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**Revised Drainage Summary Report  
Property of Brian & Jennifer Angerame  
30 Sturges Ridge Road, Wilton, CT**

The owners propose re-subdividing the parcel and constructing two new houses with the potential for future pools and patios on their property at 30 Sturges Ridge Road. The parcel originally was improved by a residence, driveway, and associated walkways and patios, but has been vacant and overgrown with scrub brush and invasive species that are threatening some of the larger trees on the parcel. The proposed improvements to the 5.727-acre site will result in an increase of approximately 25,000 square feet of new impervious area for the two (2) lots compared to original conditions. This report will show that there will be no increase in runoff from new impervious surfaces and that there will not be an adverse impact on downslope properties or drainage facilities caused by this project.

Presently runoff from the site sheet flows generally in three (3) directions to three (3) Points of Concern ("POC"). The POC remain unchanged from existing to proposed conditions. The first POC, to the south of the subject parcel, has been identified as "Site South" in the enclosed hydrologic analysis. Runoff from this sub-watershed flows generally along the front of the parcel from north to south towards an adjacent parcel. The second POC is the far back corner of the parcel and has been identified as "Site Northeast" in the enclosed hydrologic analysis. Runoff from this sub-watershed flows generally from west to east across the property and towards a stone wall. The third POC is the southeasternmost corner of the parcel and has been identified as "Site Southeast" in the enclosed hydrologic analysis. Runoff from this sub-watershed flows generally from northwest to southeast across the property and towards the back right property corner. Runoff from all original impervious surfaces appeared to discharge unabated and uncontrolled off the property.

Using the SCS TR-20 Method, we have computed the existing and proposed runoff rates for the 1-, 2-, 5-, 10-, and 25-Year, 24-Hour Storms generated by the proposed activities. The house and driveway for the future "Lot 1" is split between the "Site South" and "Site Northeast" sub-watersheds, while the house and driveway for "Lot 2" is split between the "Site South" and "Site Southeast" sub-watersheds. property has been identified as "Site" in the enclosed hydrologic analysis. Tables I-III summarize the existing and proposed runoff rates generated by the site to each POC.

**Table I – Summary of Runoff Rates & Volumes from "Site Northeast"**

Storm Event	Flow/Volume	Existing	Proposed	$\Delta$	$\Delta(\%)$
1-Year	q (cfs)	1.99	1.43	-0.56	-28.14%
	v (CF)	8,239.00	5,837.00	-2,402.00	-29.15%
2-Year	q (cfs)	2.70	2.03	-0.67	-24.81%
	v (CF)	10,994.00	8,025.00	-2,969.00	-27.01%

5-Year	q (cfs)	4.05	3.21	-0.84	-20.74%
	v (CF)	16,322.00	12,351.00	-3,971.00	-24.33%
10-Year	q (cfs)	5.31	4.32	-0.99	-18.64%
	v (CF)	21,335.00	16,728.00	-4,607.00	-21.59%
25-Year	q (cfs)	7.42	6.21	-1.21	-16.31%
	v (CF)	29,843.00	24,487.00	-5,356.00	-17.95%

**Table II – Summary of Runoff Rates & Volumes from “Site South”**

Storm Event	Flow/Volume	Existing	Proposed	$\Delta$	$\Delta(\%)$
1-Year	q (cfs)	2.26	1.09	-1.17	-51.77%
	v (CF)	9,093.00	4,837.00	-4,256.00	-46.81%
2-Year	q (cfs)	3.03	1.61	-1.42	-46.86%
	v (CF)	12,049.00	7,197.00	-4,852.00	-40.27%
5-Year	q (cfs)	4.50	2.84	-1.66	-36.89%
	v (CF)	17,736.00	12,185.00	-5,551.00	-31.30%
10-Year	q (cfs)	5.86	4.65	-1.21	-20.65%
	v (CF)	23,065.00	17,067.00	-5,998.00	-26.00%
25-Year	q (cfs)	8.11	6.45	-1.66	-20.47%
	v (CF)	32,077.00	25,376.00	-6,701.00	-20.89%

**Table III – Summary of Runoff Rates & Volumes from “Site Southeast”**

Storm Event	Flow/Volume	Existing	Proposed	$\Delta$	$\Delta(\%)$
1-Year	q (cfs)	1.73	0.76	-0.97	-56.07%
	v (CF)	6,381.00	2,751.00	-3,630.00	-56.89%
2-Year	q (cfs)	2.34	1.15	-1.19	-50.85%
	v (CF)	8,514.00	3,914.00	-4,600.00	-54.03%
5-Year	q (cfs)	3.51	1.93	-1.58	-45.01%
	v (CF)	12,639.00	6,271.00	-6,368.00	-50.38%
10-Year	q (cfs)	4.60	2.68	-1.92	-41.74%
	v (CF)	16,521.00	9,404.00	-7,117.00	-43.08%
25-Year	q (cfs)	6.41	3.99	-2.42	-37.75%
	v (CF)	23,107.00	15,245.00	-7,862.00	-34.02%

Runoff from the front of the driveway and house on Lot 1 will be stored in eighteen (18) Cultec Recharger 280HD units with a storage volume of 1,160 CF. Once runoff backs up in the Cultec units it will overflow via a 6" PVC pipe to a level spreader in the front yard. The Water Quality Volume (WQV) for the house and driveway on Lot 1 is 840.7 CF, which will be detained in the Cultec units, below the outlet. Runoff from the back of the driveway and house on Lot 1 as well as a future barn on the parcel will be stored in twenty-four (24) Cultec Recharger 280HD units with a storage volume of 1,547 CF. Once runoff backs up in the Cultec units it will overflow via an 8" PVC pipe to a level spreader in the rear yard. The level spreader will convert the point discharge from the outlet control structure to a sheet flow condition. The Water Quality Volume

(WQV) for the back of the house and driveway on Lot 1 is 515.5 CF, which will be detained in the Cultec units, below the outlet. Runoff from the driveway, walks and house on Lot 2 will be stored in forty-four (44) Cultec Recharger 280HD units with a storage volume of 2,836 CF. Once runoff backs up in the Cultec units it will overflow via an 8" PVC pipe to a level spreader in the rear yard. This level spreader will also convert the point discharge from the outlet control structure to a sheet flow condition. The Water Quality Volume (WQV) for the house, walks and driveway on Lot 2 is 968.3 CF, which will be detained in the Cultec units, below the outlet. The proposed Cultec units will provide a Total Suspended Solids ("TSS") removal rate that exceeds 80%. The remainder of the site will continue to allow runoff to flow along existing drainage paths.

Furthermore, this project employs "Low Impact Development" or "LID" techniques as outlined in the August 2011 addendum to the Connecticut Stormwater Quality Manual entitled, "Low Impact Development Appendix to the *Connecticut Stormwater Quality Manual*". LID techniques specifically incorporated in this project include:

- Disconnection of impervious surfaces – runoff from the rainfall that falls on the future pools will be detained within the pools themselves. Runoff from the proposed patios will be allowed to sheet flow onto the lawns for their respective parcels. Runoff from the houses and driveways will be infiltrated through subsurface rechargers and thus can be considered "disconnected".
- Infiltration of runoff via subsurface rechargers
- Preservation of existing storm water travel paths
- Preservation of existing trees – many of the large diameter trees on the property will remain and be protected during construction.

All of the proposed activities will be conducted in Flood Zone "X" as delineated on the attached site plan. Please refer to the enclosed calculations and plans for further details.

With the proposed drainage structures in place, it is our professional opinion that there will be no adverse hydrological or hydraulic impacts caused to surrounding or downstream properties or drainage facilities by this development. To the best of my knowledge, this drainage proposal complies with the Town of Wilton Planning and Zoning Regulations.



Respectfully submitted,  
Frangione Engineering, LLC

A handwritten signature in blue ink, appearing to read "R. Frangione", written over a horizontal line.

Robert M. Frangione, P.E.  
Owner & Chief Engineer  
October 6, 2021

Enclosures



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**Revised Water Quality Volume Calculations  
Angerame – 30 Sturges Ridge Road, Wilton, CT  
October 6, 2021**

**“Site South” Water Quality Volume (WQV) Calculations:**

Total Contributing Area = 0.437ac. = 19,046 SF

Impervious Area = 8,066 SF = 0.185 ac.

Woods Area = 0 SF = 0.0 ac.

Lawn Area = 10,980 SF = 0.252 ac.

$$\%I = (0.185/0.437) = 0.424$$

$$RvI = 0.95$$

$$\%T = (0.252/0.437) = 0.576$$

$$RvT = 0.22$$

$$\%F = (0.00/0.437) = 0.0$$

$$RvF = 0.04$$

$$\begin{aligned} R &= (RvI \times \%I) + (RvT \times \%T) + (RvF \times \%F) \\ &= (0.95)(0.424) + (0.22)(0.576) + (0.04)(0.0) = 0.53 \end{aligned}$$

$$WQV = (1'' \times R \times A)/12$$

$$= (1'' \times 0.53 \times 0.437 \text{ ac.})/12 = 0.0193 \text{ ac.-ft.} = 840.7 \text{ CF}$$

Proposed Detention Facility: (18) Cultec Recharger 280HD units

$V_{\text{Cultecs}} = 1,014 \text{ CF}$  (internal storage volume from HydroCAD analysis for 1-Year Storm) >> WQV required => WQV storage is met.

**“Site South” Groundwater Recharge Volume:**

$$GRV = F \times I$$

F = 0.35 inches for Type “B” Soils

I = 8,066 SF

$$GRV = (0.35 \text{ in.})/(12 \text{ in./ft.}) \times 8,066 \text{ SF} = 235.3 \text{ CF} \ll V_{\text{Cultecs}} \Rightarrow \text{GRV storage is met}$$

**“Site Northeast” Water Quality Volume (WQV) Calculations:**

Total Contributing Area = 0.161 ac. = 7,022 SF

Impervious Area = 6,344 SF = 0.146 ac.

Woods Area = 0 SF = 0.0 ac.

Lawn Area = 678 SF = 0.015 ac.

$$\%I = (0.146/0.161) = 0.907$$

$$RvI = 0.95$$

$$\%T = (0.015/0.161) = 0.093$$

$$RvT = 0.22$$

$$\%F = (0.00/0.161) = 0.0$$

$$RvF = 0.04$$

$$R = (RvI \times \%I) + (RvT \times \%T) + (RvF \times \%F) \\ = (0.95)(0.907) + (0.22)(0.093) + (0.04)(0.0) = 0.882$$

$$WQV = (1'' \times R \times A)/12$$

$$= (1'' \times 0.882 \times 0.161 \text{ ac.})/12 = 0.0118 \text{ ac.-ft.} = 515.5 \text{ CF}$$

Proposed Detention Facility: (24) Cultec Recharger 280HD units

$V_{\text{Cultecs}} = 750 \text{ CF}$  (internal storage volume from HydroCAD analysis for 1-Year Storm) >> WQV required  
=> WQV storage is met.

#### **“Site Northeast” Groundwater Recharge Volume:**

$$GRV = F \times I$$

$F = 0.35$  inches for Type “B” Soils

$I = 6,344 \text{ SF}$

$$GRV = (0.35 \text{ in.})/(12 \text{ in./ft.}) \times 6,344 \text{ SF} = 185.0 \text{ CF} \ll V_{\text{Cultecs}} \Rightarrow \text{GRV storage is met}$$

#### **“Site Southeast” Water Quality Volume (WQV) Calculations:**

Total Contributing Area = 0.494 ac. = 21,520 SF

Impervious Area = 9,447 SF = 0.217 ac.

Woods Area = 0 SF = 0.0 ac.

Lawn Area = 12,073 SF = 0.277 ac.

$$\%I = (0.217/0.494) = 0.439$$

$$RvI = 0.95$$

$$\%T = (0.277/0.494) = 0.561$$

$$RvT = 0.22$$

$$\%F = (0.00/0.494) = 0.0$$

$$RvF = 0.04$$

$$R = (RvI \times \%I) + (RvT \times \%T) + (RvF \times \%F) \\ = (0.95)(0.439) + (0.22)(0.561) + (0.04)(0.0) = 0.54$$

$$WQV = (1'' \times R \times A)/12$$

$$= (1'' \times 0.54 \times 0.494 \text{ ac.})/12 = 0.0222 \text{ ac.-ft.} = 968.3 \text{ CF}$$

Proposed Detention Facility: (44) Cultec Recharger 280HD units

$V_{\text{Cultecs}} = 1,101 \text{ CF}$  (internal storage volume from HydroCAD analysis for 1-Year Storm) >> WQV required  
=> WQV storage is met.

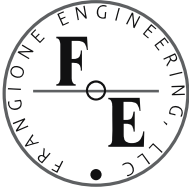
#### **“Site Southeast” Groundwater Recharge Volume:**

$$GRV = F \times I$$

$F = 0.35$  inches for Type “B” Soils

$I = 9,447 \text{ SF}$

$$GRV = (0.35 \text{ in.})/(12 \text{ in./ft.}) \times 9,447 \text{ SF} = 275.5 \text{ CF} \ll V_{\text{Cultecs}} \Rightarrow \text{GRV storage is met}$$



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**Outlet Protection Calculations**  
**Angerame – 30 Sturges Ridge Road, Wilton, CT**  
**October 6, 2021**

**Lot 1 – House Front**

Minimum Level Spreader length = 13 LF/cfs of flow

$$Q_{25} \text{ (Cultecs outlet)} = 1.59 \text{ cfs}$$

$$L = 13 \text{ LF/cfs} \times 1.59 \text{ cfs} = 20.67 \text{ LF minimum}$$

Proposed Length of level spreader = 25 LF

**Lot 1 – House Rear**

Minimum Level Spreader length = 13 LF/cfs of flow

$$Q_{25} \text{ (Cultecs outlet)} = 0.35 \text{ cfs}$$

$$L = 13 \text{ LF/cfs} \times 0.35 \text{ cfs} = 4.55 \text{ LF minimum}$$

Proposed Length of level spreader = 20 LF

**Lot 2 – House Rear**

Minimum Level Spreader length = 13 LF/cfs of flow

$$Q_{25} \text{ (Cultecs outlet)} = 0.78 \text{ cfs}$$

$$L = 13 \text{ LF/cfs} \times 0.78 \text{ cfs} = 10.14 \text{ LF minimum}$$

Proposed Length of level spreader = 20 LF

Angerame 30 Sturges Ridge Road  
Disconnected Impervious Area Table

	Existing	Proposed
	(SF)	(SF)
Pervious Surface Area	244,314	218,216
Directly Connected Impervious	6,465	0
Disconnected Impervious	0	32,563
Total Area:	250,779	250,779

TSS Removal  
Calculation  
Worksheet

Location: 30 Sturges Ridge Road, Wilton

A BMP <sup>1</sup>	B TSS Removal Rate <sup>1</sup>	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Catch Basin Sumps	25%	1.00	0.25	0.75
Cultec Units	90%	0.75	0.68	0.08
		0.08	0.00	0.08
		0.08	0.00	0.08
		0.08	0.00	0.08

Total TSS Removal =

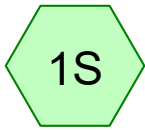
93%

Separate Form Needs to be  
Completed for Each Outlet or  
BMP Train

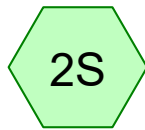
Project: Angerame  
Prepared By: Rob Frangione, P.E.  
Date: 8/30/2021

\*Equals remaining load from previous BMP (E) which enters the BMP

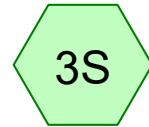




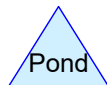
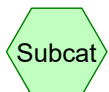
Site Northeast



Site South



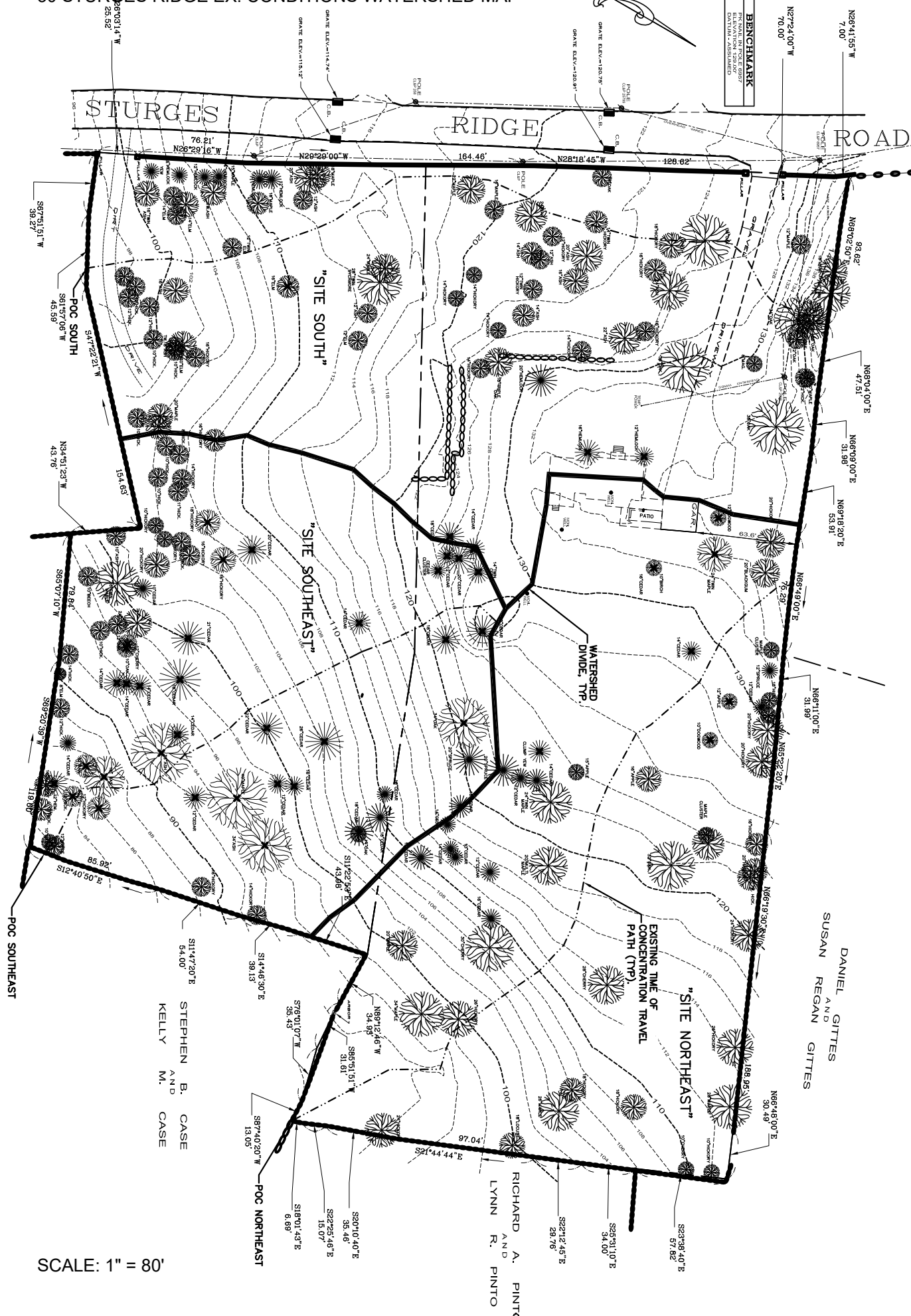
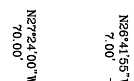
Site Southeast



**Routing Diagram for Angerame Existing**

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SCALE: 1" = 80'

**Angerame Existing**

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*Type III 24-hr 100-Year Rainfall=9.10"*

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**Events for Subcatchment 1S: Site Northeast**

Event	Runoff (cfs)	Volume (cubic-feet)
1-Year	1.99	8,239
2-Year	2.70	10,994
5-Year	4.05	16,322
10-Year	5.31	21,335
25-Year	7.42	29,843
50-Year	9.39	37,958
100-Year	<b>11.86</b>	<b>48,330</b>

**Angerame Existing**

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*Type III 24-hr 100-Year Rainfall=9.10"*

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**Events for Subcatchment 2S: Site South**

Event	Runoff (cfs)	Volume (cubic-feet)
1-Year	2.26	9,093
2-Year	3.03	12,049
5-Year	4.50	17,736
10-Year	5.86	23,065
25-Year	8.11	32,077
50-Year	10.21	40,649
100-Year	<b>12.85</b>	<b>51,585</b>

**Angerame Existing**

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*Type III 24-hr 100-Year Rainfall=9.10"*

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**Events for Subcatchment 3S: Site Southeast**

Event	Runoff (cfs)	Volume (cubic-feet)
1-Year	1.73	6,381
2-Year	2.34	8,514
5-Year	3.51	12,639
10-Year	4.60	16,521
25-Year	6.41	23,107
50-Year	8.10	29,390
100-Year	<b>10.23</b>	<b>37,420</b>

**Angerame Existing**

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Type III 24-hr 25-Year Rainfall=6.40"

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**Summary for Subcatchment 1S: Site Northeast**

Runoff = 7.42 cfs @ 12.19 hrs, Volume= 29,843 cf, Depth&gt; 4.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25-Year Rainfall=6.40"

Area (sf)	CN	Description
* 1,848	98	Original House
87,046	79	<50% Grass cover, Poor, HSG B
88,894	79	Weighted Average
87,046		97.92% Pervious Area
1,848		2.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	88	0.1020	0.15		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.50"
4.6	407	0.0860	1.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
14.3	495	Total			

**Summary for Subcatchment 2S: Site South**

Runoff = 8.11 cfs @ 12.19 hrs, Volume= 32,077 cf, Depth&gt; 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25-Year Rainfall=6.40"

Area (sf)	CN	Description
* 733	98	Original House
3,884	96	Gravel surface, HSG B
1,197	82	Dirt roads, HSG B
87,292	79	<50% Grass cover, Poor, HSG B
93,106	80	Weighted Average
92,373		99.21% Pervious Area
733		0.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	106	0.2120	0.21		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.50"
5.2	404	0.0670	1.29		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
13.6	510	Total			

**Angerame Existing**

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Type III 24-hr 25-Year Rainfall=6.40"

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**Summary for Subcatchment 3S: Site Southeast**

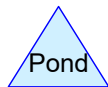
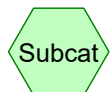
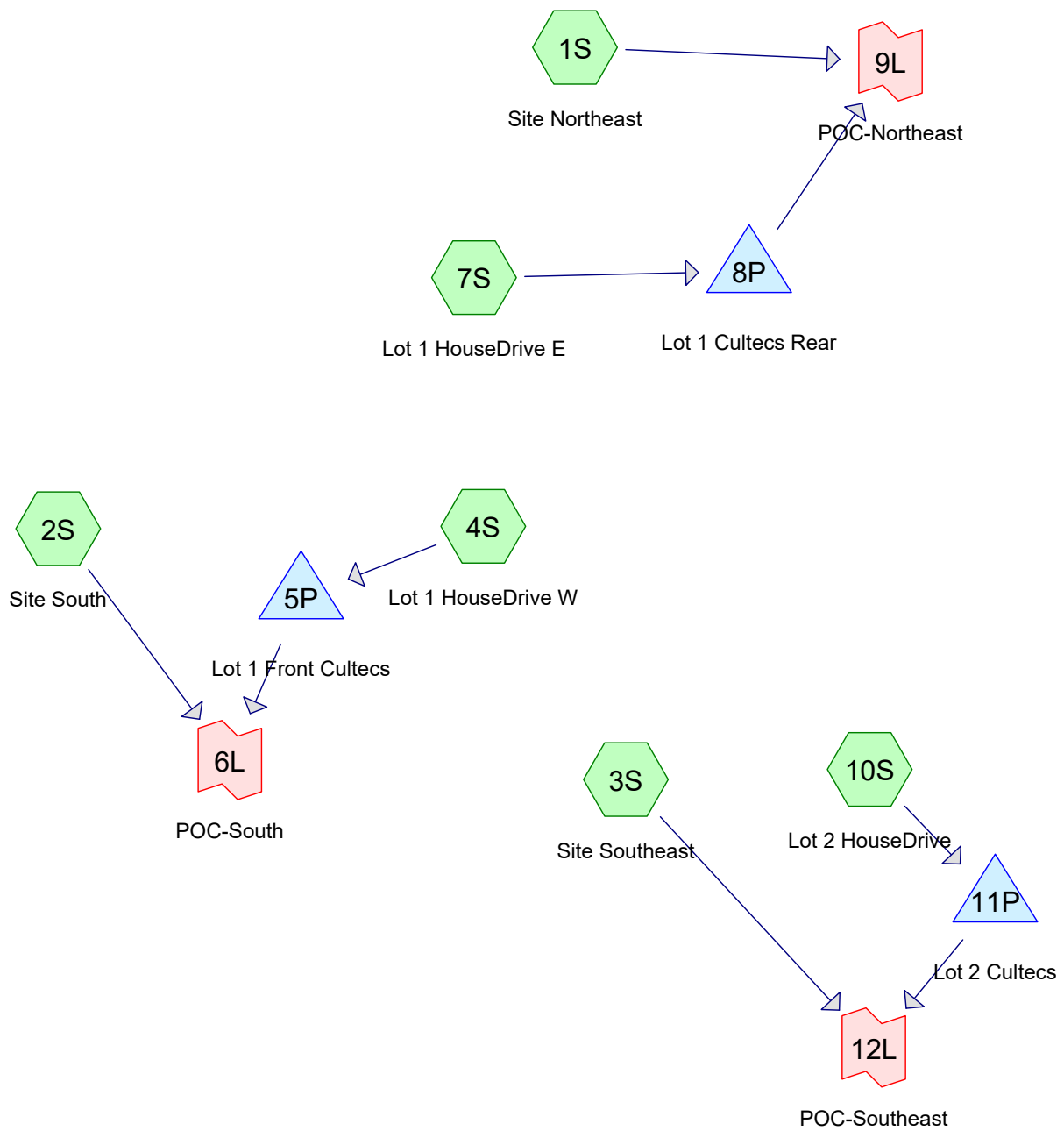
Runoff = 6.41 cfs @ 12.14 hrs, Volume= 23,107 cf, Depth&gt; 4.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs  
Type III 24-hr 25-Year Rainfall=6.40"

Area (sf)	CN	Description
68,779	79	<50% Grass cover, Poor, HSG B
68,779		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0	96	0.1930	0.20		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.50"
2.4	249	0.1240	1.76		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
10.4	345	Total			





**Angerame Proposed r1**

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*Type III 24-hr 100-Year Rainfall=9.10"*

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**Events for Link 9L: POC-Northeast**

Event	Primary (cfs)	Volume (cubic-feet)
1-Year	1.43	5,837
2-Year	2.03	8,025
5-Year	3.21	12,351
10-Year	4.32	16,728
25-Year	6.21	24,487
50-Year	8.76	31,974
100-Year	<b>11.29</b>	<b>41,581</b>

**Angerame Proposed r1**

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*Type III 24-hr 100-Year Rainfall=9.10"*

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**Events for Link 6L: POC-South**

Event	Primary (cfs)	Volume (cubic-feet)
1-Year	1.09	4,837
2-Year	1.61	7,197
5-Year	2.84	12,185
10-Year	4.65	17,067
25-Year	6.45	25,376
50-Year	9.02	34,085
100-Year	<b>11.28</b>	<b>44,354</b>

**Angerame Proposed r1***Type III 24-hr 100-Year Rainfall=9.10"*

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**Events for Link 12L: POC-Southeast**

Event	Primary (cfs)	Volume (cubic-feet)
1-Year	0.76	2,751
2-Year	1.15	3,914
5-Year	1.93	6,271
10-Year	2.68	9,404
25-Year	3.99	15,245
50-Year	6.45	20,896
100-Year	<b>11.17</b>	<b>29,451</b>

**Angerame Proposed r1**

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Type III 24-hr 25-Year Rainfall=6.40"

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**Summary for Subcatchment 1S: Site Northeast**

Runoff = 6.21 cfs @ 12.17 hrs, Volume= 23,639 cf, Depth> 3.62"  
 Routed to Link 9L : POC-Northeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs  
 Type III 24-hr 25-Year Rainfall=6.40"

	Area (sf)	CN	Description
*	1,662	98	Lot 1 Future Drive
	55,239	79	<50% Grass cover, Poor, HSG B
*	387	98	Lot 1 Walk
*	1,162	98	Lot 1 Patio
*	19,972	61	Pr. Lawn
	78,422	75	Weighted Average
	75,211		95.91% Pervious Area
	3,211		4.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	104	0.0870	0.22		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.50"
4.5	402	0.0870	1.47		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
12.3	506	Total			

**Summary for Subcatchment 2S: Site South**

Runoff = 5.45 cfs @ 12.19 hrs, Volume= 21,478 cf, Depth> 3.31"  
 Routed to Link 6L : POC-South

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs  
 Type III 24-hr 25-Year Rainfall=6.40"

	Area (sf)	CN	Description
	40,973	79	<50% Grass cover, Poor, HSG B
	33,438	61	>75% Grass cover, Good, HSG B
*	2,341	96	Lot 2 Gravel Driveway
*	1,009	98	Lot 1 Walk
	77,761	72	Weighted Average
	76,752		98.70% Pervious Area
	1,009		1.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	106	0.2120	0.21		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.50"
5.2	404	0.0670	1.29		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
13.6	510	Total			

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**Summary for Subcatchment 3S: Site Southeast**

Runoff = 3.99 cfs @ 12.10 hrs, Volume= 12,615 cf, Depth> 3.22"  
 Routed to Link 12L : POC-Southeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs  
 Type III 24-hr 25-Year Rainfall=6.40"

	Area (sf)	CN	Description
	20,986	79	<50% Grass cover, Poor, HSG B
*	1,843	98	Lot 2 Patios
*	302	98	Lot 2 Walks
*	23,877	61	Lawn
	47,008	71	Weighted Average
	44,863		95.44% Pervious Area
	2,145		4.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	103	0.1840	0.30		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.50"
0.7	246	0.1260	5.71		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
6.5	349	Total			

**Summary for Subcatchment 4S: Lot 1 HouseDrive W**

Runoff = 1.95 cfs @ 12.09 hrs, Volume= 6,074 cf, Depth> 3.83"  
 Routed to Pond 5P : Lot 1 Front Cultecs

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs  
 Type III 24-hr 25-Year Rainfall=6.40"

	Area (sf)	CN	Description
*	2,862	98	Pr. House
*	5,204	98	Pr. Drive
	10,980	61	>75% Grass cover, Good, HSG B
	19,046	77	Weighted Average
	10,980		57.65% Pervious Area
	8,066		42.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	63	0.2980	0.22		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.50"
0.5	87	0.0230	3.08		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
5.3	150	Total, Increased to minimum Tc = 6.0 min			

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**Summary for Subcatchment 7S: Lot 1 HouseDrive E**

Runoff = 0.98 cfs @ 12.08 hrs, Volume= 3,329 cf, Depth> 5.69"  
 Routed to Pond 8P : Lot 1 Cultecs Rear

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs  
 Type III 24-hr 25-Year Rainfall=6.40"

	Area (sf)	CN	Description
*	4,317	98	Lot 1 House
*	1,227	98	Lot 1 Drive
*	800	98	Future Barn
*	678	61	Lawn to Drive
	7,022	94	Weighted Average
	678		9.66% Pervious Area
	6,344		90.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					<b>Direct Entry,</b>

**Summary for Subcatchment 10S: Lot 2 HouseDrive**

Runoff = 2.15 cfs @ 12.10 hrs, Volume= 6,862 cf, Depth> 3.83"  
 Routed to Pond 11P : Lot 2 Cultecs

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs  
 Type III 24-hr 25-Year Rainfall=6.40"

	Area (sf)	CN	Description
*	4,514	98	Pr. Lot 2 House
*	4,042	98	Pr. Lot 2 Asphalt Drive
*	12,073	61	Lawn to Drive
*	130	98	Pr. Walks
*	761	96	Pr. Lot 2 Gravel Drive
	21,520	77	Weighted Average
	12,834		59.64% Pervious Area
	8,686		40.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	100	0.1500	0.27		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.50"
0.3	91	0.1300	5.80		<b>Shallow Concentrated Flow,</b> Unpaved Kv= 16.1 fps
0.4	93	0.0340	3.74		<b>Shallow Concentrated Flow,</b> Paved Kv= 20.3 fps
6.8	284	Total			

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**Summary for Pond 5P: Lot 1 Front Cultecs**

Inflow Area = 19,046 sf, 42.35% Impervious, Inflow Depth > 3.83" for 25-Year event  
 Inflow = 1.95 cfs @ 12.09 hrs, Volume= 6,074 cf  
 Outflow = 1.61 cfs @ 12.09 hrs, Volume= 4,779 cf, Atten= 17%, Lag= 0.0 min  
 Discarded = 0.02 cfs @ 12.09 hrs, Volume= 881 cf  
 Primary = 1.59 cfs @ 12.09 hrs, Volume= 3,898 cf  
 Routed to Link 6L : POC-South

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2  
 Peak Elev= 124.43' @ 12.09 hrs Surf.Area= 619 sf Storage= 1,264 cf

Plug-Flow detention time= 118.8 min calculated for 4,773 cf (79% of inflow)  
 Center-of-Mass det. time= 39.8 min ( 858.0 - 818.2 )

Volume	Invert	Avail.Storage	Storage Description
#1A	120.70'	481 cf	<b>13.75'W x 45.00'L x 3.21'H Field A</b> 1,985 cf Overall - 783 cf Embedded = 1,202 cf x 40.0% Voids
#2A	121.20'	783 cf	<b>Cultec R-280HD x 18 Inside #1</b> Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 3 rows
1,264 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	120.70'	<b>0.520 in/hr Exfiltration over Surface area</b> Conductivity to Groundwater Elevation = 118.70'
#2	Primary	123.20'	<b>8.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Discarded OutFlow** Max=0.02 cfs @ 12.09 hrs HW=124.43' (Free Discharge)  
 ↑**1=Exfiltration** ( Controls 0.02 cfs)

**Primary OutFlow** Max=1.59 cfs @ 12.09 hrs HW=124.42' (Free Discharge)  
 ↑**2=Orifice/Grate** (Orifice Controls 1.59 cfs @ 4.55 fps)

**Summary for Pond 8P: Lot 1 Cultecs Rear**

Inflow Area = 7,022 sf, 90.34% Impervious, Inflow Depth > 5.69" for 25-Year event  
 Inflow = 0.98 cfs @ 12.08 hrs, Volume= 3,329 cf  
 Outflow = 0.37 cfs @ 12.32 hrs, Volume= 2,092 cf, Atten= 62%, Lag= 14.2 min  
 Discarded = 0.02 cfs @ 12.32 hrs, Volume= 1,243 cf  
 Primary = 0.35 cfs @ 12.32 hrs, Volume= 848 cf  
 Routed to Link 9L : POC-Northeast

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2  
 Peak Elev= 105.24' @ 12.32 hrs Surf.Area= 811 sf Storage= 1,543 cf

Plug-Flow detention time= 211.1 min calculated for 2,089 cf (63% of inflow)  
 Center-of-Mass det. time= 110.2 min ( 876.5 - 766.3 )

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Volume	Invert	Avail.Storage	Storage Description
#1A	102.40'	626 cf	<b>13.75'W x 59.00'L x 3.21'H Field A</b> 2,603 cf Overall - 1,038 cf Embedded = 1,564 cf x 40.0% Voids
#2A	102.90'	1,038 cf	<b>Cultec R-280HD</b> x 24 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 3 rows
		1,664 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	102.40'	<b>0.520 in/hr Exfiltration over Surface area</b> Conductivity to Groundwater Elevation = 100.40'
#2	Primary	104.90'	<b>8.0" Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Discarded OutFlow** Max=0.02 cfs @ 12.32 hrs HW=105.23' (Free Discharge)↑**1=Exfiltration** ( Controls 0.02 cfs)**Primary OutFlow** Max=0.35 cfs @ 12.32 hrs HW=105.23' (Free Discharge)↑**2=Orifice/Grate** (Orifice Controls 0.35 cfs @ 1.97 fps)**Summary for Pond 11P: Lot 2 Cultecs**

Inflow Area = 21,520 sf, 40.36% Impervious, Inflow Depth > 3.83" for 25-Year event  
 Inflow = 2.15 cfs @ 12.10 hrs, Volume= 6,862 cf  
 Outflow = 0.82 cfs @ 12.37 hrs, Volume= 4,369 cf, Atten= 62%, Lag= 16.5 min  
 Discarded = 0.04 cfs @ 12.37 hrs, Volume= 1,739 cf  
 Primary = 0.78 cfs @ 12.37 hrs, Volume= 2,630 cf  
 Routed to Link 12L : POC-Southeast

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2  
 Peak Elev= 92.25' @ 12.37 hrs Surf.Area= 1,413 sf Storage= 2,863 cf

Plug-Flow detention time= 183.2 min calculated for 4,364 cf (64% of inflow)  
 Center-of-Mass det. time= 81.4 min ( 900.2 - 818.9 )

Volume	Invert	Avail.Storage	Storage Description
#1A	89.20'	1,056 cf	<b>17.67'W x 80.00'L x 3.21'H Field A</b> 4,534 cf Overall - 1,894 cf Embedded = 2,640 cf x 40.0% Voids
#2A	89.70'	1,894 cf	<b>Cultec R-280HD</b> x 44 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 4 rows
		2,950 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	89.20'	<b>0.520 in/hr Exfiltration over Surface area</b> Conductivity to Groundwater Elevation = 86.70'



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#2 Primary 91.70' 8.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

**Discarded OutFlow** Max=0.04 cfs @ 12.37 hrs HW=92.25' (Free Discharge)

↑1=Exfiltration ( Controls 0.04 cfs)

**Primary OutFlow** Max=0.78 cfs @ 12.37 hrs HW=92.25' (Free Discharge)

↑2=Orifice/Grate (Orifice Controls 0.78 cfs @ 2.53 fps)

### Summary for Link 6L: POC-South

Inflow Area = 96,807 sf, 9.37% Impervious, Inflow Depth > 3.15" for 25-Year event  
Inflow = 6.45 cfs @ 12.18 hrs, Volume= 25,376 cf  
Primary = 6.45 cfs @ 12.18 hrs, Volume= 25,376 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

### Summary for Link 9L: POC-Northeast

Inflow Area = 85,444 sf, 11.18% Impervious, Inflow Depth > 3.44" for 25-Year event  
Inflow = 6.21 cfs @ 12.17 hrs, Volume= 24,487 cf  
Primary = 6.21 cfs @ 12.17 hrs, Volume= 24,487 cf, Atten= 0%, Lag= 0.0 min

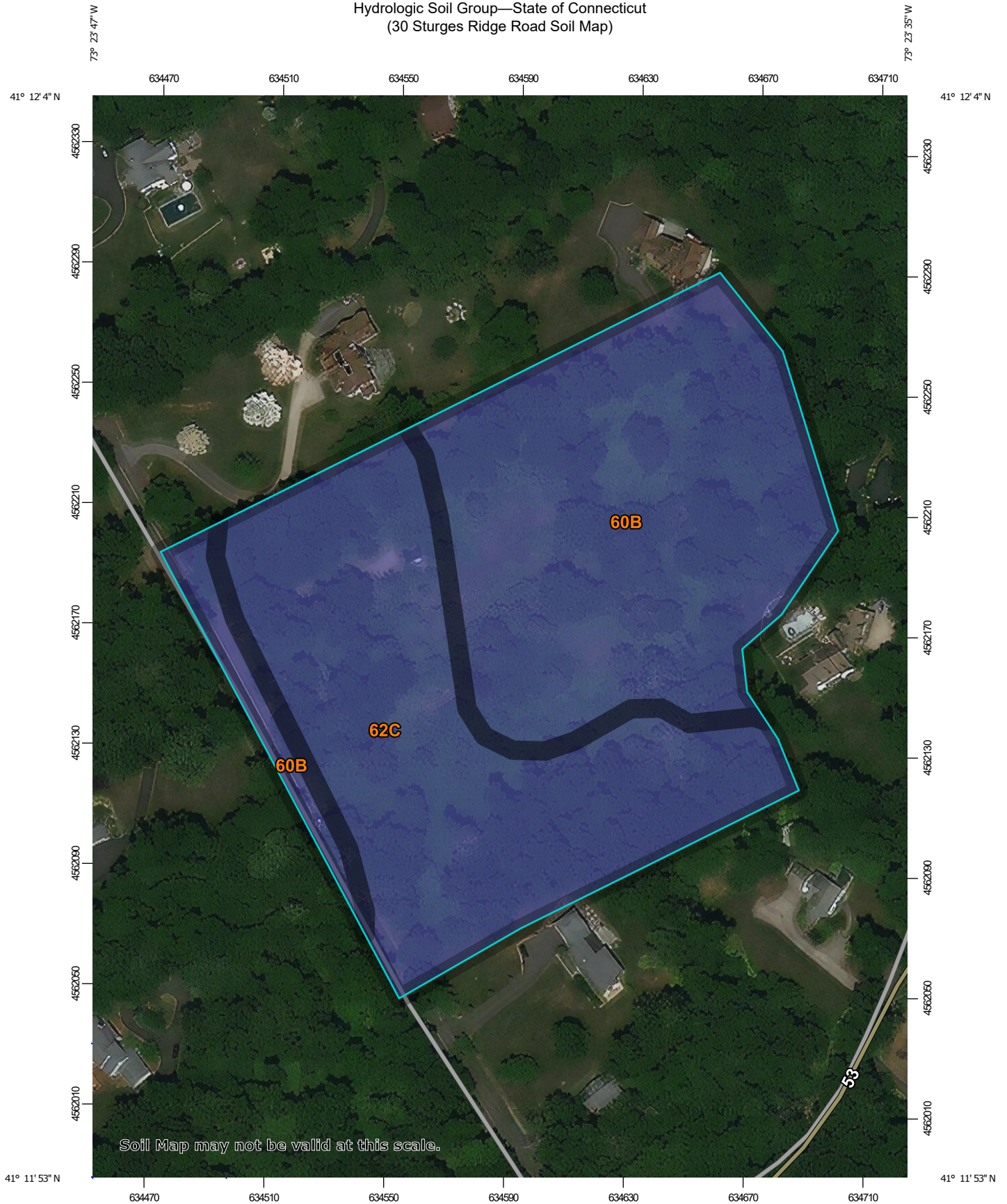
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

### Summary for Link 12L: POC-Southeast

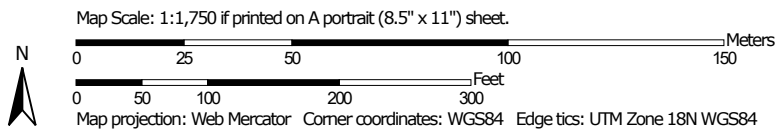
Inflow Area = 68,528 sf, 15.81% Impervious, Inflow Depth > 2.67" for 25-Year event  
Inflow = 3.99 cfs @ 12.10 hrs, Volume= 15,245 cf  
Primary = 3.99 cfs @ 12.10 hrs, Volume= 15,245 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

# Hydrologic Soil Group—State of Connecticut (30 Sturges Ridge Road Soil Map)



Soil Map may not be valid at this scale.



**Natural Resources  
Conservation Service**

Web Soil Survey  
National Cooperative Soil Survey

8/23/2021  
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# Hydrologic Soil Group—State of Connecticut (30 Sturges Ridge Road Soil Map)

## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons





 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Lines


 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Points

 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available

### 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:  
 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: State of Connecticut  
 Survey Area Data: Version 20, Jun 9, 2020

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

Date(s) aerial images were photographed: Dec 31, 2009—Oct 5, 2016

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.

## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
60B	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	B	4.1	52.9%
62C	Canton and Charlton fine sandy loams, 3 to 15 percent slopes, extremely stony	B	3.7	47.1%
<b>Totals for Area of Interest</b>			<b>7.8</b>	<b>100.0%</b>

## Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher