

## 42733.00 - Proposed Conditions - Crop Production

Prepared by VHB

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Printed 11/4/2021

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### Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 year	Type III 24-hr		Default	24.00	1	3.16	2
2	25 year	Type III 24-hr		Default	24.00	1	6.15	2
3	50 year	Type III 24-hr		Default	24.00	1	6.99	2
4	100 year	Type III 24-hr		Default	24.00	1	7.92	2

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 1: Subcat 1**      Runoff Area=4.920 ac    2.44% Impervious    Runoff Depth>1.08"  
Flow Length=600'    Slope=0.0250 '/'    Tc=13.5 min    CN=77    Runoff=5.16 cfs    0.444 af

**Pond 1P: (new Pond)**      Peak Elev=195.86'    Storage=12,135 cf    Inflow=5.16 cfs    0.444 af  
Discarded=0.29 cfs    0.195 af    Primary=0.00 cfs    0.000 af    Outflow=0.29 cfs    0.195 af

**Total Runoff Area = 4.920 ac    Runoff Volume = 0.444 af    Average Runoff Depth = 1.08"**  
**97.56% Pervious = 4.800 ac    2.44% Impervious = 0.120 ac**

**Summary for Subcatchment 1: Subcat 1**

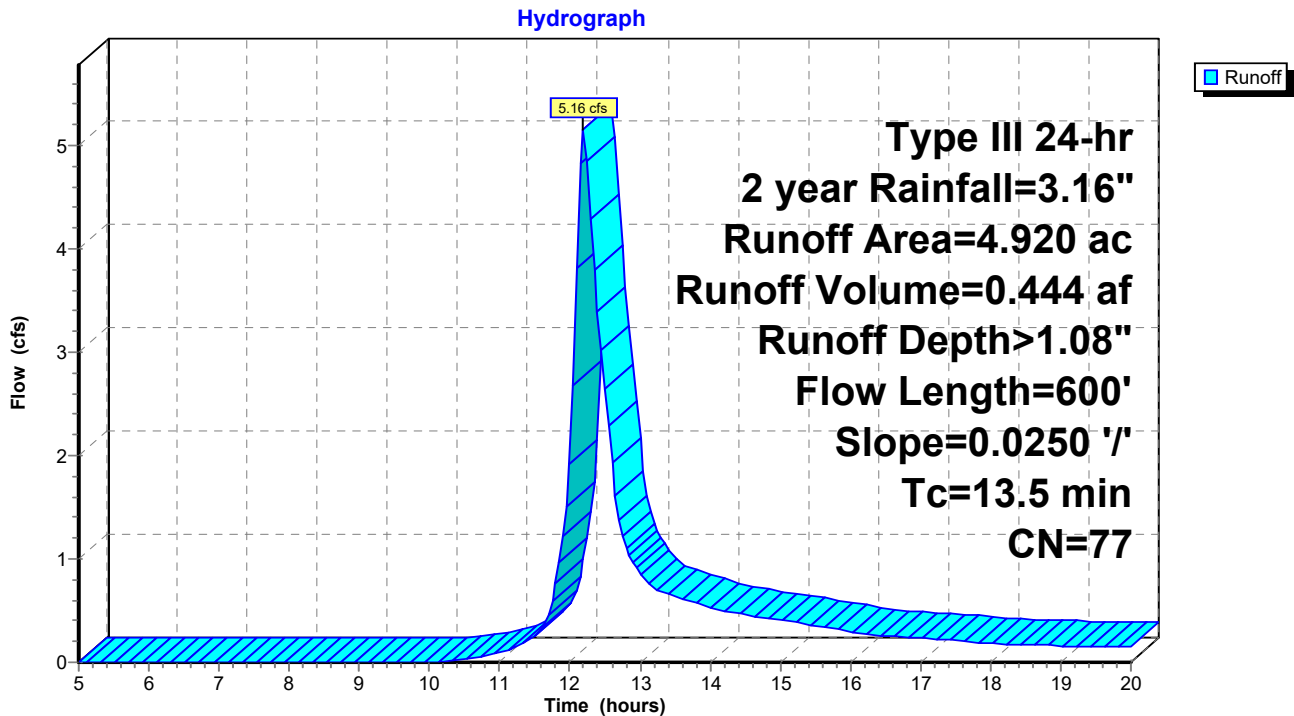
Runoff = 5.16 cfs @ 12.20 hrs, Volume= 0.444 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2 year Rainfall=3.16"

Area (ac)	CN	Description
* 3.200	74	50-75% Grass cover, Fair, HSG B-C
* 0.120	98	Farm roads
* 1.600	81	Row crops, straight row, Good, HSG B-C
4.920	77	Weighted Average
4.800		97.56% Pervious Area
0.120		2.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0250	0.16		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.16"
8.3	550	0.0250	1.11		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
13.5	600	Total			

**Subcatchment 1: Subcat 1**



**Summary for Pond 1P: (new Pond)**

Inflow Area = 4.920 ac, 2.44% Impervious, Inflow Depth > 1.08" for 2 year event  
 Inflow = 5.16 cfs @ 12.20 hrs, Volume= 0.444 af  
 Outflow = 0.29 cfs @ 16.05 hrs, Volume= 0.195 af, Atten= 94%, Lag= 231.1 min  
 Discarded = 0.29 cfs @ 16.05 hrs, Volume= 0.195 af  
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 195.86' @ 16.05 hrs Surf.Area= 6,024 sf Storage= 12,135 cf

Plug-Flow detention time= 223.1 min calculated for 0.194 af (44% of inflow)  
 Center-of-Mass det. time= 133.9 min ( 951.3 - 817.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	193.00'	24,642 cf	<b>15.00'W x 170.00'L x 4.60'H Prismatic Z=3.0</b>

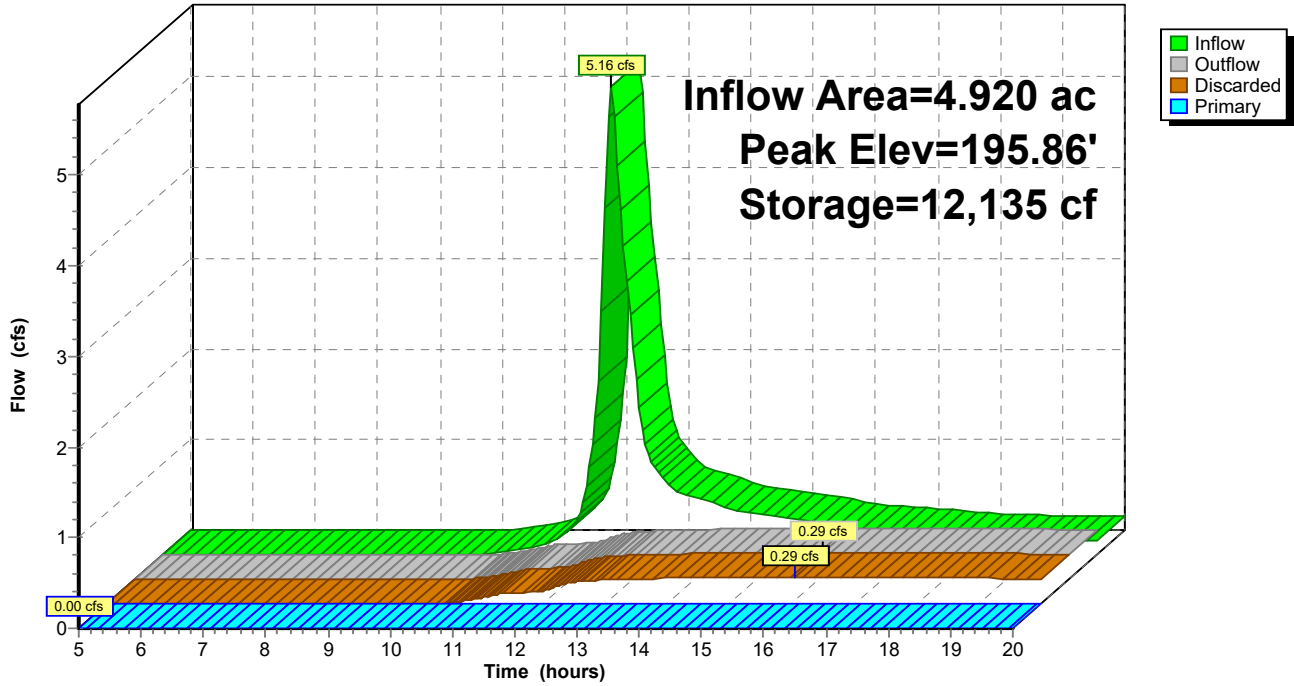
Device	Routing	Invert	Outlet Devices
#1	Primary	197.00'	<b>20.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	193.00'	<b>2.000 in/hr Exfiltration over Wetted area</b> Conductivity to Groundwater Elevation = 10.00'

**Discarded OutFlow** Max=0.29 cfs @ 16.05 hrs HW=195.86' (Free Discharge)  
 ↑2=Exfiltration ( Controls 0.29 cfs)

**Primary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=193.00' (Free Discharge)  
 ↑1=Broad-Crested Rectangular Weir( Controls 0.00 cfs)

### Pond 1P: (new Pond)

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 1: Subcat 1**    Runoff Area=4.920 ac    2.44% Impervious    Runoff Depth>3.37"  
Flow Length=600'    Slope=0.0250 '/'    Tc=13.5 min    CN=77    Runoff=16.26 cfs    1.380 af

**Pond 1P: (new Pond)**    Peak Elev=197.36'    Storage=22,659 cf    Inflow=16.26 cfs    1.380 af  
Discarded=0.39 cfs    0.289 af    Primary=10.64 cfs    0.636 af    Outflow=11.04 cfs    0.925 af

**Total Runoff Area = 4.920 ac    Runoff Volume = 1.380 af    Average Runoff Depth = 3.37"**  
**97.56% Pervious = 4.800 ac    2.44% Impervious = 0.120 ac**

**Summary for Subcatchment 1: Subcat 1**

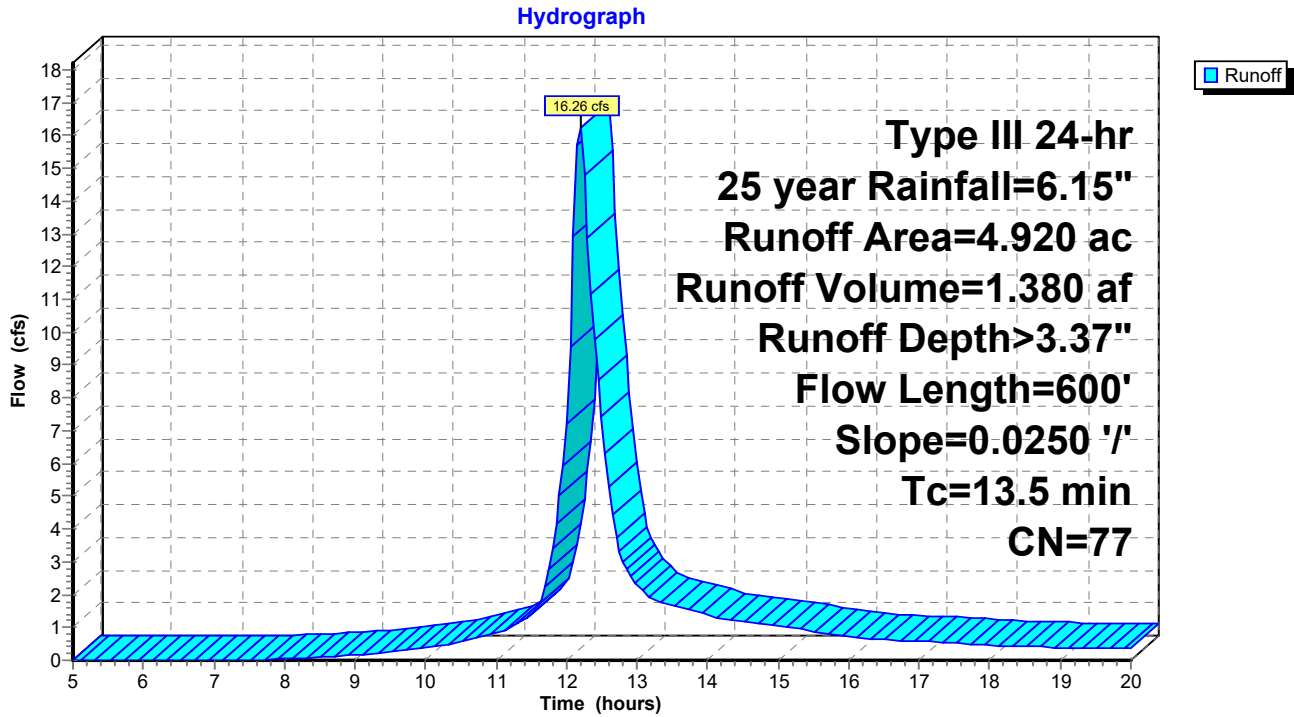
Runoff = 16.26 cfs @ 12.19 hrs, Volume= 1.380 af, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 25 year Rainfall=6.15"

Area (ac)	CN	Description
* 3.200	74	50-75% Grass cover, Fair, HSG B-C
* 0.120	98	Farm roads
* 1.600	81	Row crops, straight row, Good, HSG B-C
4.920	77	Weighted Average
4.800		97.56% Pervious Area
0.120		2.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0250	0.16		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.16"
8.3	550	0.0250	1.11		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
13.5	600	Total			

**Subcatchment 1: Subcat 1**



**Summary for Pond 1P: (new Pond)**

Inflow Area = 4.920 ac, 2.44% Impervious, Inflow Depth > 3.37" for 25 year event  
 Inflow = 16.26 cfs @ 12.19 hrs, Volume= 1.380 af  
 Outflow = 11.04 cfs @ 12.37 hrs, Volume= 0.925 af, Atten= 32%, Lag= 10.9 min  
 Discarded = 0.39 cfs @ 12.37 hrs, Volume= 0.289 af  
 Primary = 10.64 cfs @ 12.37 hrs, Volume= 0.636 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 197.36' @ 12.37 hrs Surf.Area= 8,073 sf Storage= 22,659 cf

Plug-Flow detention time= 116.5 min calculated for 0.925 af (67% of inflow)  
 Center-of-Mass det. time= 47.4 min ( 839.3 - 791.9 )

Volume	Invert	Avail.Storage	Storage Description
#1	193.00'	24,642 cf	<b>15.00'W x 170.00'L x 4.60'H Prismatic Z=3.0</b>

Device	Routing	Invert	Outlet Devices
#1	Primary	197.00'	<b>20.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b> 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 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	193.00'	<b>2.000 in/hr Exfiltration over Wetted area</b> Conductivity to Groundwater Elevation = 10.00'

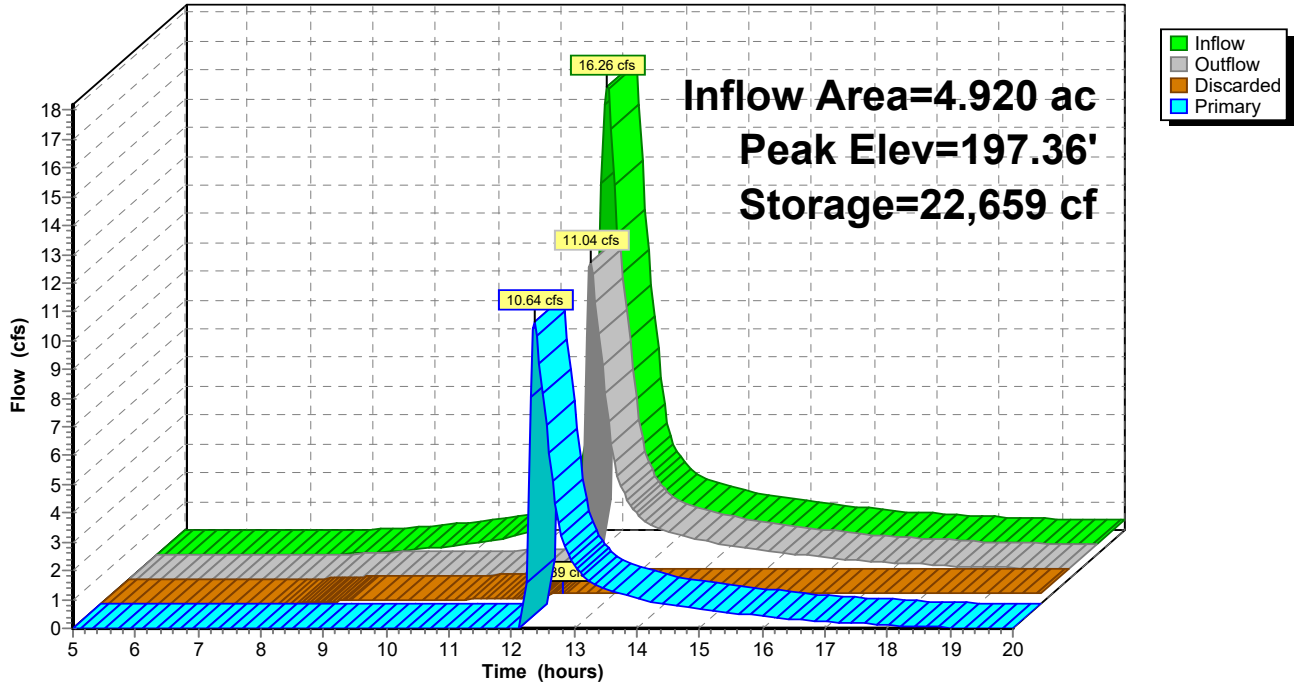
**Discarded OutFlow** Max=0.39 cfs @ 12.37 hrs HW=197.35' (Free Discharge)  
 ↑2=Exfiltration ( Controls 0.39 cfs)

**Primary OutFlow** Max=10.30 cfs @ 12.37 hrs HW=197.35' (Free Discharge)  
 ↑1=Broad-Crested Rectangular Weir(Weir Controls 10.30 cfs @ 1.46 fps)



### Pond 1P: (new Pond)

Hydrograph



**42733.00 - Proposed Conditions - Crop Production**    *Type III 24-hr 50 year Rainfall=6.99"*

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Printed 11/4/2021

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

**Subcatchment 1: Subcat 1**

Runoff Area=4.920 ac    2.44% Impervious    Runoff Depth>4.07"  
Flow Length=600'    Slope=0.0250 '/'    Tc=13.5 min    CN=77    Runoff=19.58 cfs    1.670 af

**Pond 1P: (new Pond)**

Peak Elev=197.46'    Storage=23,490 cf    Inflow=19.58 cfs    1.670 af  
Discarded=0.40 cfs    0.299 af    Primary=16.06 cfs    0.914 af    Outflow=16.46 cfs    1.213 af

**Total Runoff Area = 4.920 ac    Runoff Volume = 1.670 af    Average Runoff Depth = 4.07"**  
**97.56% Pervious = 4.800 ac    2.44% Impervious = 0.120 ac**

**Summary for Subcatchment 1: Subcat 1**

Runoff = 19.58 cfs @ 12.19 hrs, Volume= 1.670 af, Depth> 4.07"

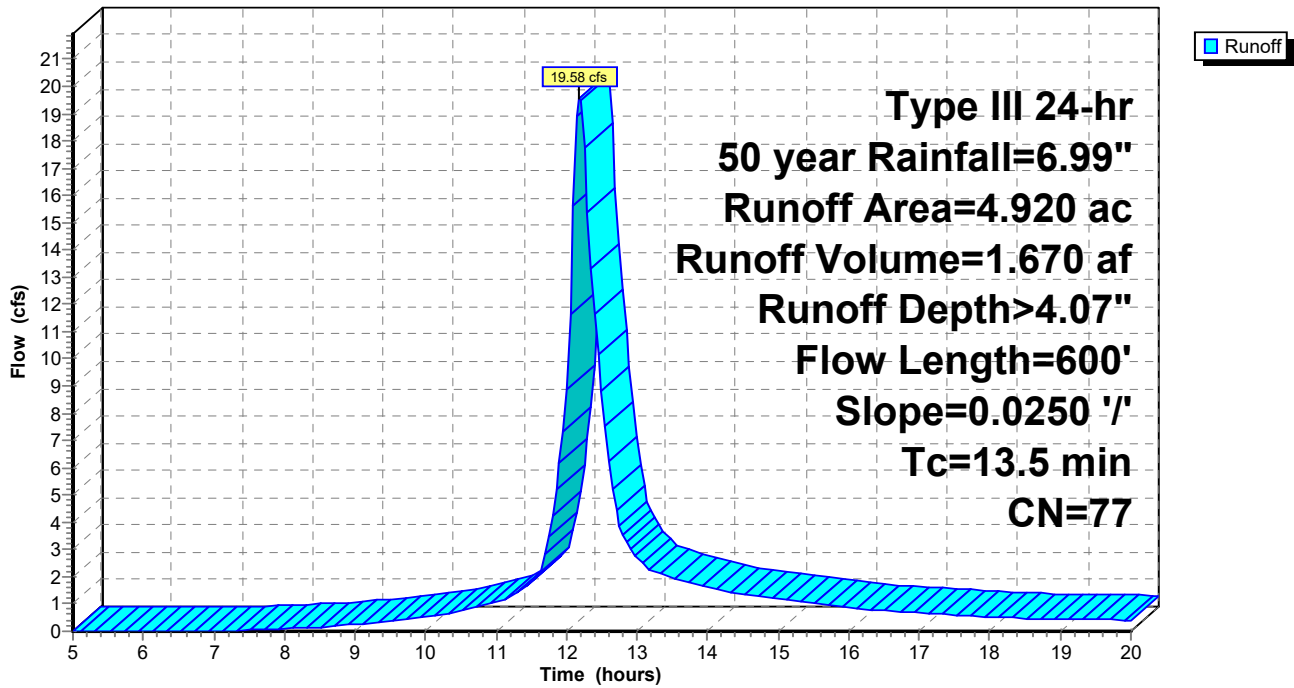
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 50 year Rainfall=6.99"

Area (ac)	CN	Description
* 3.200	74	50-75% Grass cover, Fair, HSG B-C
* 0.120	98	Farm roads
* 1.600	81	Row crops, straight row, Good, HSG B-C
4.920	77	Weighted Average
4.800		97.56% Pervious Area
0.120		2.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0250	0.16		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.16"
8.3	550	0.0250	1.11		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
13.5	600	Total			

**Subcatchment 1: Subcat 1**

Hydrograph



**Summary for Pond 1P: (new Pond)**

Inflow Area = 4.920 ac, 2.44% Impervious, Inflow Depth > 4.07" for 50 year event  
 Inflow = 19.58 cfs @ 12.19 hrs, Volume= 1.670 af  
 Outflow = 16.46 cfs @ 12.29 hrs, Volume= 1.213 af, Atten= 16%, Lag= 6.0 min  
 Discarded = 0.40 cfs @ 12.29 hrs, Volume= 0.299 af  
 Primary = 16.06 cfs @ 12.29 hrs, Volume= 0.914 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 197.46' @ 12.29 hrs Surf.Area= 8,219 sf Storage= 23,490 cf

Plug-Flow detention time= 101.4 min calculated for 1.209 af (72% of inflow)  
 Center-of-Mass det. time= 39.5 min ( 827.0 - 787.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	193.00'	24,642 cf	<b>15.00'W x 170.00'L x 4.60'H Prismatic Z=3.0</b>

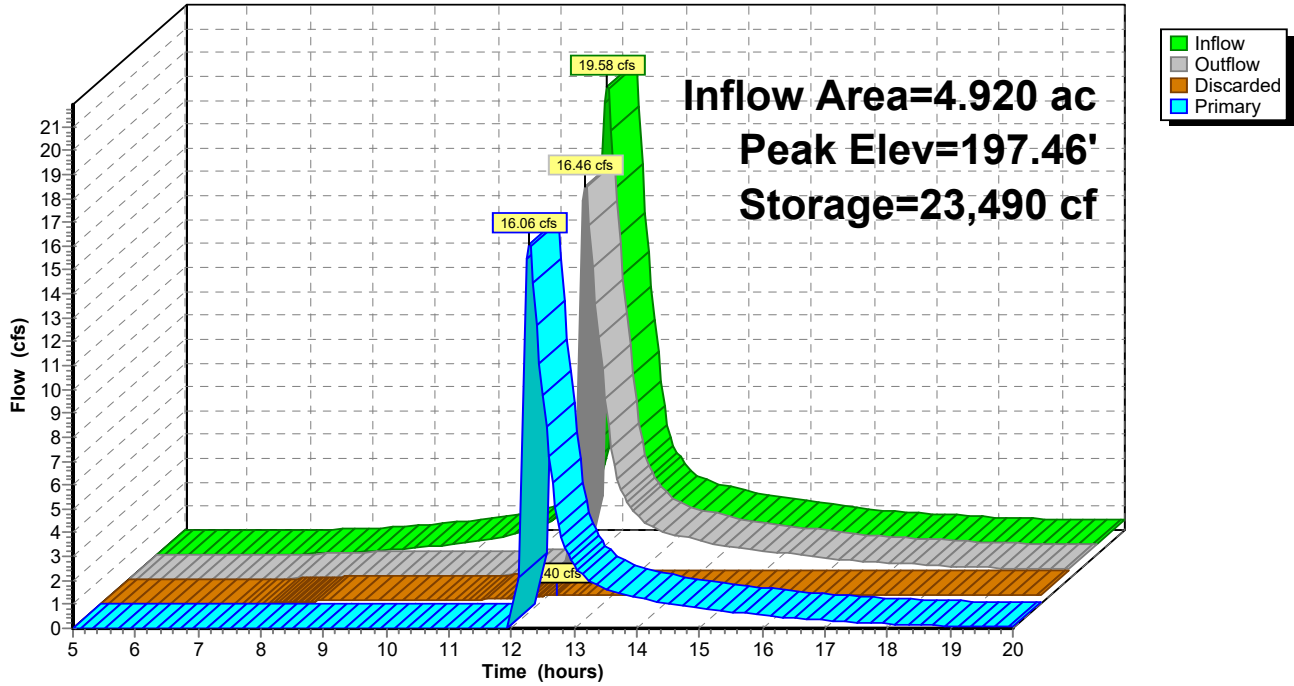
Device	Routing	Invert	Outlet Devices
#1	Primary	197.00'	<b>20.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	193.00'	<b>2.000 in/hr Exfiltration over Wetted area</b> Conductivity to Groundwater Elevation = 10.00'

**Discarded OutFlow** Max=0.40 cfs @ 12.29 hrs HW=197.46' (Free Discharge)  
 ↑**2=Exfiltration** ( Controls 0.40 cfs)

**Primary OutFlow** Max=15.86 cfs @ 12.29 hrs HW=197.46' (Free Discharge)  
 ↑**1=Broad-Crested Rectangular Weir**(Weir Controls 15.86 cfs @ 1.73 fps)

### Pond 1P: (new Pond)

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 1: Subcat 1** Runoff Area=4.920 ac 2.44% Impervious Runoff Depth=4.87"  
Flow Length=600' Slope=0.0250 '/' Tc=13.5 min CN=77 Runoff=23.29 cfs 1.998 af

**Pond 1P: (new Pond)** Peak Elev=197.55' Storage=24,216 cf Inflow=23.29 cfs 1.998 af  
Discarded=0.41 cfs 0.311 af Primary=21.58 cfs 1.229 af Outflow=21.98 cfs 1.540 af

**Total Runoff Area = 4.920 ac Runoff Volume = 1.998 af Average Runoff Depth = 4.87"**  
**97.56% Pervious = 4.800 ac 2.44% Impervious = 0.120 ac**

**Summary for Subcatchment 1: Subcat 1**

Runoff = 23.29 cfs @ 12.19 hrs, Volume= 1.998 af, Depth> 4.87"

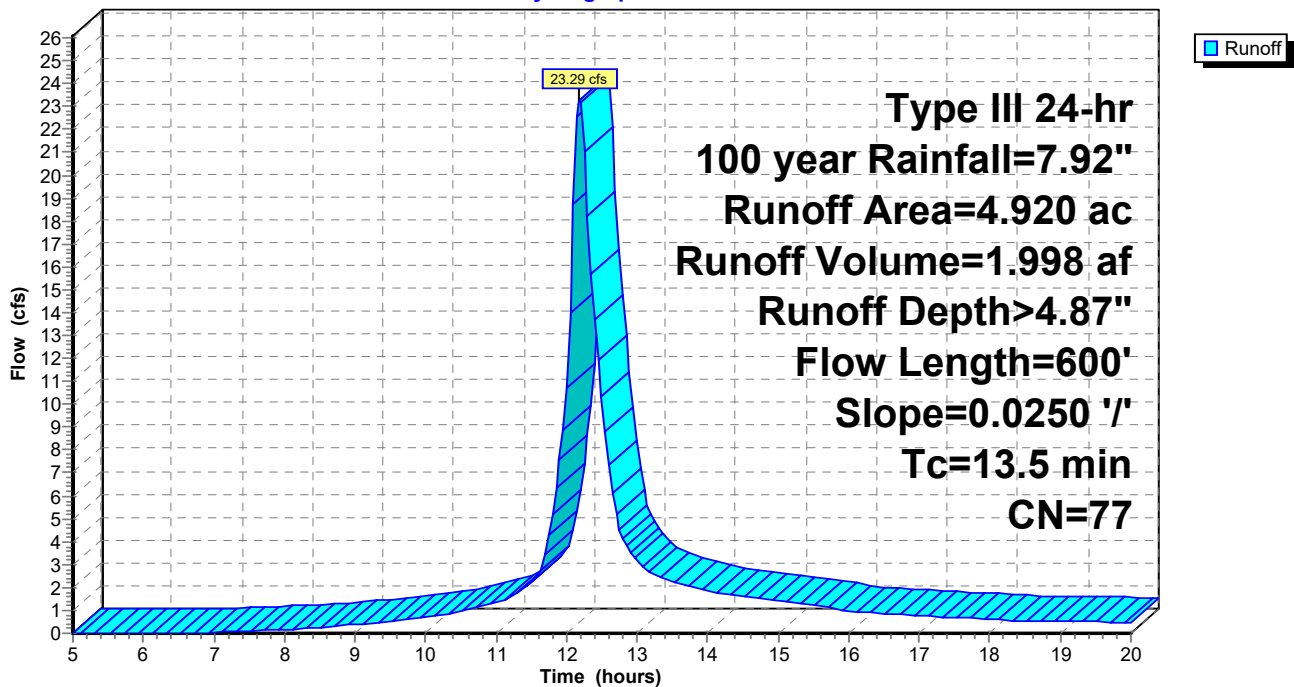
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Type III 24-hr 100 year Rainfall=7.92"

Area (ac)	CN	Description
* 3.200	74	50-75% Grass cover, Fair, HSG B-C
* 0.120	98	Farm roads
* 1.600	81	Row crops, straight row, Good, HSG B-C
4.920	77	Weighted Average
4.800		97.56% Pervious Area
0.120		2.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0250	0.16		<b>Sheet Flow,</b> Grass: Short n= 0.150 P2= 3.16"
8.3	550	0.0250	1.11		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
13.5	600	Total			

**Subcatchment 1: Subcat 1**

Hydrograph



**Summary for Pond 1P: (new Pond)**

Inflow Area = 4.920 ac, 2.44% Impervious, Inflow Depth > 4.87" for 100 year event  
 Inflow = 23.29 cfs @ 12.19 hrs, Volume= 1.998 af  
 Outflow = 21.98 cfs @ 12.24 hrs, Volume= 1.540 af, Atten= 6%, Lag= 3.3 min  
 Discarded = 0.41 cfs @ 12.24 hrs, Volume= 0.311 af  
 Primary = 21.58 cfs @ 12.24 hrs, Volume= 1.229 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 197.55' @ 12.24 hrs Surf.Area= 8,345 sf Storage= 24,216 cf

Plug-Flow detention time= 91.5 min calculated for 1.540 af (77% of inflow)  
 Center-of-Mass det. time= 34.6 min ( 817.9 - 783.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	193.00'	24,642 cf	<b>15.00'W x 170.00'L x 4.60'H Prismatic Z=3.0</b>

Device	Routing	Invert	Outlet Devices
#1	Primary	197.00'	<b>20.0' long x 5.0' breadth Broad-Crested Rectangular Weir</b> 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 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#2	Discarded	193.00'	<b>2.000 in/hr Exfiltration over Wetted area</b> Conductivity to Groundwater Elevation = 10.00'

**Discarded OutFlow** Max=0.41 cfs @ 12.24 hrs HW=197.55' (Free Discharge)  
 ↳2=Exfiltration ( Controls 0.41 cfs)

**Primary OutFlow** Max=21.35 cfs @ 12.24 hrs HW=197.55' (Free Discharge)  
 ↳1=Broad-Crested Rectangular Weir (Weir Controls 21.35 cfs @ 1.96 fps)



### Pond 1P: (new Pond)

Hydrograph

