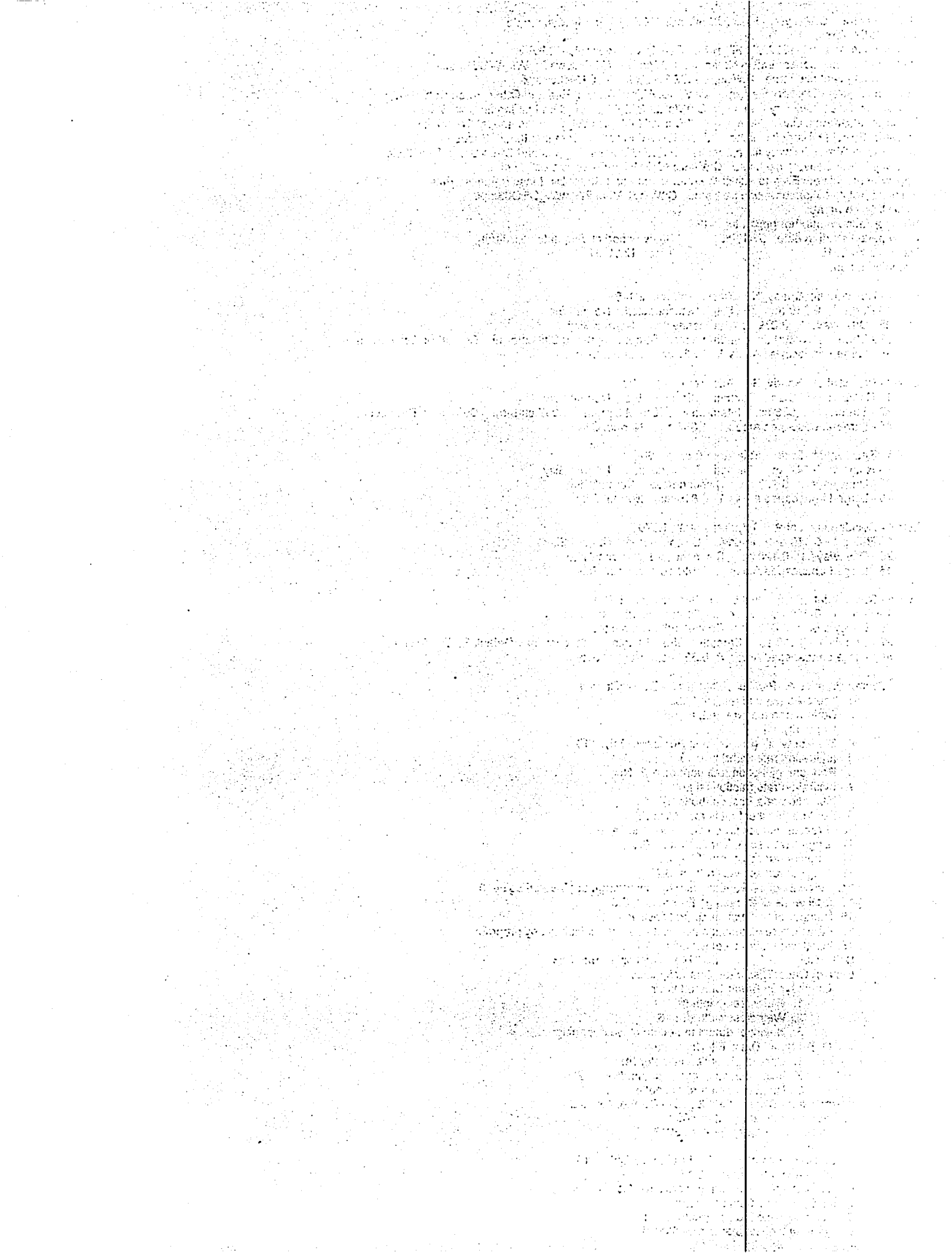
LU# 3 - Residential: East Total area (ac): 1.060
1 - Roofs 1: 0.147 ac. Pitched Disconnected Normal Silty
25 - Driveways 1: 0.097 ac. Disconnected Normal Silty
45 - Large Landscaped Areas 1: 0.816 ac. Normal Silty

LU# 4 - Residential: Lot 9 Total area (ac): 1.370
1 - Roofs 1: 0.110 ac. Pitched Disconnected Normal Silty
25 - Driveways 1: 0.120 ac. Disconnected Normal Silty
45 - Large Landscaped Areas 1: 1.140 ac. Normal Silty

LU# 5 - Residential: Residential 5 Total area (ac): 1.280
1 - Roofs 1: 0.250 ac. Pitched Disconnected Normal Silty
25 - Driveways 1: 0.060 ac. Connected Connected
37 - Streets 1: 0.110 ac. Smooth Street Length = 0.08 curb-mi Default St. Dirt Accum.
45 - Large Landscaped Areas 1: 0.860 ac. Normal Silty

Control Practice 1: Biofilter CP# 1 (DS) - DS Biofilters # 1
1. Top area (square feet) = 3852
2. Bottom aea (square feet) = 1460
3. Depth (ft): 4
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.13
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Fraction of rock filled volume as voids = 0
11. Engineered soil infiltration rate: 0.5
12. Engineered soil depth (ft) = 2
13. Engineered soil void ratio = 0.27
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0
Soil Data Soil Type Fraction in Eng. Soil
Biofilter Outlet/Discharge Characteristics:
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 4
2. Weir crest width (ft): 5
3. Height of datum to bottom of weir opening: 2.8
Outlet type: Drain Tile/Underdrain
1. Underdrain outlet diameter (ft): 0.5
2. Invert elevation above datum (ft): 0.25
3. Number of underdrain outlets: 1

Control Practice 2: Biofilter CP# 2 (DS) - DS Biofilters # 2
1. Top area (square feet) = 4000
2. Bottom aea (square feet) = 2017
3. Depth (ft): 3
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.13
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0



10. Fraction of rock filled volume as voids = 0
11. Engineered soil infiltration rate: 0.5
12. Engineered soil depth (ft) = 2
13. Engineered soil void ratio = 0.27
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir
1. Weir crest length (ft): 4
2. Weir crest width (ft): 5
3. Height of datum to bottom of weir opening: 2.75

Outlet type: Drain Tile/Underdrain
1. Underdrain outlet diameter (ft): 0.5
2. Invert elevation above datum (ft): 0.25
3. Number of underdrain outlets: 1

Control Practice 3: Biofilter CP# 3 (DS) - DS Biofilters # 3

1. Top area (square feet) = 3135
2. Bottom aea (square feet) = 430
3. Depth (ft): 5
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.13
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Fraction of rock filled volume as voids = 0
11. Engineered soil infiltration rate: 0.5
12. Engineered soil depth (ft) = 2
13. Engineered soil void ratio = 0.27
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

Biofilter Outlet/Discharge Characteristics:

Outlet type: Sharp Crested Weir
1. Weir length (ft): 0.16
2. Invert elevation above datum (ft): 3.25

Outlet type: Broad Crested Weir
1. Weir crest length (ft): 10
2. Weir crest width (ft): 5
3. Height of datum to bottom of weir opening: 4.6

Outlet type: Vertical Stand Pipe
1. Stand pipe diameter (ft): 0.5
2. Stand pipe height above datum (ft): 3.9

Outlet type: Drain Tile/Underdrain
1. Underdrain outlet diameter (ft): 0.5
2. Invert elevation above datum (ft): 0.25
3. Number of underdrain outlets: 1

Control Practice 4: Biofilter CP# 4 (DS) - DS Biofilters # 4

1. Top area (square feet) = 2000
2. Bottom aea (square feet) = 163
3. Depth (ft): 4
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.13
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Fraction of rock filled volume as voids = 0
11. Engineered soil infiltration rate: 0.5
12. Engineered soil depth (ft) = 2
13. Engineered soil void ratio = 0.27
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir
1. Weir crest length (ft): 5
2. Weir crest width (ft): 4
3. Height of datum to bottom of weir opening: 3.75

Outlet type: Vertical Stand Pipe
1. Stand pipe diameter (ft): 0.33
2. Stand pipe height above datum (ft): 3.25

Outlet type: Drain Tile/Underdrain
1. Underdrain outlet diameter (ft): 0.5
2. Invert elevation above datum (ft): 0.25

3. Number of underdrain outlets: 1

Control Practice 5: Biofilter CP# 5 (DS) - DS Biofilters # 5

1. Top area (square feet) = 2171
2. Bottom aea (square feet) = 726
3. Depth (ft): 3
4. Biofilter width (ft) - for Cost Purposes Only: 10
5. Infiltration rate (in/hr) = 0.13
6. Random infiltration rate generation? No
7. Infiltration rate fraction (side): 1
8. Infiltration rate fraction (bottom): 1
9. Depth of biofilter that is rock filled (ft) 0
10. Fraction of rock filled volume as voids = 0
11. Engineered soil infiltration rate: 0.5
12. Engineered soil depth (ft) = 2
13. Engineered soil void ratio = 0.27
14. Percent solids reduction due to flow through engineered soil = 0
15. Biofilter peak to average flow ratio = 3.8
16. Number of biofiltration control devices = 1
17. Particle size distribution file: Not needed - calculated by program
18. Initial water surface elevation (ft): 0

Soil Data Soil Type Fraction in Eng. Soil

Biofilter Outlet/Discharge Characteristics:

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 6
2. Weir crest width (ft): 4
3. Height of datum to bottom of weir opening: 2.9

Outlet type: Vertical Stand Pipe

1. Stand pipe diameter (ft): 0.66
2. Stand pipe height above datum (ft): 2.75

MAPLE RIDGE ADDITION

SHAWN_N DRAINAGE AREA (3.42 AC.)

FRONT ½ LOTS 1, 2, 3

ALL LOTS 6, 7, 8

ASSUMING AVG SINGLE FAMILY HOUSE = 2,200 S.F. ROOF

ASSUMING AVG DUPLEX BLDG = 4,000 S.F. ROOF

AVG SINGLE FAMILY DRIVEWAY = 900 S.F.

AVG DUPLEX DRIVEWAY = 1650 S.F.

AVG ACCESSORY BLDG = 1000 S.F. ROOF

ROADWAY W/ DITCHES 17,840 S.F. ⇒ 0.41 AC.

ROOF (½)(3)(2200) + (2200) + (2)(4000) + (2)(1000) + 5000 + 2660 (EX. SHEDS) = 23160 S.F. ⇒ 0.532

DRIVEWAY (4)(900) + (2)(1650) = 6900 S.F. ⇒ 0.158 AC.

1.1 AC.

GREEN AREA 3.42 - 1.1 = 2.32 AC.

TO POND ALONG NEW ROAD (1.28 AC) (3S)

FRONT ½ LOTS 1, 2, 3, ACCESSORY BLDG, (3) DRIVEWAYS

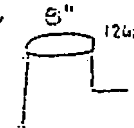
TOWN ROAD (450 L.F.) × (11 FT) = 4950 S.F. ⇒ 0.11 AC.

ROOF (½)(3)(2200) + 5000 + 2660 (EX. SHEDS) = 10960 S.F. ⇒ 0.25 AC.

DRIVEWAY (3)(900) = 2700 S.F. ⇒ 0.06 AC

0.42 AC.

5P 8" 12%



GREEN AREA 1.28 AC − 0.42 AC. = 0.86 AC.

10' EMERGENCY OVERFLOW

TO NORTH POND (2.14) (4S)

TOWN ROAD 0.3 AC

ROOF (2)(2200) + (4000) + (2)(1000) = 10,400 S.F. ⇒ 0.239 AC.

DRIVEWAY (2)(900) + (1650) = 3450 S.F. ⇒ 0.079 AC.

6F 8" 1%

GREEN 1.582 AC

BREAKDOWN

Wisconsin Department of Commerce
Division of Safety and Buildings

SOIL EVALUATION - STORM

in accordance with Comm 82.365 & 85, Wis. Adm. Code

County: La Crosse
Parcel I.D.: 9-1401-4
Reviewed by: Date:

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

Please print all information.

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

Property Owner	Property Location
Joe Hengel c/o La Crosse Engineering	Govt. Lot SE 1/4 SE 1/4 S 35 T 16 N R 7 E (or) (W)
Property Owner's Mailing Address: 1212 S. 3rd St.	Lot #: N.A. Block #: N.A. Subd. Name or CSM#: N.A.
City: La Crosse State: WI Zip Code: 54601 Phone Number: (608) 782-3433	☐ City ☐ Village ☒ Town: Medary Nearest Road: CTH "F" / Shady Maple Ridge Rd.

Drainage area 5.5 +/- ☐ sq. ft. ☒ acres

Optional:
Test Site Suitable for (check all that apply)
☒ Irrigation ☐ Bioretention trench ☐ Trench(es)
☒ Rain garden ☒ Grassed swale ☐ Reuse
☒ Infiltration trench ☐ SDS (> 15' wide) ☐ Other ______

Hydraulic Application Test Method:
☒ Morphological Evaluation
☐ Double-Ring Infiltrometer
☐ Other (specify).______

Obs. # 1 ☐ Boring ☒ Pit Ground surface elev. 97.5 ft. Depth to limiting factor 37 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
Ap	0-12	7.5YR3/3	none	sil	2cgr	mvfr	gw	0	.13
B/E	12-22	7.5YR4/4	none	sil	2csbk	mfr	gi	0	.13
B/C	22-37	7.5YR 4/6	none	sil	2mabk	mfr	gi	0	.13
C1	37-75	10YR4/4	c2d 7.5YR6/1-5YR4/8	sil-sicl	1cabk	mfr	gi	5	.04
C2	75-87	10YR4/6	c2d 7.5YR6/1-5YR4/8	sil-sicl	massive	mfi	db	30	.04
Cr	87-100	2.5YR4/8	m3p 7.5YR6/1-5YR4/8	l-sicl-cl	massive	mfi	—	≥50%	.04
								Cr	conditions

Obs. # 2 ☐ Boring ☒ Pit Ground surface elev. 95.8 ft. Depth to limiting factor 43 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
Ap	0-7	7.5YR3/3	none	sil	2mgr	mvfr	cw	0	.13
B/E	7-16	7.5YR4/4	none	sil	2csbk	mfr	gw	0	.13
B/C	16-43	7.5YR 4/6	none	sil	2msbk	mfr	gi	5	.13
C	43-84	10YR 4/4	c2d 7.5YR6/1	sil-sicl	2cabk	mfr	gi	30	.04
Cr	84-96	2.5YR4/8	Cr @ 84"	sicl-cl	massive	mfi	—	≥50%	.04

CST/PSS Name (Please Print): Michael G. Havlik
Signature: [signature]
CST/PSS Number: 224975 #206
Address: W464 County Rd. K Stoddard, WI 54658
Date Evaluation Conducted: May 25, 2014
Telephone Number: (608) 782-7870

Property Owner La Crosse Engineering Parcel ID # 9-1401-4 Page 2 of 3

3 Obs. # ☐ Boring ☒ Pit Ground surface elev. 833.0 ft. Depth to limiting factor 18 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
Ap	0-10	7.5YR3/3	none	sil	2mgr	mvfr	cw	0	.13
E/B	10-18	10YR4/6	none	sil	2msbk	mfr	gi	0	.13
B	18-30	7.5YR4/4	C2d 7.5YR6/1-5YR4/6	sil	2msbk	mfr	gw	10	.13
Cr	30-74	5YR5/8	Cr conditions	1-sided	massive	mfi		≥50%	.04

4 Obs. # ☐ Boring ☒ Pit Ground surface elev. 862.3 ft. Depth to limiting factor 24 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
Ap	0-7	7.5YR3/3	none	sil	2mgr	mfr	cw	0	.13
B/E	7-16	7.5YR4/4	none	sil	3cabk	mfr	gw	0	.13
B	16-24	10YR4/4	none	sil	2mcabk	mfr	gi	0	.13
C	24-32	10YR5/6	C2d 7.5YR6/1-5YR4/6	sil-sicl	2msbk	mfr	db	10	.04
Cr	32-74	5YR5/8	Cr conditions	1-sided	massive	mfi	—	≥50%	.04

Test Results and/or Summary Comments

2006 La Crosse County Soil Survey shows
soil map units 137C2 Valton series
137B2 Valton series
137C2 Valton series

For Septic Systems map unit shows Restricted permeability
pit # 1 At-Grade Pit
pit # 2 At-Grade Pit
pit # 3 Mound Pit
pit # 4 Mound Pit

Property Owner La Crosse Engineering Parcel ID # 9-1401-4 Page 2 of 3

3 Obs. # ☐ Boring ☒ Pit Ground surface elev. 930 ft. Depth to limiting factor 18 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App Rate Inches/Hr
Ap	0-10	7.5YR3/3	none	sil	2mgr	mvfr	cw	0	.13
E/B	10-18	10YR4/6	none	sil	2mabk	mfr	gi	0	.13
B	18-30	7.5YR4/4	c2d 7.5YR6/1-5YR6/8	sil	2mabk	mfr	gw	10	.13
Cr	30-74	5YR5/8	Cr conditions	l-sicl-d	massive	mfi		250%	.014

4 Obs. # ☐ Boring ☒ Pit Ground surface elev. 802.3 ft. Depth to limiting factor 24 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
Ap	0-7	7.5YR3/3	none	sil	2mgr	mfr	cw	0	.13
B/E	7-16	7.5YR4/4	none	sil	3cabk	mfr	gw	0	.13
B	16-24	10YR4/4	none	sil	2mcabk	mfr	gi	0	.13
C	24-32	10YR5/6	c2d 7.5YR6/1-5YR4/8	sil-sicl	2msbk	mfr	gb	10	.014
Cr	32-74	5YR5/8	Cr conditions	l-sicl-d	massive	mfi	—	250	.014

Test Results and/or Summary Comments

2006 La Crosse County Soil Survey shows
soil map units 132C2 Valton Series
132Bd Valton Series
132C2 Valton Series

For Septic Systems map unit shows Restricted permeability
pit #1 At-Grade Pit
pit #2 At-Grade Pit
pit #3 Mound Pit
pit #4 Mound Pit

Hydrograph for Pond 4P: Southwest

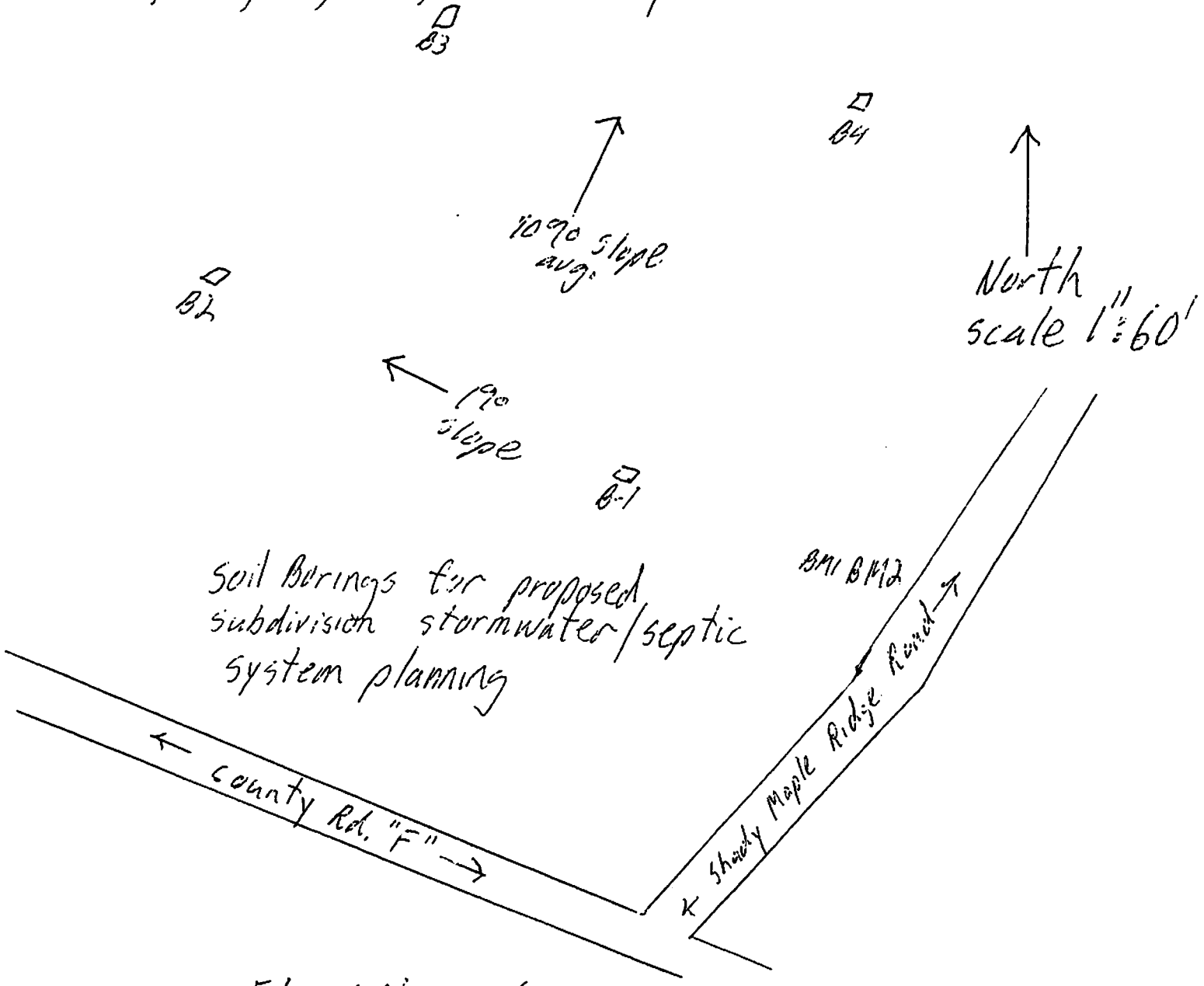
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
5.00	0.00	0	712.00	0.00	0.00	0.00
5.50	0.00	0	712.00	0.00	0.00	0.00
6.00	0.00	0	712.00	0.00	0.00	0.00
6.50	0.00	0	712.00	0.00	0.00	0.00
7.00	0.00	0	712.00	0.00	0.00	0.00
7.50	0.00	0	712.00	0.00	0.00	0.00
8.00	0.00	0	712.00	0.00	0.00	0.00
8.50	0.00	0	712.00	0.00	0.00	0.00
9.00	0.00	0	712.00	0.00	0.00	0.00
9.50	0.00	0	712.00	0.00	0.00	0.00
10.00	0.00	0	712.00	0.00	0.00	0.00
10.50	0.01	1	712.01	0.01	0.01	0.00
11.00	0.02	3	712.02	0.01	0.01	0.00
11.50	**0.04**	20	712.10	0.02	0.02	0.00
12.00	**0.90**	**723**	**713.62**	**0.50**	**0.07**	**0.43**
12.50	0.12	**522**	**713.35**	**0.24**	**0.06**	**0.19**
13.00	0.07	355	713.06	0.12	0.04	0.07
13.50	0.05	336	713.02	0.06	0.04	0.02
14.00	0.04	331	713.01	0.04	0.04	0.01
14.50	0.04	327	713.00	0.04	0.04	0.00
15.00	0.03	322	712.99	0.04	0.04	0.00
15.50	0.03	312	712.97	0.04	0.04	0.00
16.00	0.03	296	712.93	0.04	0.04	0.00
16.50	0.02	277	712.89	0.04	0.04	0.00
17.00	0.02	258	712.84	0.03	0.03	0.00
17.50	0.02	237	712.79	0.03	0.03	0.00
18.00	0.02	217	712.74	0.03	0.03	0.00
18.50	0.02	196	712.69	0.03	0.03	0.00
19.00	0.02	175	712.63	0.03	0.03	0.00
19.50	0.02	153	712.57	0.03	0.03	0.00
20.00	0.02	132	712.50	0.03	0.03	0.00

PLOT PLAN

Property Owner's Name(s) Joe Hengel c/o La Crosse Engineering

Mailing Address/Legal Description 1212 S. 3rd St. La Crosse, WI. 54601

SE 1/4, SE 1/4, S35, T16N, R7W. Medary Twp. La Crosse Co. WI



Benchmark = BM1 - El. 100.0' Top of survey pin Rod 6" behind Phone Ped # GORM S001-1A - BM2 El. 102.8 - Top of Phone Ped

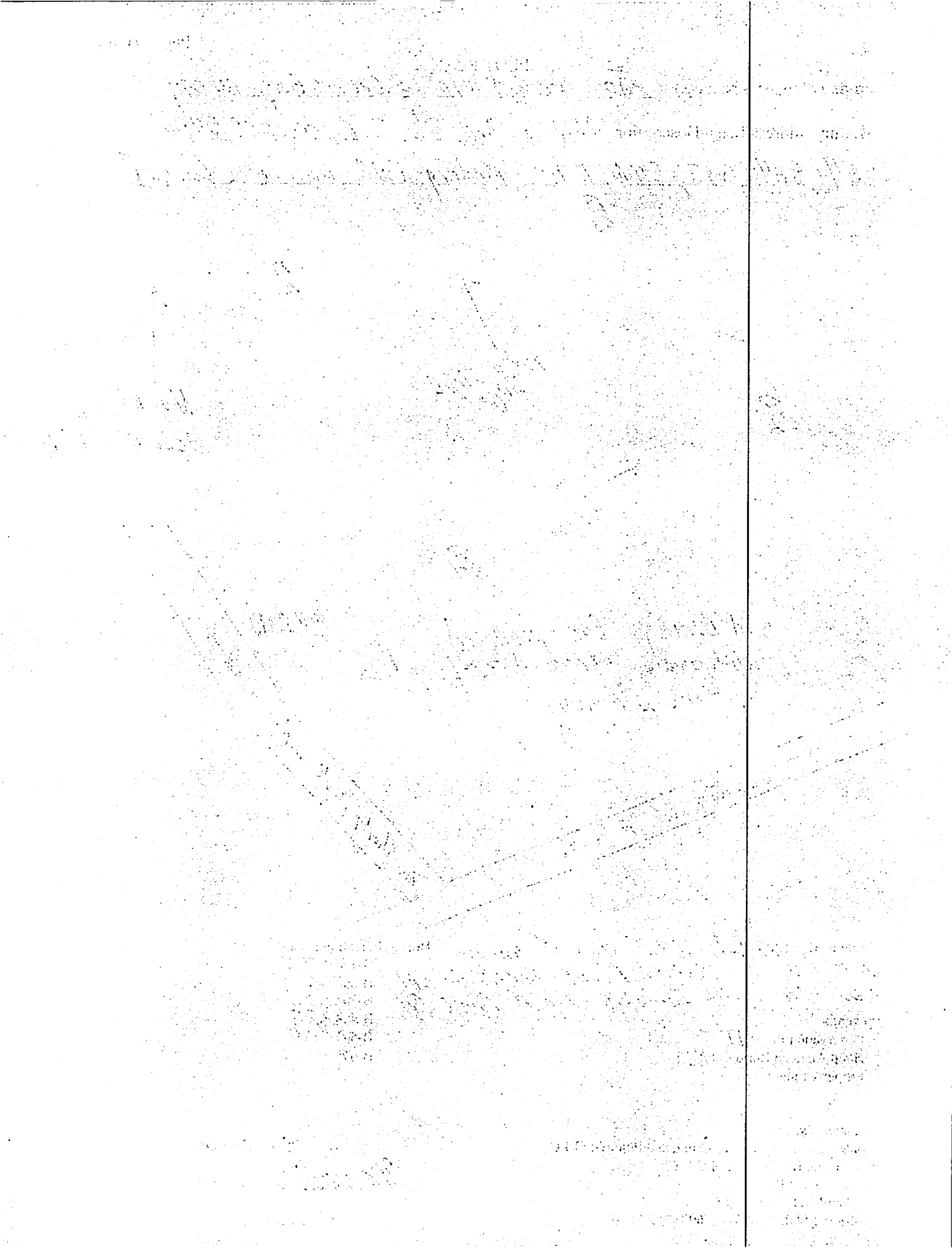
Legend:
Observation Pit = □
Hand Augered Boring = N.A.
Property Line = -----

Boring Elevation Data:
B-1@ 97.5'
B-2@ 95.8'
B-3@ 83.0'
B-4@ 90.3'
B-5@
B-6@

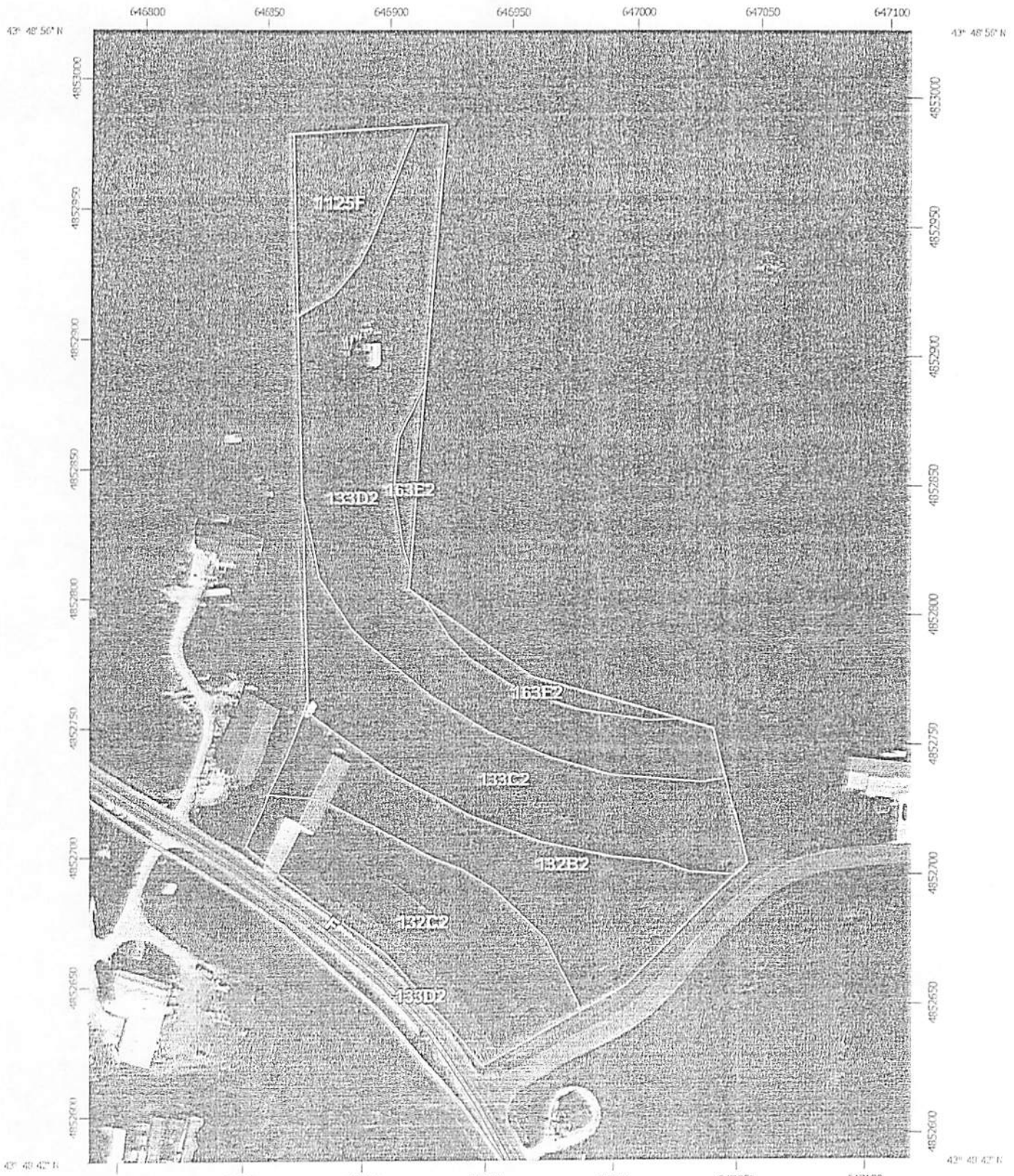
Prepared By:
Coulee Soil Testing, Excavating, and Plumbing LLC
Michael G. Havlik, CSTM#224975
W464 County Rd. K
Stoddard, WI 54658-9062
(608)-782-SOIL (7645) or (608)-782-7870

Signature: Michael G. Havlik

Date: May 25, 2014



Soil Map—La Crosse County, Wisconsin
(Shady Maple)



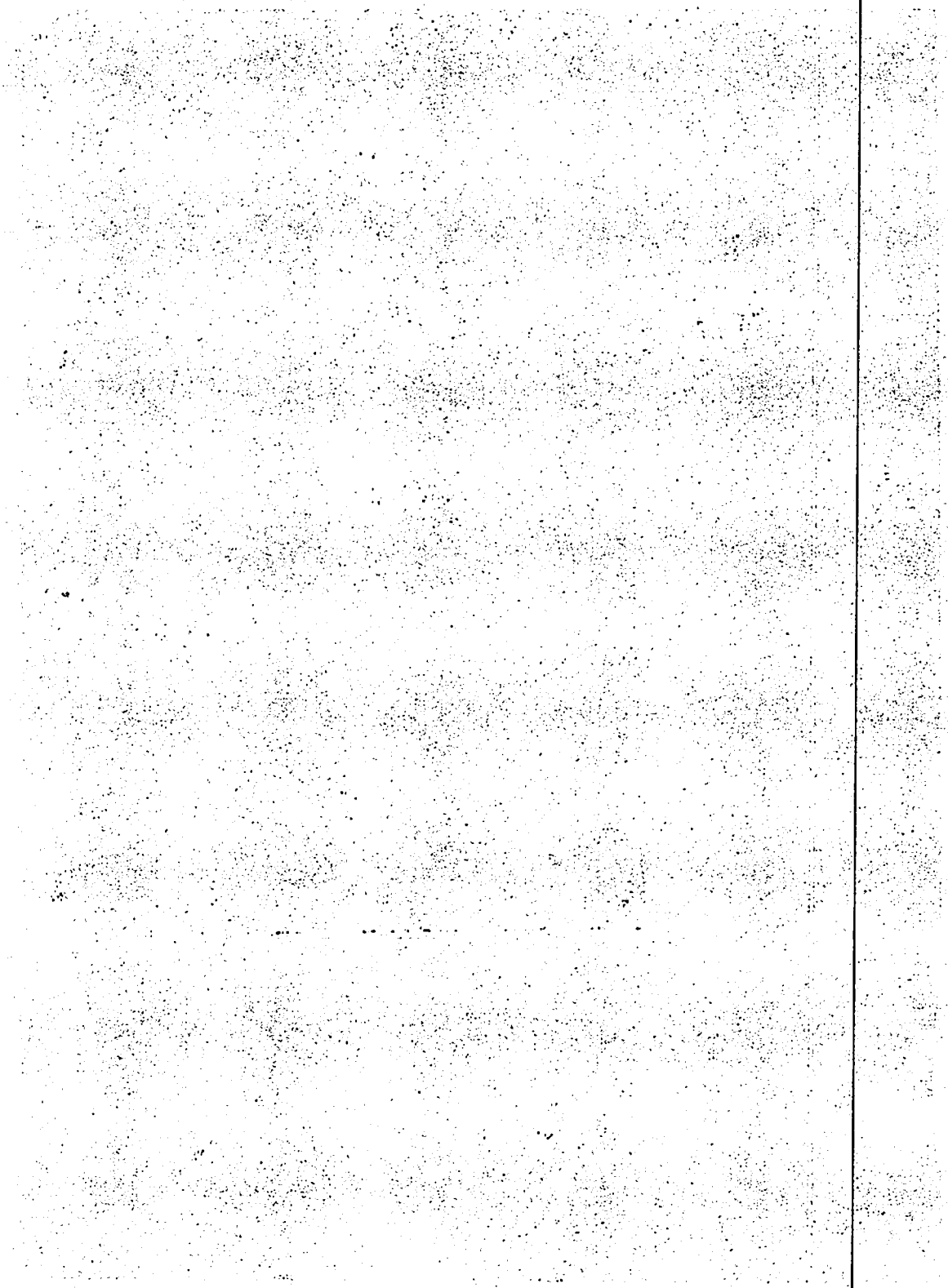
Map Scale: 1:2,130 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 30, 60, 120, 180

Feet: 0, 100, 200, 400, 600

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

> Warning: Soil Map may not be valid at this scale.
>
> Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: La Crosse County, Wisconsin
Survey Area Data: Version 12, Dec 24, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 1, 2010—Sep 11, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

La Crosse County, Wisconsin (WI063)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
132B2	Brinkman silt loam, 2 to 6 percent slopes, moderately eroded	1.4	17.8%
132C2	Brinkman silt loam, 6 to 12 percent slopes, moderately eroded	1.5	18.9%
133C2	Valton silt loam, 6 to 12 percent slopes, moderately eroded	1.6	20.9%
133D2	Valton silt loam, 12 to 20 percent slopes, moderately eroded	2.5	31.8%
163E2	Elbaville silt loam, 20 to 30 percent slopes, moderately eroded	0.3	3.5%
1125F	Dorerton, very stony-Elbaville complex, 30 to 60 percent slopes	0.6	7.1%
[illegible]	[illegible]	[illegible]	[illegible]

La Crosse County, Wisconsin

132B2—Brinkman silt loam, 2 to 6 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 1q9my
Elevation: 700 to 1,400 feet
Mean annual precipitation: 28 to 34 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 135 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Brinkman and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brinkman

Setting

Landform: Hills
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess over clayey pedisediment

Typical profile

Ap - 0 to 9 inches: silt loam
Bt - 9 to 71 inches: silt loam
2Bt - 71 to 80 inches: clay

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 42 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very high (about 12.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Other vegetative classification: High AWC, adequately drained (G105XY008WI)

Minor Components

Valton

Percent of map unit: 8 percent
Landform: Hills
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Mod AWC, adequately drained (G105XY005WI)

Mt. carroll

Percent of map unit: 2 percent
Landform: Hills
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: High AWC, adequately drained (G105XY008WI)

Data Source Information

Soil Survey Area: La Crosse County, Wisconsin
Survey Area Data: Version 14, Sep 17, 2015

La Crosse County, Wisconsin

133C2—Valton silt loam, 6 to 12 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 1q9n4
Elevation: 680 to 1,400 feet
Mean annual precipitation: 28 to 35 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Valton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Valton

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess over clayey pedisediment

Typical profile

Ap - 0 to 9 inches: silt loam
Bt - 9 to 22 inches: silt loam
2Bt - 22 to 60 inches: clay

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Other vegetative classification: Mod AWC, adequately drained (G105XY005WI)

Minor Components

Brinkman

Percent of map unit: 6 percent
Landform: Hills
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: High AWC, adequately drained (G105XY008WI)

Lamoille

Percent of map unit: 4 percent
Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Mod AWC, adequately drained (G105XY005WI)

Data Source Information

Soil Survey Area: La Crosse County, Wisconsin
Survey Area Data: Version 14, Sep 17, 2015

La Crosse County, Wisconsin

163E2—Elbaville silt loam, 20 to 30 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 2t7zh
Elevation: 800 to 1,300 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 120 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Elbaville and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elbaville

Setting

Landform: Ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Head slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Loess over clayey pedisediment derived from dolomite over loamy sketetal colluvium derived from dolomite

Typical profile

A - 0 to 5 inches: silt loam
E1 - 5 to 8 inches: silt loam
E2 - 8 to 11 inches: silt loam
B/E - 11 to 17 inches: silt loam
Bt1 - 17 to 21 inches: silt loam
2Bt2 - 21 to 26 inches: silty clay
3Bt3 - 26 to 37 inches: very flaggy silty clay loam
3C - 37 to 79 inches: extremely flaggy sandy loam

Properties and qualities

Slope: 20 to 30 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Other vegetative classification: Mod AWC, adequately drained with limitations (G105XY006WI)

Minor Components

Lamoille
Percent of map unit: 10 percent
Landform: Valley sides
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Mod AWC, adequately drained with limitations (G105XY006WI)

Newglarus, deep
Percent of map unit: 6 percent
Landform: Ridges
Landform position (two-dimensional): Backslope, shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Mod AWC, adequately drained with limitations (G105XY006WI)

Dorerton, very stony
Percent of map unit: 5 percent
Landform: Valley sides
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear

Valton
Percent of map unit: 4 percent
Landform: Ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear