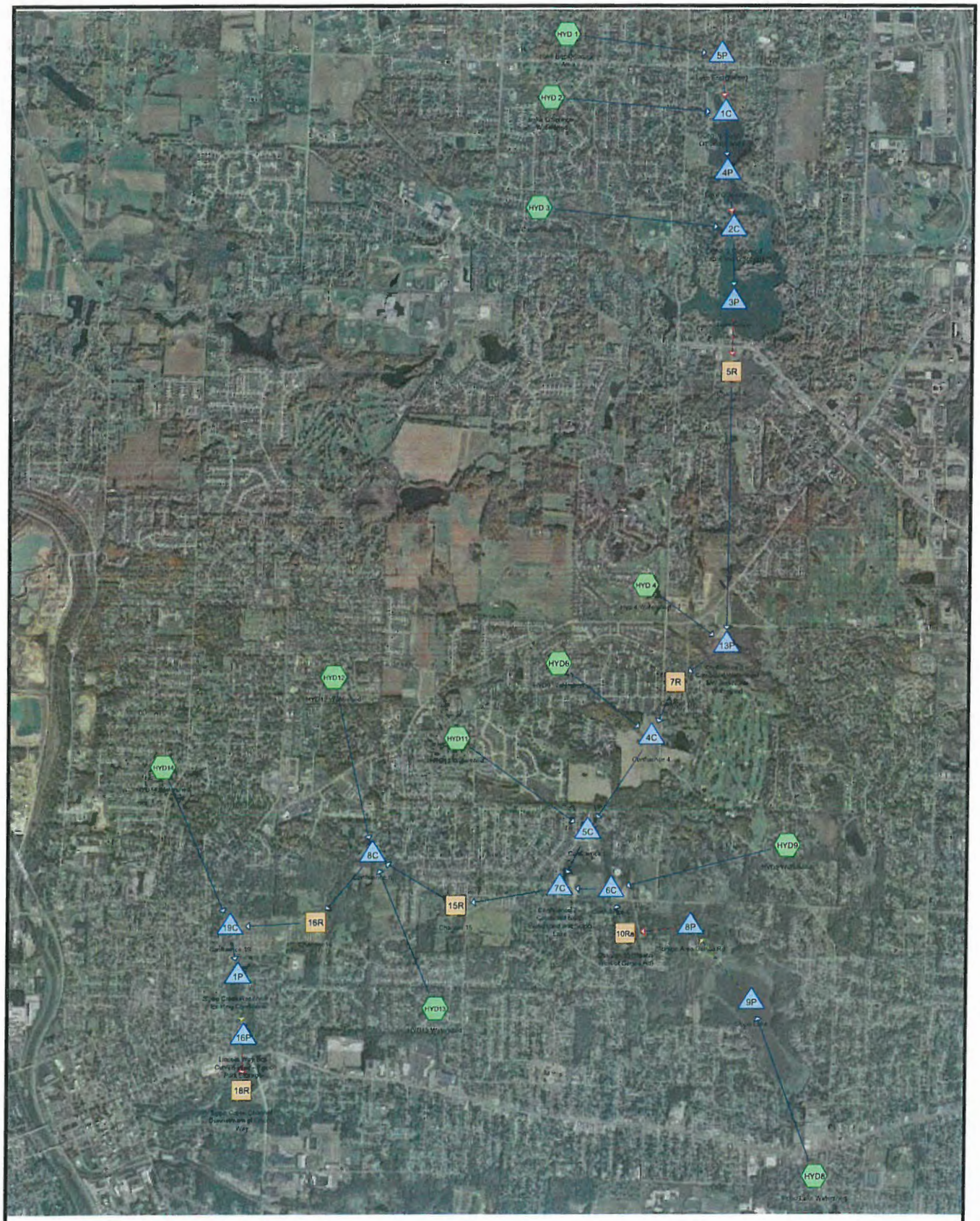


Drainage Diagram for Existing Conditions Sippo Resevoir-URS-Fina
Prepared by URS Corporation, Printed 10/21/2011
HydroCAD® 9.10 s/n 04378 © 2010 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1,427.200	67	(HYD11, HYD9)
1,075.200	68	1 acre lots, 20% imp, HSG B (HYD 4)
1,068.800	69	Pasture/grassland/range, Fair, HSG B (HYD6)
1,401.600	70	1/2 acre lots, 25% imp, HSG B (HYD 3)
838.400	74	>75% Grass cover, Good, HSG C (HYD 1, HYD12)
2,969.600	75	1/4 acre lots, 38% imp, HSG B (HYD 2, HYD13, HYD8)
678.400	80	1/2 acre lots, 25% imp, HSG C (HYD14)
9,459.200	72	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
6,515.200	HSG B	HYD 2, HYD 3, HYD 4, HYD13, HYD6, HYD8
1,516.800	HSG C	HYD 1, HYD12, HYD14
0.000	HSG D	
1,427.200	Other	HYD11, HYD9
9,459.200		**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Fill (inches)
1	3P	1,088.00	1,076.00	450.0	0.0267	0.012	36.0	0.0	0.0
2	8P	1,018.00	1,017.00	60.0	0.0167	0.025	48.0	0.0	0.0
3	16P	978.25	978.13	121.8	0.0010	0.015	168.0	98.0	0.0

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment HYD 1: Lake Eric Runoff Area=115.200 ac 0.00% Impervious Runoff Depth=22.36"
Tc=44.0 min CN=74 Runoff=1,201.03 cfs 214.656 af

Subcatchment HYD 2: Lake O'Springs Runoff Area=268.800 ac 38.00% Impervious Runoff Depth=22.54"
Tc=65.0 min CN=75 Runoff=2,527.02 cfs 504.797 af

Subcatchment HYD 3: Lake Cable Runoff Area=1,401.600 ac 25.00% Impervious Runoff Depth=21.63"
Tc=226.0 min CN=70 Runoff=6,713.23 cfs 2,526.163 af

Subcatchment HYD 4: Hyd 4 Runoff Area=1,075.200 ac 20.00% Impervious Runoff Depth=21.24"
Tc=128.0 min CN=68 Runoff=7,108.10 cfs 1,903.393 af

Subcatchment HYD11: HYD11 Watershed Runoff Area=774.400 ac 0.00% Impervious Runoff Depth=21.05"
Tc=129.0 min CN=67 Runoff=5,048.23 cfs 1,358.154 af

Subcatchment HYD12: HYD12 Watershed Runoff Area=723.200 ac 0.00% Impervious Runoff Depth=22.36"
Tc=110.0 min CN=74 Runoff=5,426.14 cfs 1,347.565 af

Subcatchment HYD13: HYD13 Runoff Area=736.000 ac 38.00% Impervious Runoff Depth=22.54"
Tc=72.0 min CN=75 Runoff=6,690.59 cfs 1,382.182 af

Subcatchment HYD14: HYD14 Runoff Area=678.400 ac 25.00% Impervious Runoff Depth=23.37"
Tc=78.0 min CN=80 Runoff=6,163.49 cfs 1,321.298 af

Subcatchment HYD6: HYD6 Watershed Runoff Area=1,068.800 ac 0.00% Impervious Runoff Depth=21.44"
Tc=155.0 min CN=69 Runoff=6,371.96 cfs 1,909.350 af

Subcatchment HYD8: Sippo Lake Runoff Area=1,964.800 ac 38.00% Impervious Runoff Depth=22.54"
Tc=156.0 min CN=75 Runoff=12,291.40 cfs 3,689.826 af

Subcatchment HYD9: HYD9 Watershed Runoff Area=652.800 ac 0.00% Impervious Runoff Depth=21.05"
Tc=151.0 min CN=67 Runoff=3,883.92 cfs 1,144.890 af

Reach 5R: Channel 5 Avg. Flow Depth=8.80' Max Vel=9.96 fps Inflow=6,815.05 cfs 3,323.095 af
L=8,800.0' S=0.0240 '/' Capacity=106,015.62 cfs Outflow=6,665.91 cfs 3,316.193 af

Reach 7R: Channel 7 Avg. Flow Depth=19.37' Max Vel=4.19 fps Inflow=9,680.66 cfs 5,219.296 af
L=5,900.0' S=0.0017 '/' Capacity=195,473.52 cfs Outflow=9,512.17 cfs 5,207.816 af

Reach 10Ra: Channel 10 (Reach Avg. Flow Depth=9.70' Max Vel=3.28 fps Inflow=8,241.98 cfs 3,417.777 af
L=900.0' S=0.0028 '/' Capacity=36,685.79 cfs Outflow=8,238.61 cfs 3,416.977 af

Reach 15R: Channel 15 Avg. Flow Depth=21.03' Max Vel=4.13 fps Inflow=26,875.65 cfs 13,036.329 af
L=8,800.0' S=0.0010 '/' Capacity=189,892.92 cfs Outflow=25,726.43 cfs 12,993.444 af

Reach 16R: Channel 16 Avg. Flow Depth=24.88' Max Vel=5.15 fps Inflow=30,666.22 cfs 15,722.689 af
L=7,500.0' S=0.0010 '/' Capacity=42,389.29 cfs Outflow=29,994.14 cfs 15,677.921 af

Reach 18R: Sippo Creek Avg. Flow Depth=15.82' Max Vel=15.14 fps Inflow=31,762.22 cfs 16,983.052 af
L=450.0' S=0.0084 '/' Capacity=200,707.82 cfs Outflow=31,762.34 cfs 16,982.927 af

Pond 1C: CONF 1 Combined O'Springs and Eric Inflow=3,664.37 cfs 719.332 af
Primary=3,664.37 cfs 719.332 af

Pond 1P: Sippo Creek Peak Elev=1,017.39' Storage=617.831 af Inflow=31,969.77 cfs 16,998.692 af
698 af Secondary=20,860.32 cfs 10,293.374 af Tertiary=4,808.93 cfs 1,903.735 af Outflow=31,764.74 cfs 16,984.808 af

Pond 2C: CONF 2 Combined Cable and O'Springs Inflow=7,733.17 cfs 3,244.892 af
Primary=7,733.17 cfs 3,244.892 af

Pond 3P: Lake Cable Peak Elev=1,101.10' Storage=2,975.885 af Inflow=7,733.17 cfs 3,244.891 af
Primary=1,137.10 cfs 1,445.120 af Secondary=5,677.95 cfs 1,878.118 af Outflow=6,815.05 cfs 3,323.238 af

Pond 4C: Confluence 4 Inflow=13,887.05 cfs 7,117.016 af
Primary=13,887.05 cfs 7,117.016 af

Pond 4P: Lake O'Springs Peak Elev=1,109.71' Storage=135.596 af Inflow=3,664.37 cfs 719.332 af
Primary=3,158.66 cfs 666.641 af Secondary=428.38 cfs 52.088 af Outflow=3,587.04 cfs 718.729 af

Pond 5C: Confluence 5 Inflow=18,421.74 cfs 8,475.020 af
Primary=18,421.74 cfs 8,475.020 af

Pond 5P: Lake Eric (Slagle) Peak Elev=1,121.10' Storage=32.369 af Inflow=1,201.03 cfs 214.656 af
Primary=711.29 cfs 146.788 af Secondary=487.85 cfs 67.747 af Outflow=1,199.15 cfs 214.535 af

Pond 6C: Confluence 6 Inflow=10,750.17 cfs 4,561.781 af
Primary=10,750.17 cfs 4,561.781 af

Pond 7C: Confluence 7 - Combined North Watershed and Sippo Inflow=26,875.65 cfs 13,036.565 af
Primary=26,875.65 cfs 13,036.565 af

Pond 8C: Confluence 8 Inflow=30,666.22 cfs 15,722.940 af
Primary=30,666.22 cfs 15,722.940 af

Pond 8P: Storage Area Genoa Peak Elev=1,029.90' Storage=1,292.779 af Inflow=12,104.92 cfs 3,596.882 af
Primary=130.35 cfs 292.476 af Secondary=8,142.61 cfs 3,125.388 af Outflow=8,241.98 cfs 3,417.863 af

Pond 9P: Sippo Lake Peak Elev=1,031.37' Storage=668.631 af Inflow=12,291.40 cfs 3,689.826 af
cfs 2,921.396 af Secondary=291.63 cfs 77.072 af Tertiary=2,744.05 cfs 598.415 af Outflow=12,104.92 cfs 3,596.882 af

Pond 13P: Confluence 3 - Combined Watershed NW and North Inflow=9,680.66 cfs 5,219.441 af
Primary=9,680.66 cfs 5,219.441 af

Pond 16P: Lincoln Way Box Peak Elev=1,014.62' Storage=299.154 af Inflow=31,764.74 cfs 16,984.540 af
Primary=3,400.33 cfs 4,540.004 af Secondary=28,633.45 cfs 12,443.317 af Outflow=31,762.22 cfs 16,983.321 af

Pond 19C: Confluence 19 Inflow=31,969.77 cfs 16,998.956 af
Primary=31,969.77 cfs 16,998.956 af

Total Runoff Area = 9,459.200 ac Runoff Volume = 17,302.274 af Average Runoff Depth = 21.9
80.30% Pervious = 7,595.712 ac 19.70% Impervious = 1,863.488 ac

Summary for Subcatchment HYD 1: Lake Eric Drainage Area

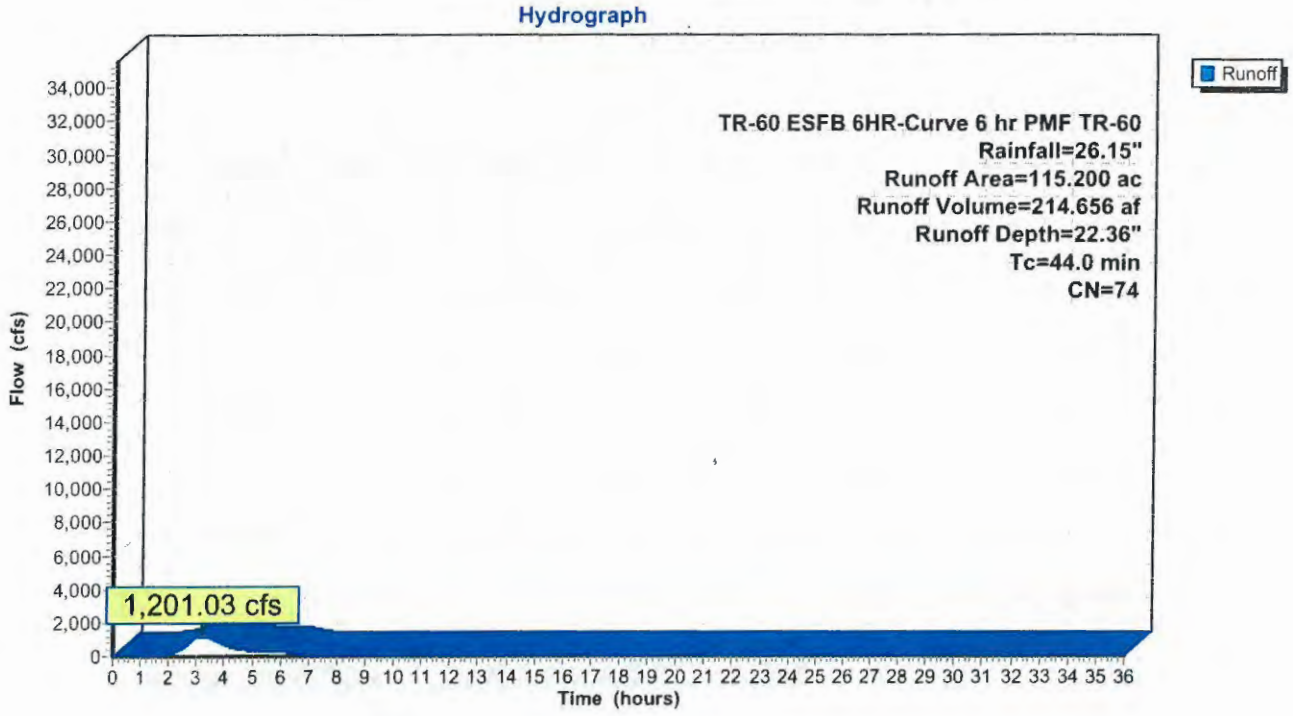
Runoff = 1,201.03 cfs @ 3.18 hrs, Volume= 214.656 af, Depth=22.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6 hr PMF TR-60 Rainfall=26.15"

Area (ac)	CN	Description
115.200	74	>75% Grass cover, Good, HSG C
115.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.0					**Direct Entry, HEC-1 Lag Time = 0.44 hr**

Subcatchment HYD 1: Lake Eric Drainage Area



Summary for Subcatchment HYD 2: Lake O'Springs Watershed

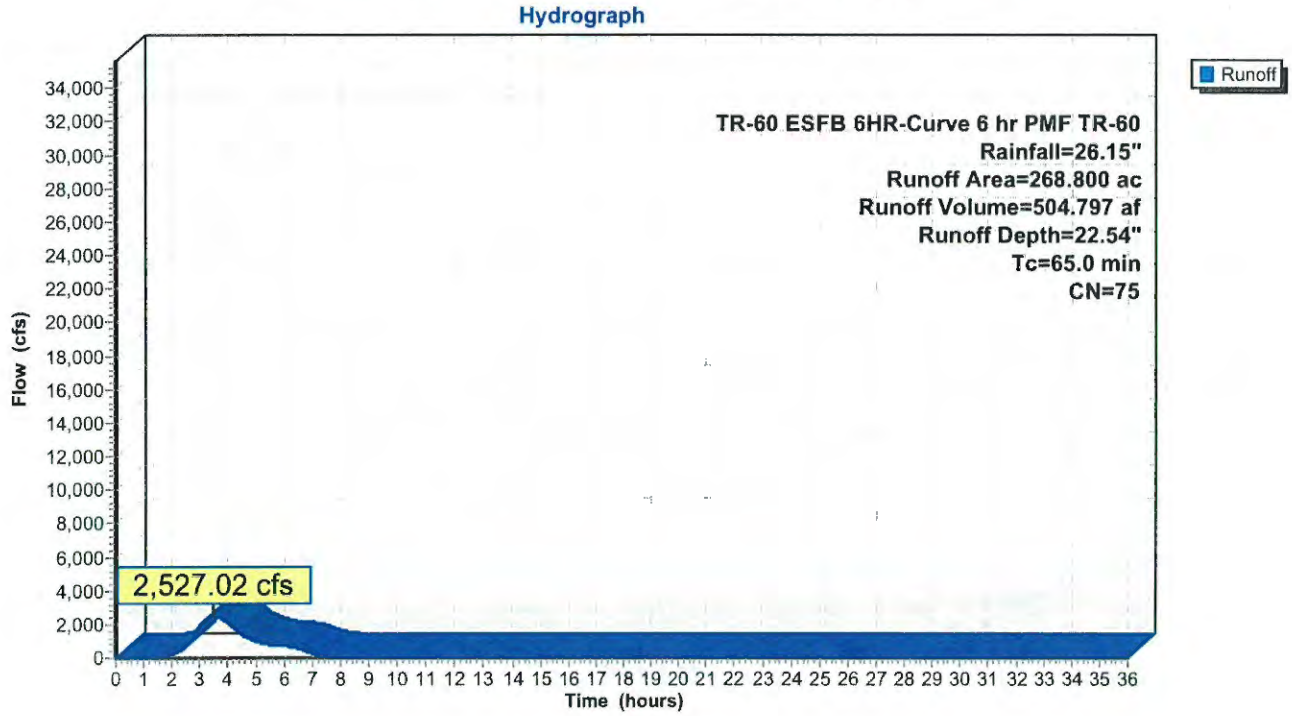
Runoff = 2,527.02 cfs @ 3.47 hrs, Volume= 504.797 af, Depth=22.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6 hr PMF TR-60 Rainfall=26.15"

Area (ac)	CN	Description
268.800	75	1/4 acre lots, 38% imp, HSG B
166.656		62.00% Pervious Area
102.144		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.0					**Direct Entry, HEC-1 Lag Time = 0.65 hours**

Subcatchment HYD 2: Lake O'Springs Watershed



Summary for Subcatchment HYD 3: Lake Cable Watershed

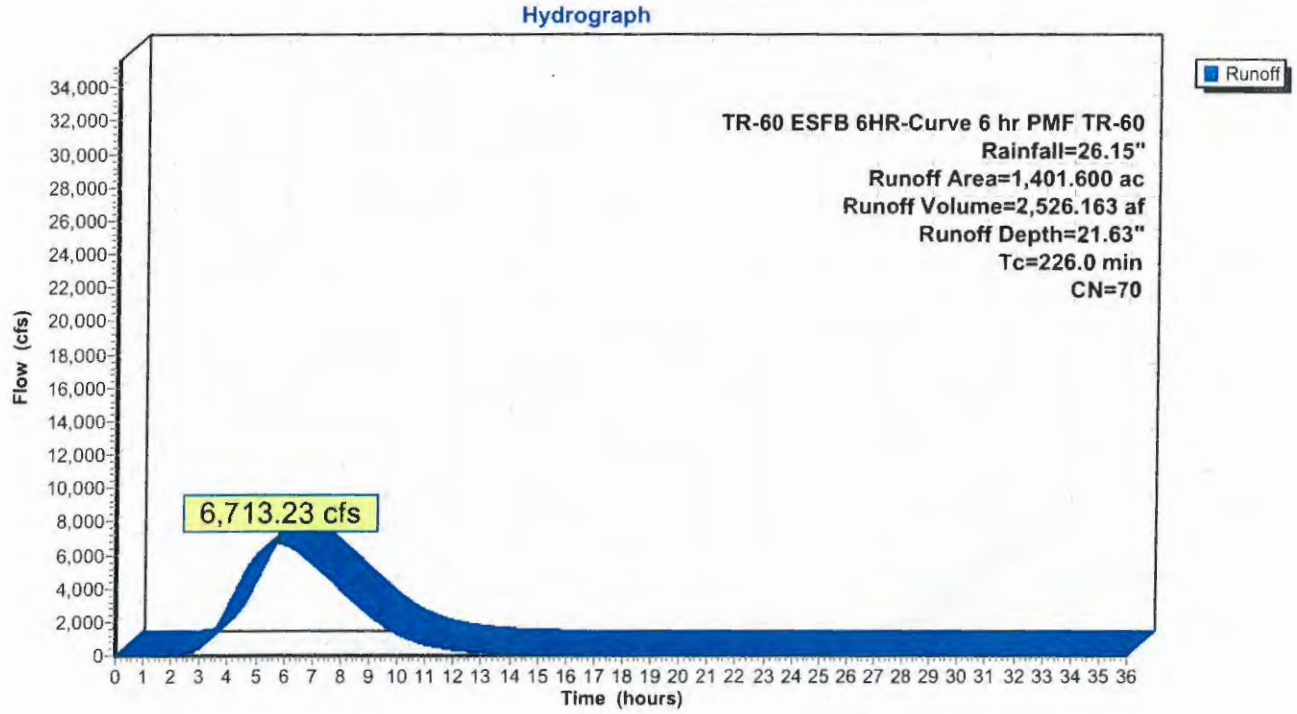
Runoff = 6,713.23 cfs @ 5.78 hrs, Volume= 2,526.163 af, Depth=21.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6 hr PMF TR-60 Rainfall=26.15"

Area (ac)	CN	Description
1,401.600	70	1/2 acre lots, 25% imp, HSG B
1,051.200		75.00% Pervious Area
350.400		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
226.0					**Direct Entry, HEC-1 Lag time 2.26hr**

Subcatchment HYD 3: Lake Cable Watershed



Summary for Subcatchment HYD 4: Hyd 4 Watershed

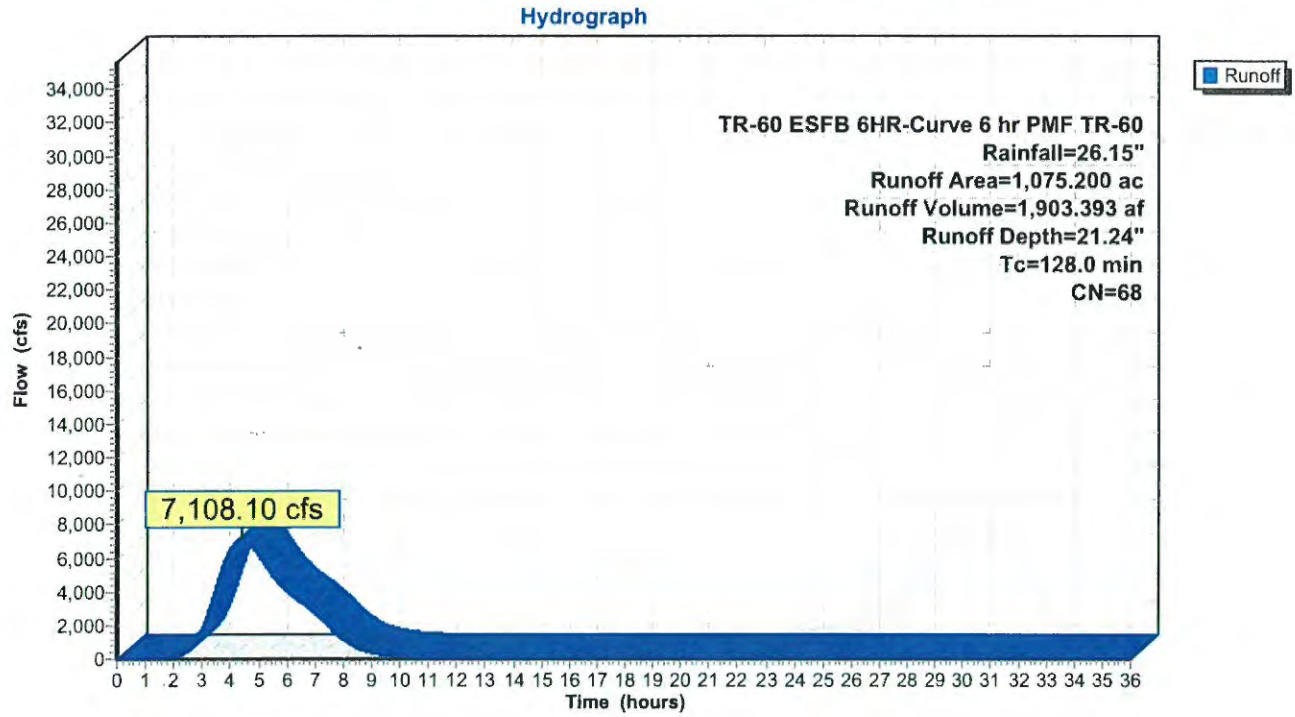
Runoff = 7,108.10 cfs @ 4.41 hrs, Volume= 1,903.393 af, Depth=21.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6 hr PMF TR-60 Rainfall=26.15"

Area (ac)	CN	Description
1,075.200	68	1 acre lots, 20% imp, HSG B
860.160		80.00% Pervious Area
215.040		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
128.0					**Direct Entry, HEC-1 Lag Time = 1.28 hr**

Subcatchment HYD 4: Hyd 4 Watershed



Summary for Subcatchment HYD11: HYD11 Watershed

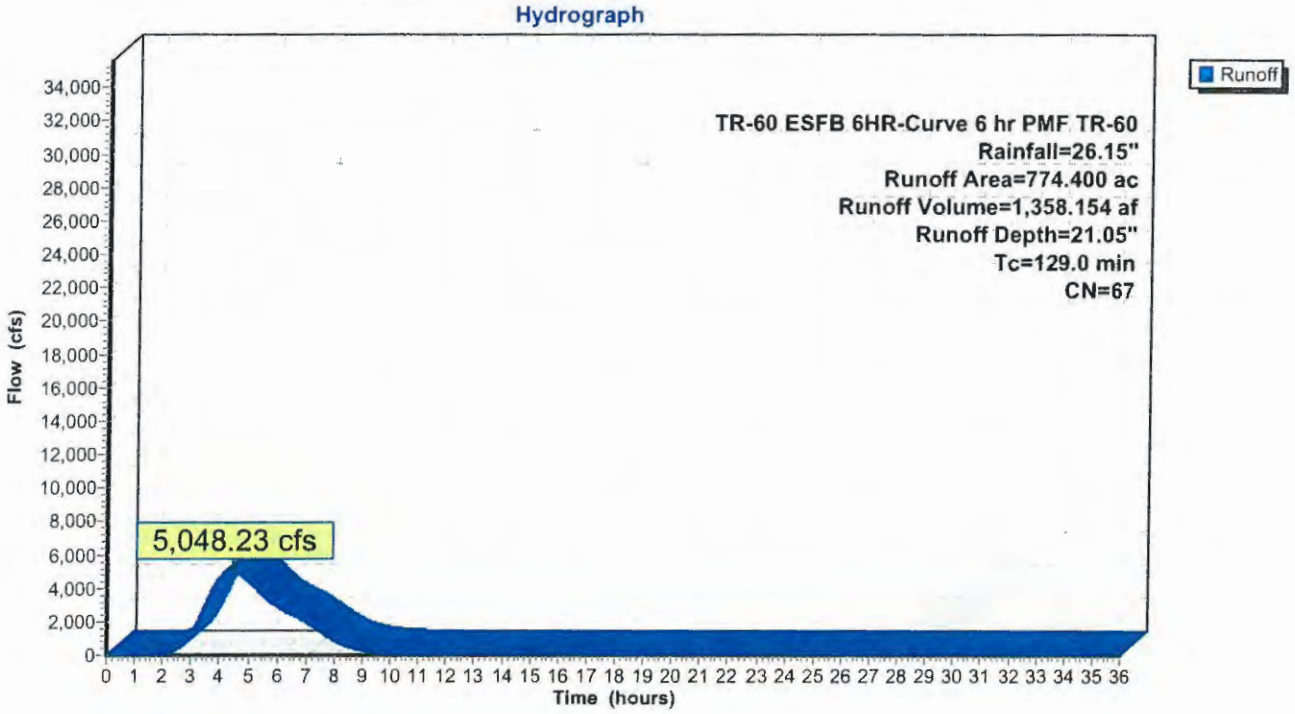
Runoff = 5,048.23 cfs @ 4.44 hrs, Volume= 1,358.154 af, Depth=21.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6 hr PMF TR-60 Rainfall=26.15"

	Area (ac)	CN	Description
*	774.400	67	
	774.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
129.0					**Direct Entry, HEC-1 Lag Time = 1.29 hr**

Subcatchment HYD11: HYD11 Watershed



Summary for Subcatchment HYD12: HYD12 Watershed

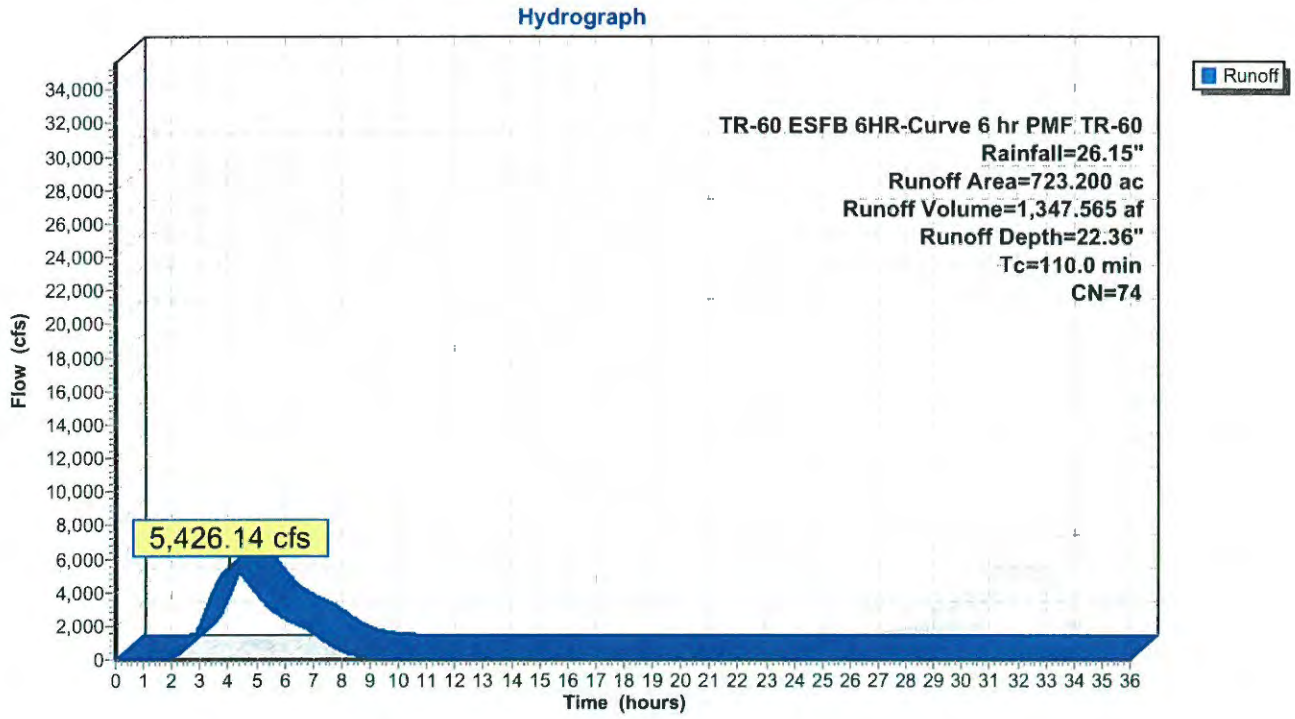
Runoff = 5,426.14 cfs @ 4.04 hrs, Volume= 1,347.565 af, Depth=22.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6 hr PMF TR-60 Rainfall=26.15"

Area (ac)	CN	Description
723.200	74	>75% Grass cover, Good, HSG C
723.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
110.0					**Direct Entry, HEC-1 Lag Time = 1.10 hr**

Subcatchment HYD12: HYD12 Watershed



Summary for Subcatchment HYD13: HYD13 Watershed

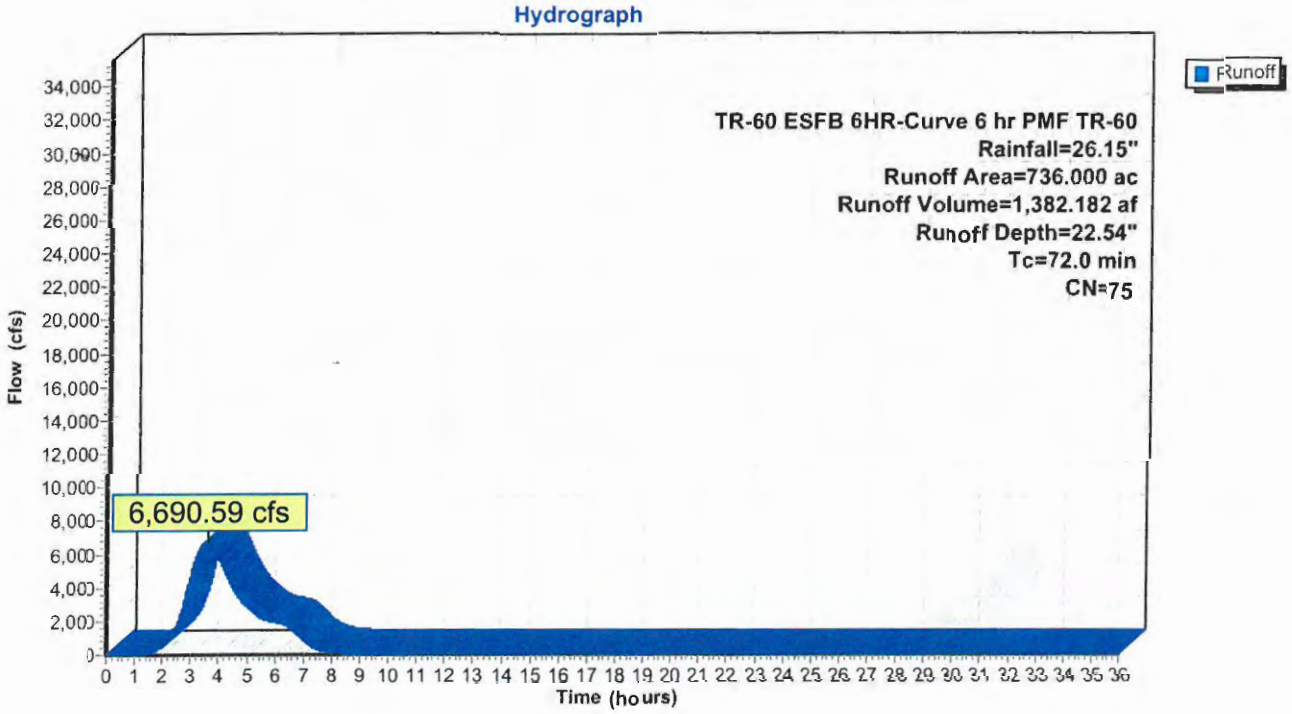
Runoff = 6,690.59 cfs @ 3.60 hrs, Volume= 1,382.182 af, Depth=22.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6 hr PMF TR-60 Rainfall=26.15"

Area (ac)	CN	Description
736.000	75	1/4 acre lots, 38% imp, HSG B
456.320		62.00% Pervious Area
279.680		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
72.0					**Direct Entry, HEC-1 Lag Time = 0.72 hr**

Subcatchment HYD13: HYD13 Watershed



Summary for Subcatchment HYD14: HYD14 Watershed

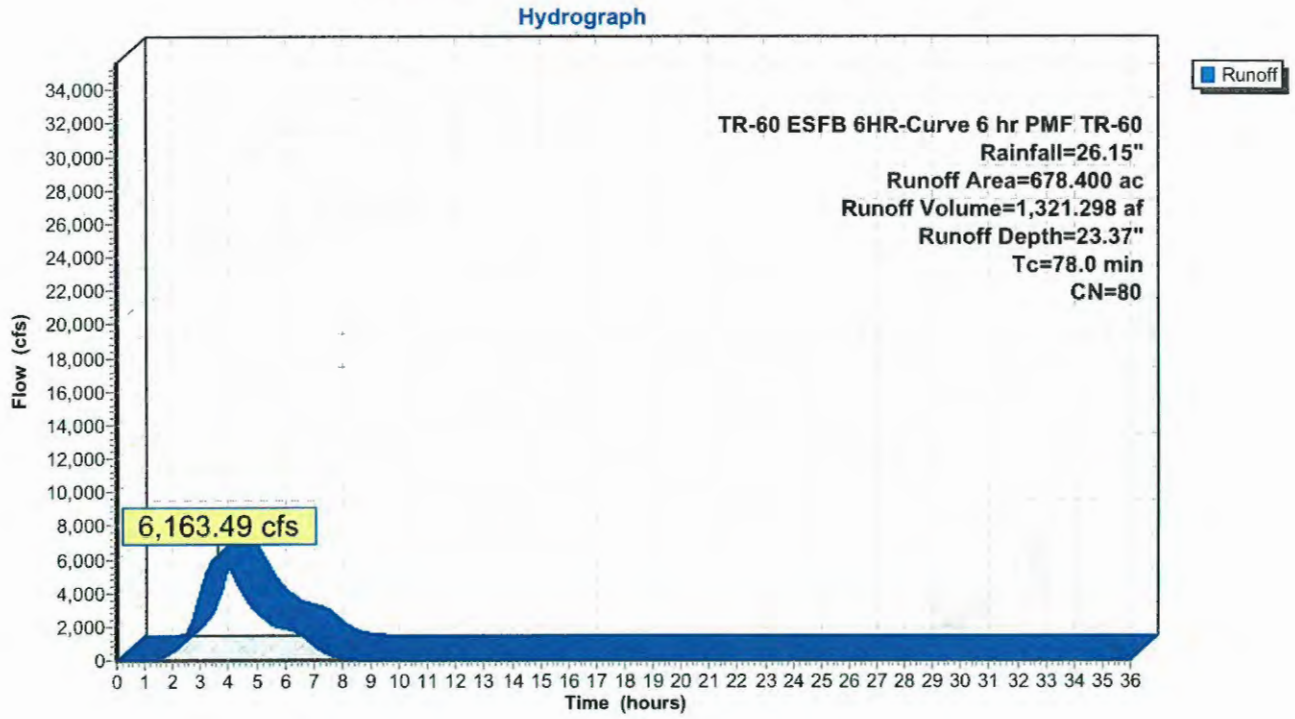
Runoff = 6,163.49 cfs @ 3.64 hrs, Volume= 1,321.298 af, Depth=23.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6 hr PMF TR-60 Rainfall=26.15"

Area (ac)	CN	Description
678.400	80	1/2 acre lots, 25% imp, HSG C
508.800		75.00% Pervious Area
169.600		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.0					**Direct Entry, HEC-1 Lag Time = 0.78 hr**

Subcatchment HYD14: HYD14 Watershed



Summary for Subcatchment HYD6: HYD6 Watershed

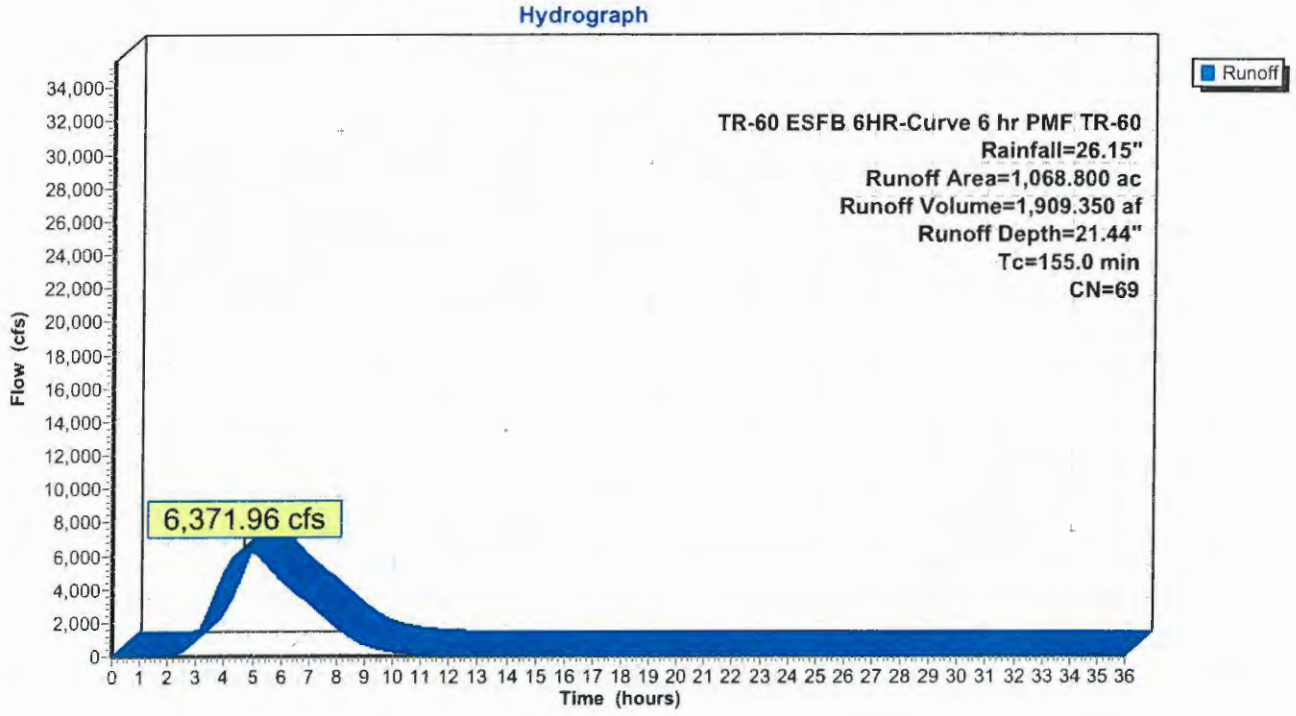
Runoff = 6,371.96 cfs @ 4.66 hrs, Volume= 1,909.350 af, Depth=21.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6 hr PMF TR-60 Rainfall=26.15"

Area (ac)	CN	Description
1,068.800	69	Pasture/grassland/range, Fair, HSG B
1,068.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
155.0					**Direct Entry, HEC-1 Lag Time = 1.55 hr**

Subcatchment HYD6: HYD6 Watershed



Summary for Subcatchment HYD8: Sippo Lake Watershed

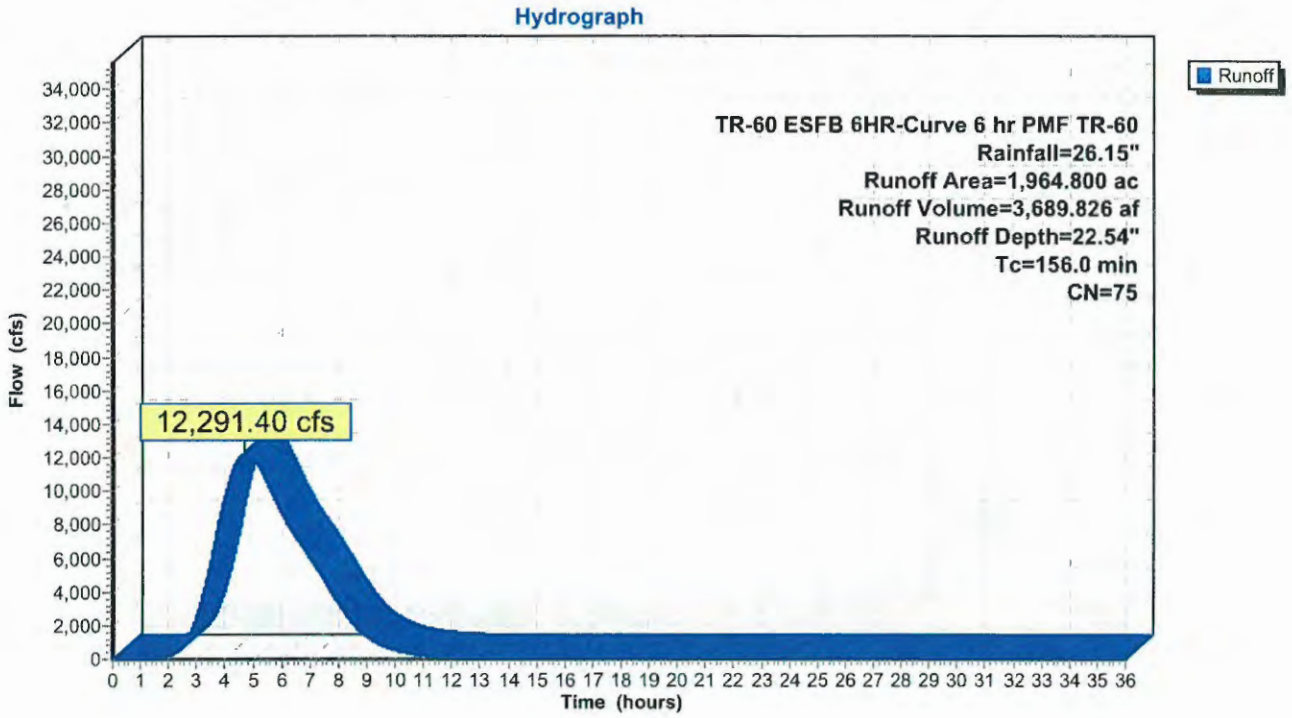
Runoff = 12,291.40 cfs @ 4.68 hrs, Volume= 3,689.826 af, Depth=22.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6 hr PMF TR-60 Rainfall=26.15"

Area (ac)	CN	Description
1,964.800	75	1/4 acre lots, 38% imp, HSG B
1,218.176		62.00% Pervious Area
746.624		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
156.0					**Direct Entry, HEC-1 Lag Time = 1.56hr**

Subcatchment HYD8: Sippo Lake Watershed



Summary for Subcatchment HYD9: HYD9 Watershed

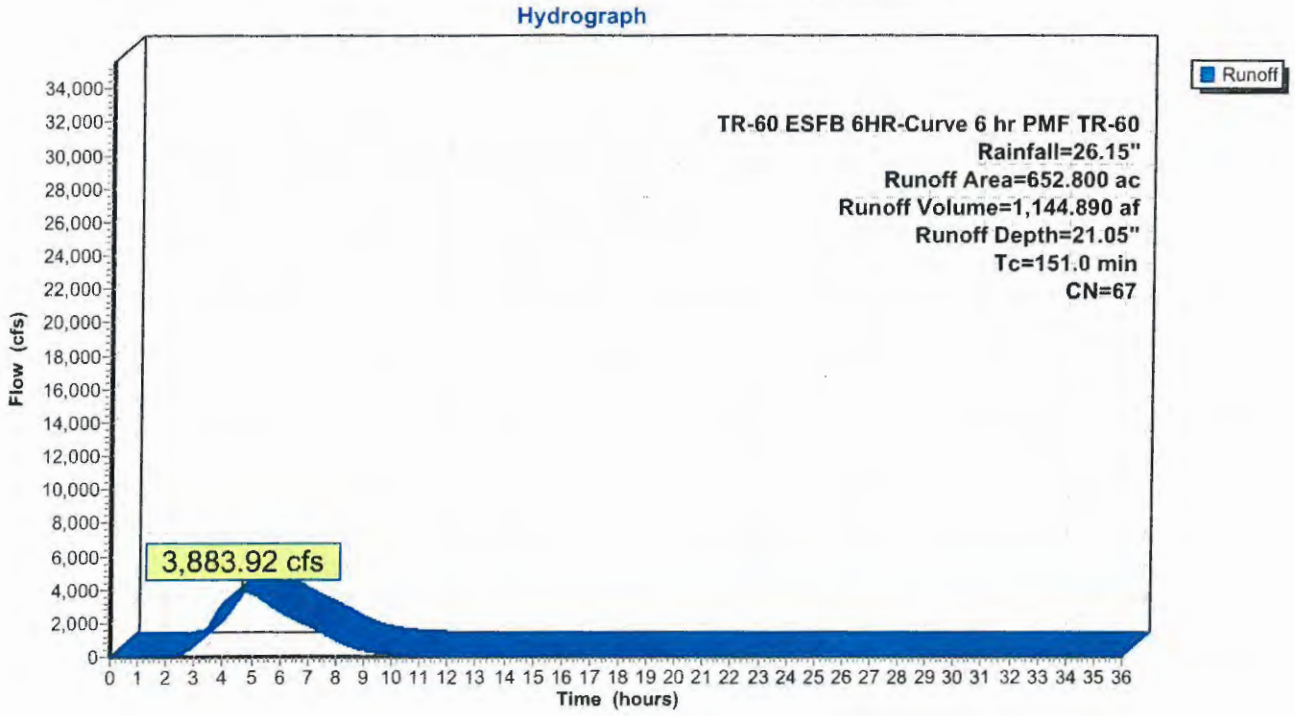
Runoff = 3,883.92 cfs @ 4.70 hrs, Volume= 1,144.890 af, Depth=21.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6 hr PMF TR-60 Rainfall=26.15"

	Area (ac)	CN	Description
*	652.800	67	
	652.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
151.0					**Direct Entry, HEC-1 Lag Time = 1.51hr**

Subcatchment HYD9: HYD9 Watershed



Summary for Reach 5R: Channel 5

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 22.33" for 6 hr PMF TR-60 event
Inflow = 6,815.05 cfs @ 6.63 hrs, Volume= 3,323.095 af
Outflow = 6,665.91 cfs @ 6.97 hrs, Volume= 3,316.193 af, Atten= 2%, Lag= 20.3 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.96 fps, Min. Travel Time= 14.7 min
Avg. Velocity = 6.06 fps, Avg. Travel Time= 24.2 min

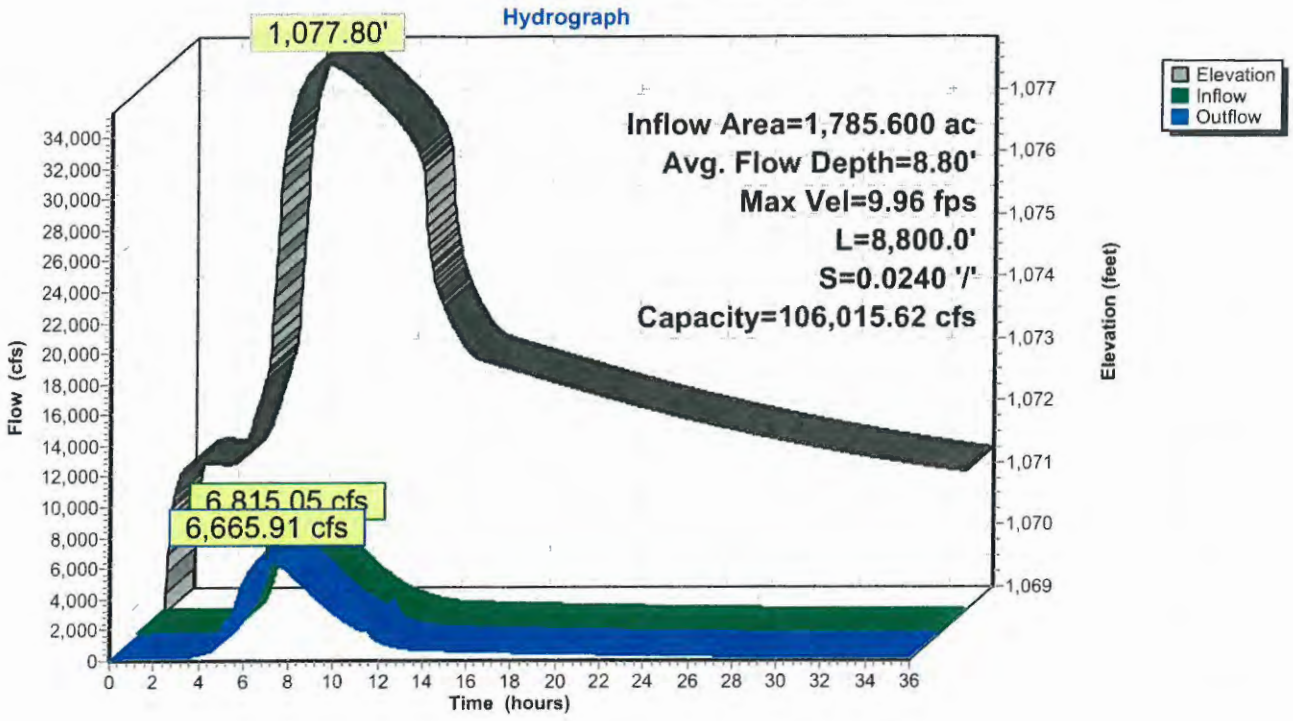
Peak Storage= 9,397,422 cf @ 6.97 hrs
Average Depth at Peak Storage= 8.80'
Defined Flood Depth= 16.00', Capacity at Flood Depth= 106,015.62 cfs
Bank-Full Depth= 16.00', Capacity at Bank-Full= 106,015.62 cfs

Custom cross-section, Length= 8,800.0' Slope= 0.0240 '/' (102 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,069.00', Outlet Invert= 857.80'

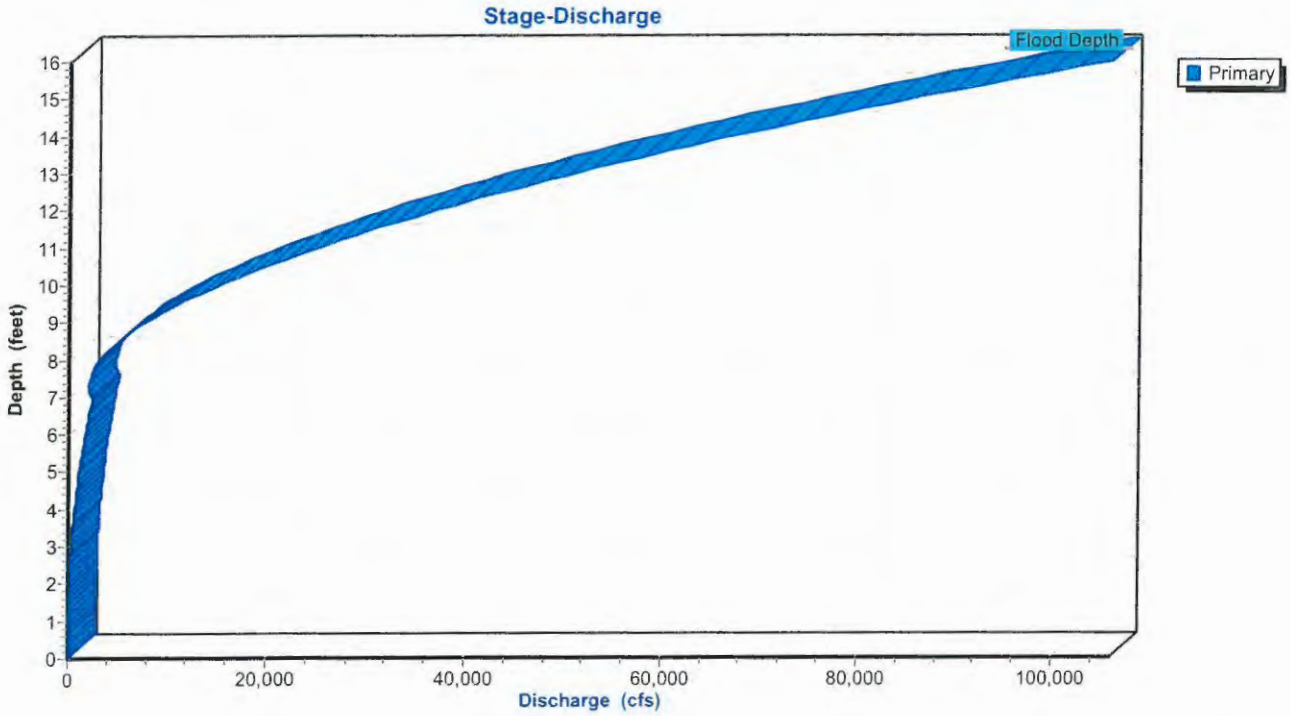
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,085.00	0.00		
200.00	1,078.00	7.00	0.060	
465.00	1,076.00	9.00	0.060	
494.00	1,069.00	16.00	0.050	
500.00	1,069.00	16.00	0.060	
530.00	1,076.00	9.00	0.060	
900.00	1,077.00	8.00	0.060	
1,000.00	1,085.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	6.0	0	0.00
7.00	248.5	66.6	2,186,800	2,476.94
8.00	564.8	569.1	4,969,800	3,087.89
9.00	1,204.8	714.2	10,601,800	7,790.91
16.00	7,198.5	1,002.1	63,346,800	106,015.62

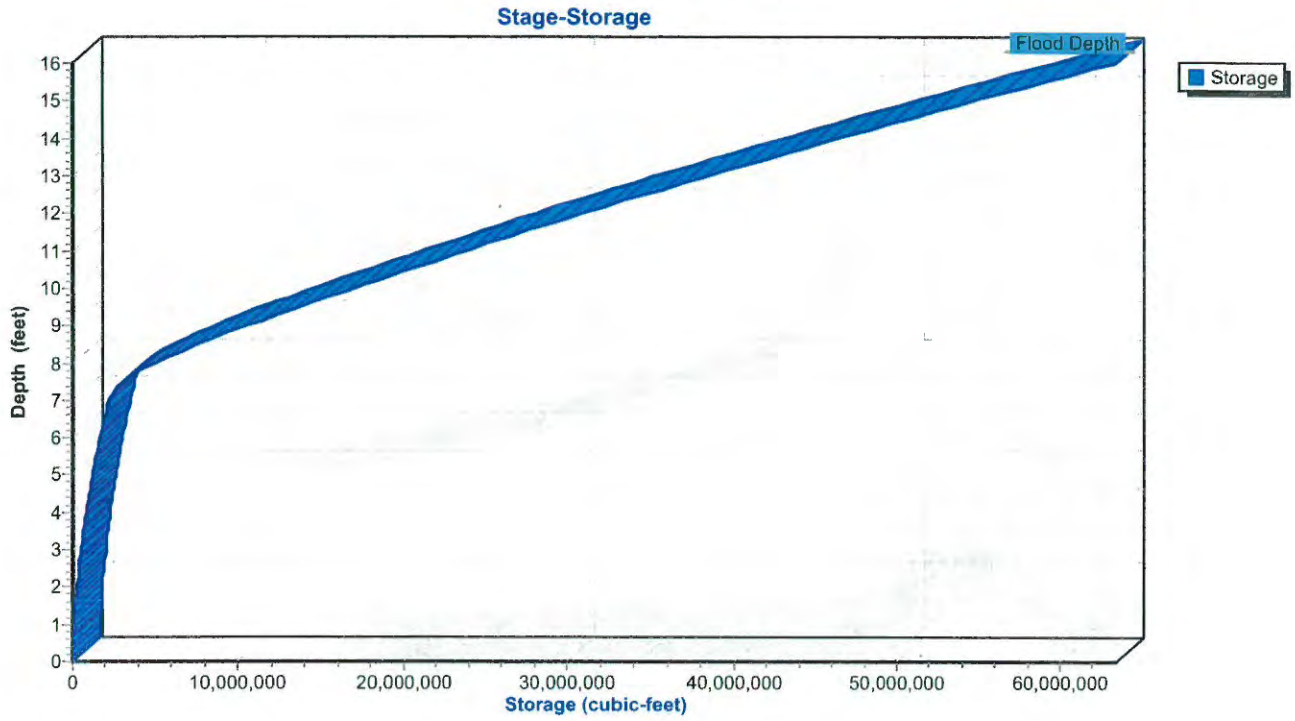
Reach 5R: Channel 5



Reach 5R: Channel 5



Reach 5R: Channel 5



Summary for Reach 7R: Channel 7

Inflow Area = 2,860.800 ac, 23.34% Impervious, Inflow Depth > 21.89" for 6 hr PMF TR-60 event
Inflow = 9,680.66 cfs @ 6.63 hrs, Volume= 5,219.296 af
Outflow = 9,512.17 cfs @ 6.91 hrs, Volume= 5,207.816 af, Atten= 2%, Lag= 17.0 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.19 fps, Min. Travel Time= 23.5 min
Avg. Velocity = 2.85 fps, Avg. Travel Time= 34.6 min

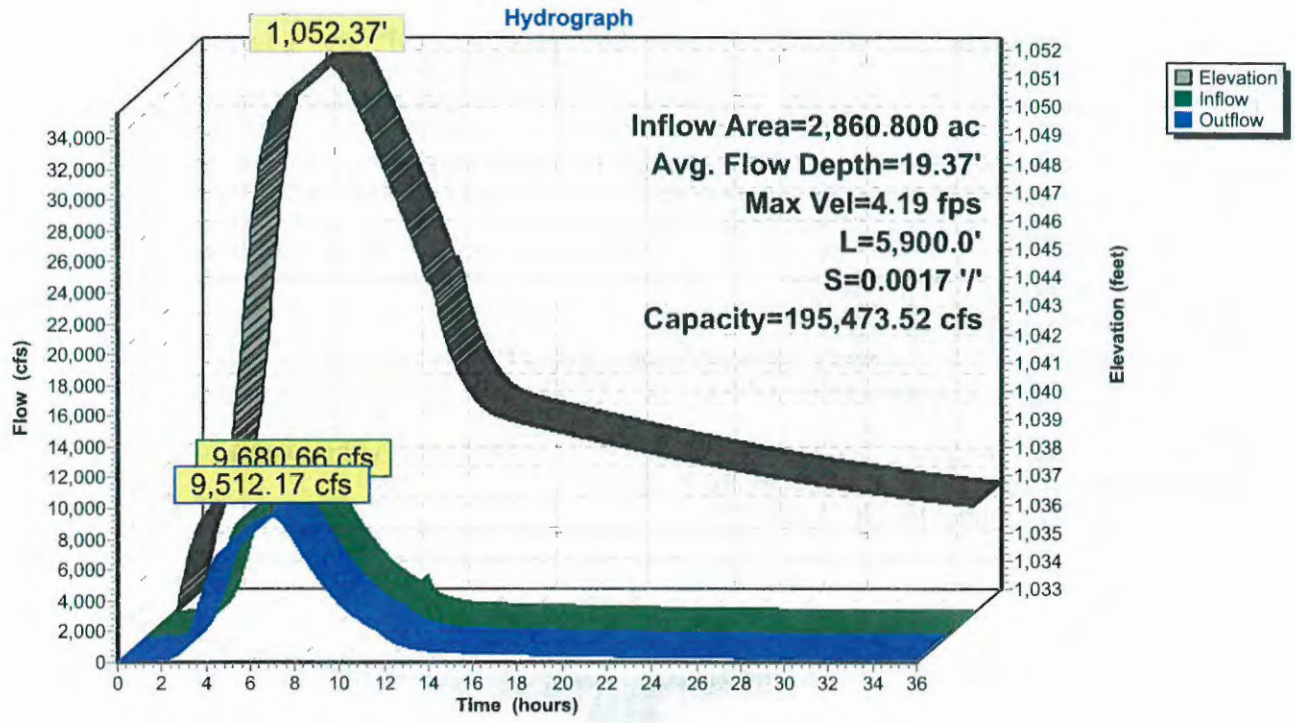
Peak Storage= 13,400,691 cf @ 6.91 hrs
Average Depth at Peak Storage= 19.37'
Defined Flood Depth= 47.00', Capacity at Flood Depth= 195,473.52 cfs
Bank-Full Depth= 47.00', Capacity at Bank-Full= 195,473.52 cfs

Custom cross-section, Length= 5,900.0' Slope= 0.0017 '/' (104 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,033.00', Outlet Invert= 1,022.97'

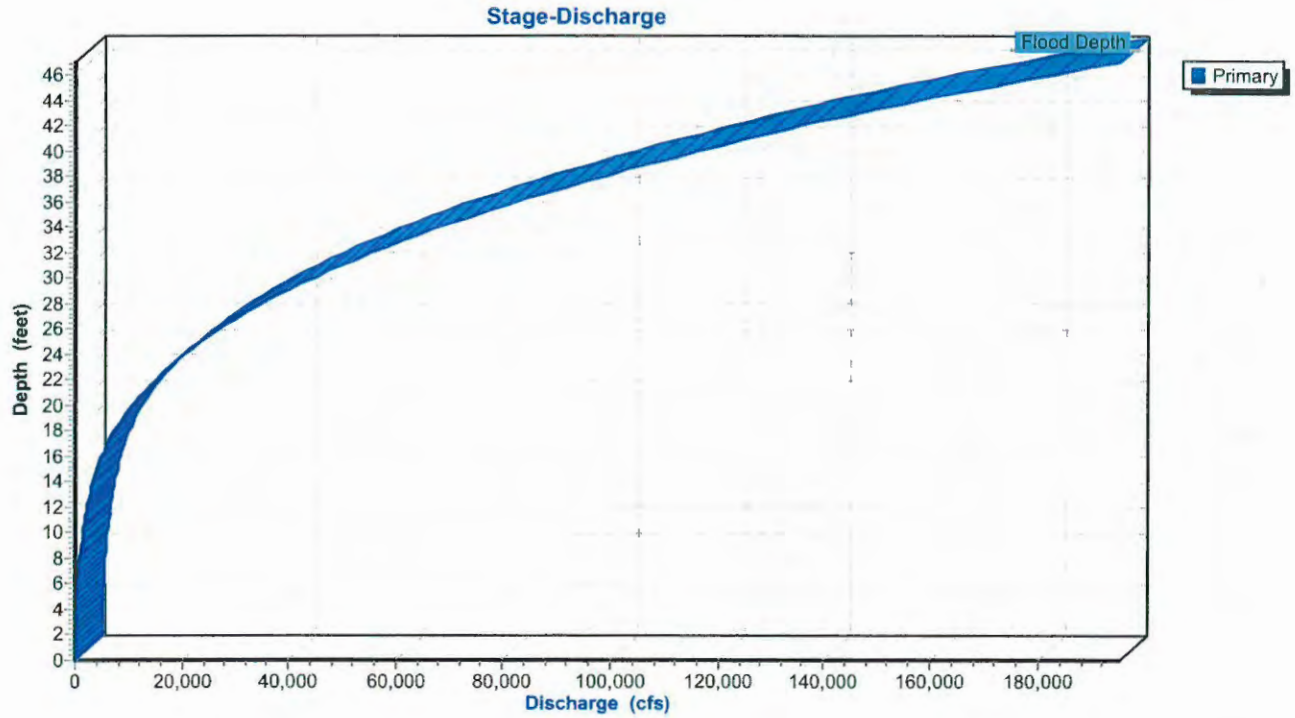
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,080.00	0.00		
100.00	1,065.00	15.00	0.060	
350.00	1,052.00	28.00	0.060	
460.00	1,045.00	35.00	0.060	
490.00	1,033.00	47.00	0.050	
500.00	1,033.00	47.00	0.050	
550.00	1,045.00	35.00	0.060	
700.00	1,052.00	28.00	0.060	
1,000.00	1,075.00	5.00	0.060	
1,005.00	1,080.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	10.0	0	0.00
12.00	600.0	93.7	3,540,000	2,349.60
19.00	2,140.0	354.1	12,626,000	8,862.05
32.00	9,417.2	774.5	55,561,326	55,339.93
42.00	18,098.3	972.7	106,780,167	135,620.34
47.00	23,027.5	1,013.5	135,862,250	195,473.52

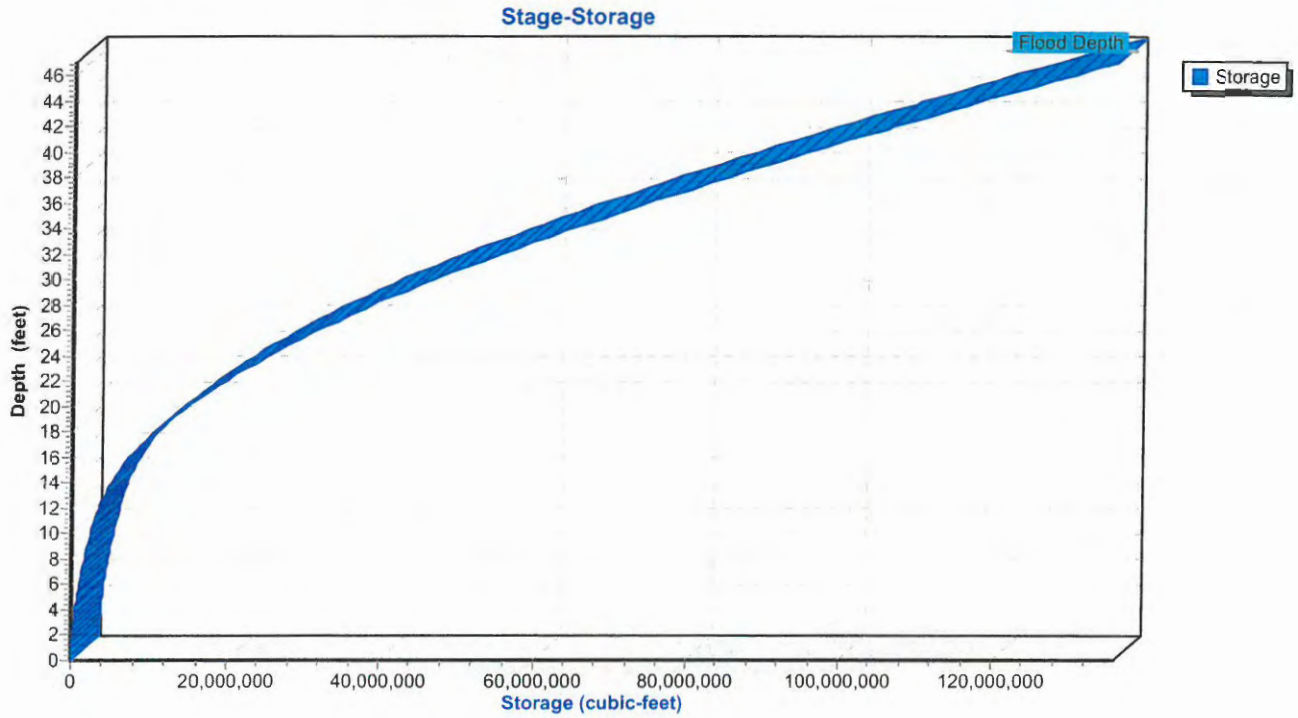
Reach 7R: Channel 7



Reach 7R: Channel 7



Reach 7R: Channel 7



Summary for Reach 10Ra: Channel 10 (Reach West of Genoa Rd)

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth > 20.87" for 6 hr PMF TR-60 event
Inflow = 8,241.98 cfs @ 6.31 hrs, Volume= 3,417.777 af
Outflow = 8,238.61 cfs @ 6.37 hrs, Volume= 3,416.977 af, Atten= 0%, Lag= 3.4 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.28 fps, Min. Travel Time= 4.6 min
Avg. Velocity = 2.50 fps, Avg. Travel Time= 6.0 min

Peak Storage= 2,380,441 cf @ 6.37 hrs
Average Depth at Peak Storage= 9.70'
Defined Flood Depth= 15.00', Capacity at Flood Depth= 36,685.79 cfs
Bank-Full Depth= 15.00', Capacity at Bank-Full= 36,685.79 cfs

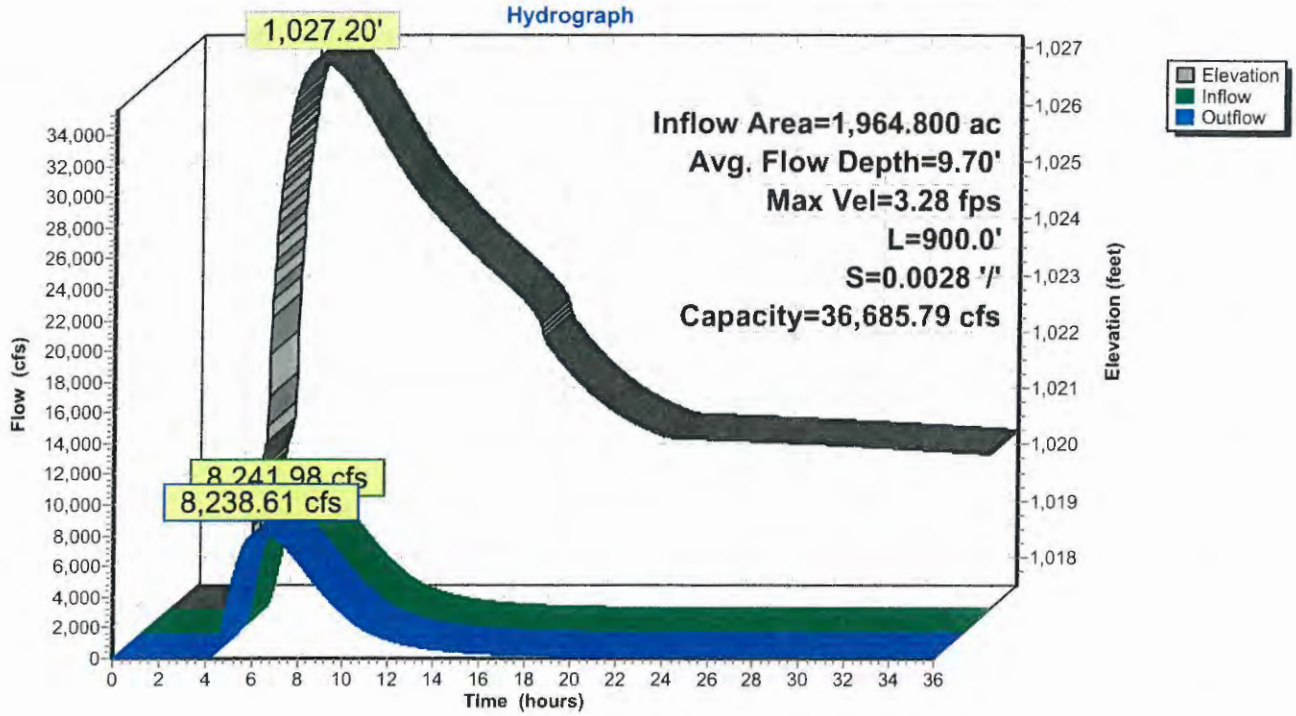
Custom cross-section, Length= 900.0' Slope= 0.0028 '/' (103 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,017.50', Outlet Invert= 1,015.00'

‡

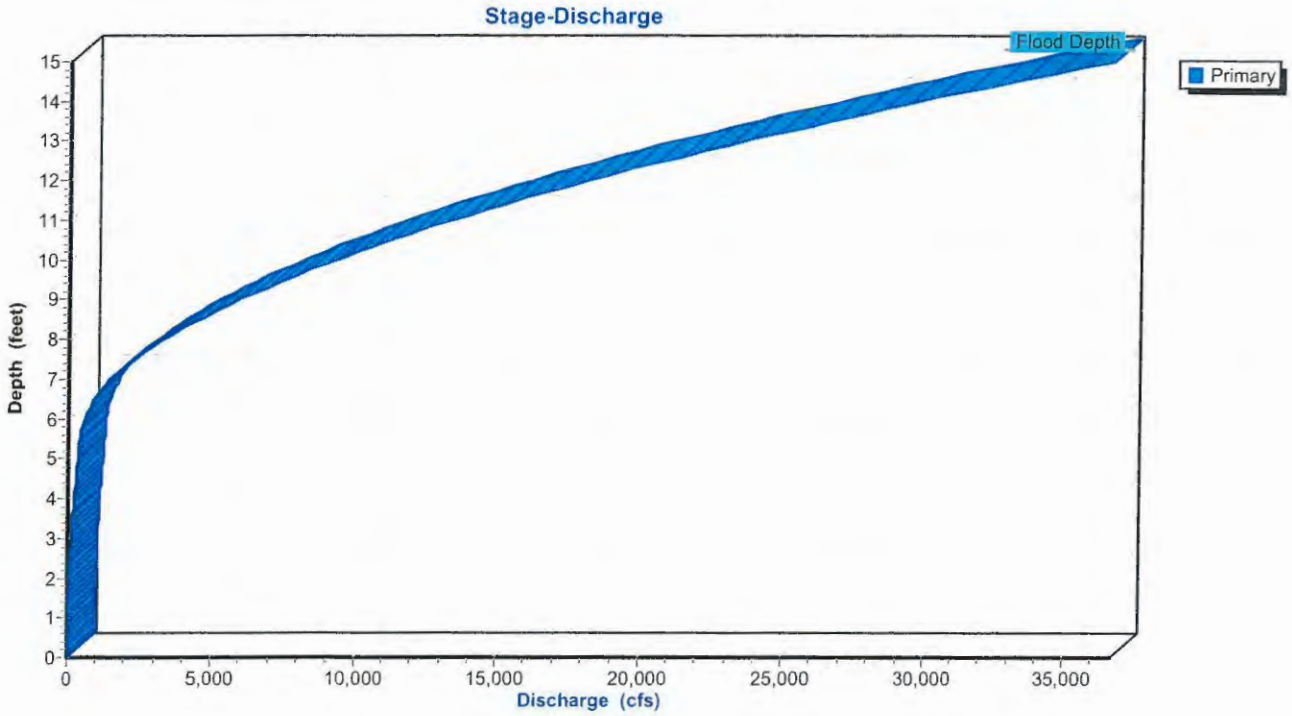
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,032.00	0.00		
190.00	1,024.00	8.00	0.060	
485.00	1,022.00	10.00	0.060	
495.00	1,017.00	15.00	0.050	
505.00	1,017.00	15.00	0.050	
515.00	1,022.00	10.00	0.060	
820.00	1,024.00	8.00	0.060	
900.00	1,027.00	5.00	0.060	
1,000.00	1,032.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	10.0	0	0.00
5.00	100.0	32.4	90,000	328.73
7.00	760.0	632.4	684,000	1,430.41
10.00	2,876.9	783.7	2,589,188	9,317.36
15.00	7,330.0	1,002.7	6,597,000	36,685.79

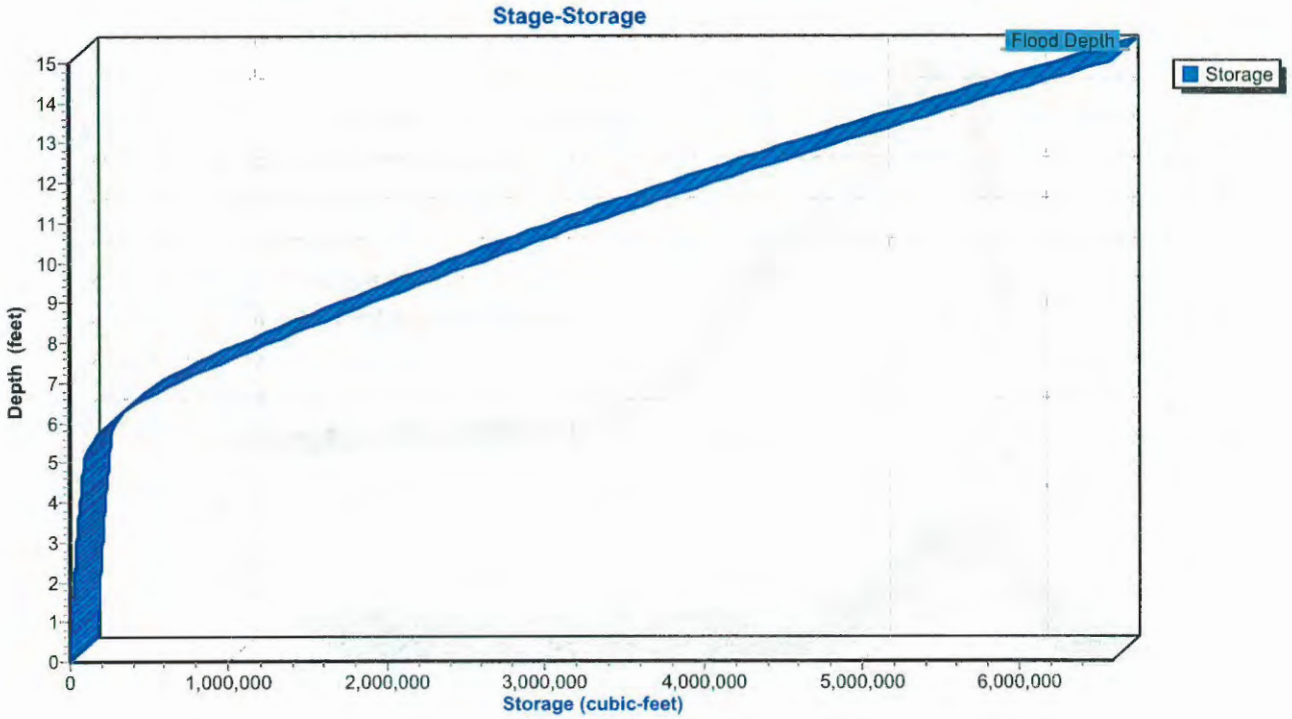
Reach 10Ra: Channel 10 (Reach West of Genoa Rd)



Reach 10Ra: Channel 10 (Reach West of Genoa Rd)



Reach 10Ra: Channel 10 (Reach West of Genoa Rd)



Summary for Reach 15R: Channel 15

Inflow Area = 7,321.600 ac, 19.32% Impervious, Inflow Depth > 21.37" for 6 hr PMF TR-60 event
Inflow = 26,875.65 cfs @ 5.38 hrs, Volume= 13,036.329 af
Outflow = 25,726.43 cfs @ 5.65 hrs, Volume= 12,993.444 af, Atten= 4%, Lag= 16.5 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.13 fps, Min. Travel Time= 35.5 min
Avg. Velocity = 2.01 fps, Avg. Travel Time= 72.9 min

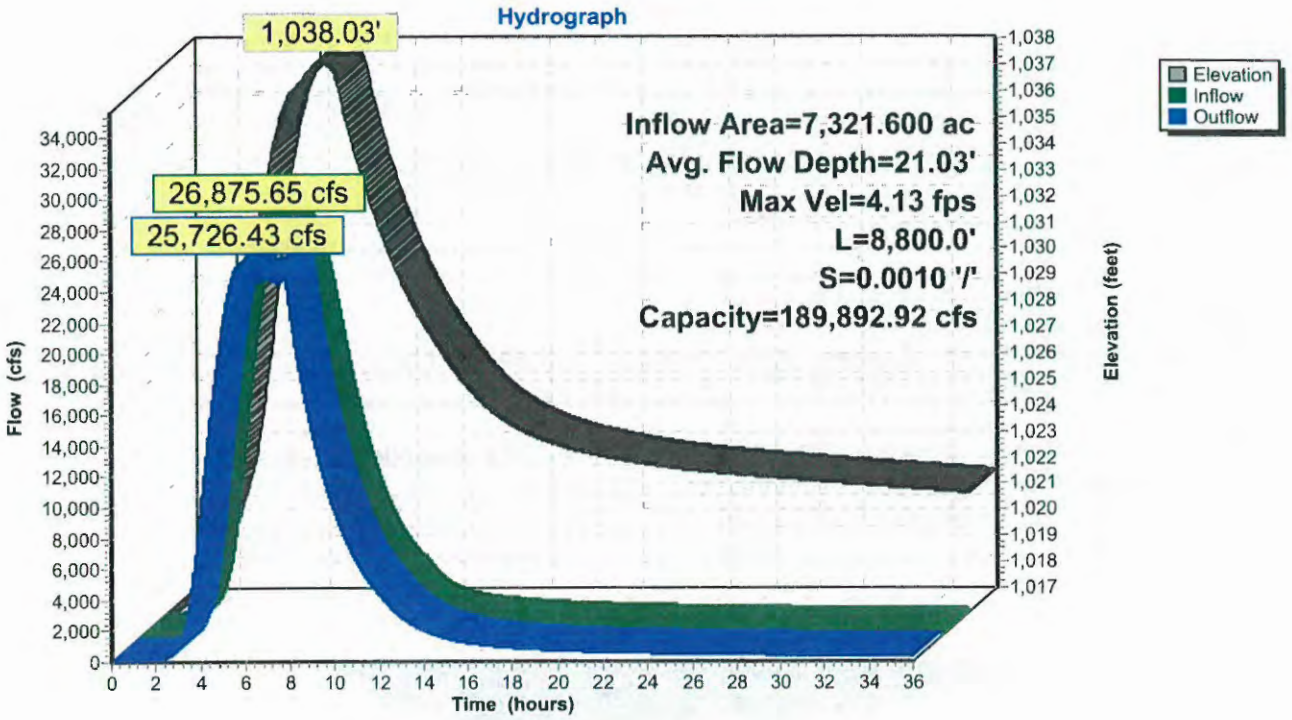
Peak Storage= 60,963,087 cf @ 6.91 hrs
Average Depth at Peak Storage= 21.03'
Defined Flood Depth= 43.00', Capacity at Flood Depth= 189,892.92 cfs
Bank-Full Depth= 43.00', Capacity at Bank-Full= 189,892.92 cfs

Custom cross-section, Length= 8,800.0' Slope= 0.0010 '/' (106 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,017.00', Outlet Invert= 1,008.20'

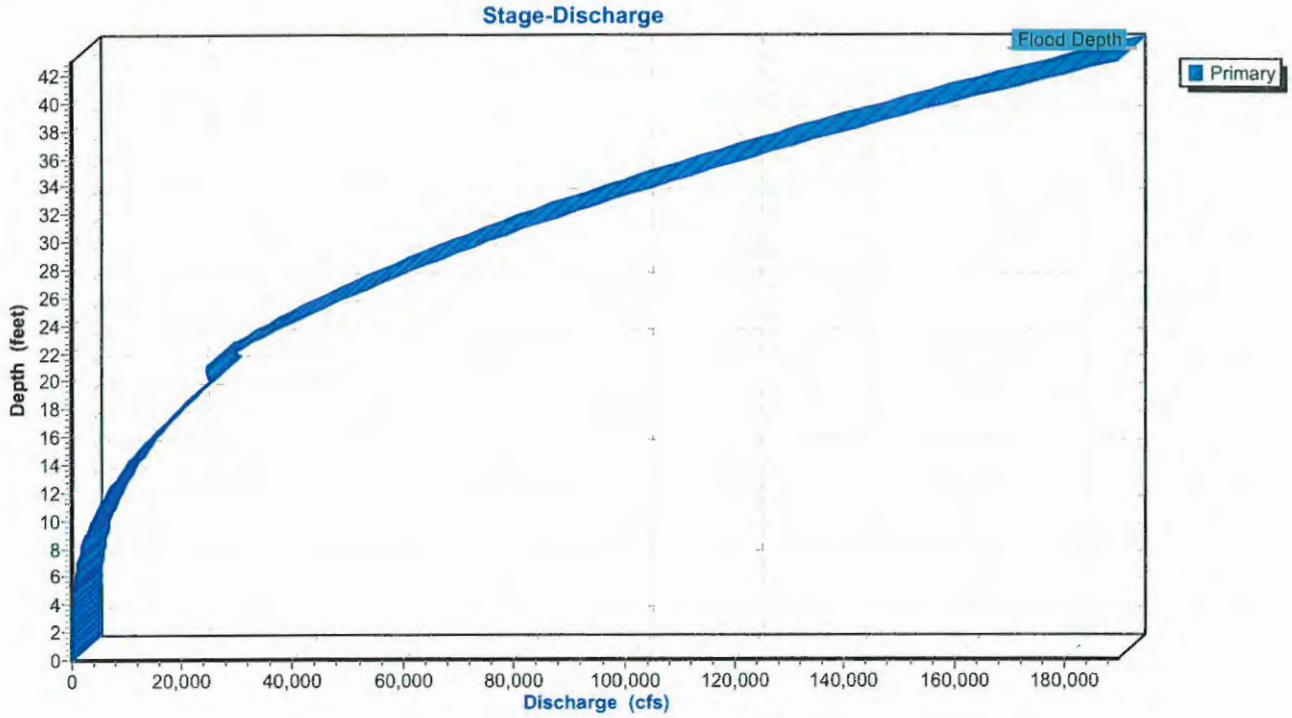
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,060.00	0.00		
300.00	1,026.00	34.00	0.060	
470.00	1,023.00	37.00	0.060	
493.00	1,017.00	43.00	0.050	
507.00	1,017.00	43.00	0.050	
520.00	1,020.00	40.00	0.060	
630.00	1,022.00	38.00	0.060	
750.00	1,037.00	23.00	0.060	
1,000.00	1,038.00	22.00	0.060	
1,010.00	1,060.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	14.0	0	0.00
3.00	78.8	39.2	693,000	116.39
5.00	273.4	157.2	2,406,067	396.99
6.00	435.5	169.2	3,832,400	733.92
9.00	1,230.5	363.4	10,828,400	2,703.81
20.00	6,230.3	549.8	54,826,847	25,737.78
21.00	6,906.8	808.7	60,779,788	24,784.16
43.00	26,881.5	1,028.2	236,557,200	189,892.92

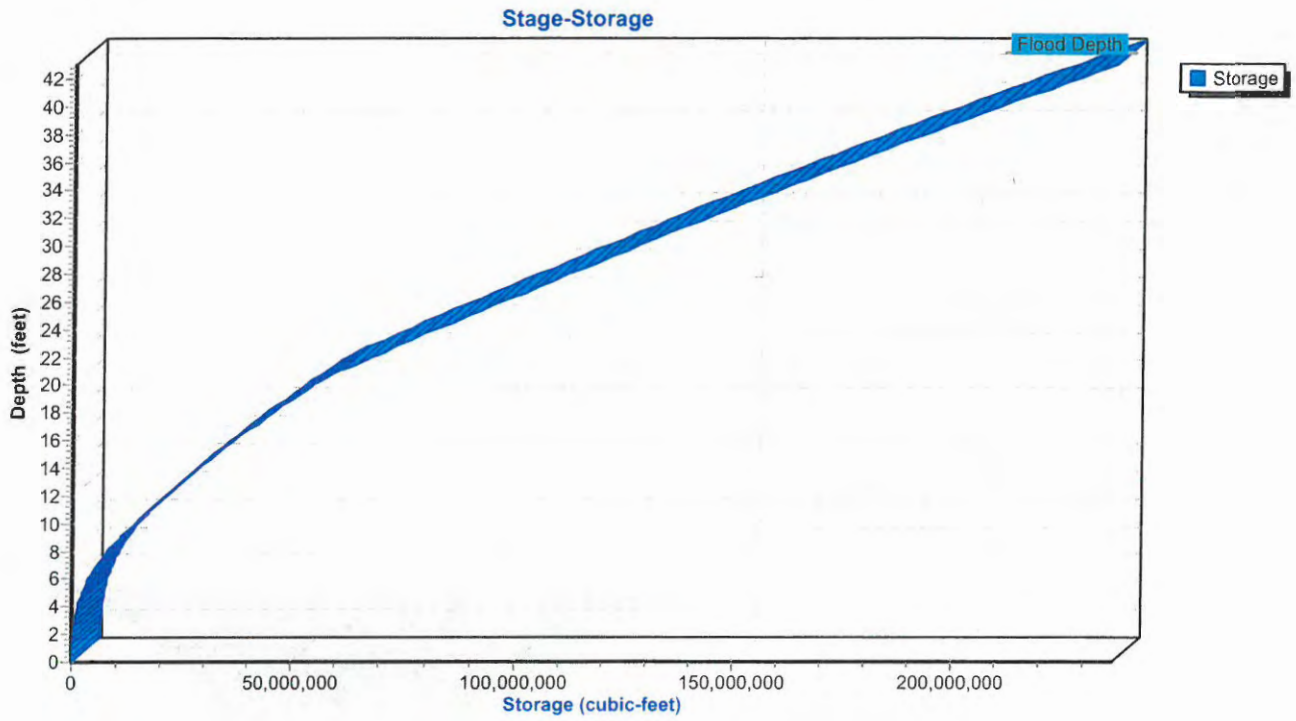
Reach 15R: Channel 15



Reach 15R: Channel 15



Reach 15R: Channel 15



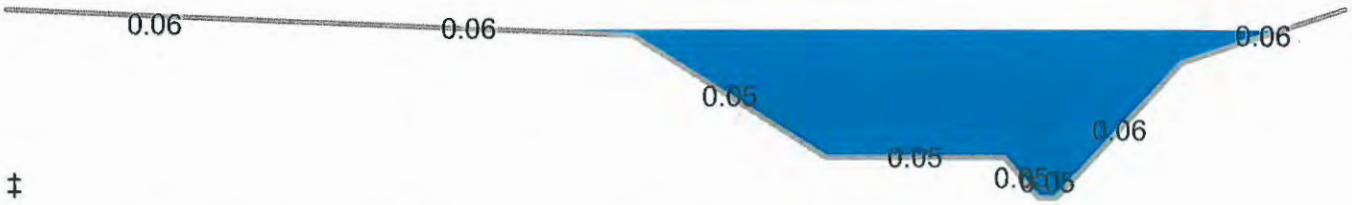
Summary for Reach 16R: Channel 16

Inflow Area = 8,780.800 ac, 19.29% Impervious, Inflow Depth > 21.49" for 6 hr PMF TR-60 event
Inflow = 30,666.22 cfs @ 5.66 hrs, Volume= 15,722.689 af
Outflow = 29,994.14 cfs @ 5.80 hrs, Volume= 15,677.921 af, Atten= 2%, Lag= 8.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.15 fps, Min. Travel Time= 24.3 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 54.7 min

Peak Storage= 43,668,232 cf @ 5.80 hrs
Average Depth at Peak Storage= 24.88'
Defined Flood Depth= 28.00', Capacity at Flood Depth= 42,389.29 cfs
Bank-Full Depth= 28.00', Capacity at Bank-Full= 42,389.29 cfs

Custom cross-section, Length= 7,500.0' Slope= 0.0010 '/' (104 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,006.00', Outlet Invert= 998.50'

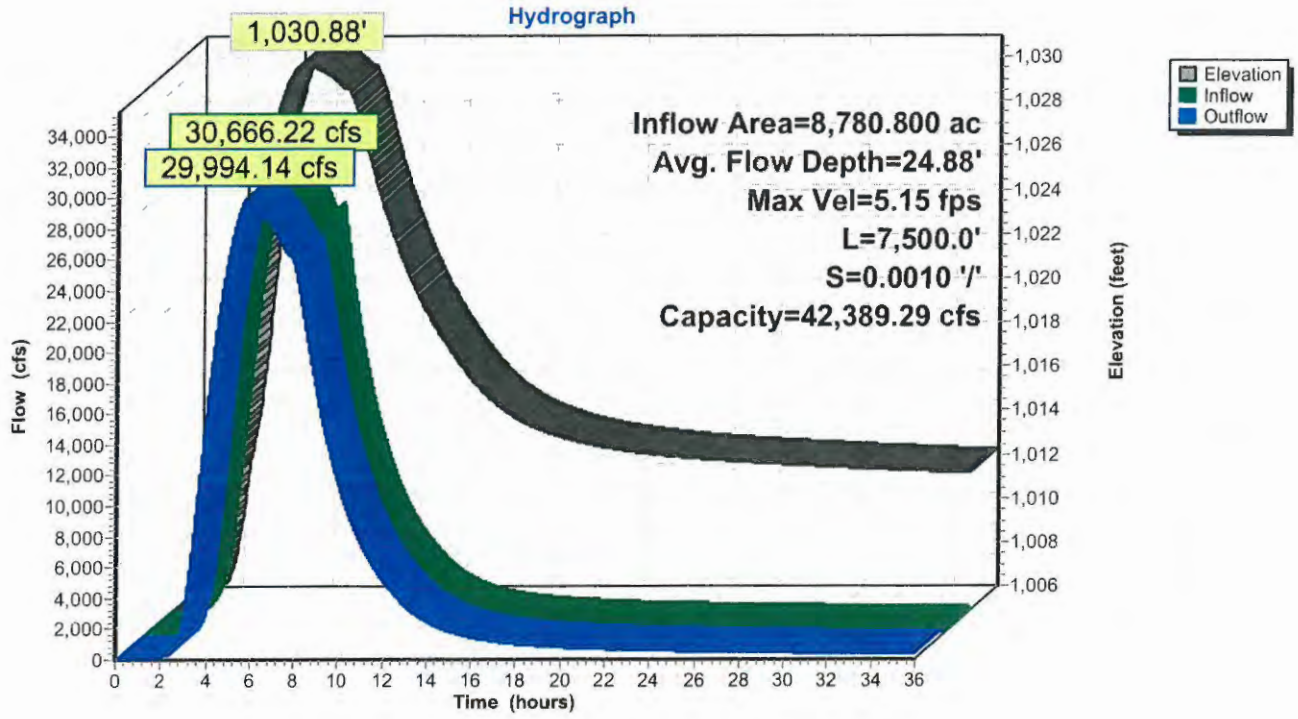


‡

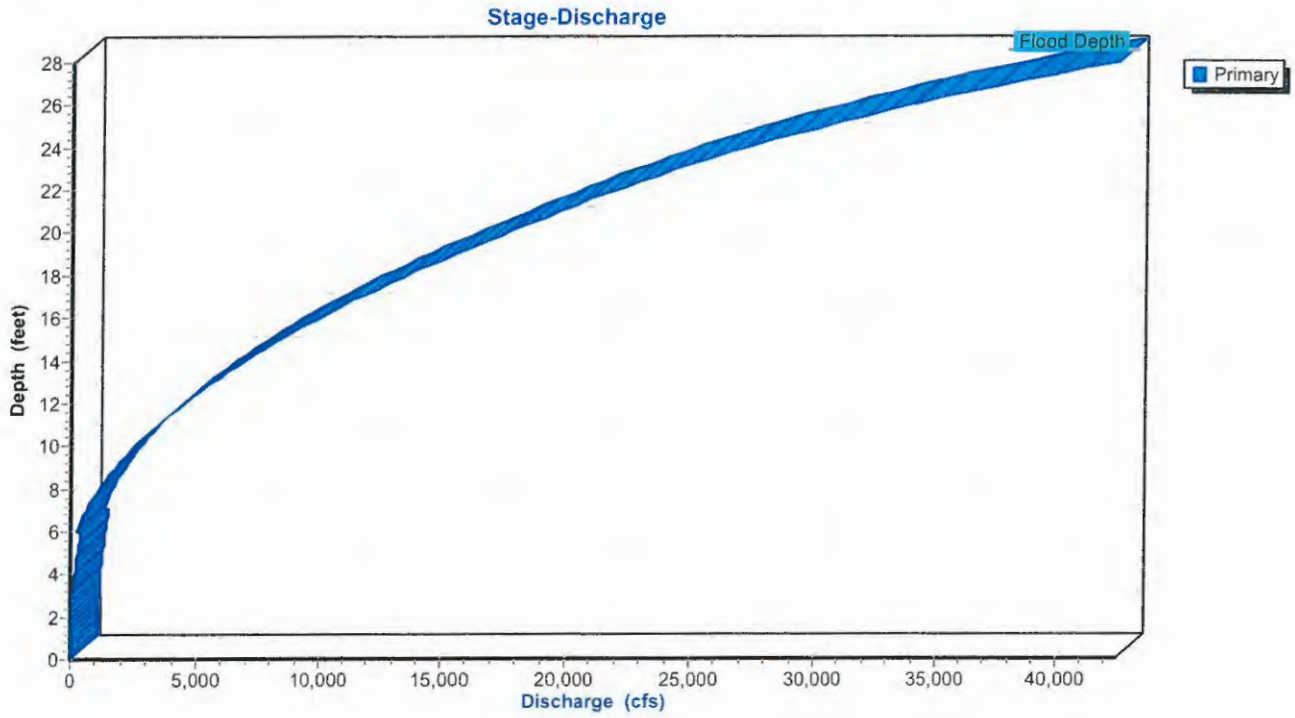
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,034.00	0.00		
200.00	1,032.00	2.00	0.060	
420.00	1,030.00	4.00	0.060	
550.00	1,012.00	22.00	0.050	
670.00	1,012.00	22.00	0.050	
693.00	1,006.00	28.00	0.050	
705.00	1,006.00	28.00	0.050	
790.00	1,026.00	8.00	0.060	
900.00	1,034.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	12.0	0	0.00
6.00	217.5	182.0	1,631,250	246.41
20.00	3,868.8	345.2	29,015,833	17,663.27
24.00	5,401.0	429.5	40,507,500	27,141.14
26.00	6,498.5	677.1	48,738,750	33,993.67
28.00	8,071.0	904.6	60,532,500	42,389.29

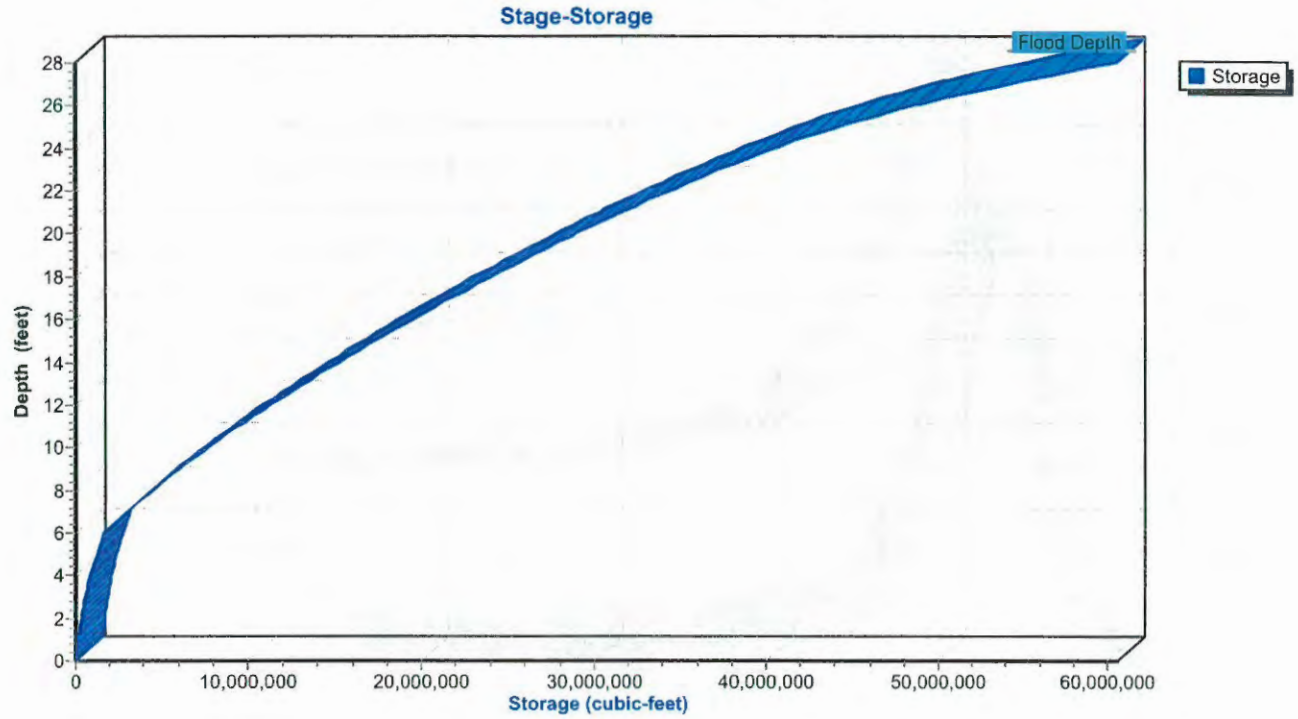
Reach 16R: Channel 16



Reach 16R: Channel 16



Reach 16R: Channel 16



Summary for Reach 18R: Sippo Creek Channel Downstream of Lincoln Way

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 21.54" for 6 hr PMF TR-60 event
Inflow = 31,762.22 cfs @ 5.97 hrs, Volume= 16,983.052 af
Outflow = 31,762.34 cfs @ 5.98 hrs, Volume= 16,982.927 af, Atten= 0%, Lag= 0.4 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 15.14 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 10.00 fps, Avg. Travel Time= 0.8 min

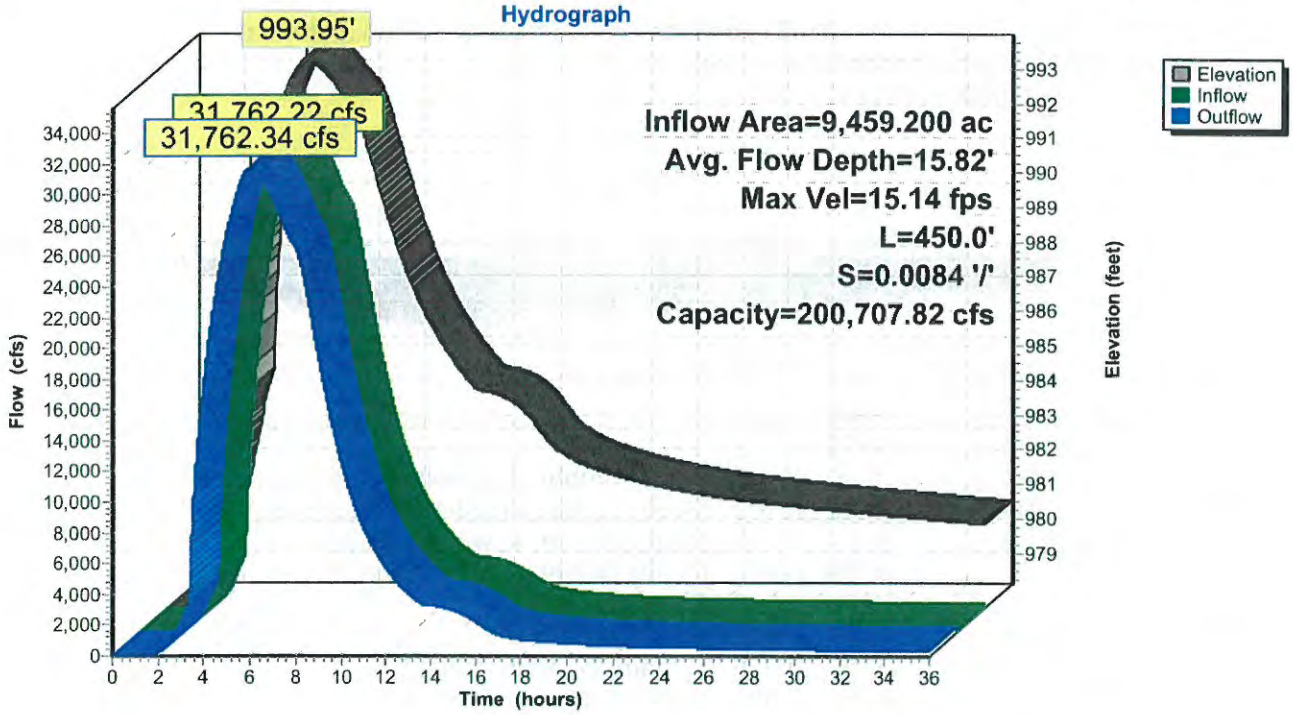
Peak Storage= 944,202 cf @ 5.98 hrs
Average Depth at Peak Storage= 15.82'
Defined Flood Depth= 15.00', Capacity at Flood Depth= 28,360.41 cfs
Bank-Full Depth= 40.50', Capacity at Bank-Full= 200,707.82 cfs

Custom cross-section, Length= 450.0' Slope= 0.0084 '/' (1006 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 978.13', Outlet Invert= 974.35'

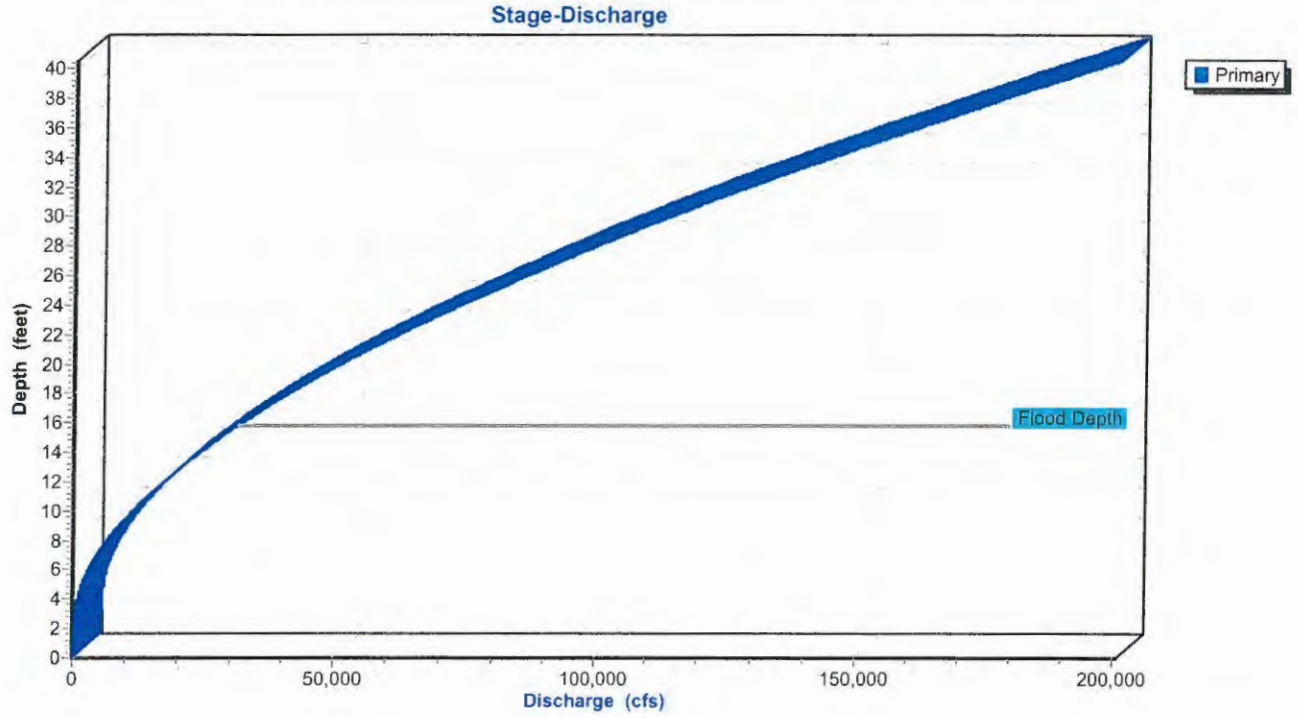
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,012.00	0.00		
20.00	1,008.00	4.00	0.100	Heavy timber, flow below branches
51.00	980.00	32.00	0.100	Heavy timber, flow below branches
74.00	978.00	34.00	0.100	Heavy timber, flow below branches
121.00	976.00	36.00	0.100	Heavy timber, flow below branches
173.00	974.00	38.00	0.030	Short grass
175.00	972.00	40.00	0.030	Short grass
176.00	971.50	40.50	0.025	Stream, clean & straight
187.00	971.50	40.50	0.025	Stream, clean & straight
188.00	972.00	40.00	0.025	Stream, clean & straight
194.00	974.00	38.00	0.030	Short grass
206.00	976.00	36.00	0.100	Heavy timber, flow below branches
225.50	978.00	34.00	0.100	Heavy timber, flow below branches
229.50	980.00	32.00	0.100	Heavy timber, flow below branches
248.00	990.00	22.00	0.100	Heavy timber, flow below branches
265.00	1,000.00	12.00	0.100	Heavy timber, flow below branches
289.00	1,012.00	0.00	0.100	Heavy timber, flow below branches

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	11.0	0	0.00
0.50	6.0	13.2	2,700	19.29
2.50	40.0	22.4	18,000	347.53
4.50	146.0	86.6	65,701	1,300.01
6.50	382.5	153.2	172,125	3,703.14
8.50	712.5	180.8	320,625	7,536.06
18.50	2,645.4	216.7	1,190,411	44,005.23
28.50	4,866.4	251.4	2,189,893	103,800.74
36.50	6,855.0	281.2	3,084,750	166,501.22
40.50	7,955.0	310.6	3,579,750	200,707.82

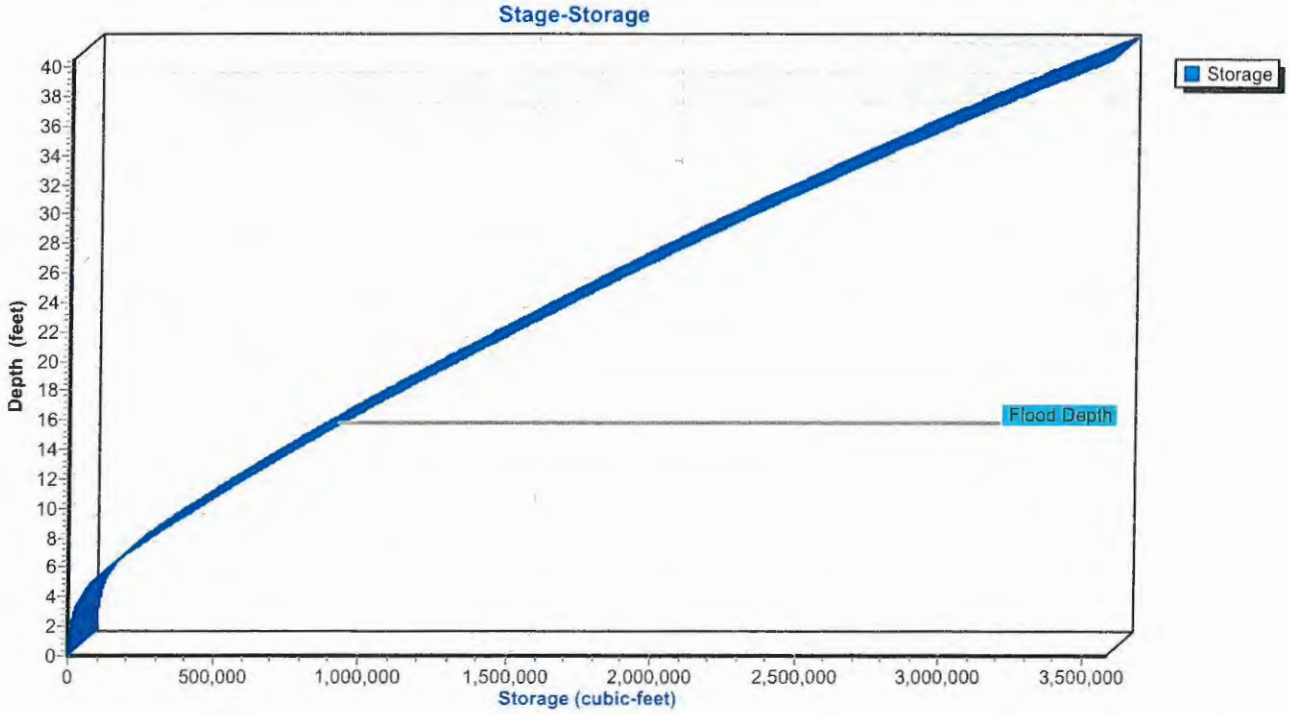
Reach 18R: Sippo Creek Channel Downstream of Lincoln Way



Reach 18R: Sippo Creek Channel Downstream of Lincoln Way



Reach 18R: Sippo Creek Channel Downstream of Lincoln Way

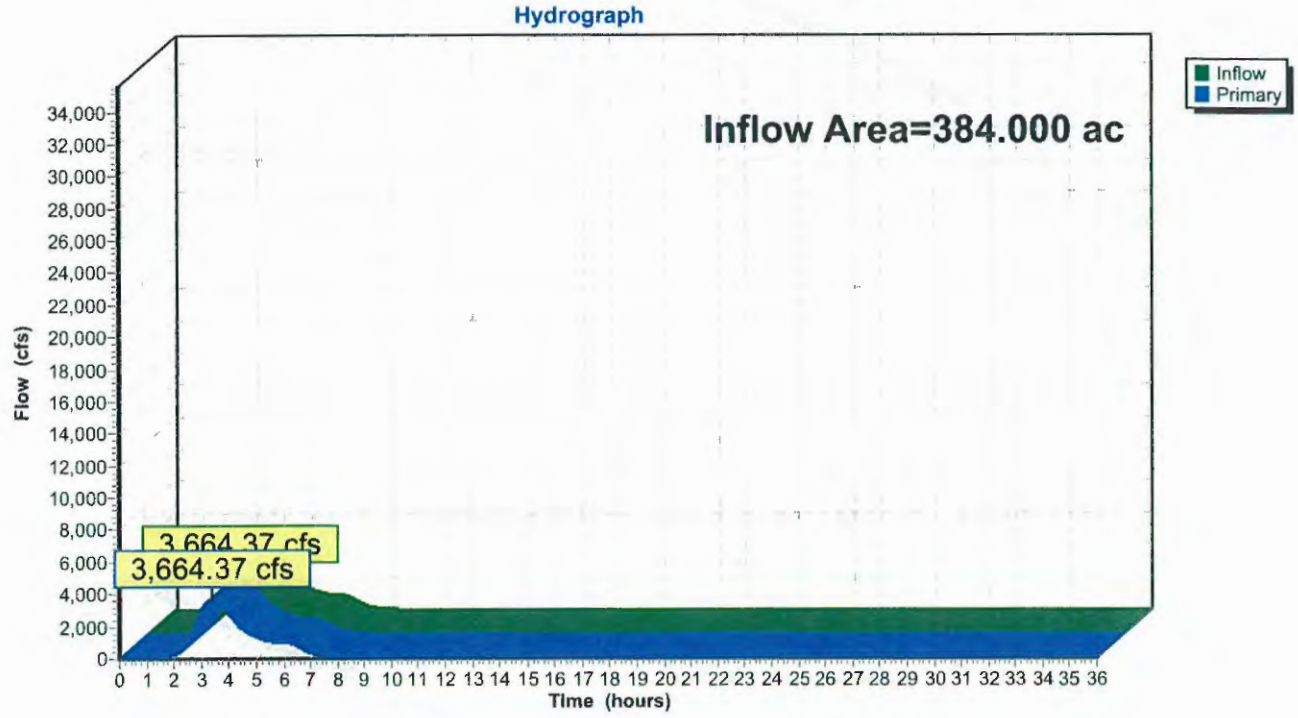


Summary for Pond 1C: CONF 1 Combined O'Springs and Eric

Inflow Area = 384.000 ac, 26.60% Impervious, Inflow Depth = 22.48" for 6 hr PMF TR-60 event
Inflow = 3,664.37 cfs @ 3.39 hrs, Volume= 719.332 af
Primary = 3,664.37 cfs @ 3.40 hrs, Volume= 719.332 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 1C: CONF 1 Combined O'Springs and Eric



Summary for Pond 1P: Sippo Creek Reservoir - Existing Conditions

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 21.56" for 6 hr PMF TR-60 event
Inflow = 31,969.77 cfs @ 5.78 hrs, Volume= 16,998.692 af
Outflow = 31,764.74 cfs @ 5.94 hrs, Volume= 16,984.808 af, Atten= 1%, Lag= 10.1 min
Primary = 6,095.56 cfs @ 5.94 hrs, Volume= 4,787.698 af
Secondary = 20,860.32 cfs @ 5.94 hrs, Volume= 10,293.374 af
Tertiary = 4,808.93 cfs @ 5.95 hrs, Volume= 1,903.735 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,001.64' Surf.Area= 7.050 ac Storage= 60.962 af
Peak Elev= 1,017.39' @ 5.96 hrs Surf.Area= 77.686 ac Storage= 617.831 af (556.869 af above start)
Flood Elev= 1,005.00' Surf.Area= 12.657 ac Storage= 91.431 af (30.469 af above start)

Plug-Flow detention time= 21.5 min calculated for 16,919.146 af (100% of inflow)
Center-of-Mass det. time= 13.2 min (496.5 - 483.3)

Volume	Invert	Avail.Storage	Storage Description
#1	985.00'	1,292.544 af	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
985.00	0.500	500.0	0.000	0.000	0.500
990.00	3.000	1,000.0	7.875	7.875	1.873
998.00	4.870	2,500.0	31.179	39.054	11.469
1,000.00	6.204	3,251.0	11.047	50.101	19.360
1,002.00	7.243	5,147.0	13.434	63.535	48.449
1,004.00	9.610	10,274.0	16.797	80.332	192.887
1,006.00	16.124	11,202.9	25.455	105.787	229.335
1,008.00	21.577	15,736.9	37.569	143.356	452.477
1,010.00	29.674	20,301.4	51.036	194.392	752.988
1,012.00	39.539	22,845.5	68.977	263.369	953.524
1,014.00	68.669	34,370.5	106.876	370.246	2,158.174
1,025.00	100.000	50,000.0	922.298	1,292.544	4,567.204

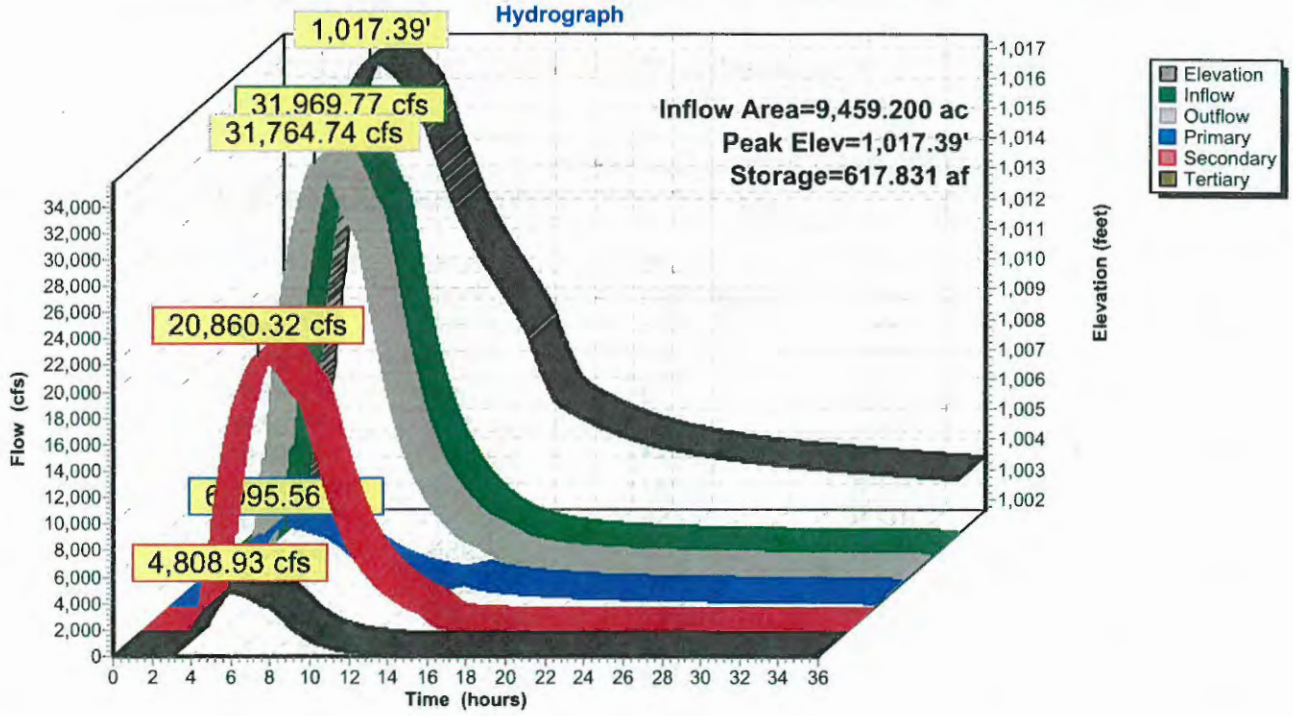
Device	Routing	Invert	Outlet Devices
#1	Primary	1,001.64'	**50.0' long x 2.9' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.45 2.58 2.66 2.66 2.65 2.64 2.65 2.69 2.69 2.73 2.83 2.95 3.01 3.12 3.32
#2	Secondary	1,005.00'	**Right Embankment Weir - Building side, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 1.60 20.00 Width (feet) 17.00 23.00 77.00 77.00
#3	Secondary	1,004.20'	**Left Embankment Weir - Playground side, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 1.80 3.80 5.80 15.80 Width (feet) 10.00 22.00 45.00 130.00 180.00 205.00
#4	Tertiary	1,008.00'	**Weir Flow around Bldg. X 0.50, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.00 4.00 6.00 8.00 10.00 12.00 Width (feet) 50.00 90.00 122.00 166.00 240.00 334.00 420.00

Primary OutFlow Max=6,095.16 cfs @ 5.94 hrs HW=1,017.39' TW=1,014.62' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 6,095.16 cfs @ 7.74 fps)

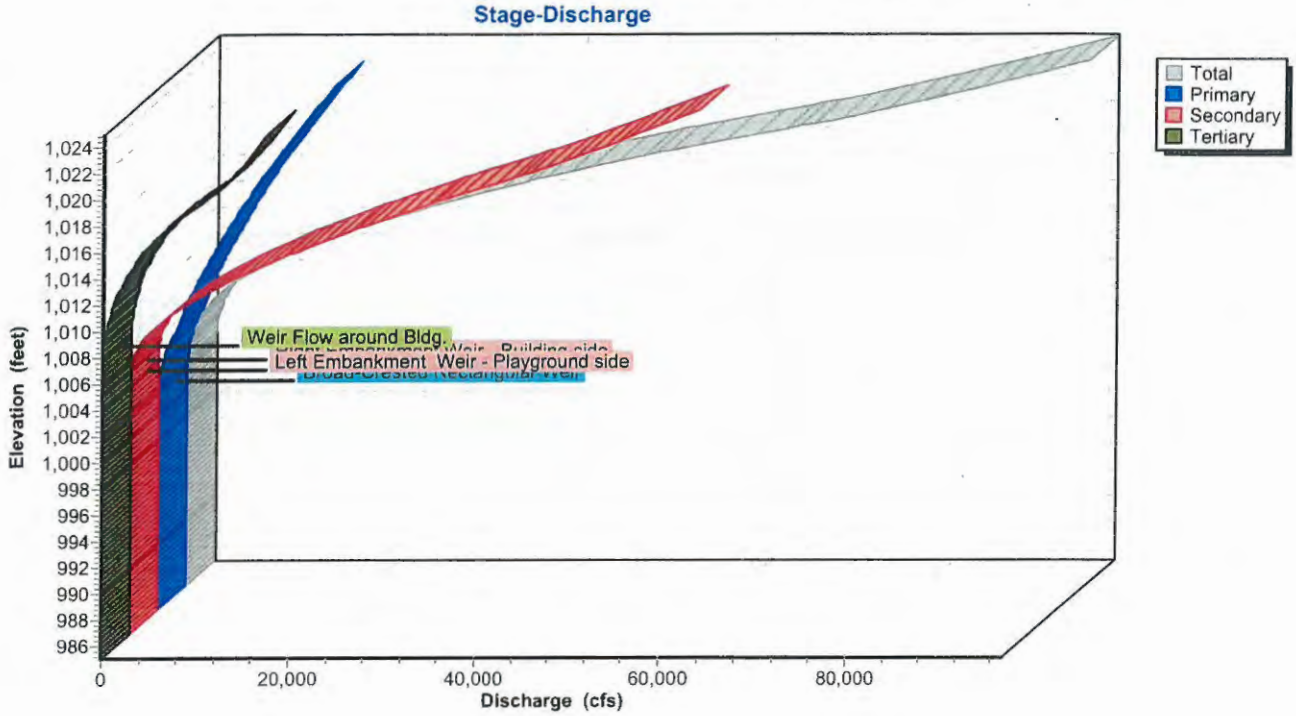
Secondary OutFlow Max=20,858.91 cfs @ 5.94 hrs HW=1,017.39' TW=1,014.62' (Dynamic Tailwater)
├─**2=Right Embankment Weir - Building side** (Weir Controls 6,611.74 cfs @ 7.51 fps)
└─**3=Left Embankment Weir - Playground side** (Weir Controls 14,247.17 cfs @ 7.40 fps)

Tertiary OutFlow Max=4,808.74 cfs @ 5.95 hrs HW=1,017.39' TW=1,014.62' (Dynamic Tailwater)
└─**4=Weir Flow around Bldg.** (Weir Controls 4,808.74 cfs @ 3.38 fps)

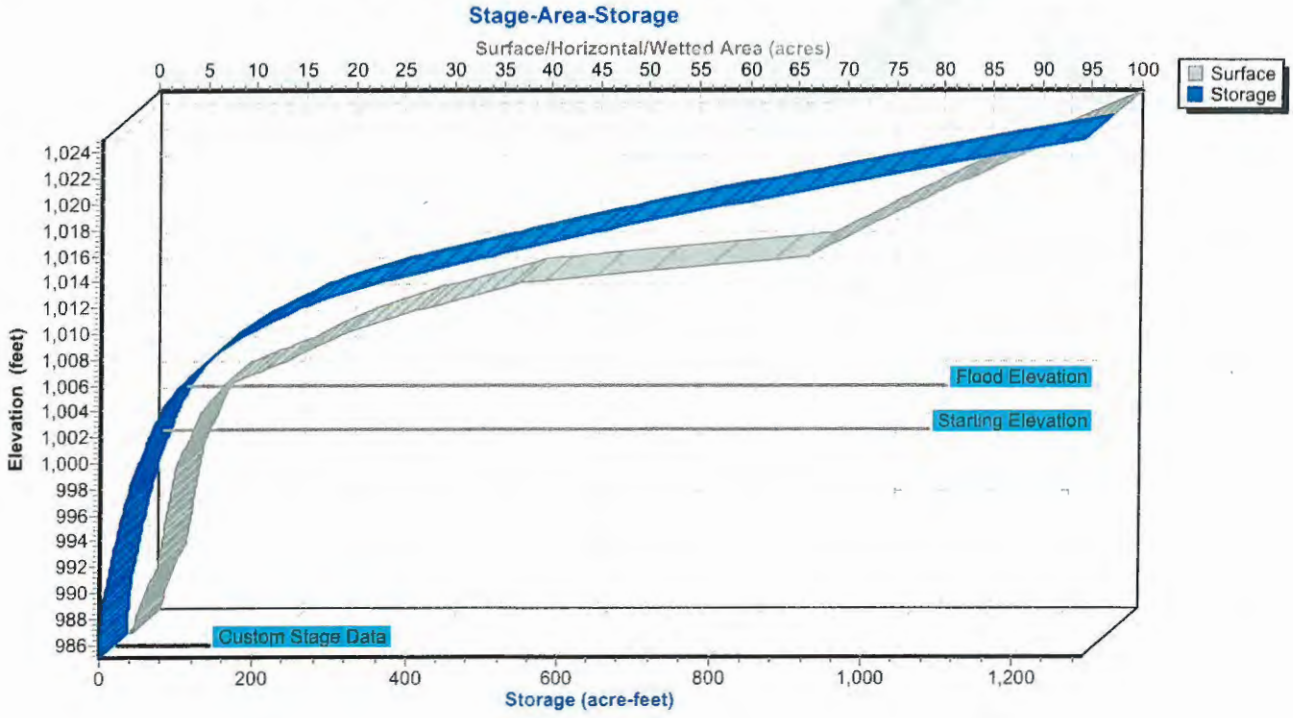
Pond 1P: Sippo Creek Reservoir - Existing Conditions



Pond 1P: Sippo Creek Reservoir - Existing Conditions



Pond 1P: Sippo Creek Reservoir - Existing Conditions

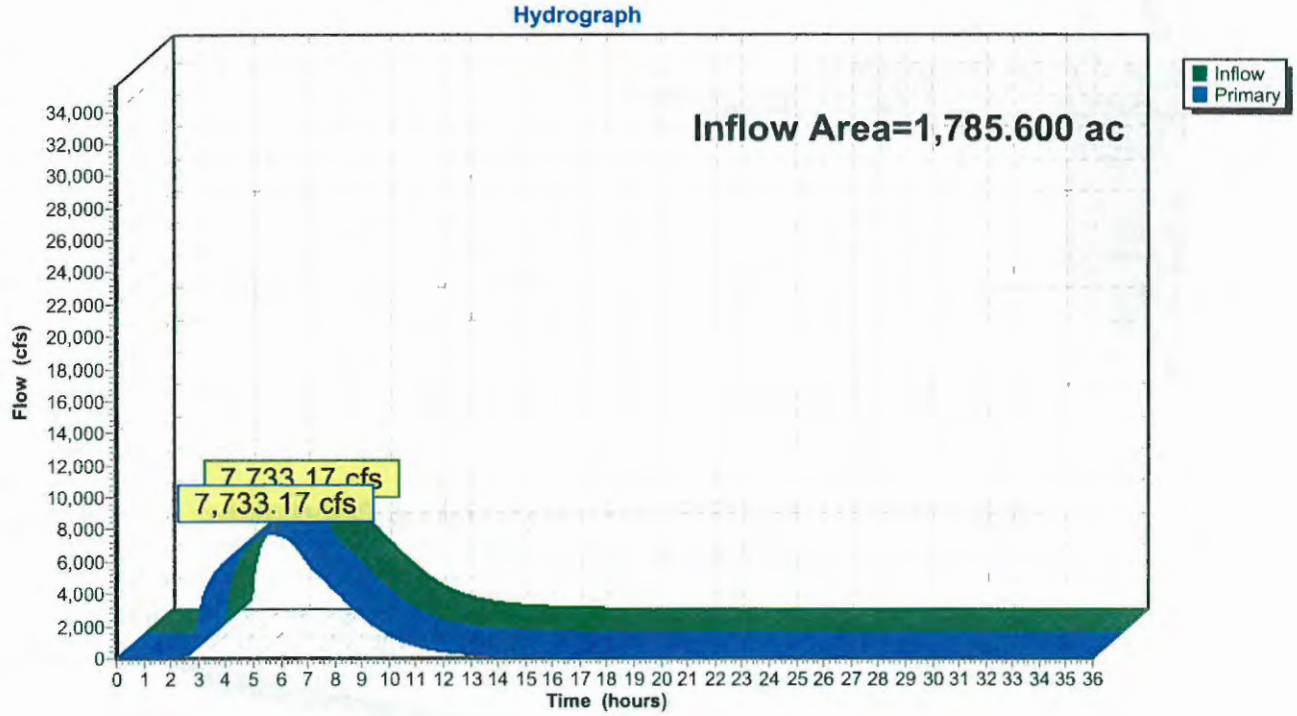


Summary for Pond 2C: CONF 2 Combined Cable and O'Springs

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 21.81" for 6 hr PMF TR-60 event
Inflow = 7,733.17 cfs @ 5.77 hrs, Volume= 3,244.892 af
Primary = 7,733.17 cfs @ 5.78 hrs, Volume= 3,244.892 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 2C: CONF 2 Combined Cable and O'Springs



Summary for Pond 3P: Lake Cable

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 21.81" for 6 hr PMF TR-60 event
Inflow = 7,733.17 cfs @ 5.78 hrs, Volume= 3,244.891 af
Outflow = 6,815.05 cfs @ 6.63 hrs, Volume= 3,323.238 af, Atten= 12%, Lag= 51.1 min
Primary = 1,137.10 cfs @ 6.63 hrs, Volume= 1,445.120 af
Secondary = 5,677.95 cfs @ 6.63 hrs, Volume= 1,878.118 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,097.40' Surf.Area= 220.000 ac Storage= 1,914.000 af
Peak Elev= 1,101.10' @ 6.63 hrs Surf.Area= 349.138 ac Storage= 2,975.885 af (1,061.885 af above start)
Flood Elev= 1,099.50' Surf.Area= 296.000 ac Storage= 2,455.800 af (541.800 af above start)

Plug-Flow detention time= 688.5 min calculated for 1,408.847 af (43% of inflow)
Center-of-Mass det. time= 249.1 min (633.6 - 384.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,080.00'	4,144.025 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

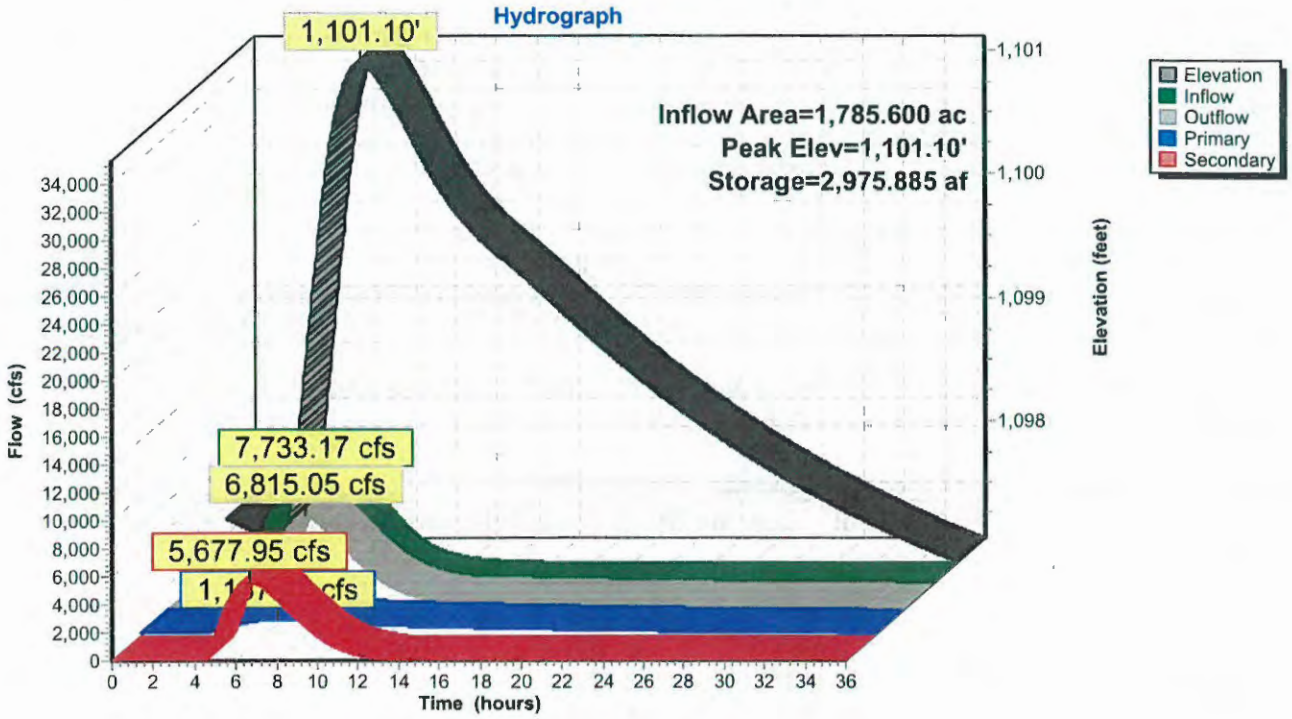
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,080.00	0.000	0.000	0.000
1,097.40	220.000	1,914.000	1,914.000
1,099.50	296.000	541.800	2,455.800
1,100.00	316.700	153.175	2,608.975
1,103.00	405.000	1,082.550	3,691.525
1,104.00	500.000	452.500	4,144.025

Device	Routing	Invert	Outlet Devices
#1	Primary	1,088.00'	**36.0" Round Culvert-RCP** L= 450.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 1,088.00' / 1,076.00' S= 0.0267 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished
#2	Primary	1,096.40'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 3.10 6.00 Width (feet) 30.00 30.00 30.00
#3	Secondary	1,099.50'	**Custom Weir/Orifice, Cv= 2.24 (C= 2.80)** Head (feet) 0.00 3.00 Width (feet) 1,000.00 1,000.00

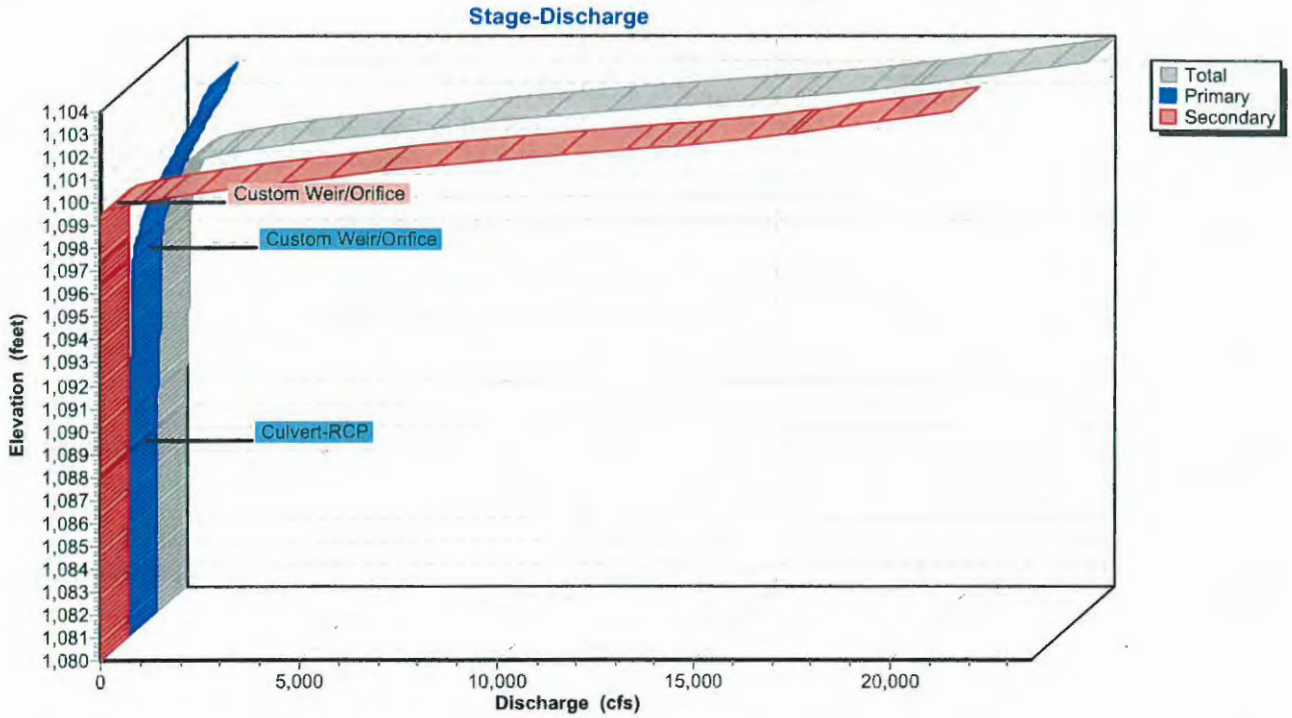
Primary OutFlow Max=1,137.10 cfs @ 6.63 hrs HW=1,101.10' TW=1,077.77' (Dynamic Tailwater)
↑—**1=Culvert-RCP** (Barrel Controls 135.33 cfs @ 19.14 fps)
└—**2=Custom Weir/Orifice** (Weir Controls 1,001.77 cfs @ 7.10 fps)

Secondary OutFlow Max=5,677.91 cfs @ 6.63 hrs HW=1,101.10' TW=1,077.77' (Dynamic Tailwater)
↑—**3=Custom Weir/Orifice** (Weir Controls 5,677.91 cfs @ 3.54 fps)

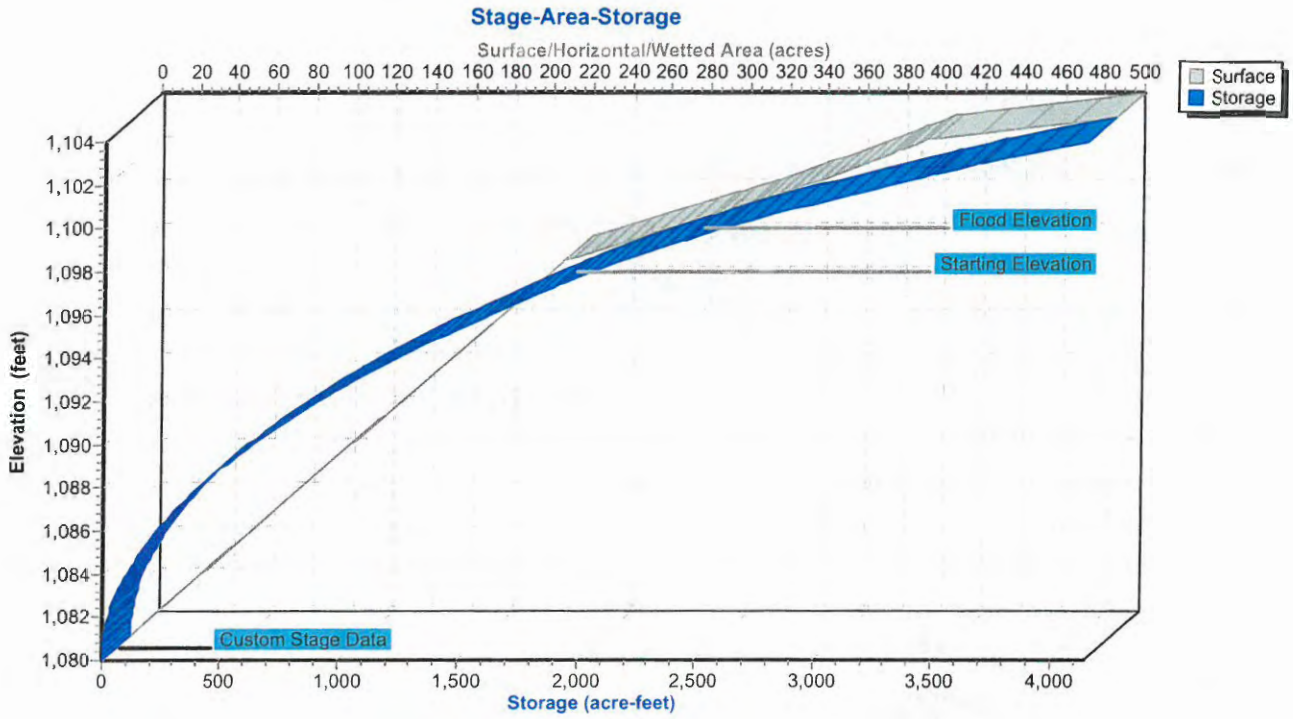
Pond 3P: Lake Cable



Pond 3P: Lake Cable



Pond 3P: Lake Cable

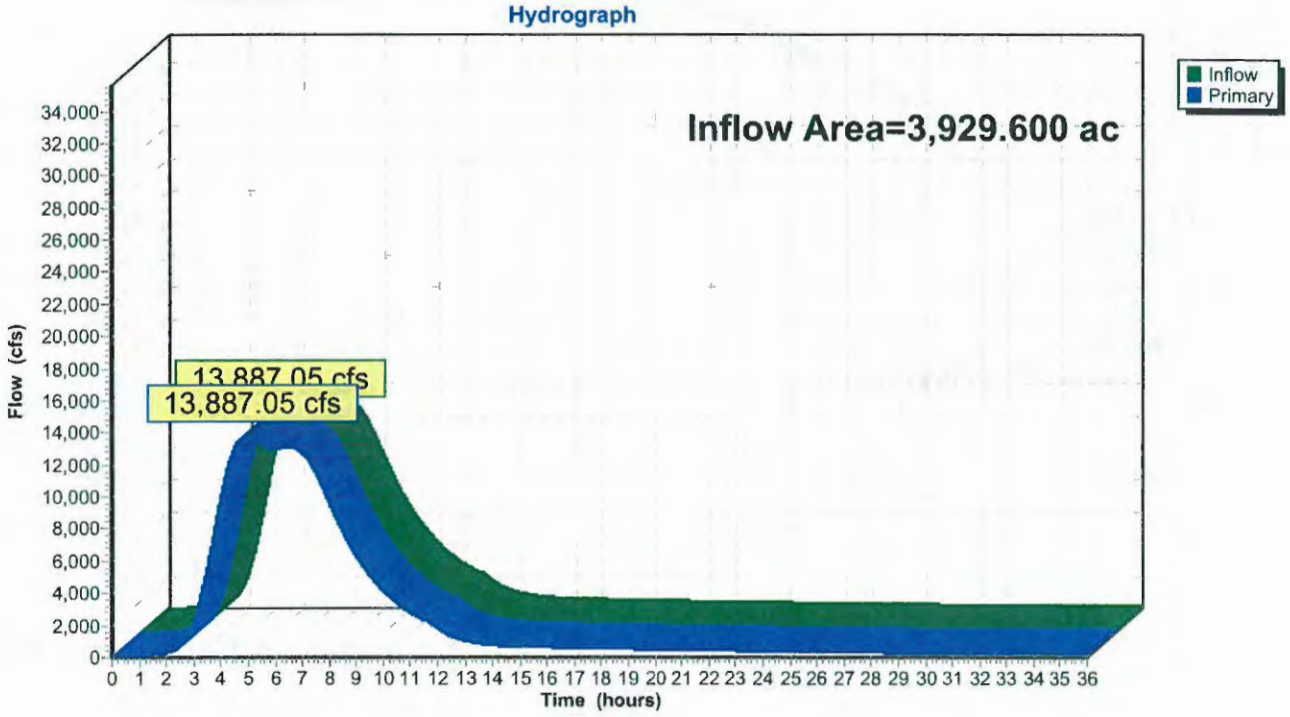


Summary for Pond 4C: Confluence 4

Inflow Area = 3,929.600 ac, 16.99% Impervious, Inflow Depth > 21.73" for 6 hr PMF TR-60 event
Inflow = 13,887.05 cfs @ 5.13 hrs, Volume= 7,117.016 af
Primary = 13,887.05 cfs @ 5.14 hrs, Volume= 7,117.016 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 4C: Confluence 4



Summary for Pond 4P: Lake O'Springs

Inflow Area = 384.000 ac, 26.60% Impervious, Inflow Depth = 22.48" for 6 hr PMF TR-60 event
Inflow = 3,664.37 cfs @ 3.40 hrs, Volume= 719.332 af
Outflow = 3,587.04 cfs @ 3.56 hrs, Volume= 718.729 af, Atten= 2%, Lag= 9.4 min
Primary = 3,158.66 cfs @ 3.56 hrs, Volume= 666.641 af
Secondary = 428.38 cfs @ 3.56 hrs, Volume= 52.088 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,106.00' Surf.Area= 27.000 ac Storage= 24.300 af
Peak Elev= 1,109.71' @ 3.56 hrs Surf.Area= 37.794 ac Storage= 135.596 af (111.296 af above start)
Flood Elev= 1,108.70' Surf.Area= 30.000 ac Storage= 101.250 af (76.950 af above start)

Plug-Flow detention time= 83.8 min calculated for 694.237 af (97% of inflow)
Center-of-Mass det. time= 68.1 min (323.5 - 255.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,104.20'	268.550 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

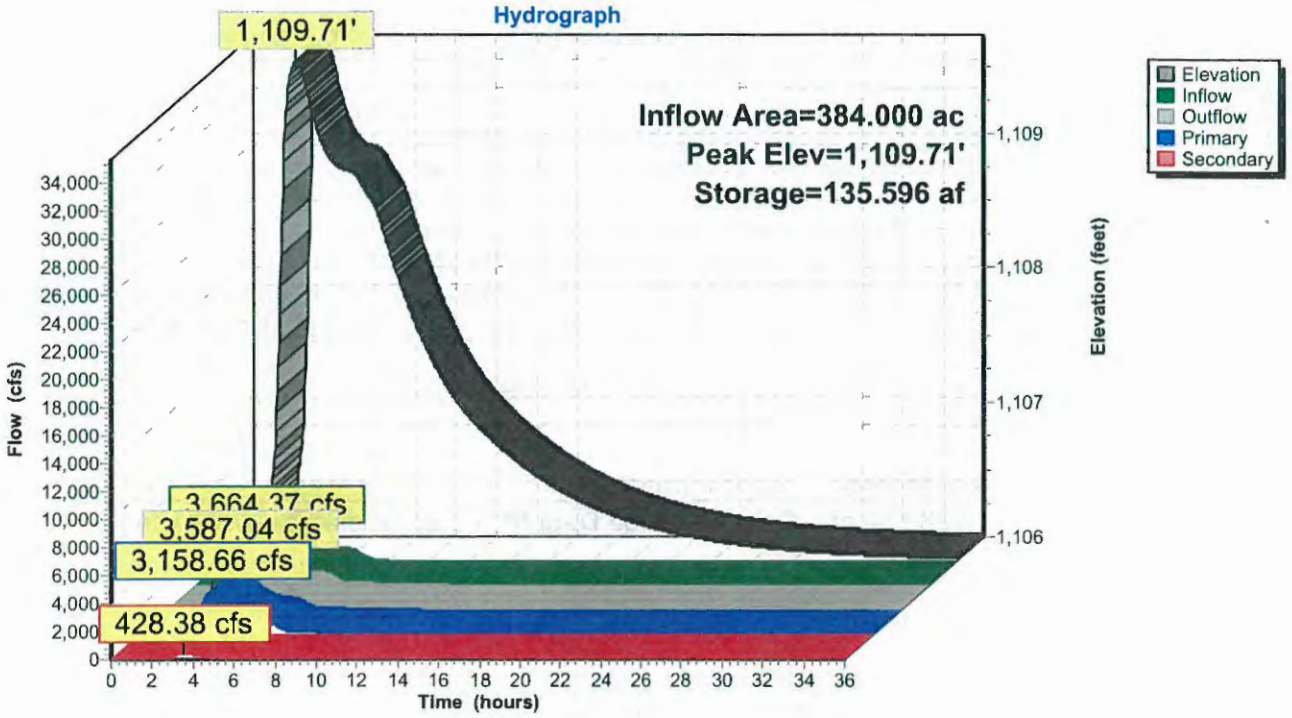
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,104.20	0.000	0.000	0.000
1,106.00	27.000	24.300	24.300
1,108.70	30.000	76.950	101.250
1,110.00	40.000	45.500	146.750
1,112.90	44.000	121.800	268.550

Device	Routing	Invert	Outlet Devices
#1	Primary	1,106.00'	**Lake Eric Special & User-Defined Outlet** Head (feet) 0.00 1.00 2.00 2.70 3.00 4.00 Disch. (cfs) 0.000 60.000 180.000 300.000 1,240.000 3,930.000
#2	Secondary	1,108.70'	**Custom Weir/Orifice, Cv= 2.24 (C= 2.80)** Head (feet) 0.00 1.30 Width (feet) 150.00 150.00

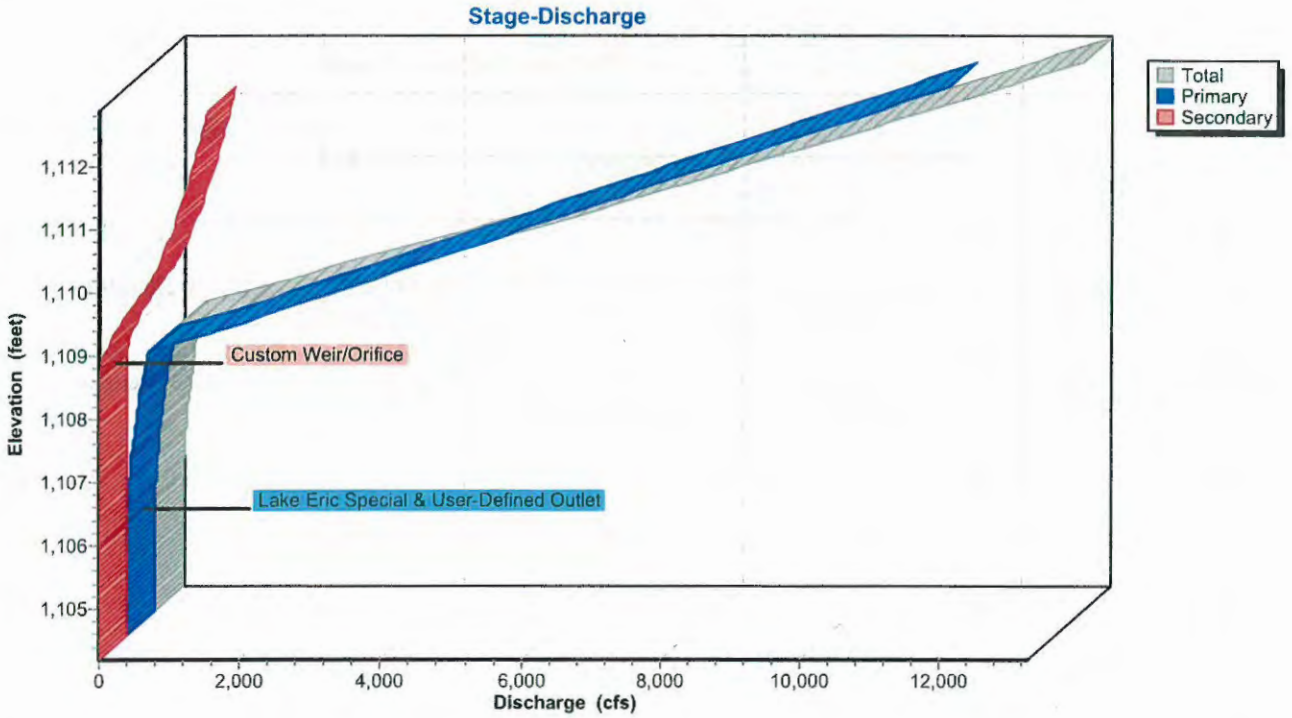
Primary OutFlow Max=3,158.65 cfs @ 3.56 hrs HW=1,109.71' TW=0.00' (Dynamic Tailwater)
↑—**1=Lake Eric Special & User-Defined Outlet** (Custom Controls 3,158.65 cfs)

Secondary OutFlow Max=428.38 cfs @ 3.56 hrs HW=1,109.71' TW=0.00' (Dynamic Tailwater)
↑—**2=Custom Weir/Orifice** (Weir Controls 428.38 cfs @ 2.82 fps)

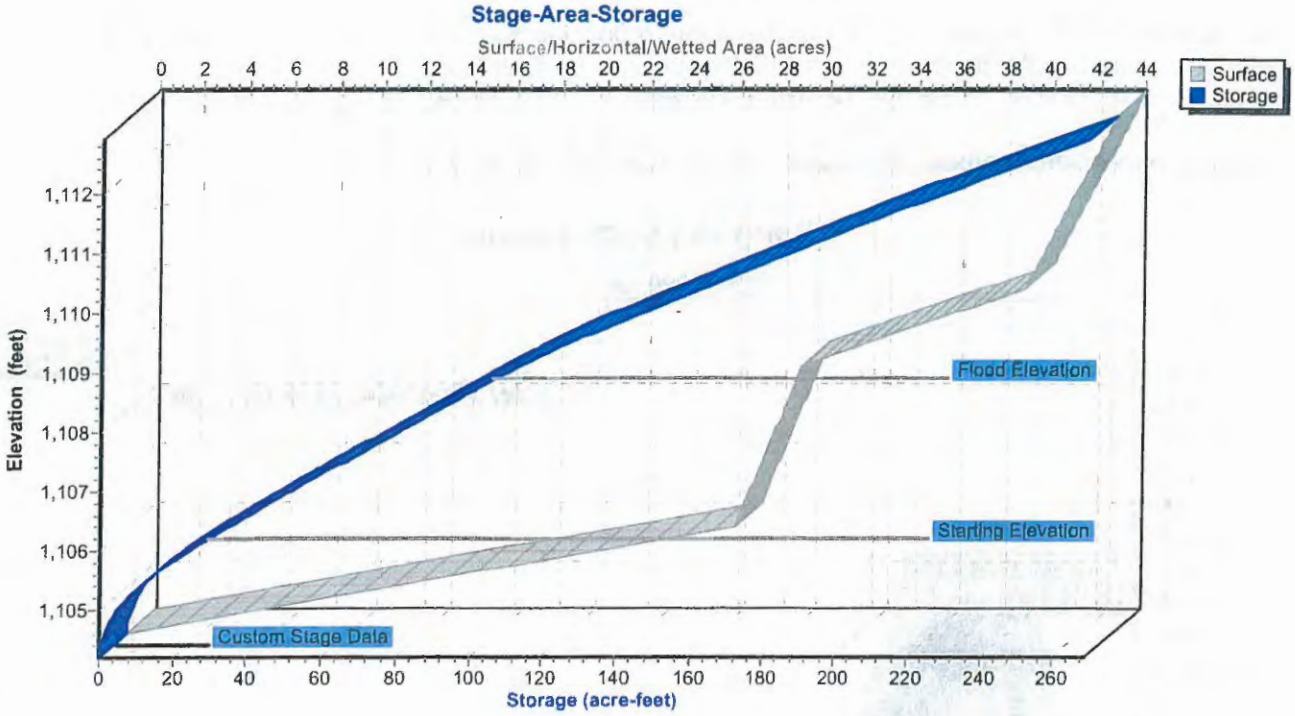
Pond 4P: Lake O'Springs



Pond 4P: Lake O'Springs



Pond 4P: Lake O'Springs

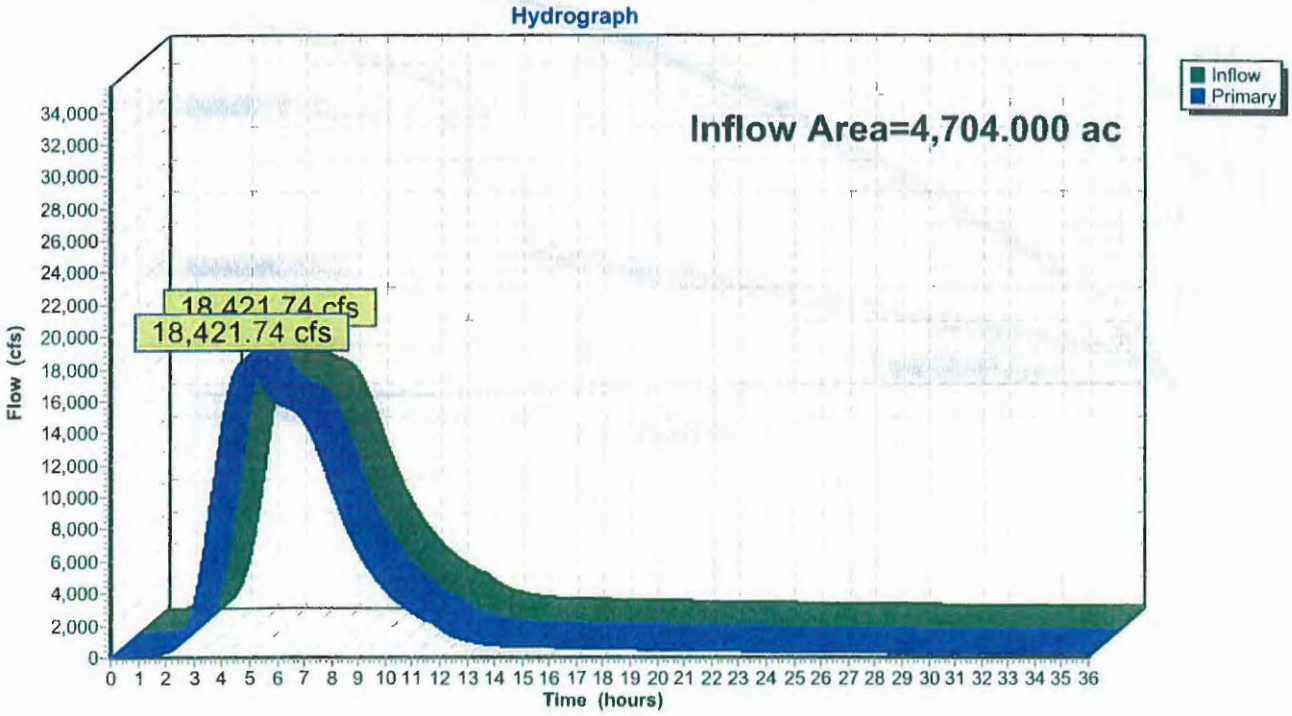


Summary for Pond 5C: Confluence 5

Inflow Area = 4,704.000 ac, 14.19% Impervious, Inflow Depth > 21.62" for 6 hr PMF TR-60 event
Inflow = 18,421.74 cfs @ 4.73 hrs, Volume= 8,475.020 af
Primary = 18,421.74 cfs @ 4.74 hrs, Volume= 8,475.020 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 5C: Confluence 5



Summary for Pond 5P: Lake Eric (Slagle)

Inflow Area = 115.200 ac, 0.00% Impervious, Inflow Depth = 22.36" for 6 hr PMF TR-60 event
Inflow = 1,201.03 cfs @ 3.18 hrs, Volume= 214.656 af
Outflow = 1,199.15 cfs @ 3.20 hrs, Volume= 214.535 af, Atten= 0%, Lag= 1.3 min
Primary = 711.29 cfs @ 3.20 hrs, Volume= 146.788 af
Secondary = 487.85 cfs @ 3.20 hrs, Volume= 67.747 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,116.50' Surf.Area= 3.700 ac Storage= 13.690 af
Peak Elev= 1,121.10' @ 3.20 hrs Surf.Area= 4.631 ac Storage= 32.369 af (18.679 af above start)
Flood Elev= 1,120.00' Surf.Area= 4.200 ac Storage= 27.490 af (13.800 af above start)

Plug-Flow detention time= 55.0 min calculated for 200.845 af (94% of inflow)
Center-of-Mass det. time= 36.7 min (267.2 - 230.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,109.10'	88.990 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

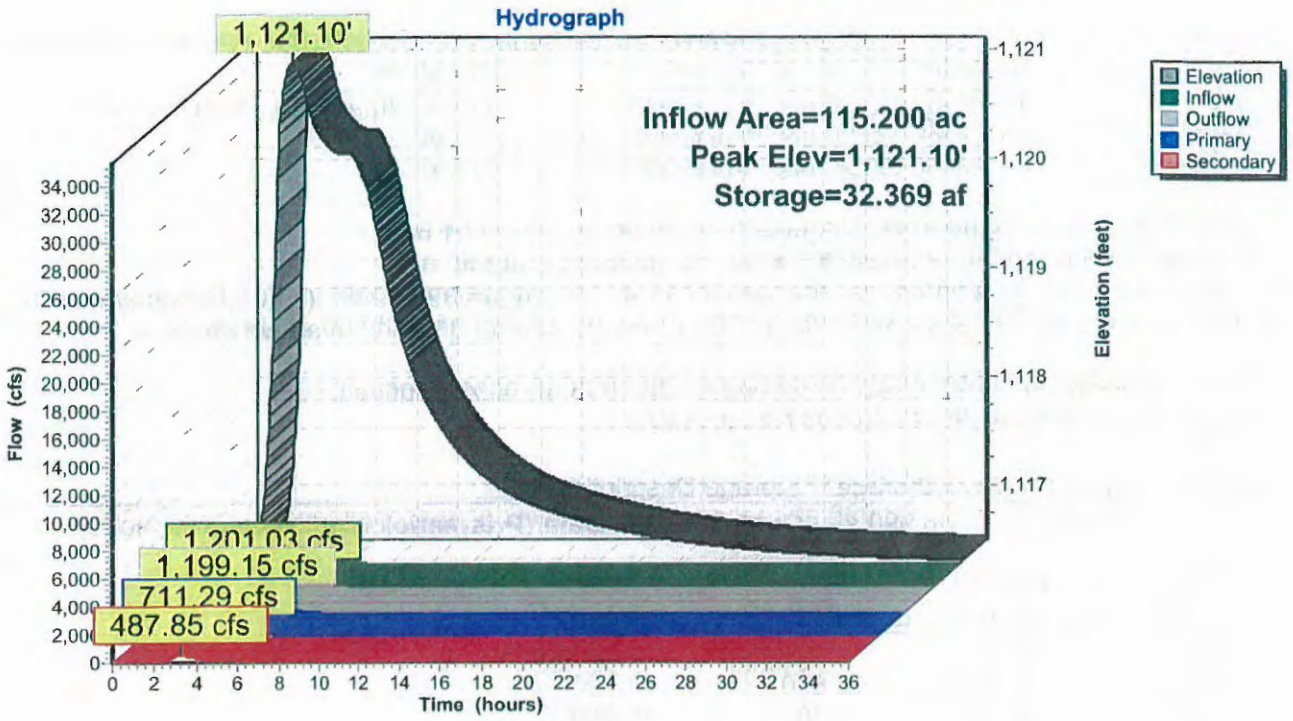
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,109.10	0.000	0.000	0.000
1,116.50	3.700	13.690	13.690
1,118.00	3.900	5.700	19.390
1,120.00	4.200	8.100	27.490
1,130.00	8.100	61.500	88.990

Device	Routing	Invert	Outlet Devices
#1	Primary	1,116.50'	**Special & User-Defined** Head (feet) 0.00 0.50 1.50 2.50 3.50 4.50 5.00 Disch. (cfs) 0.000 3.000 17.000 40.000 69.000 600.000 1,130.000
#2	Secondary	1,120.00'	**Custom Weir/Orifice, Cv= 2.24 (C= 2.80)** Head (feet) 0.00 10.00 Width (feet) 150.00 150.00

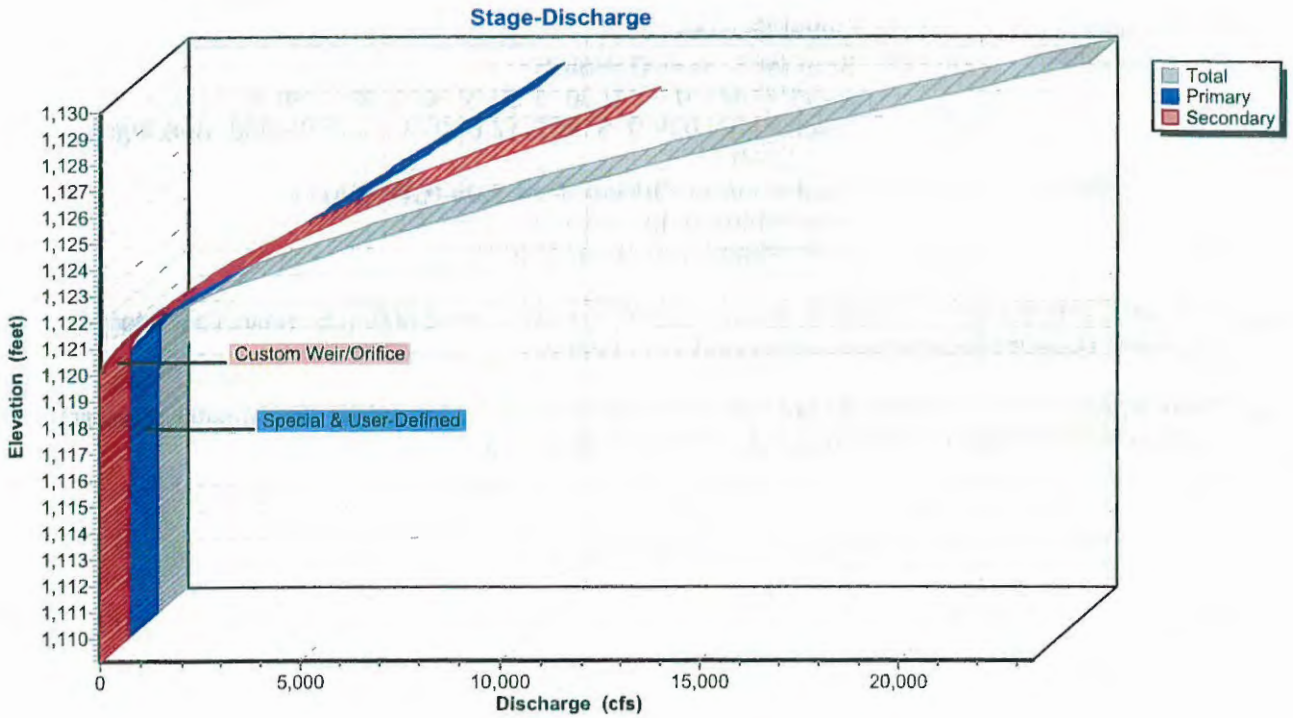
Primary OutFlow Max=711.28 cfs @ 3.20 hrs HW=1,121.10' TW=0.00' (Dynamic Tailwater)
↑**1=Special & User-Defined** (Custom Controls 711.28 cfs)

Secondary OutFlow Max=487.84 cfs @ 3.20 hrs HW=1,121.10' TW=0.00' (Dynamic Tailwater)
↑**2=Custom Weir/Orifice** (Weir Controls 487.84 cfs @ 2.94 fps)

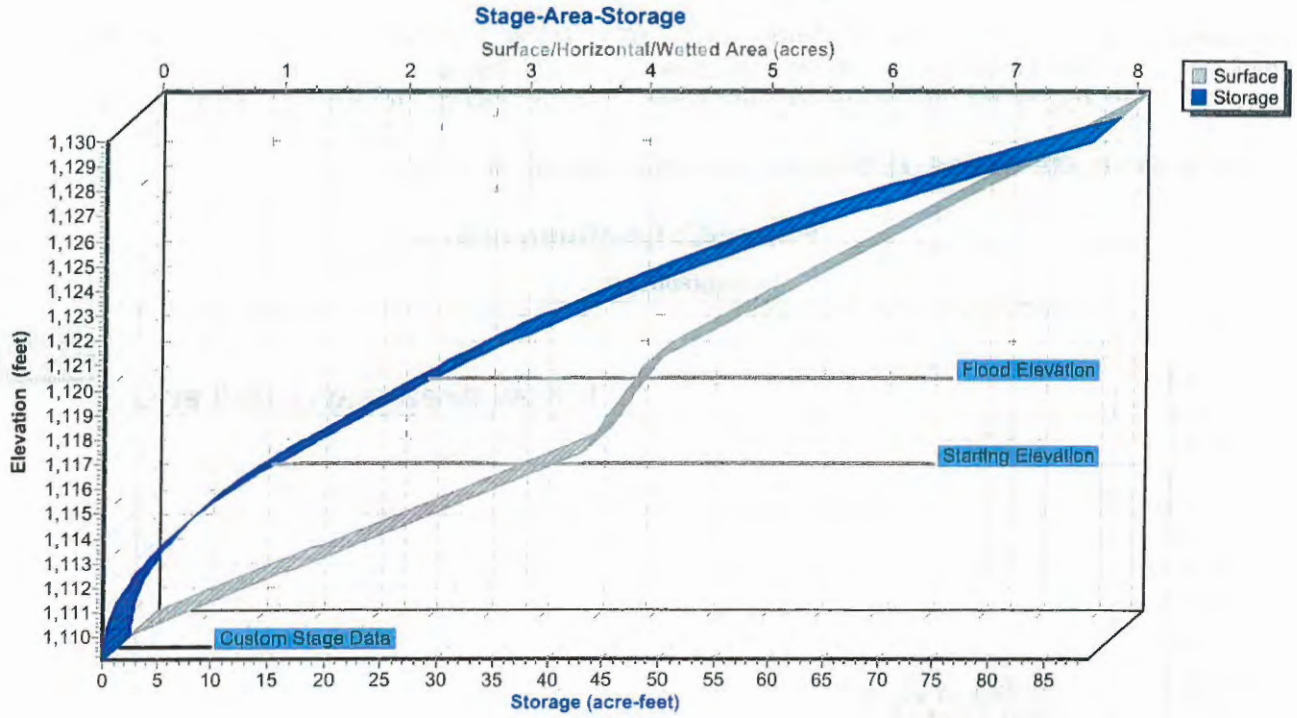
Pond 5P: Lake Eric (Slagle)



Pond 5P: Lake Eric (Slagle)



Pond 5P: Lake Eric (Slagle)

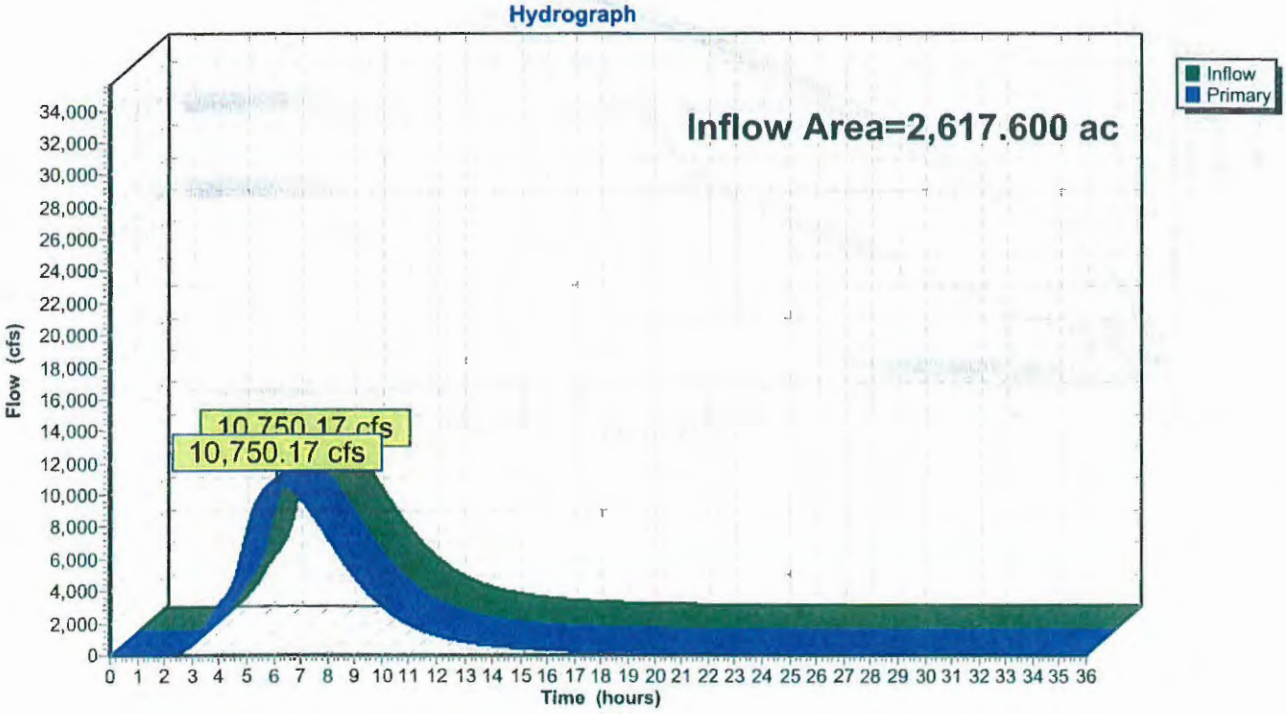


Summary for Pond 6C: Confluence 6

Inflow Area = 2,617.600 ac, 28.52% Impervious, Inflow Depth > 20.91" for 6 hr PMF TR-60 event
Inflow = 10,750.17 cfs @ 6.08 hrs, Volume= 4,561.781 af
Primary = 10,750.17 cfs @ 6.09 hrs, Volume= 4,561.781 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 6C: Confluence 6

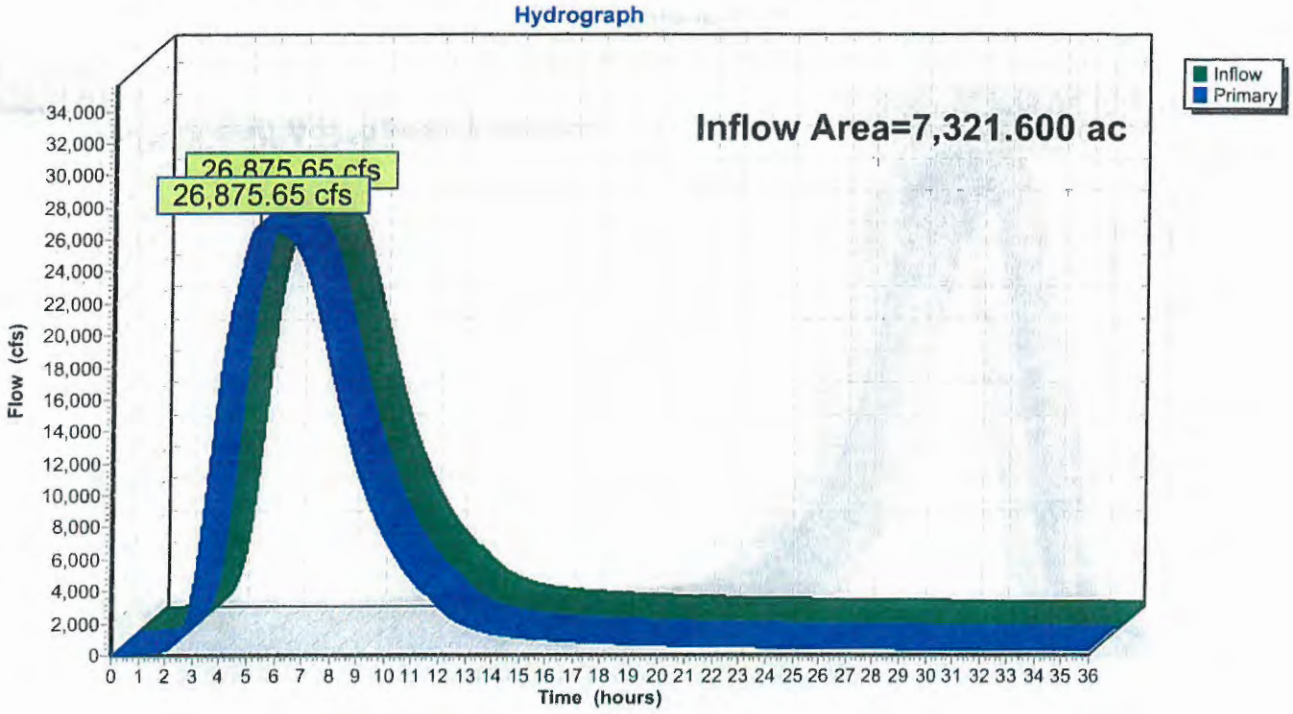


Summary for Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake

Inflow Area = 7,321.600 ac, 19.32% Impervious, Inflow Depth > 21.37" for 6 hr PMF TR-60 event
Inflow = 26,875.65 cfs @ 5.37 hrs, Volume= 13,036.565 af
Primary = 26,875.65 cfs @ 5.38 hrs, Volume= 13,036.565 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake

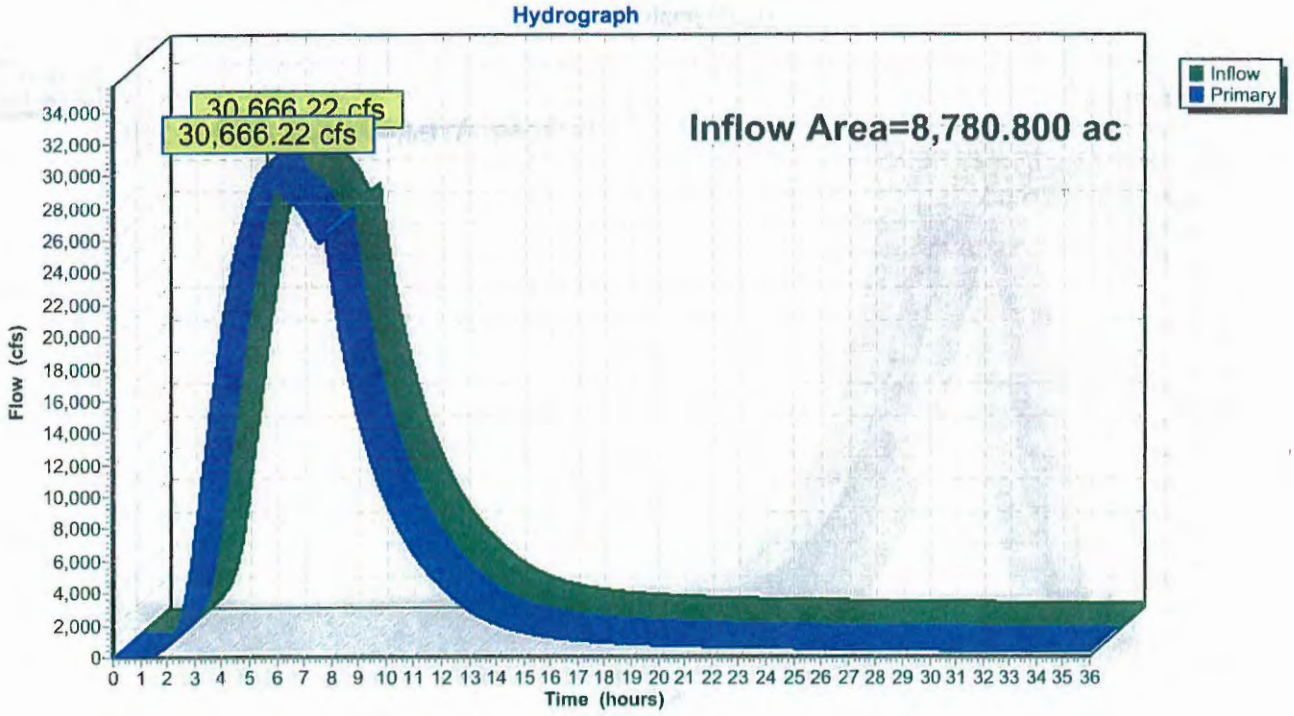


Summary for Pond 8C: Confluence 8

Inflow Area = 8,780.800 ac, 19.29% Impervious, Inflow Depth > 21.49" for 6 hr PMF TR-60 event
Inflow = 30,666.22 cfs @ 5.65 hrs, Volume= 15,722.940 af
Primary = 30,666.22 cfs @ 5.66 hrs, Volume= 15,722.940 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 8C: Confluence 8



Summary for Pond 8P: Storage Area Genoa Rd

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth = 21.97" for 6 hr PMF TR-60 event
Inflow = 12,104.92 cfs @ 4.89 hrs, Volume= 3,596.882 af
Outflow = 8,241.98 cfs @ 6.31 hrs, Volume= 3,417.863 af, Atten= 32%, Lag= 85.4 min
Primary = 130.35 cfs @ 4.23 hrs, Volume= 292.476 af
Secondary = 8,142.61 cfs @ 6.31 hrs, Volume= 3,125.388 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 1,029.90' @ 6.32 hrs Surf.Area= 252.799 ac Storage= 1,292.779 af
Flood Elev= 1,028.00' Surf.Area= 213.745 ac Storage= 851.153 af

Plug-Flow detention time= 183.3 min calculated for 3,417.863 af (95% of inflow)
Center-of-Mass det. time= 166.0 min (537.4 - 371.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,018.00'	1,873.781 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

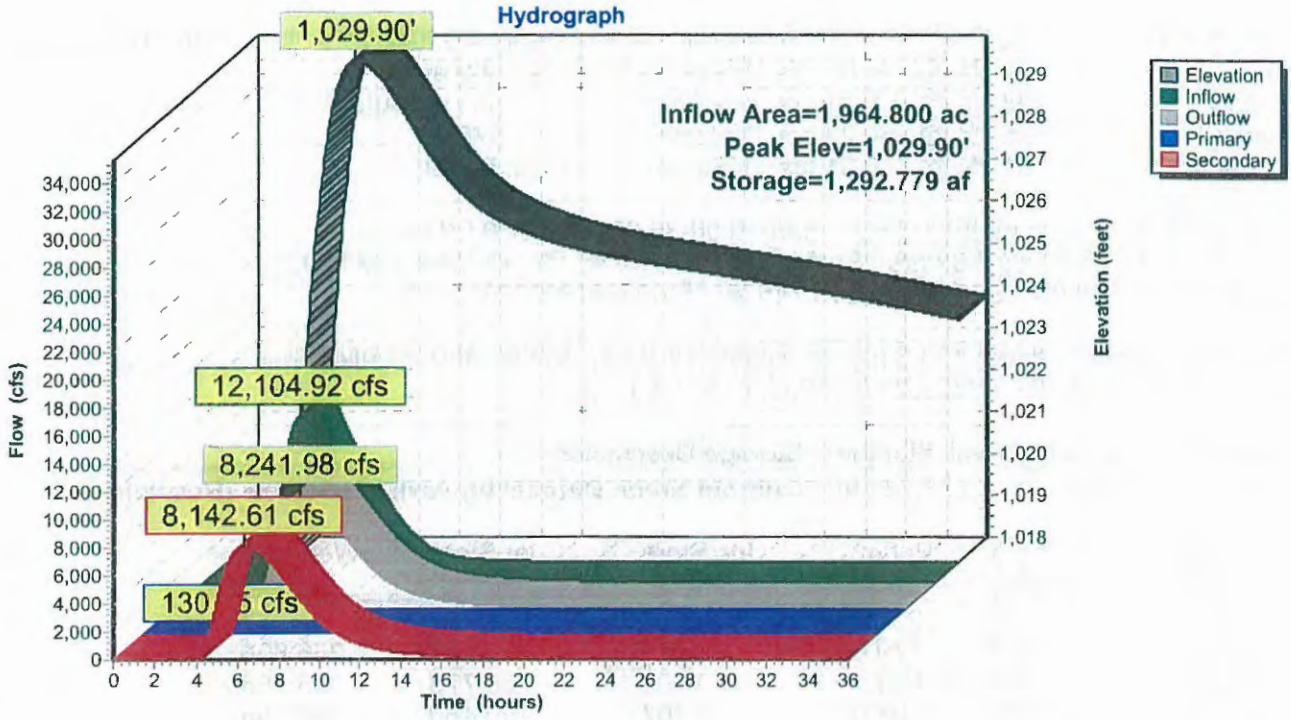
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
1,018.00	1.828	9,236.2	0.000	0.000	1.828
1,020.00	12.667	15,179.0	12.871	12.871	266.894
1,022.00	44.456	16,532.1	53.902	66.773	345.285
1,024.00	91.000	31,384.9	132.707	199.480	1,645.455
1,026.00	176.087	39,123.0	262.448	461.929	2,642.179
1,032.00	300.000	45,000.0	1,411.853	1,873.781	3,545.375

Device	Routing	Invert	Outlet Devices
#1	Primary	1,018.00'	**48.0" Round Culvert** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,018.00' / 1,017.00' S= 0.0167 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Secondary	1,025.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 3.00 5.00 Width (feet) 125.00 192.00 308.00 415.00

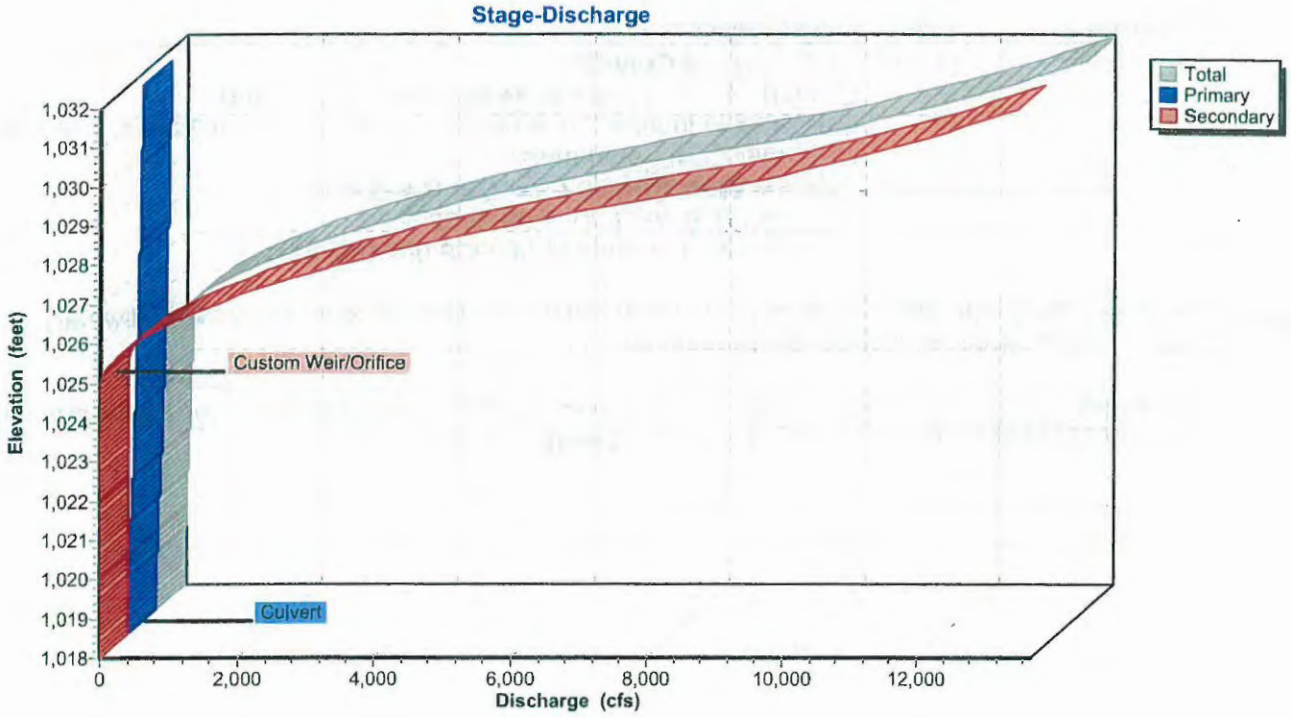
Primary OutFlow Max=128.96 cfs @ 4.23 hrs HW=1,025.34' TW=1,020.80' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 128.96 cfs @ 10.26 fps)

Secondary OutFlow Max=8,142.27 cfs @ 6.31 hrs HW=1,029.90' TW=1,027.20' (Dynamic Tailwater)
↑—**2=Custom Weir/Orifice** (Weir Controls 8,142.27 cfs @ 6.08 fps)

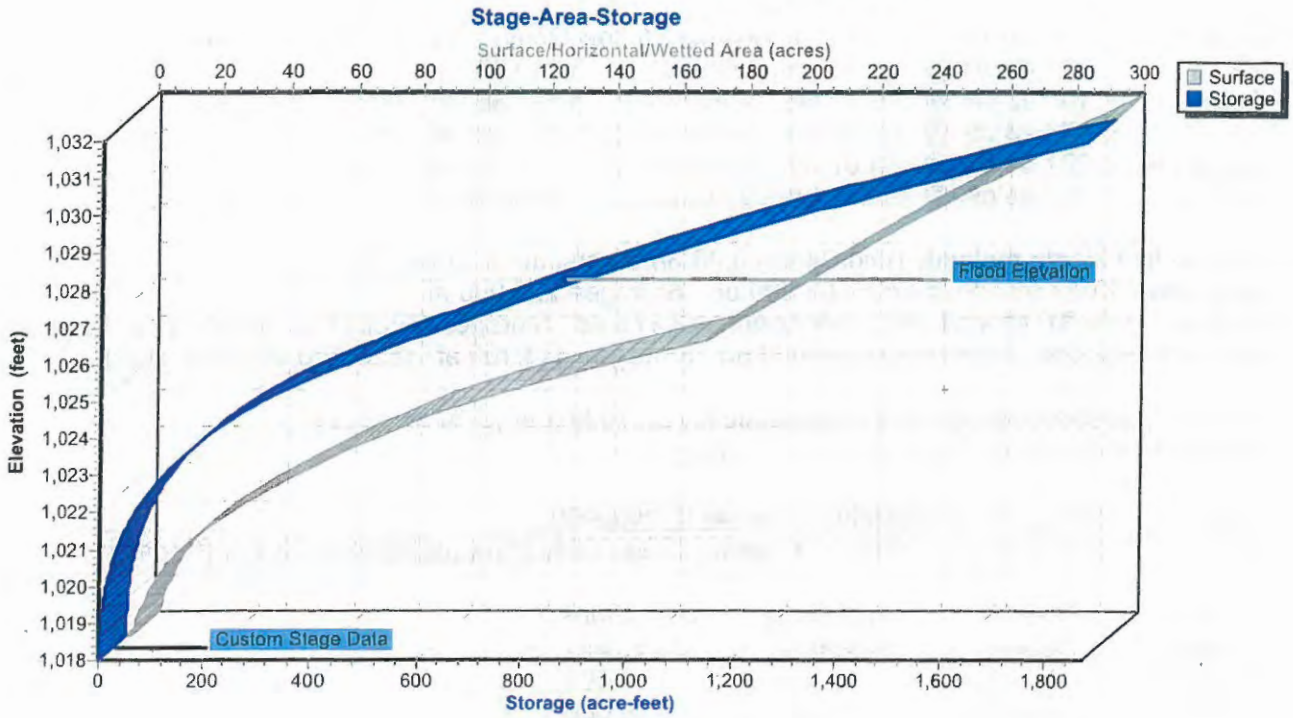
Pond 8P: Storage Area Genoa Rd



Pond 8P: Storage Area Genoa Rd



Pond 8P: Storage Area Genoa Rd



Summary for Pond 9P: Sippo Lake

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth = 22.54" for 6 hr PMF TR-60 event
Inflow = 12,291.40 cfs @ 4.68 hrs, Volume= 3,689.826 af
Outflow = 12,104.92 cfs @ 4.89 hrs, Volume= 3,596.882 af, Atten= 2%, Lag= 12.3 min
Primary = 9,076.23 cfs @ 4.88 hrs, Volume= 2,921.396 af
Secondary = 291.63 cfs @ 4.97 hrs, Volume= 77.072 af
Tertiary = 2,744.05 cfs @ 4.97 hrs, Volume= 598.415 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,027.00' Surf.Area= 88.000 ac Storage= 220.000 af
Peak Elev= 1,031.37' @ 4.97 hrs Surf.Area= 112.172 ac Storage= 668.631 af (448.631 af above start)
Flood Elev= 1,029.30' Surf.Area= 106.000 ac Storage= 443.100 af (223.100 af above start)

Plug-Flow detention time= 65.8 min calculated for 3,376.882 af (92% of inflow)
Center-of-Mass det. time= 37.5 min (371.4 - 333.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,022.00'	1,220.300 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,022.00	0.000	0.000	0.000
1,027.00	88.000	220.000	220.000
1,029.30	106.000	223.100	443.100
1,036.00	126.000	777.200	1,220.300

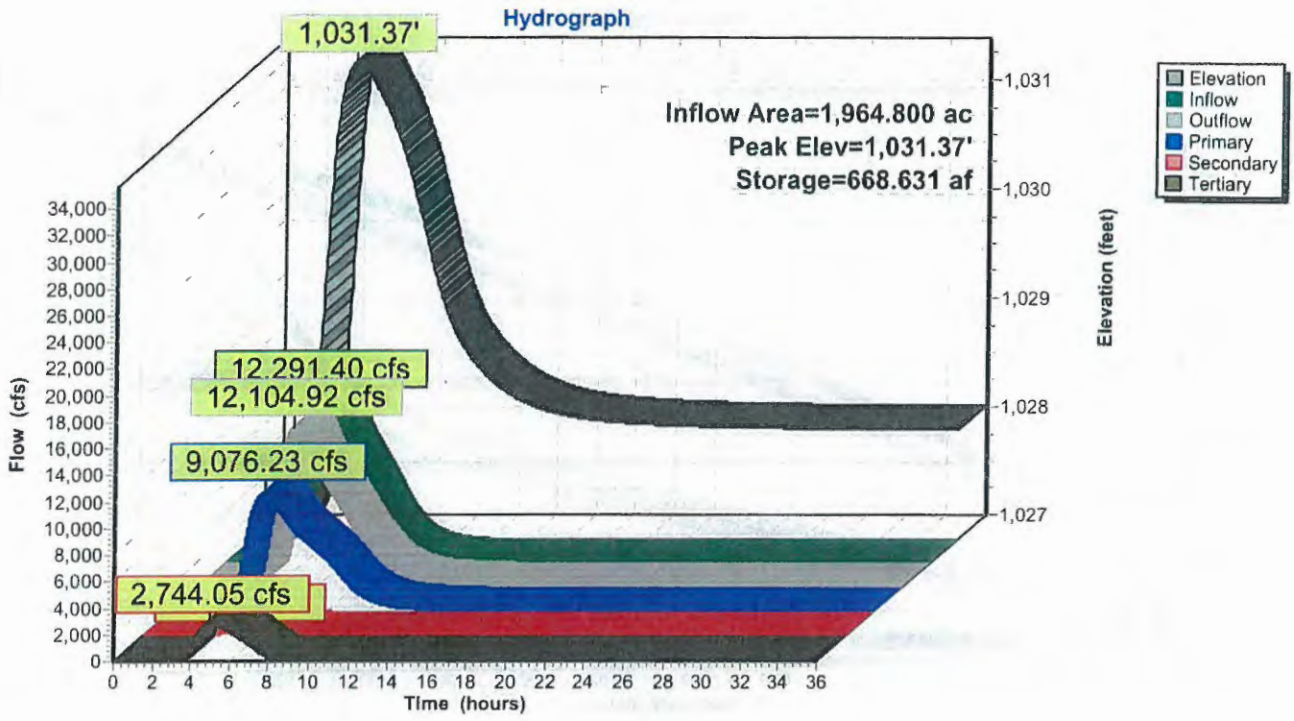
Device	Routing	Invert	Outlet Devices
#1	Primary	1,028.00'	**300.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	1,028.50'	**330.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Secondary	1,029.30'	**30.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)
#4	Tertiary	1,030.00'	**650.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=9,072.64 cfs @ 4.88 hrs HW=1,031.36' TW=1,028.07' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 4,864.02 cfs @ 4.82 fps)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 4,208.62 cfs @ 4.45 fps)

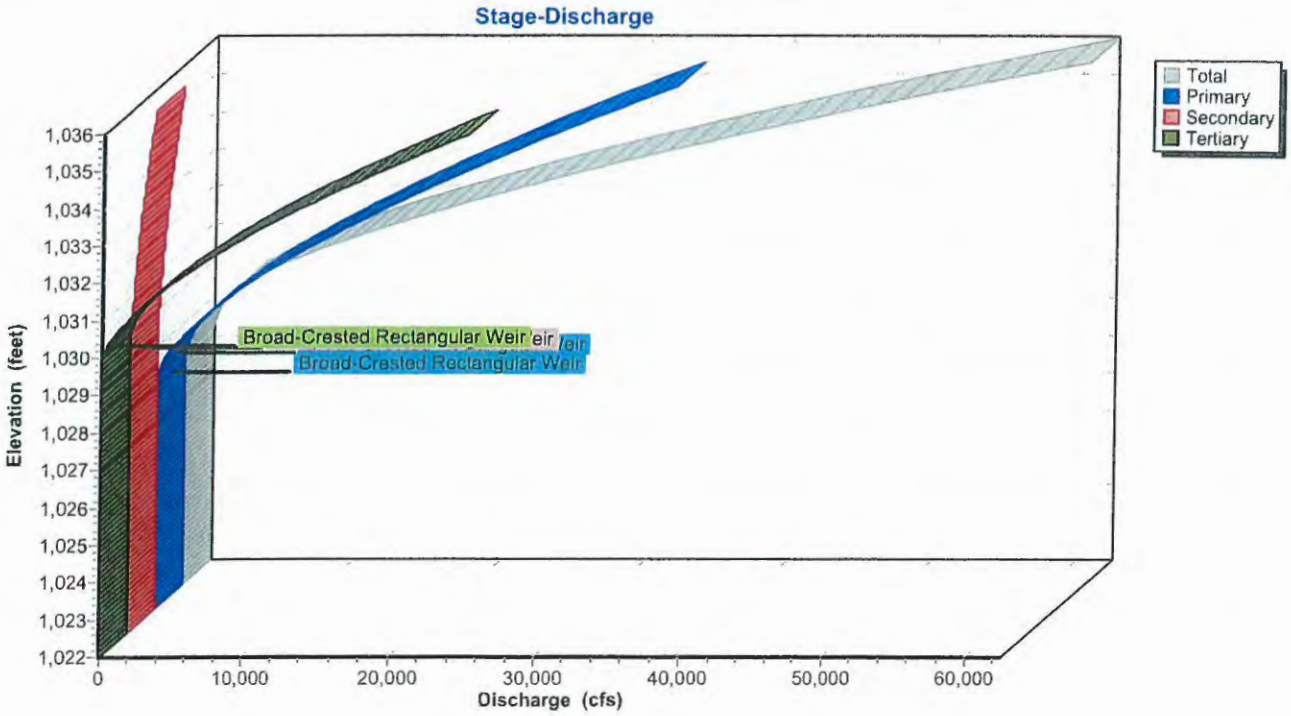
Secondary OutFlow Max=291.63 cfs @ 4.97 hrs HW=1,031.37' TW=1,028.35' (Dynamic Tailwater)
└─**3=Sharp-Crested Rectangular Weir** (Weir Controls 291.63 cfs @ 4.70 fps)

Tertiary OutFlow Max=2,744.04 cfs @ 4.97 hrs HW=1,031.37' TW=1,028.35' (Dynamic Tailwater)
└─**4=Broad-Crested Rectangular Weir** (Weir Controls 2,744.04 cfs @ 3.09 fps)

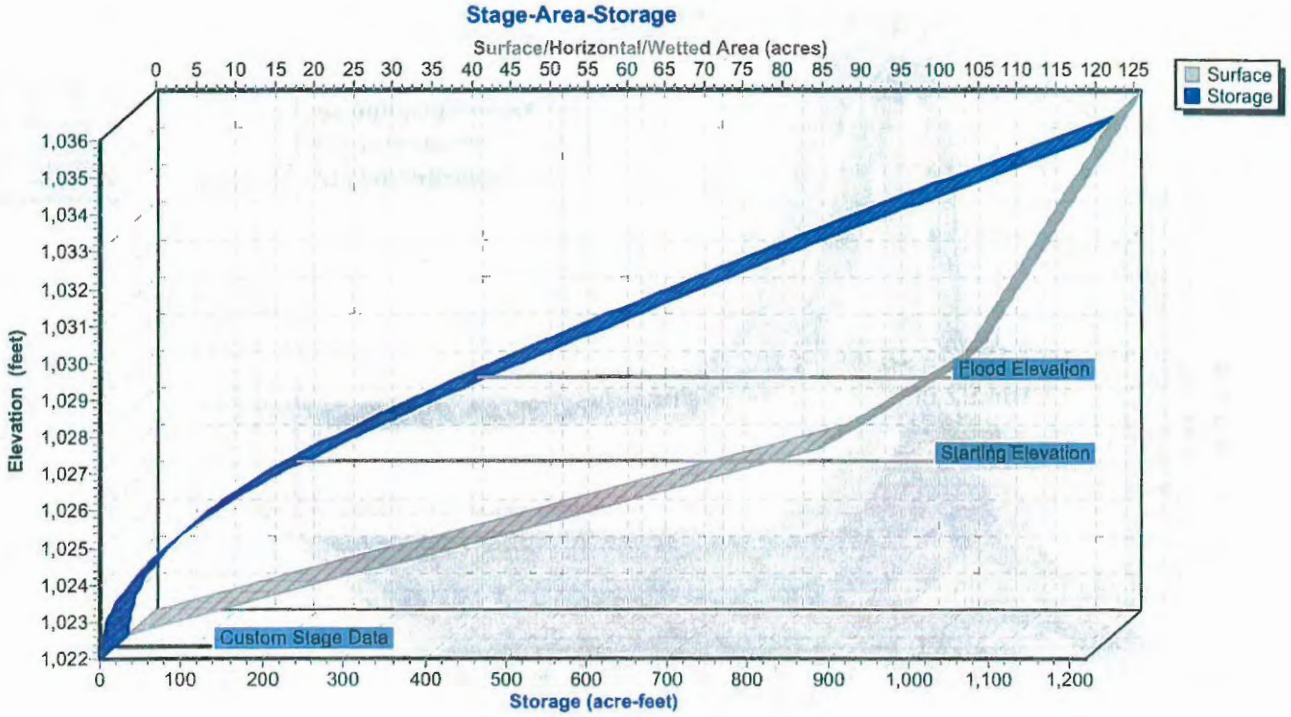
Pond 9P: Sippo Lake



Pond 9P: Sippo Lake



Pond 9P: Sippo Lake

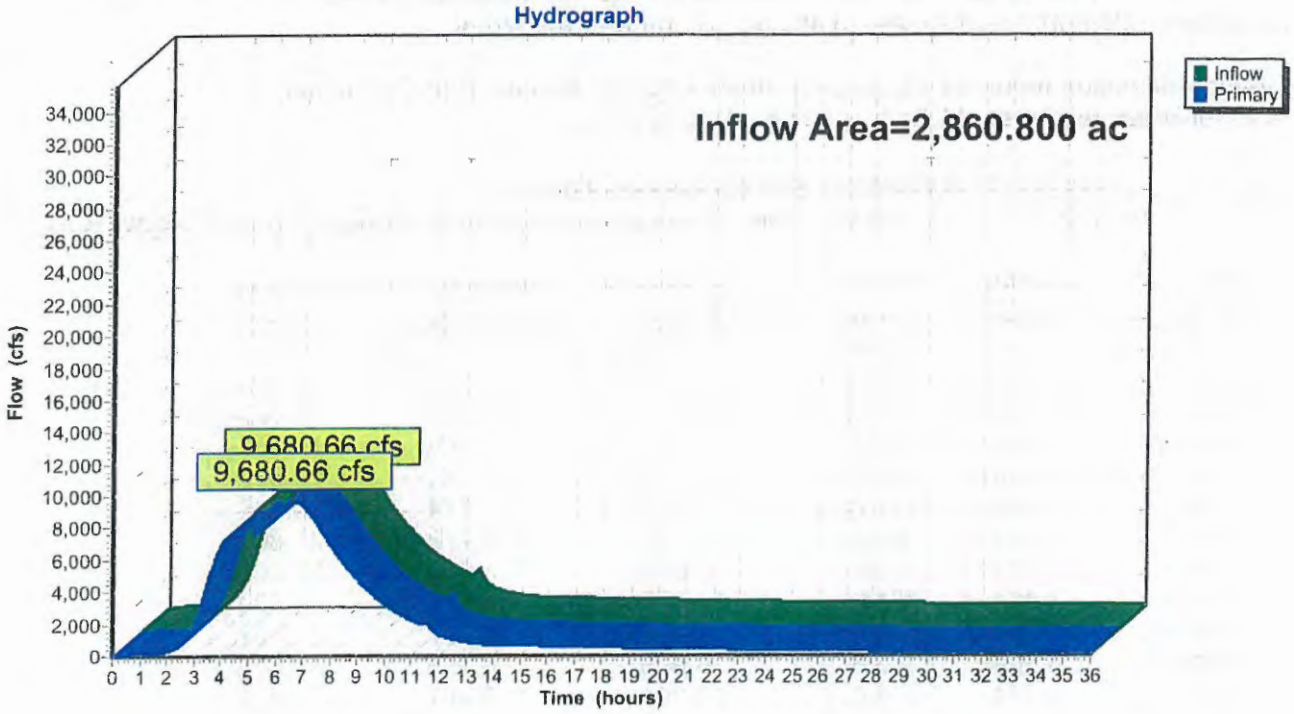


Summary for Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed

Inflow Area = 2,860.800 ac, 23.34% Impervious, Inflow Depth > 21.89" for 6 hr PMF TR-60 event
Inflow = 9,680.66 cfs @ 6.62 hrs, Volume= 5,219.441 af
Primary = 9,680.66 cfs @ 6.63 hrs, Volume= 5,219.441 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed



Summary for Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 21.55" for 6 hr PMF TR-60 event
Inflow = 31,764.74 cfs @ 5.94 hrs, Volume= 16,984.540 af
Outflow = 31,762.22 cfs @ 5.97 hrs, Volume= 16,983.321 af, Atten= 0%, Lag= 1.6 min
Primary = 3,400.33 cfs @ 3.39 hrs, Volume= 4,540.004 af
Secondary = 28,633.45 cfs @ 5.97 hrs, Volume= 12,443.317 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 1,014.62' @ 5.97 hrs Surf.Area= 18.467 ac Storage= 299.154 af
Flood Elev= 1,008.00' Surf.Area= 13.465 ac Storage= 197.028 af

Plug-Flow detention time= 11.3 min calculated for 16,978.605 af (100% of inflow)
Center-of-Mass det. time= 11.2 min (507.6 - 496.4)

Volume	Invert	Avail.Storage	Storage Description
#1	978.00'	371.368 af	**Stage Storage in Sippo Park (Irregular)** Listed below (Recalc)

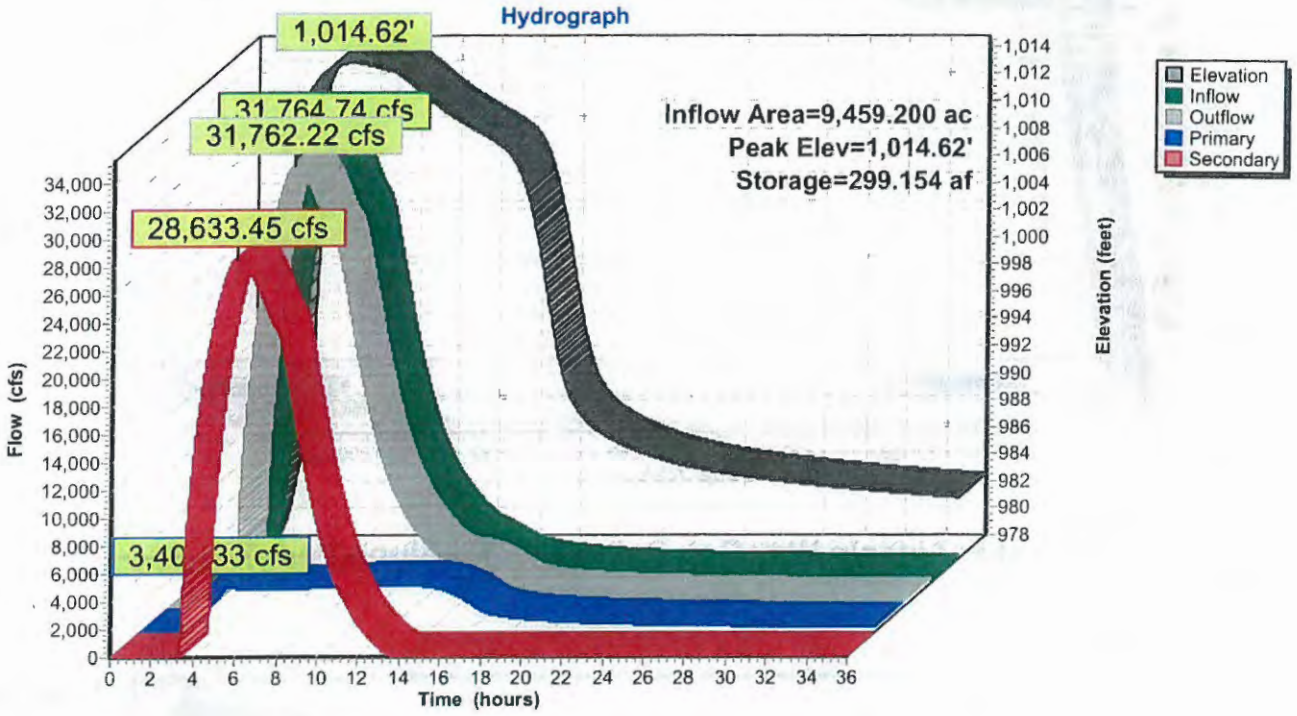
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
978.00	0.100	200.0	0.000	0.000	0.100
981.00	0.300	500.0	0.573	0.573	0.484
982.00	0.659	1,392.9	0.468	1.041	3.572
984.00	2.018	2,470.7	2.553	3.595	11.180
986.00	3.584	3,300.7	5.528	9.122	19.932
988.00	5.007	3,247.5	8.551	17.674	20.586
990.00	6.111	3,143.9	11.100	28.773	21.805
992.00	6.773	3,217.1	12.878	41.652	22.668
994.00	7.411	3,271.9	14.179	55.831	23.334
996.00	8.110	3,253.8	15.516	71.347	23.597
998.00	8.804	3,273.8	16.909	88.256	23.878
1,000.00	9.441	3,318.6	18.241	106.497	24.439
1,002.00	10.181	3,437.0	19.617	126.114	25.908
1,004.00	11.109	3,548.6	21.283	147.398	27.341
1,006.00	12.538	3,553.4	23.633	171.030	27.516
1,008.00	13.465	3,829.8	25.997	197.028	31.248
1,010.00	14.326	4,085.3	27.787	224.814	34.947
1,012.00	15.633	4,329.5	29.949	254.764	38.706
1,014.00	17.576	4,742.6	33.190	287.954	45.555
1,016.00	20.521	5,940.5	38.059	326.013	68.935
1,018.00	24.905	6,310.6	45.355	371.368	77.223

Device	Routing	Invert	Outlet Devices
#1	Primary	978.25'	**168.0" W x 98.0" H Box Box Culvert** L= 121.8' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 978.25' / 978.13' S= 0.0010 '/' Cc= 0.900 n= 0.015 Brickwork
#2	Secondary	1,008.00'	**Linclon Way (172), Cv= 2.63 (C= 3.29)** Head (feet) 0.00 1.00 2.00 4.00 6.00 8.00 10.00 Width (feet) 233.00 373.00 475.00 630.00 790.00 940.00 1,090.00

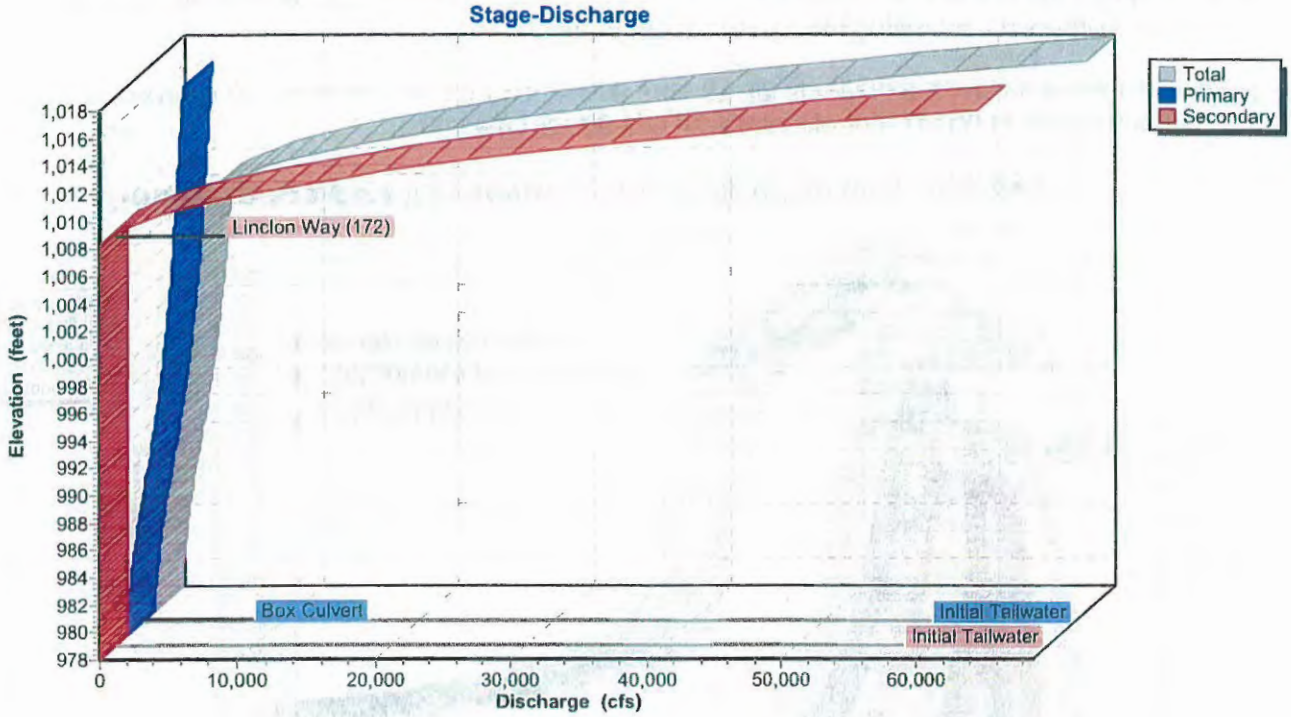
Primary OutFlow Max=3,383.15 cfs @ 3.39 hrs HW=1,009.45' TW=985.19' (Dynamic Tailwater)
└**1=Box Culvert** (Inlet Controls 3,383.15 cfs @ 29.59 fps)

Secondary OutFlow Max=28,633.37 cfs @ 5.97 hrs HW=1,014.62' TW=993.95' (Dynamic Tailwater)
└**2=Linclon Way (172)** (Weir Controls 28,633.37 cfs @ 7.62 fps)

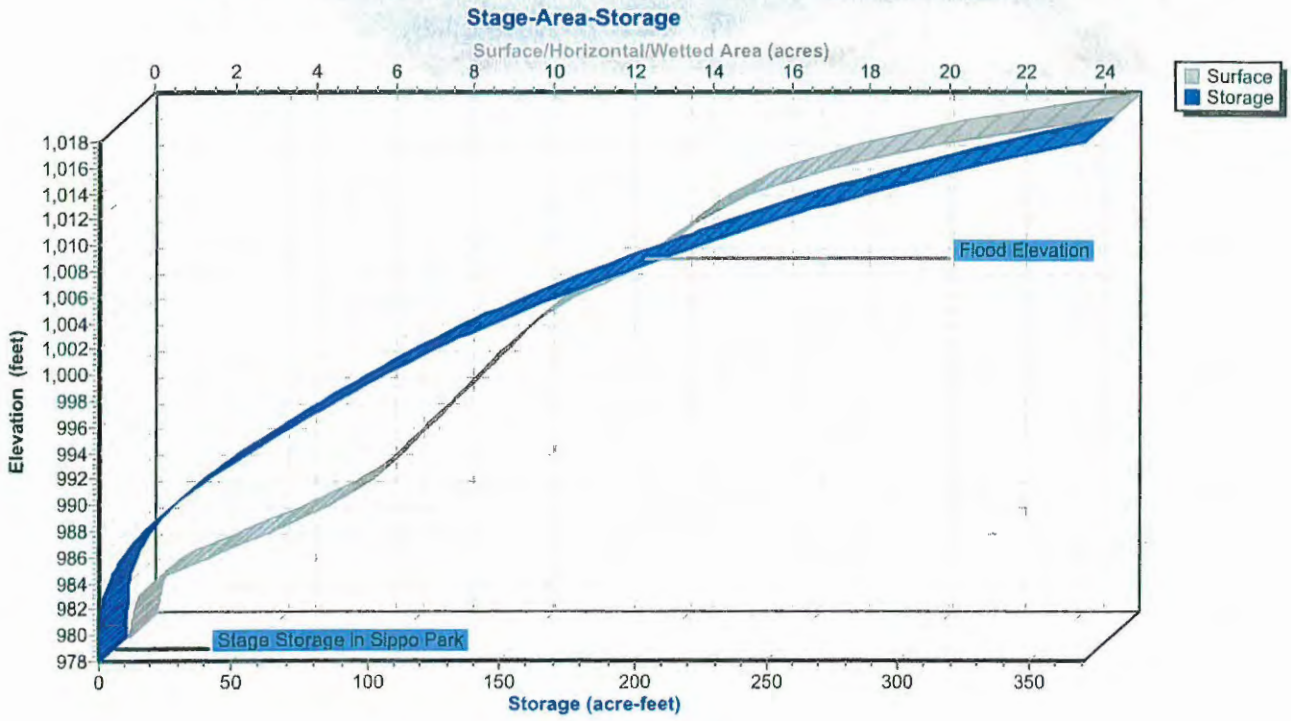
Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-



Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-



Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-

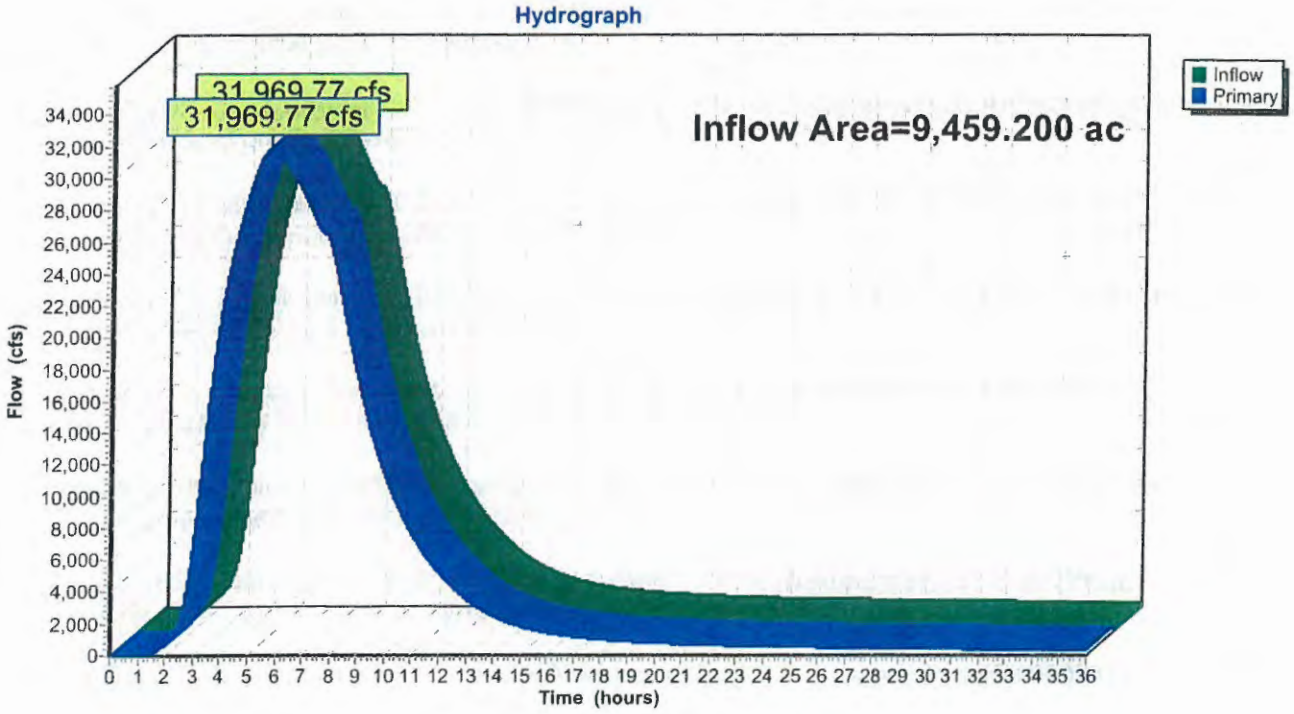


Summary for Pond 19C: Confluence 19

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 21.56" for 6 hr PMF TR-60 event
Inflow = 31,969.77 cfs @ 5.77 hrs, Volume= 16,998.956 af
Primary = 31,969.77 cfs @ 5.78 hrs, Volume= 16,998.956 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 19C: Confluence 19



Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment HYD 1: Lake Eric Drainage Runoff Area=115.200 ac 0.00% Impervious Runoff Depth=0.68"
Tc=44.0 min CN=74 Runoff=32.83 cfs 6.498 af

Subcatchment HYD 2: Lake O'Springs Runoff Area=268.800 ac 38.00% Impervious Runoff Depth=0.72"
Tc=65.0 min CN=75 Runoff=72.93 cfs 16.167 af

Subcatchment HYD 3: Lake Cable Runoff Area=1,401.600 ac 25.00% Impervious Runoff Depth=0.51"
Tc=226.0 min CN=70 Runoff=159.11 cfs 60.010 af

Subcatchment HYD 4: Hyd 4 Watershed Runoff Area=1,075.200 ac 20.00% Impervious Runoff Depth=0.44"
Tc=128.0 min CN=68 Runoff=128.56 cfs 39.553 af

Subcatchment HYD11: HYD11 Watershed Runoff Area=774.400 ac 0.00% Impervious Runoff Depth=0.41"
Tc=129.0 min CN=67 Runoff=84.91 cfs 26.294 af

Subcatchment HYD12: HYD12 Watershed Runoff Area=723.200 ac 0.00% Impervious Runoff Depth=0.68"
Tc=110.0 min CN=74 Runoff=146.23 cfs 40.794 af

Subcatchment HYD13: HYD13 Watershed Runoff Area=736.000 ac 38.00% Impervious Runoff Depth=0.72"
Tc=72.0 min CN=75 Runoff=192.06 cfs 44.266 af

Subcatchment HYD14: HYD14 Watershed Runoff Area=678.400 ac 25.00% Impervious Runoff Depth=0.97
Tc=78.0 min CN=80 Runoff=240.95 cfs 54.996 af

Subcatchment HYD6: HYD6 Watershed Runoff Area=1,068.800 ac 0.00% Impervious Runoff Depth=0.48"
Tc=155.0 min CN=69 Runoff=129.39 cfs 42.474 af

Subcatchment HYD8: Sippo Lake Runoff Area=1,964.800 ac 38.00% Impervious Runoff Depth=0.72"
Tc=156.0 min CN=75 Runoff=365.52 cfs 118.170 af

Subcatchment HYD9: HYD9 Watershed Runoff Area=652.800 ac 0.00% Impervious Runoff Depth=0.41"
Tc=151.0 min CN=67 Runoff=67.94 cfs 22.165 af

Reach 5R: Channel 5 Avg. Flow Depth=2.41' Max Vel=5.24 fps Inflow=221.72 cfs 428.033 af
L=8,800.0' S=0.0240 '/' Capacity=106,015.62 cfs Outflow=203.77 cfs 422.922 af

Reach 7R: Channel 7 Avg. Flow Depth=4.79' Max Vel=2.38 fps Inflow=304.03 cfs 462.283 af
L=5,900.0' S=0.0017 '/' Capacity=195,473.52 cfs Outflow=295.97 cfs 453.998 af

Reach 10Ra: Channel 10 (Reach West Avg. Flow Depth=1.13' Max Vel=1.51 fps Inflow=20.96 cfs 23.790 af
L=900.0' S=0.0028 '/' Capacity=36,685.79 cfs Outflow=20.96 cfs 23.727 af

Reach 15R: Channel 15 Avg. Flow Depth=5.35' Max Vel=1.53 fps Inflow=575.67 cfs 568.267 af
L=8,800.0' S=0.0010 '/' Capacity=189,892.92 cfs Outflow=502.02 cfs 551.504 af

Reach 16R: Channel 16 Avg. Flow Depth=6.98' Max Vel=2.08 fps Inflow=671.10 cfs 636.364 af
L=7,500.0' S=0.0010 '/' Capacity=42,389.29 cfs Outflow=597.79 cfs 622.575 af

Reach 18R: Sippo Creek Channel Avg. Flow Depth=3.39' Max Vel=9.09 fps Inflow=647.45 cfs 669.947 af
L=450.0' S=0.0084 '/' Capacity=200,707.82 cfs Outflow=647.44 cfs 669.847 af

Pond 1C: CONF 1 Combined O'Springs and Eric Inflow=77.31 cfs 22.597 af
Primary=77.31 cfs 22.597 af

Pond 1P: Sippo Creek Reservoir - Peak Elev=1,004.37' Storage=84.063 af Inflow=663.19 cfs 677.371 af
Primary=649.85 cfs 670.270 af Secondary=2.43 cfs 0.219 af Tertiary=0.00 cfs 0.000 af Outflow=652.28 cfs 670.490 af

Pond 2C: CONF 2 Combined Cable and O'Springs Inflow=186.56 cfs 82.400 af
Primary=186.56 cfs 82.400 af

Pond 3P: Lake Cable Peak Elev=1,097.40' Storage=1,914.000 af Inflow=186.56 cfs 82.399 af
Primary=221.72 cfs 428.129 af Secondary=0.00 cfs 0.000 af Outflow=221.72 cfs 428.129 af

Pond 4C: Confluence 4 Inflow=424.80 cfs 496.375 af
Primary=424.80 cfs 496.375 af

Pond 4P: Lake O'Springs Peak Elev=1,106.46' Storage=36.820 af Inflow=77.31 cfs 22.597 af
Primary=27.56 cfs 22.390 af Secondary=0.00 cfs 0.000 af Outflow=27.56 cfs 22.390 af

Pond 5C: Confluence 5 Inflow=507.84 cfs 522.573 af
Primary=507.84 cfs 522.573 af

Pond 5P: Lake Eric (Slagle) Peak Elev=1,117.60' Storage=17.832 af Inflow=32.83 cfs 6.498 af
Primary=11.37 cfs 6.431 af Secondary=0.00 cfs 0.000 af Outflow=11.37 cfs 6.431 af

Pond 6C: Confluence 6 Inflow=67.94 cfs 45.891 af
Primary=67.94 cfs 45.891 af

Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake Inflow=575.67 cfs 568.365 af
Primary=575.67 cfs 568.365 af

Pond 8C: Confluence 8 Inflow=671.10 cfs 636.464 af
Primary=671.10 cfs 636.464 af

Pond 8P: Storage Area Genoa Rd Peak Elev=1,019.90' Storage=11.686 af Inflow=55.00 cfs 25.501 af
Primary=20.96 cfs 23.792 af Secondary=0.00 cfs 0.000 af Outflow=20.96 cfs 23.792 af

Pond 9P: Sippo Lake Peak Elev=1,028.17' Storage=328.051 af Inflow=365.52 cfs 118.170 af
Primary=55.00 cfs 25.501 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=55.00 cfs 25.501 af

Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed Inflow=304.03 cfs 462.379 af
Primary=304.03 cfs 462.379 af

Pond 16P: Lincoln Way Box Peak Elev=984.99' Storage=5.949 af Inflow=652.28 cfs 670.389 af
Primary=647.45 cfs 670.047 af Secondary=0.00 cfs 0.000 af Outflow=647.45 cfs 670.047 af

Pond 19C: Confluence 19 Inflow=663.19 cfs 677.471 af
Primary=663.19 cfs 677.471 af

Total Runoff Area = 9,459.200 ac Runoff Volume = 471.386 af Average Runoff Depth = 0.60"
80.30% Pervious = 7,595.712 ac 19.70% Impervious = 1,863.488 ac

Summary for Subcatchment HYD 1: Lake Eric Drainage Area

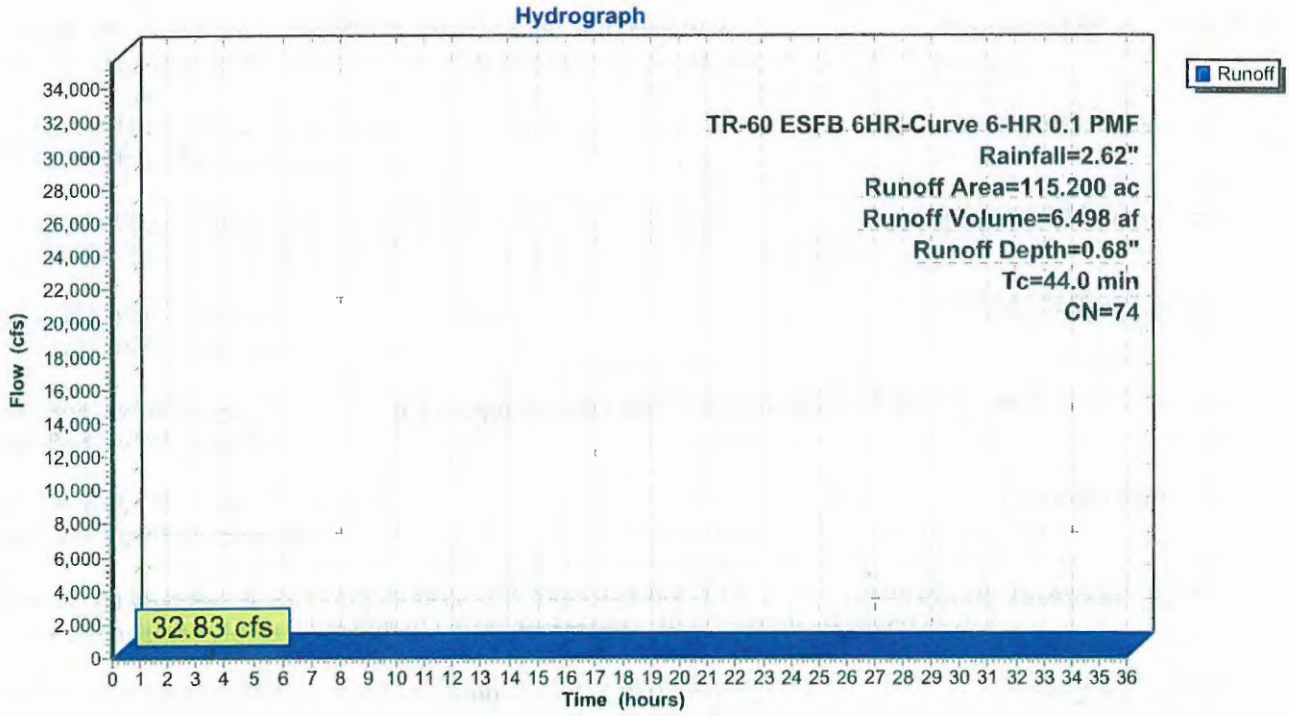
Runoff = 32.83 cfs @ 3.58 hrs, Volume= 6.498 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.1 PMF Rainfall=2.62"

Area (ac)	CN	Description
115.200	74	>75% Grass cover, Good, HSG C
115.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.0					**Direct Entry, HEC-1 Lag Time = 0.44 hr**

Subcatchment HYD 1: Lake Eric Drainage Area



Summary for Subcatchment HYD 2: Lake O'Springs Watershed

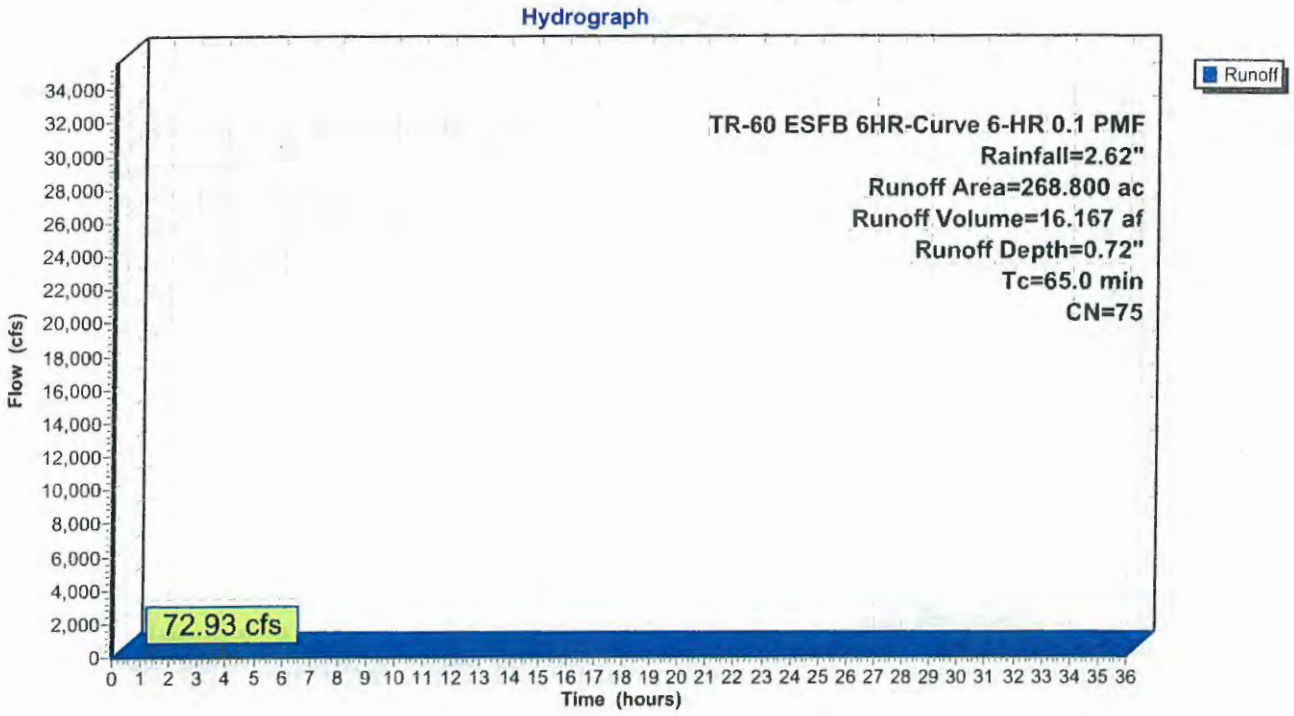
Runoff = 72.93 cfs @ 3.90 hrs, Volume= 16.167 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.1 PMF Rainfall=2.62"

Area (ac)	CN	Description
268.800	75	1/4 acre lots, 38% imp, HSG B
166.656		62.00% Pervious Area
102.144		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.0					**Direct Entry, HEC-1 Lag Time = 0.65 hours**

Subcatchment HYD 2: Lake O'Springs Watershed



Summary for Subcatchment HYD 3: Lake Cable Watershed

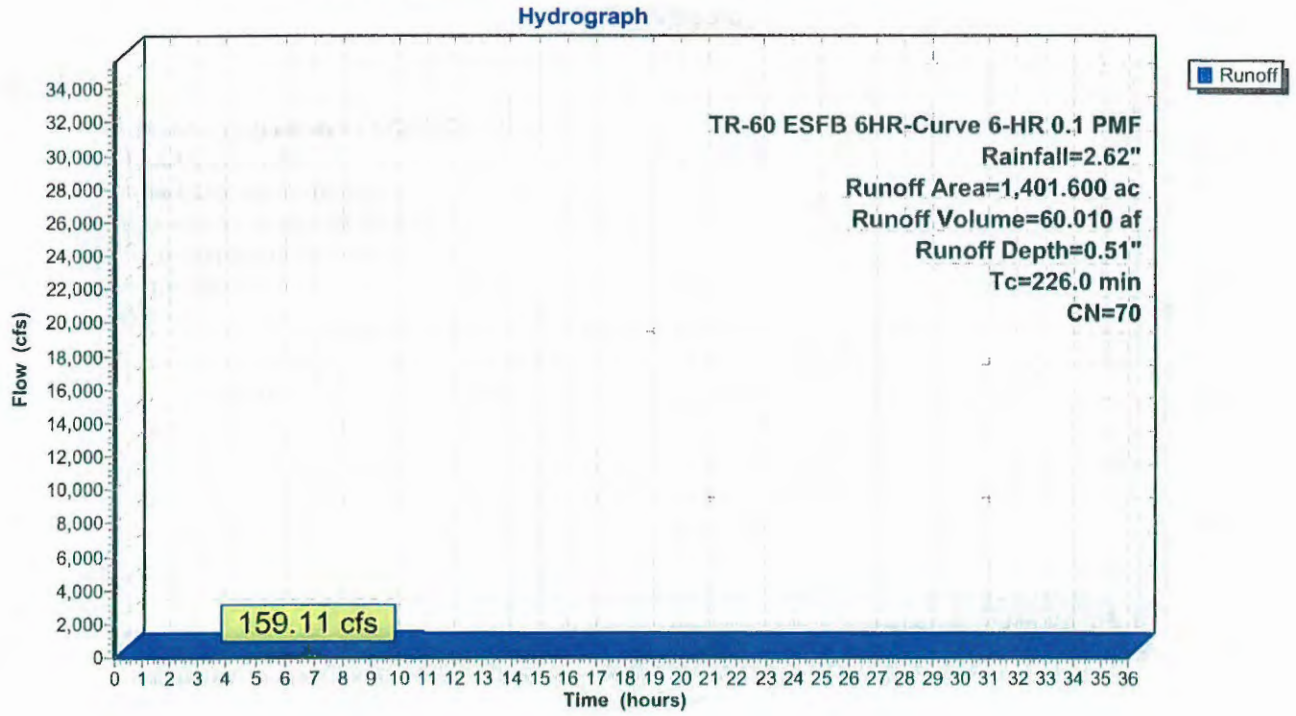
Runoff = 159.11 cfs @ 6.78 hrs, Volume= 60.010 af, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.1 PMF Rainfall=2.62"

Area (ac)	CN	Description
1,401.600	70	1/2 acre lots, 25% imp, HSG B
1,051.200		75.00% Pervious Area
350.400		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
226.0					**Direct Entry, HEC-1 Lag time 2.26hr**

Subcatchment HYD 3: Lake Cable Watershed



Summary for Subcatchment HYD 4: Hyd 4 Watershed

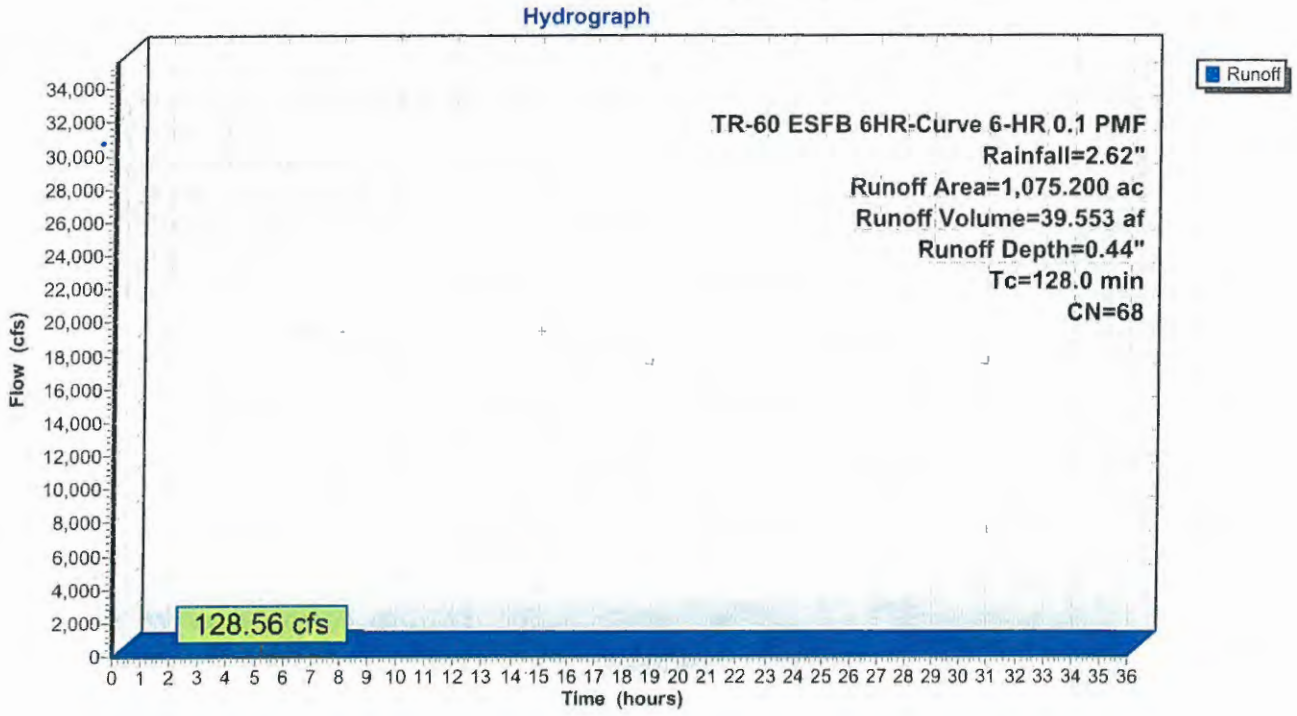
Runoff = 128.56 cfs @ 5.26 hrs, Volume= 39.553 af, Depth= 0.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.1 PMF Rainfall=2.62"

Area (ac)	CN	Description
1,075.200	68	1 acre lots, 20% imp, HSG B
860.160		80.00% Pervious Area
215.040		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
128.0					**Direct Entry, HEC-1 Lag Time = 1.28 hr**

Subcatchment HYD 4: Hyd 4 Watershed



Summary for Subcatchment HYD11: HYD11 Watershed

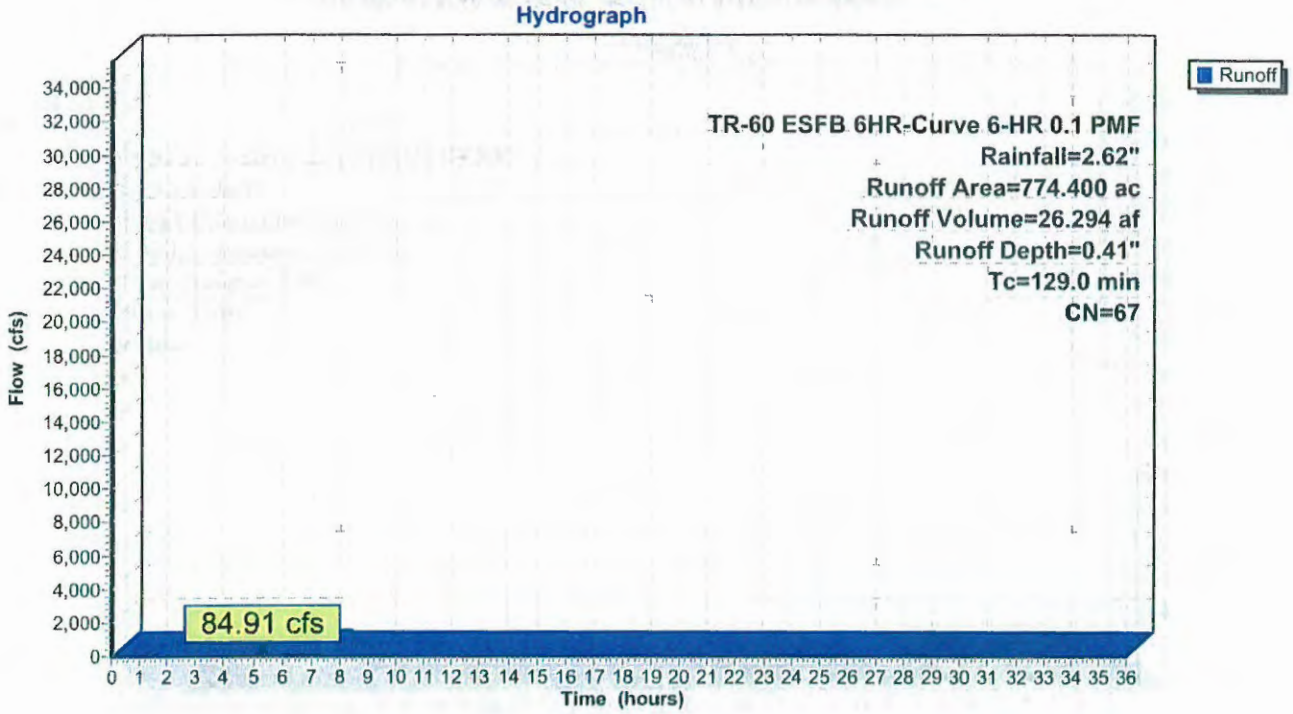
Runoff = 84.91 cfs @ 5.30 hrs, Volume= 26.294 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.1 PMF Rainfall=2.62"

	Area (ac)	CN	Description
*	774.400	67	
	774.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
129.0					**Direct Entry, HEC-1 Lag Time = 1.29 hr**

Subcatchment HYD11: HYD11 Watershed



Summary for Subcatchment HYD12: HYD12 Watershed

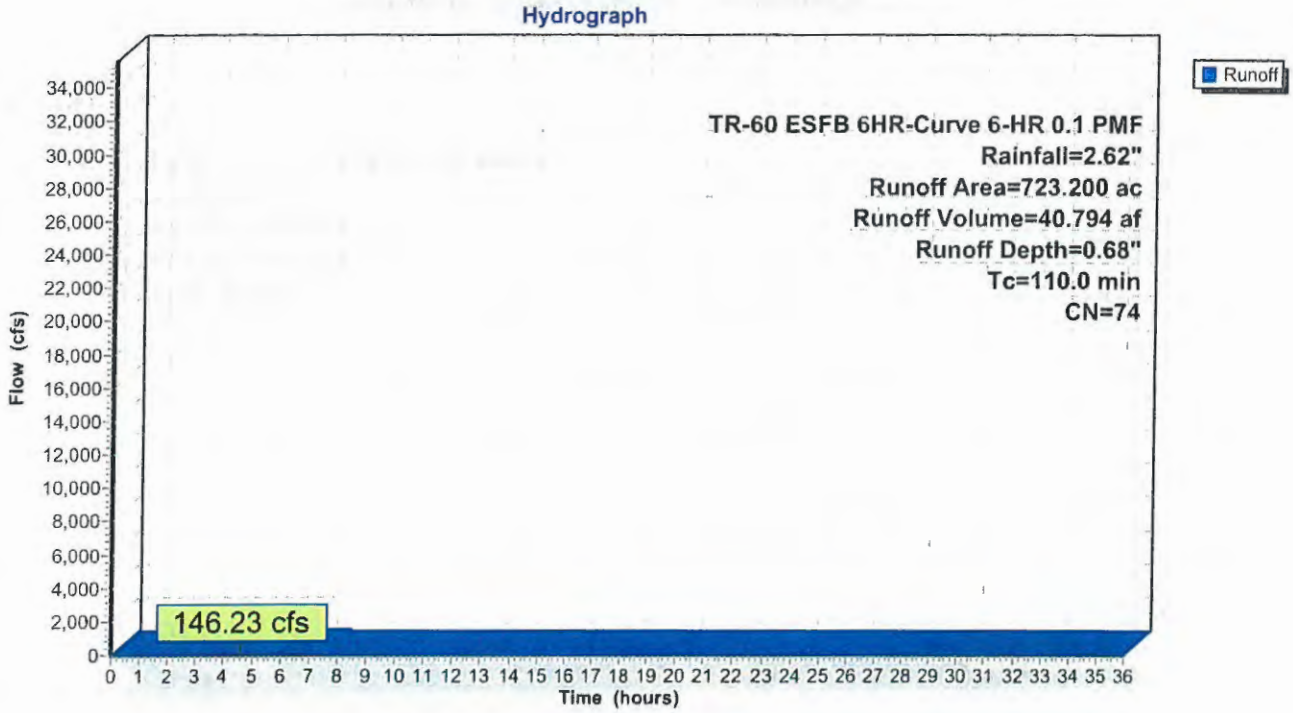
Runoff = 146.23 cfs @ 4.64 hrs, Volume= 40.794 af, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.1 PMF Rainfall=2.62"

Area (ac)	CN	Description
723.200	74	>75% Grass cover, Good, HSG C
723.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
110.0					**Direct Entry, HEC-1 Lag Time = 1.10 hr**

Subcatchment HYD12: HYD12 Watershed



Summary for Subcatchment HYD13: HYD13 Watershed

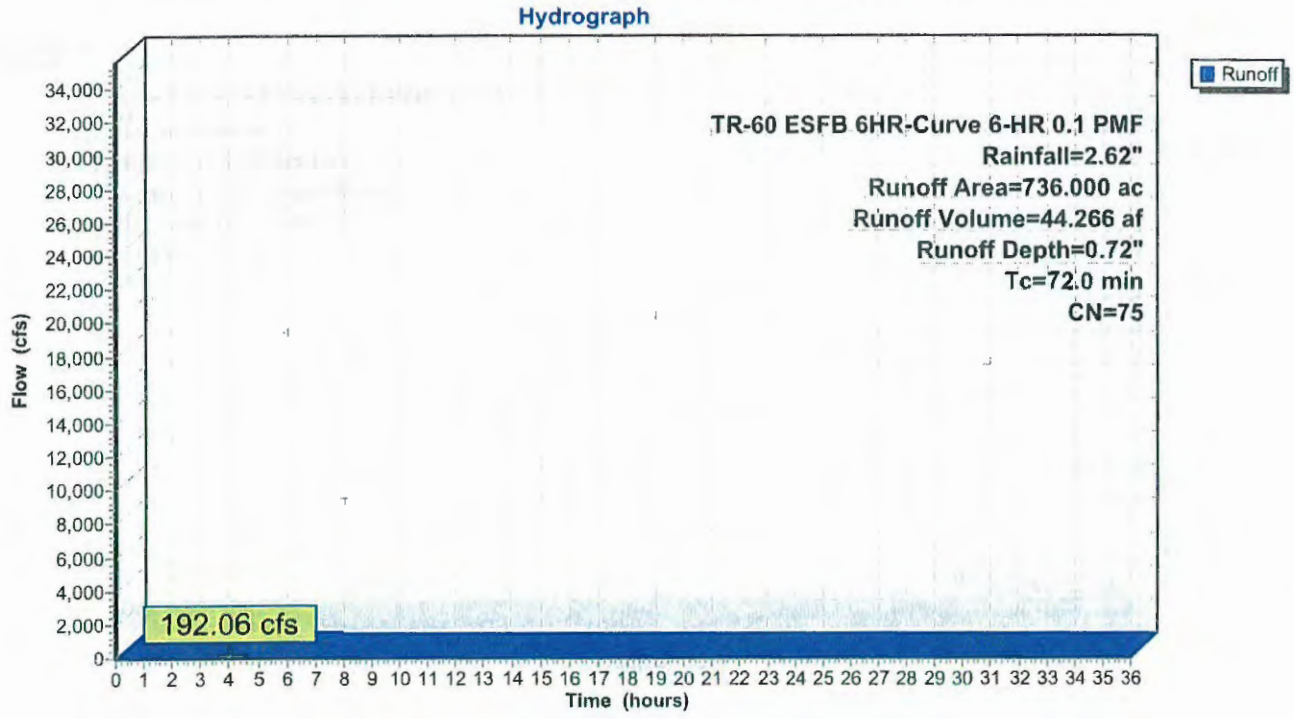
Runoff = 192.06 cfs @ 4.00 hrs, Volume= 44.266 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.1 PMF Rainfall=2.62"

Area (ac)	CN	Description
736.000	75	1/4 acre lots, 38% imp, HSG B
456.320		62.00% Pervious Area
279.680		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
72.0					**Direct Entry, HEC-1 Lag Time = 0.72 hr**

Subcatchment HYD13: HYD13 Watershed



Summary for Subcatchment HYD14: HYD14 Watershed

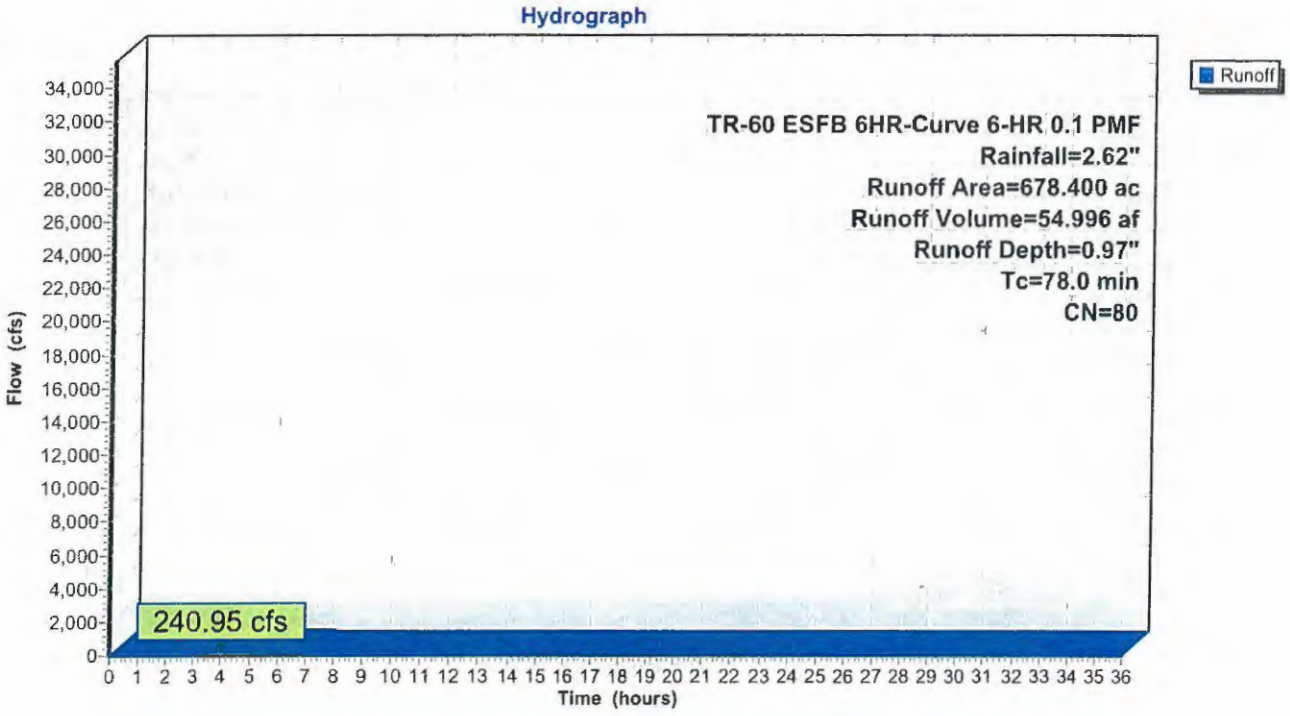
Runoff = 240.95 cfs @ 3.98 hrs, Volume= 54.996 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.1 PMF Rainfall=2.62"

Area (ac)	CN	Description
678.400	80	1/2 acre lots, 25% imp, HSG C
508.800		75.00% Pervious Area
169.600		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.0					**Direct Entry, HEC-1 Lag Time = 0.78 hr**

Subcatchment HYD14: HYD14 Watershed



Summary for Subcatchment HYD6: HYD6 Watershed

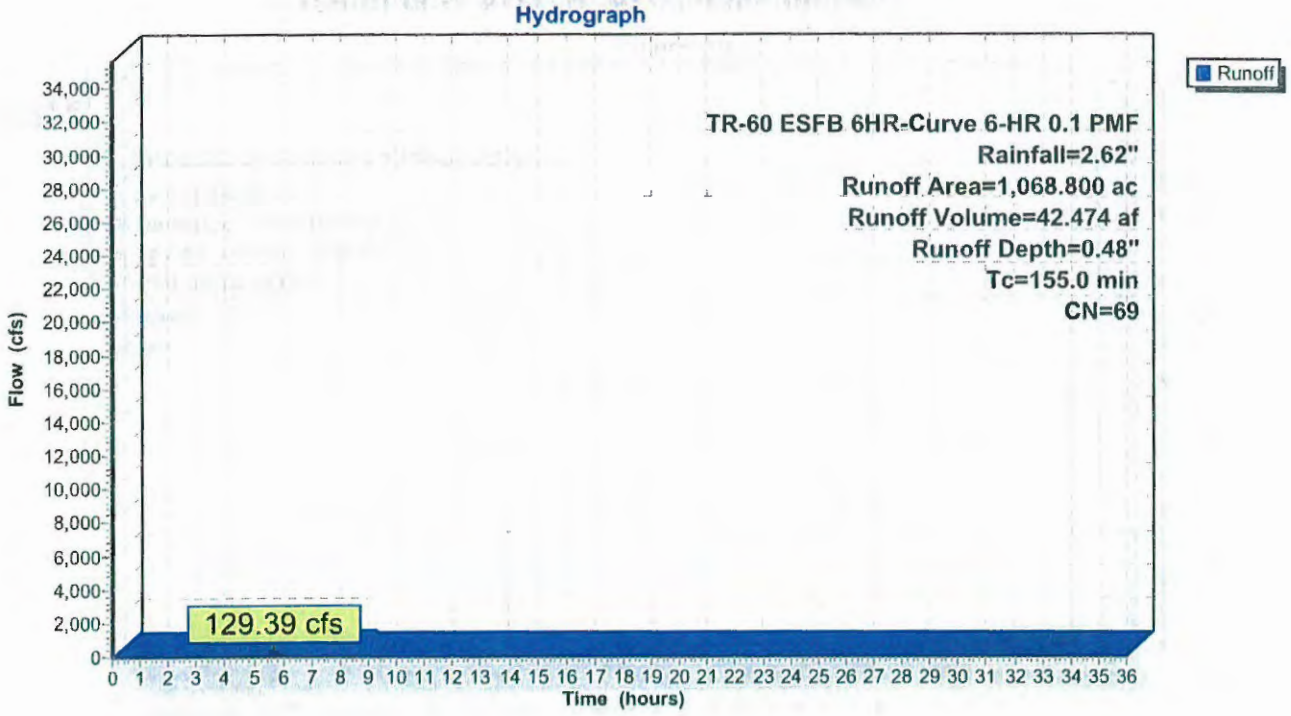
Runoff = 129.39 cfs @ 5.68 hrs, Volume= 42.474 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.1 PMF Rainfall=2.62"

Area (ac)	CN	Description
1,068.800	69	Pasture/grassland/range, Fair, HSG B
1,068.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
155.0					Direct Entry, HEC-1 Lag Time = 1.55 hr

Subcatchment HYD6: HYD6 Watershed



Summary for Subcatchment HYD8: Sippo Lake Watershed

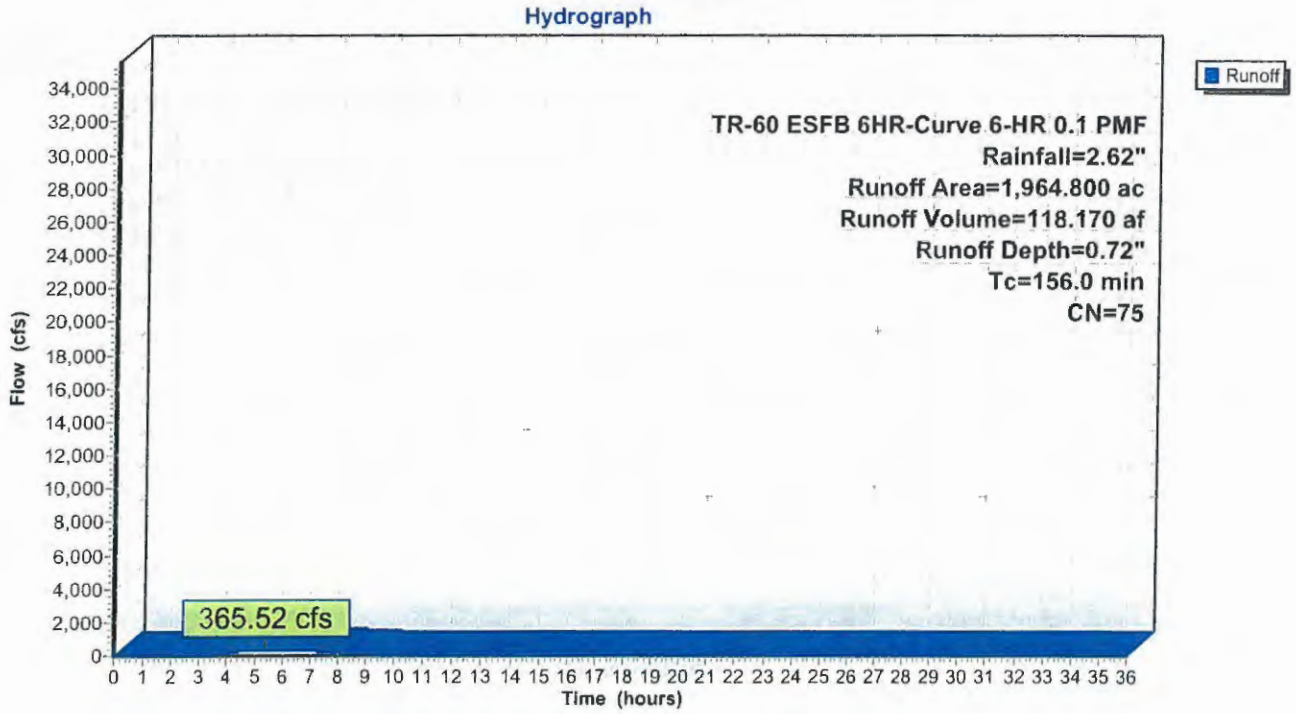
Runoff = 365.52 cfs @ 5.37 hrs, Volume= 118.170 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.1 PMF Rainfall=2.62"

Area (ac)	CN	Description
1,964.800	75	1/4 acre lots, 38% imp, HSG B
1,218.176		62.00% Pervious Area
746.624		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
156.0					**Direct Entry, HEC-1 Lag Time = 1.56hr**

Subcatchment HYD8: Sippo Lake Watershed



Summary for Subcatchment HYD9: HYD9 Watershed

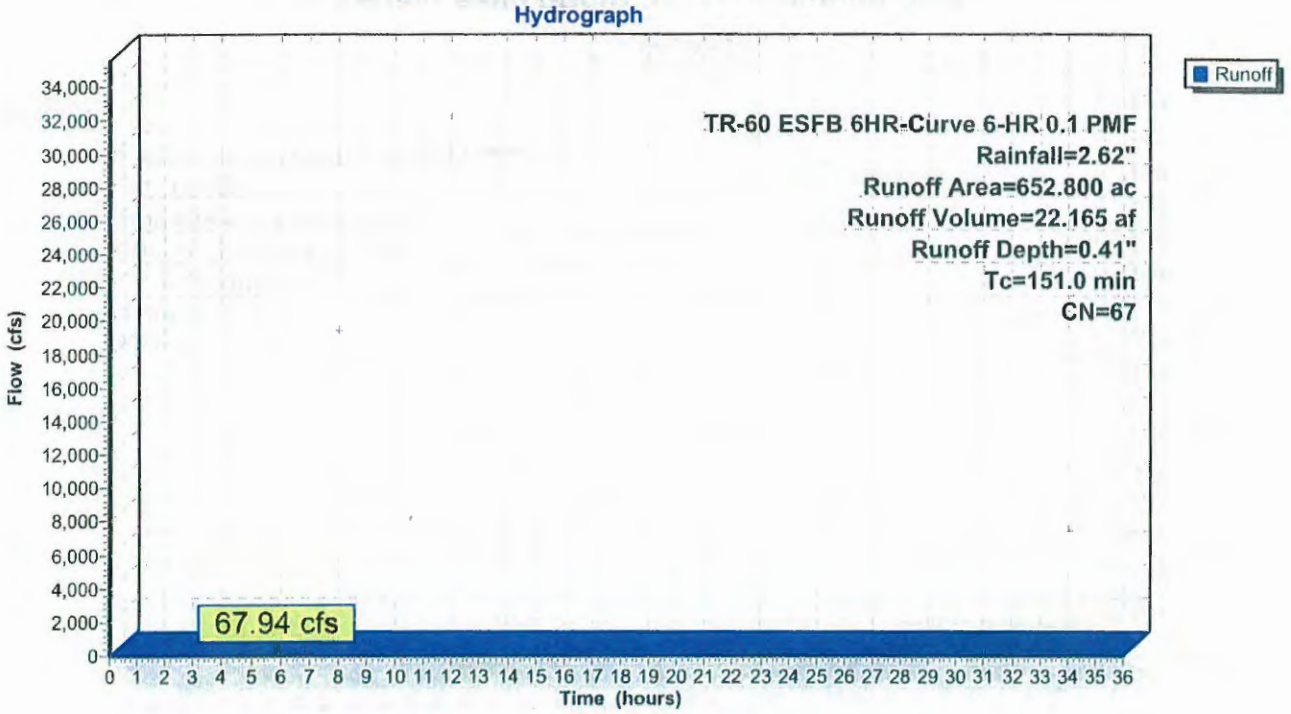
Runoff = 67.94 cfs @ 5.87 hrs, Volume= 22.165 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.1 PMF Rainfall=2.62"

	Area (ac)	CN	Description
*	652.800	67	
	652.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
151.0					**Direct Entry, HEC-1 Lag Time = 1.51hr**

Subcatchment HYD9: HYD9 Watershed



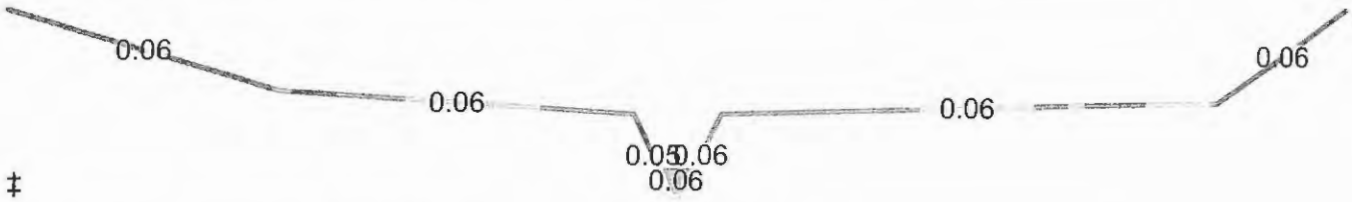
Summary for Reach 5R: Channel 5

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 2.88" for 6-HR 0.1 PMF event
Inflow = 221.72 cfs @ 0.00 hrs, Volume= 428.033 af
Outflow = 203.77 cfs @ 1.54 hrs, Volume= 422.922 af, Atten= 8%, Lag= 92.3 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.24 fps, Min. Travel Time= 28.0 min
Avg. Velocity = 4.74 fps, Avg. Travel Time= 30.9 min

Peak Storage= 342,459 cf @ 1.54 hrs
Average Depth at Peak Storage= 2.41'
Defined Flood Depth= 16.00', Capacity at Flood Depth= 106,015.62 cfs
Bank-Full Depth= 16.00', Capacity at Bank-Full= 106,015.62 cfs

Custom cross-section, Length= 8,800.0' Slope= 0.0240 '/' (102 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,069.00', Outlet Invert= 857.80'

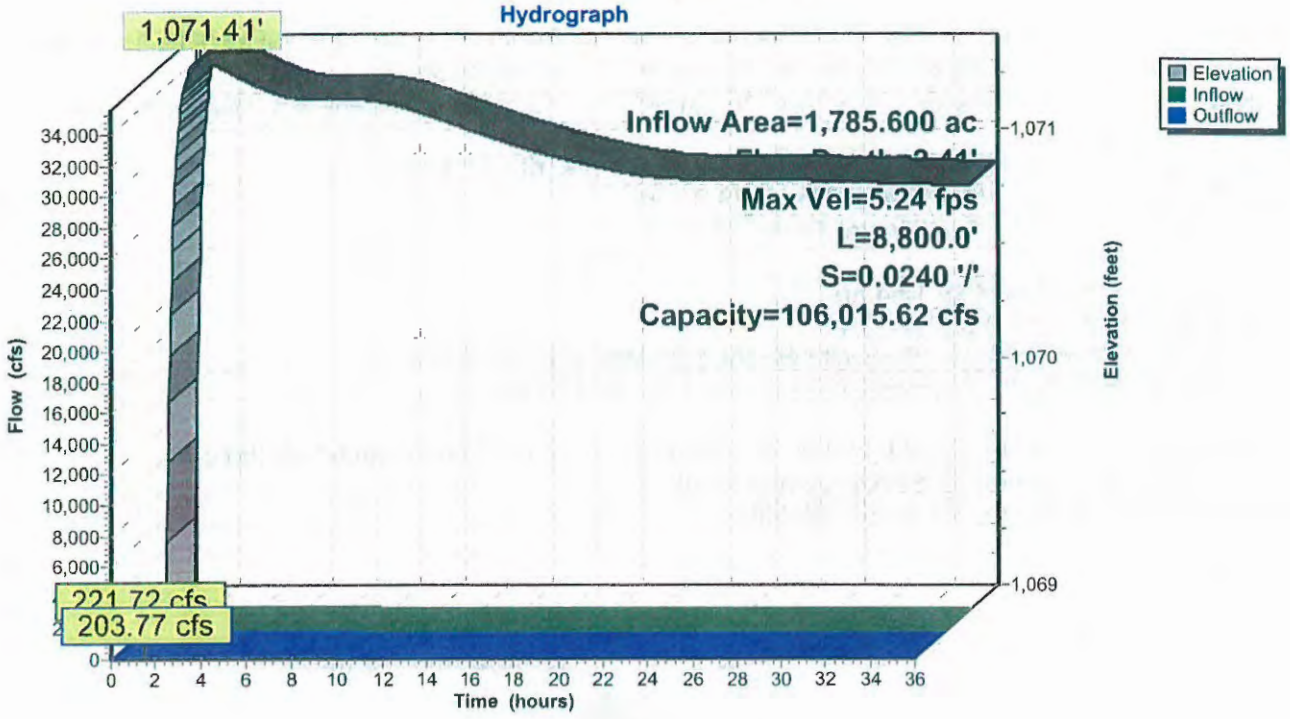


‡

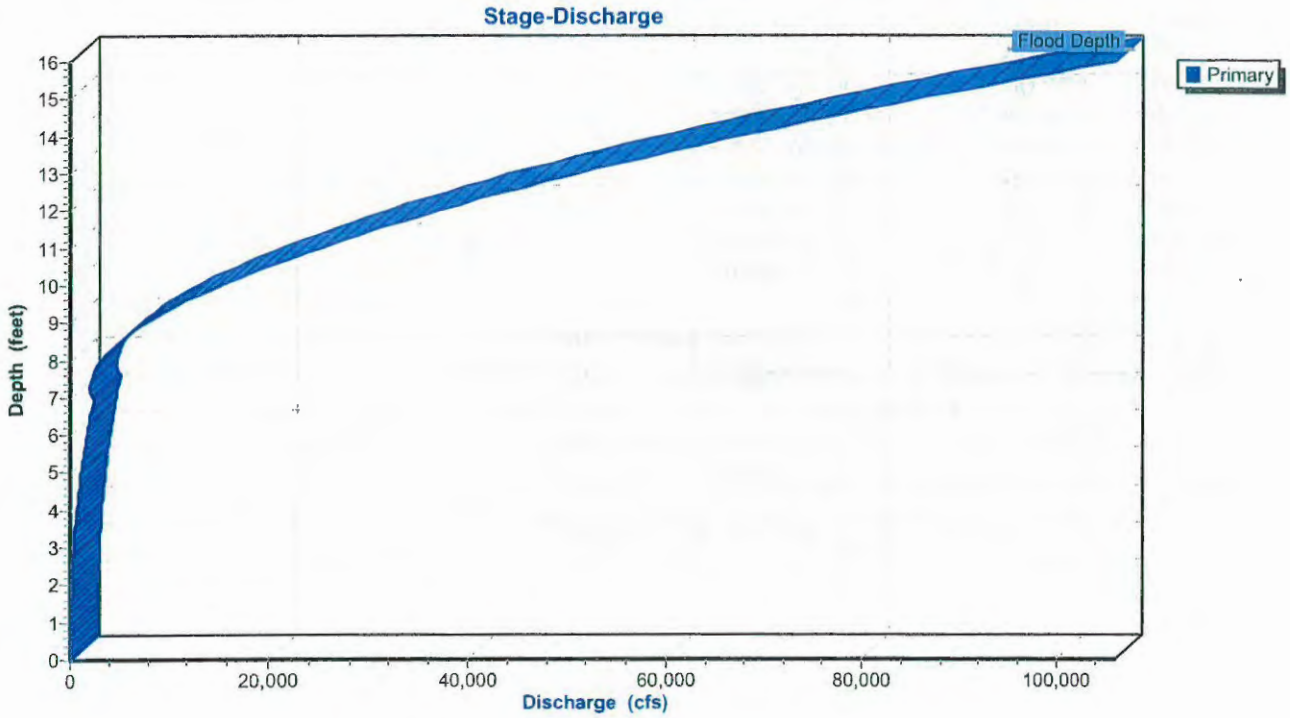
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,085.00	0.00		
200.00	1,078.00	7.00	0.060	
465.00	1,076.00	9.00	0.060	
494.00	1,069.00	16.00	0.050	
500.00	1,069.00	16.00	0.060	
530.00	1,076.00	9.00	0.060	
900.00	1,077.00	8.00	0.060	
1,000.00	1,085.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	6.0	0	0.00
7.00	248.5	66.6	2,186,800	2,476.94
8.00	564.8	569.1	4,969,800	3,087.89
9.00	1,204.8	714.2	10,601,800	7,790.91
16.00	7,198.5	1,002.1	63,346,800	106,015.62

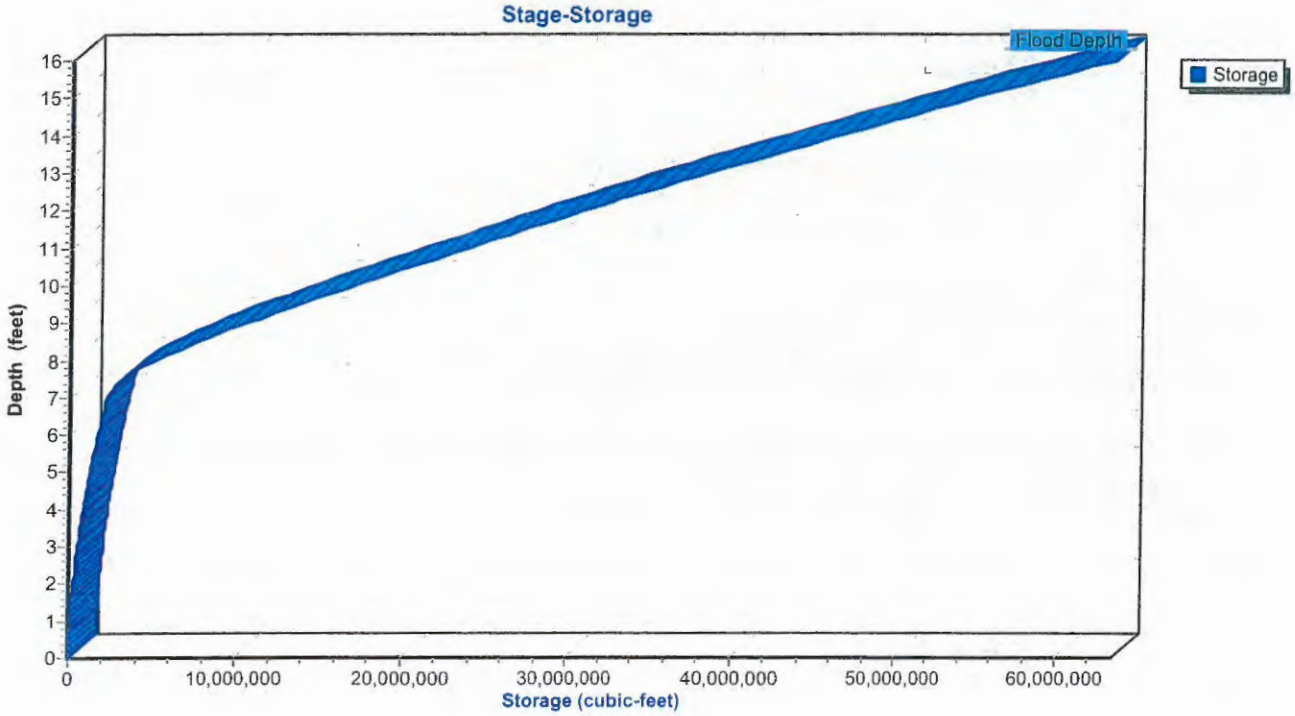
Reach 5R: Channel 5



Reach 5R: Channel 5



Reach 5R: Channel 5



Summary for Reach 7R: Channel 7

Inflow Area = 2,860.800 ac, 23.34% Impervious, Inflow Depth > 1.94" for 6-HR 0.1 PMF event
Inflow = 304.03 cfs @ 5.14 hrs, Volume= 462.283 af
Outflow = 295.97 cfs @ 5.90 hrs, Volume= 453.998 af, Atten= 3%, Lag= 45.5 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.38 fps, Min. Travel Time= 41.4 min
Avg. Velocity = 1.99 fps, Avg. Travel Time= 49.4 min

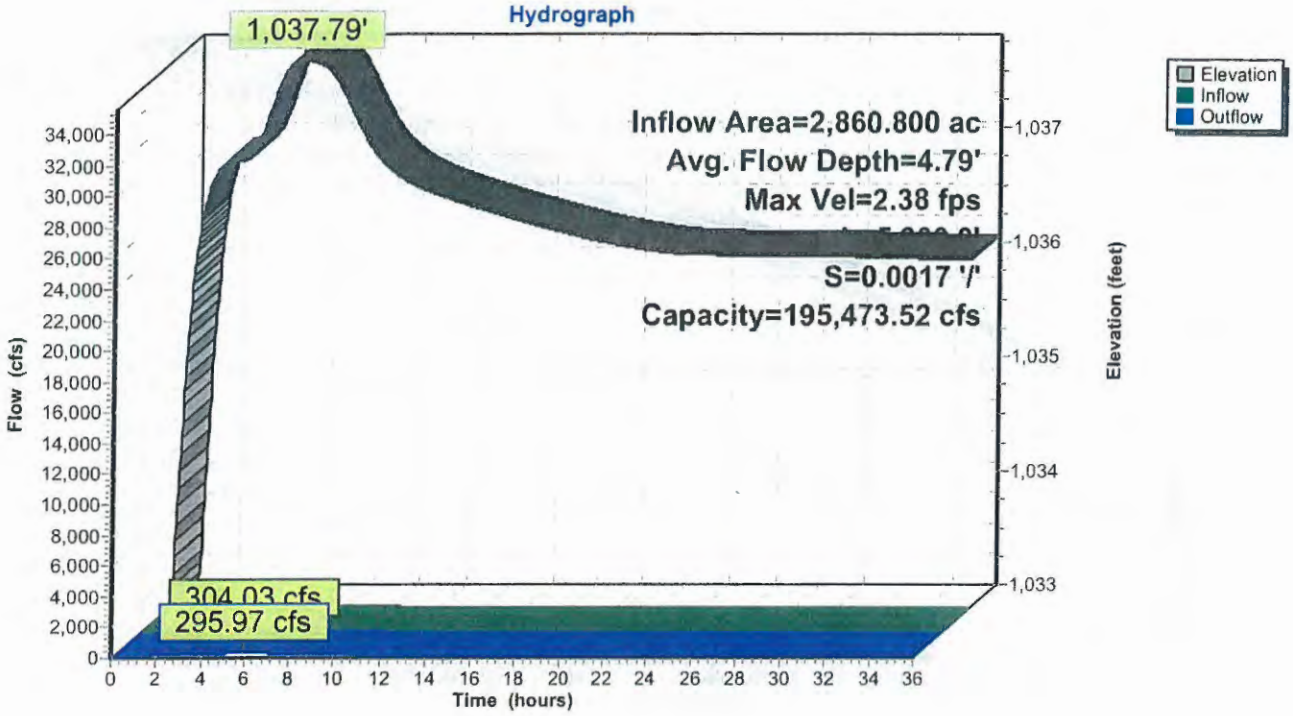
Peak Storage= 735,173 cf @ 5.90 hrs
Average Depth at Peak Storage= 4.79'
Defined Flood Depth= 47.00', Capacity at Flood Depth= 195,473.52 cfs
Bank-Full Depth= 47.00', Capacity at Bank-Full= 195,473.52 cfs

Custom cross-section, Length= 5,900.0' Slope= 0.0017 '/' (104 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,033.00', Outlet Invert= 1,022.97'

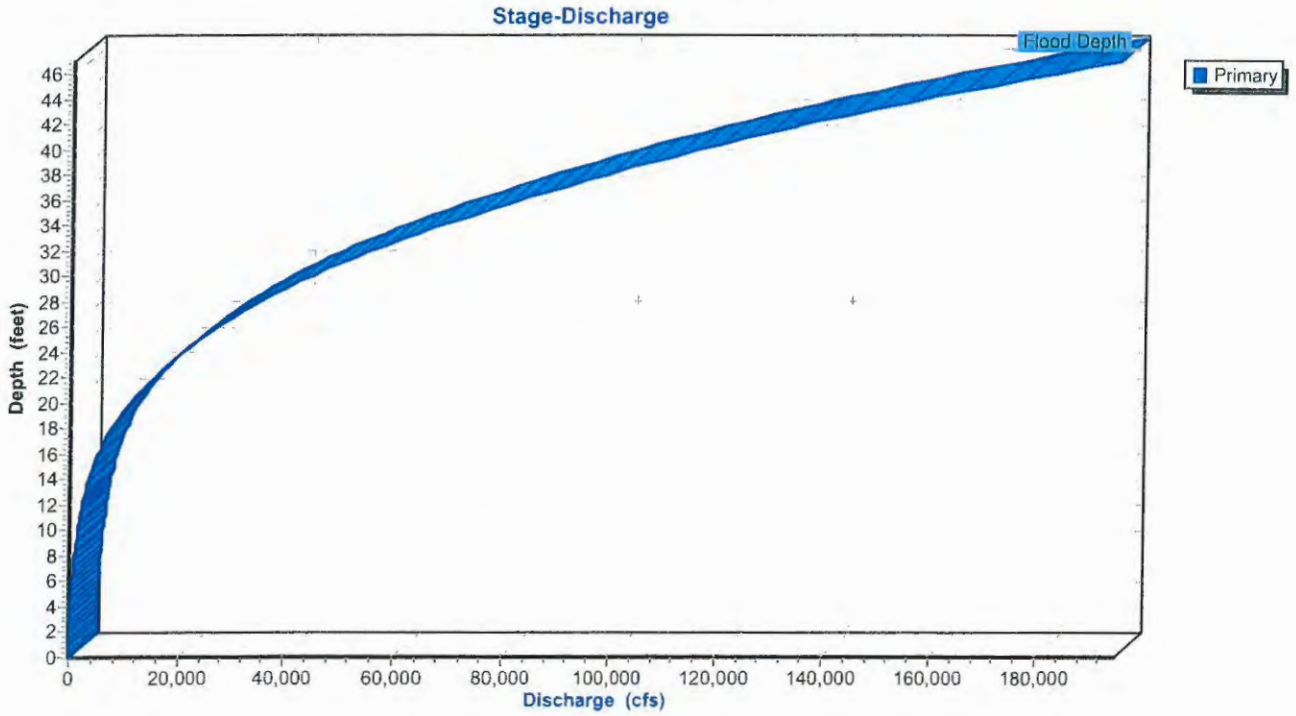
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,080.00	0.00		
100.00	1,065.00	15.00	0.060	
350.00	1,052.00	28.00	0.060	
460.00	1,045.00	35.00	0.060	
490.00	1,033.00	47.00	0.050	
500.00	1,033.00	47.00	0.050	
550.00	1,045.00	35.00	0.060	
700.00	1,052.00	28.00	0.060	
1,000.00	1,075.00	5.00	0.060	
1,005.00	1,080.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	10.0	0	0.00
12.00	600.0	93.7	3,540,000	2,349.60
19.00	2,140.0	354.1	12,626,000	8,862.05
32.00	9,417.2	774.5	55,561,326	55,339.93
42.00	18,098.3	972.7	106,780,167	135,620.34
47.00	23,027.5	1,013.5	135,862,250	195,473.52

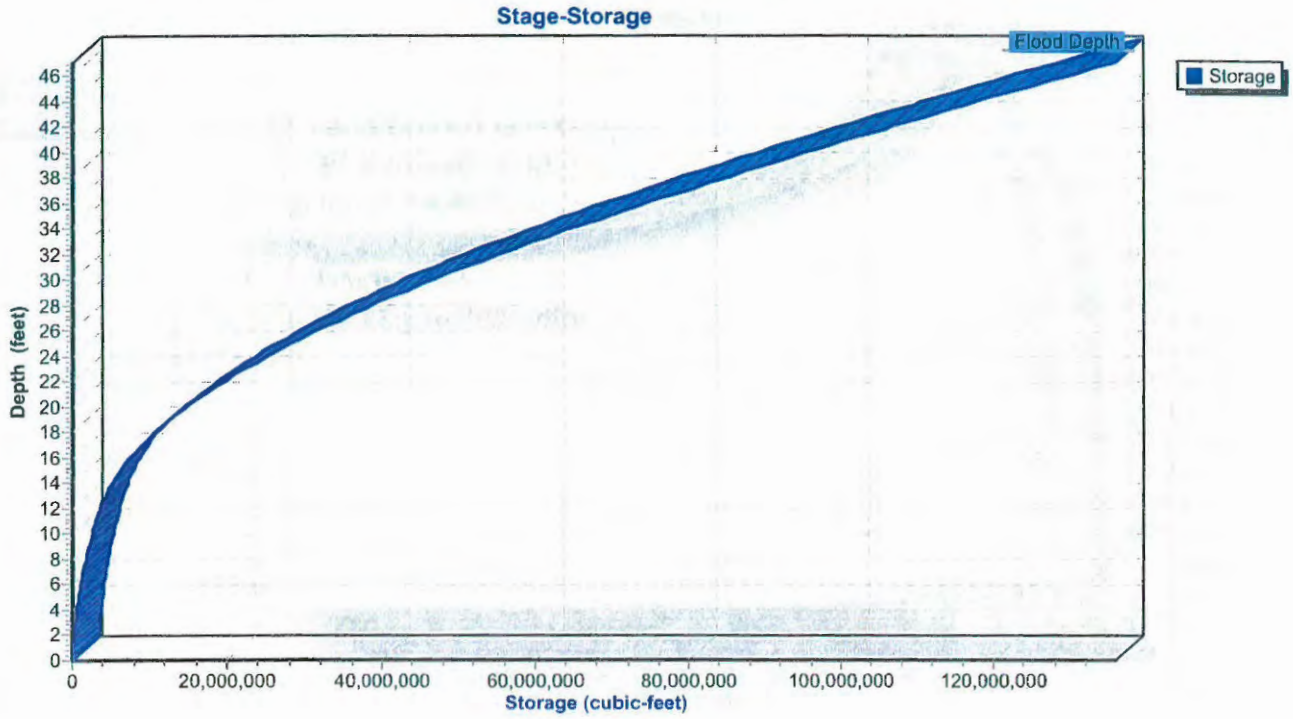
Reach 7R: Channel 7



Reach 7R: Channel 7



Reach 7R: Channel 7



Summary for Reach 10Ra: Channel 10 (Reach West of Genoa Rd)

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth > 0.15" for 6-HR 0.1 PMF event
Inflow = 20.96 cfs @ 13.13 hrs, Volume= 23.790 af
Outflow = 20.96 cfs @ 13.24 hrs, Volume= 23.727 af, Atten= 0%, Lag= 6.9 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.51 fps, Min. Travel Time= 10.0 min
Avg. Velocity = 1.10 fps, Avg. Travel Time= 13.7 min

Peak Storage= 12,538 cf @ 13.24 hrs
Average Depth at Peak Storage= 1.13'
Defined Flood Depth= 15.00', Capacity at Flood Depth= 36,685.79 cfs
Bank-Full Depth= 15.00', Capacity at Bank-Full= 36,685.79 cfs

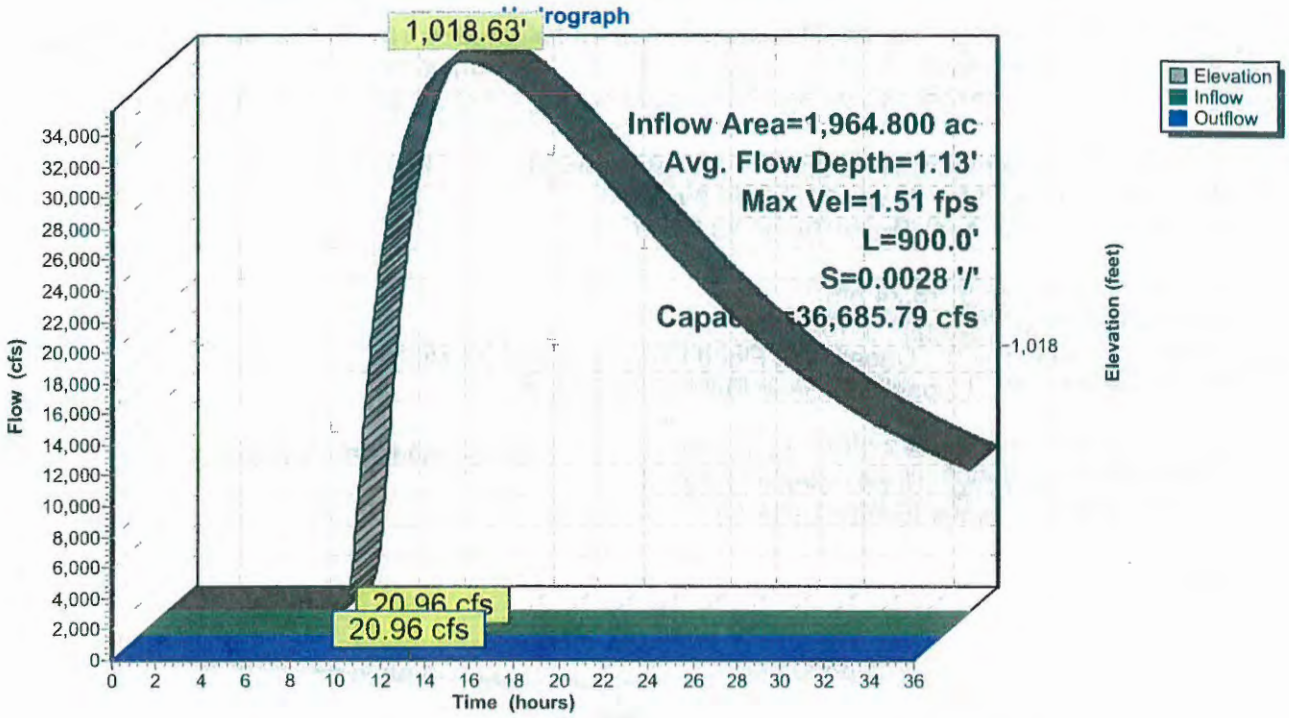
Custom cross-section, Length= 900.0' Slope= 0.0028 '/' (103 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,017.50', Outlet Invert= 1,015.00'

‡

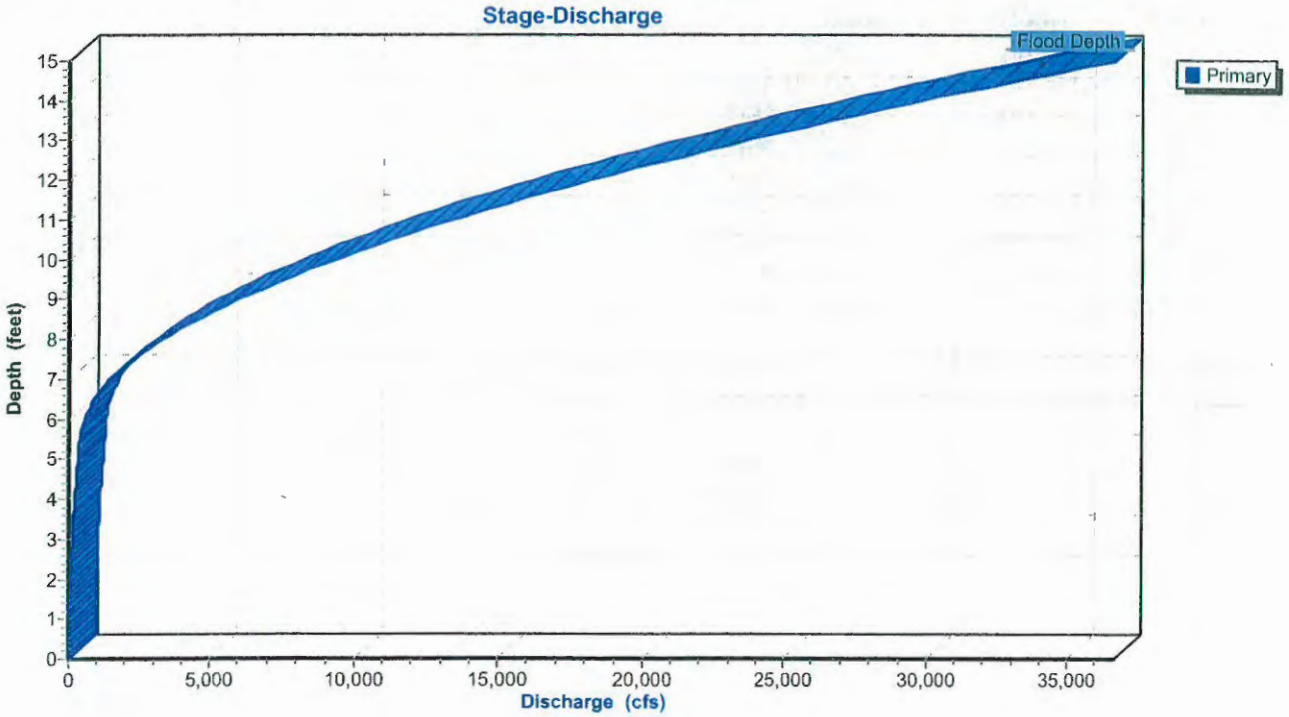
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,032.00	0.00		
190.00	1,024.00	8.00	0.060	
485.00	1,022.00	10.00	0.060	
495.00	1,017.00	15.00	0.050	
505.00	1,017.00	15.00	0.050	
515.00	1,022.00	10.00	0.060	
820.00	1,024.00	8.00	0.060	
900.00	1,027.00	5.00	0.060	
1,000.00	1,032.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	10.0	0	0.00
5.00	100.0	32.4	90,000	328.73
7.00	760.0	632.4	684,000	1,430.41
10.00	2,876.9	783.7	2,589,188	9,317.36
15.00	7,330.0	1,002.7	6,597,000	36,685.79

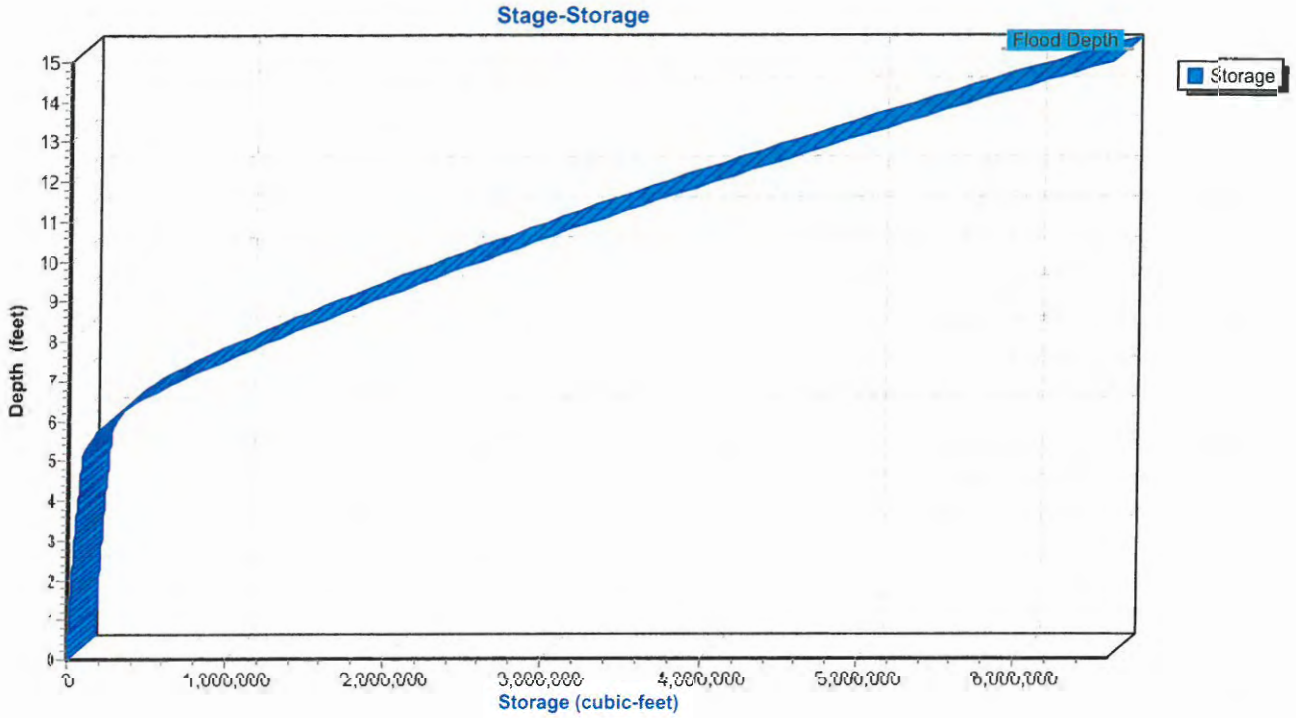
Reach 10Ra: Channel 10 (Reach West of Genoa Rd)



Reach 10Ra: Channel 10 (Reach West of Genoa Rd)



Reach 10Ra: Channel 10 (Reach West of Genoa Rd)



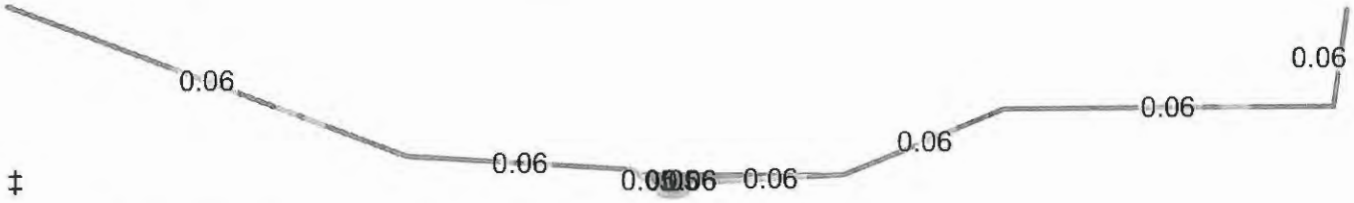
Summary for Reach 15R: Channel 15

Inflow Area = 7,321.600 ac, 19.32% Impervious, Inflow Depth > 0.93" for 6-HR 0.1 PMF event
Inflow = 575.67 cfs @ 5.72 hrs, Volume= 568.267 af
Outflow = 502.02 cfs @ 7.29 hrs, Volume= 551.504 af, Atten= 13%, Lag= 94.2 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.53 fps, Min. Travel Time= 96.0 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 104.6 min

Peak Storage= 2,894,665 cf @ 7.29 hrs
Average Depth at Peak Storage= 5.35'
Defined Flood Depth= 43.00', Capacity at Flood Depth= 189,892.92 cfs
Bank-Full Depth= 43.00', Capacity at Bank-Full= 189,892.92 cfs

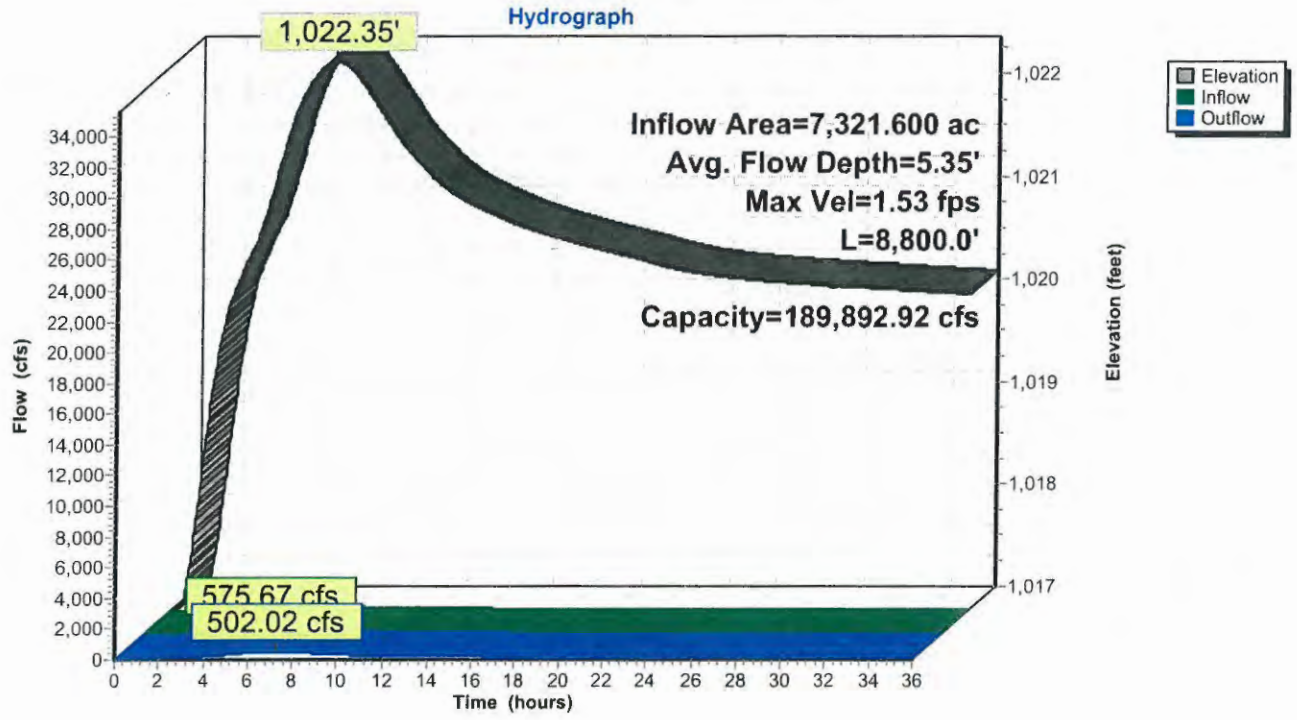
Custom cross-section, Length= 8,800.0' Slope= 0.0010 '/' (106 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,017.00', Outlet Invert= 1,008.20'



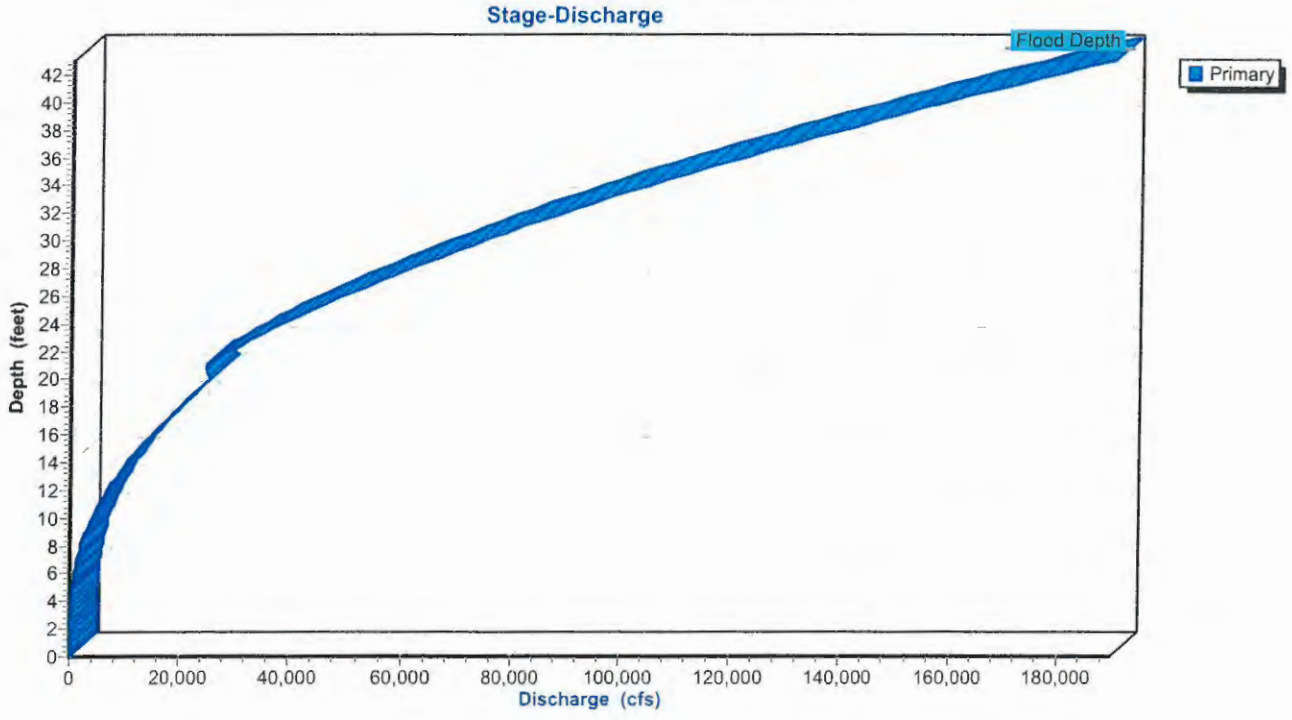
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,060.00	0.00		
300.00	1,026.00	34.00	0.060	
470.00	1,023.00	37.00	0.060	
493.00	1,017.00	43.00	0.050	
507.00	1,017.00	43.00	0.050	
520.00	1,020.00	40.00	0.060	
630.00	1,022.00	38.00	0.060	
750.00	1,037.00	23.00	0.060	
1,000.00	1,038.00	22.00	0.060	
1,010.00	1,060.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	14.0	0	0.00
3.00	78.8	39.2	693,000	116.39
5.00	273.4	157.2	2,406,067	396.99
6.00	435.5	169.2	3,832,400	733.92
9.00	1,230.5	363.4	10,828,400	2,703.81
20.00	6,230.3	549.8	54,826,847	25,737.78
21.00	6,906.8	808.7	60,779,788	24,784.16
43.00	26,881.5	1,028.2	236,557,200	189,892.92

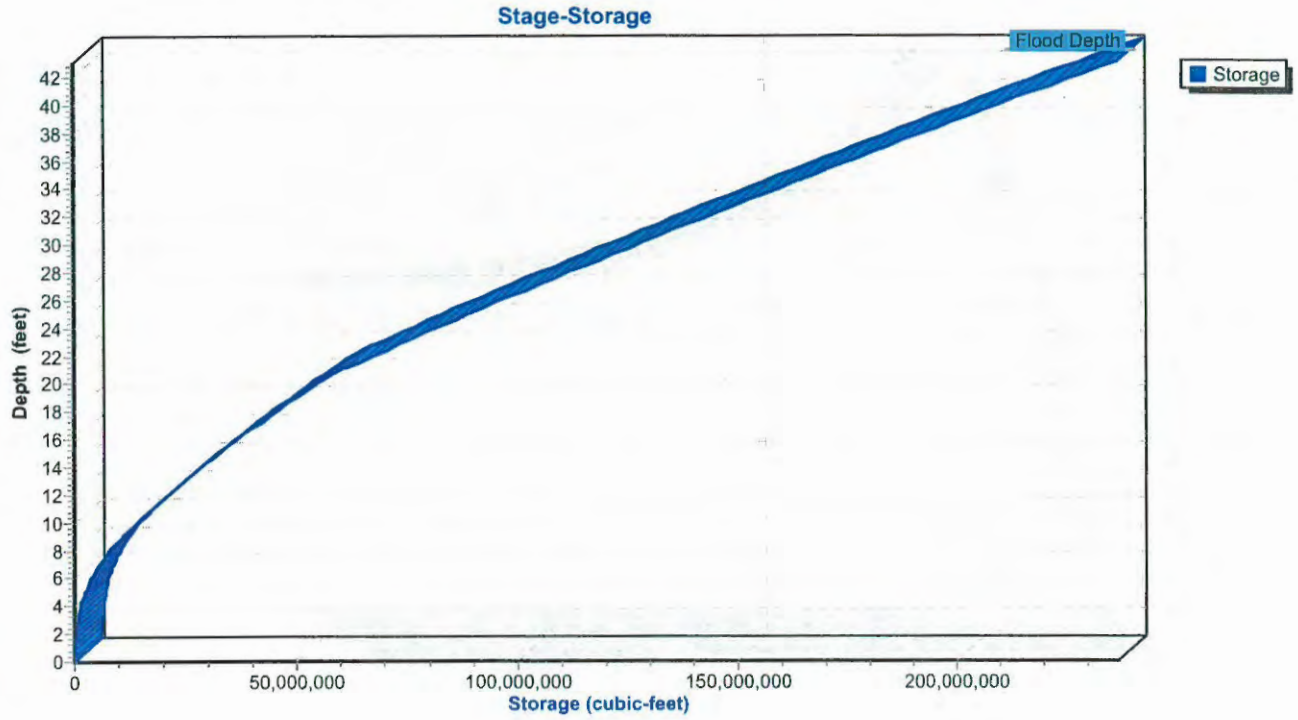
Reach 15R: Channel 15



Reach 15R: Channel 15



Reach 15R: Channel 15



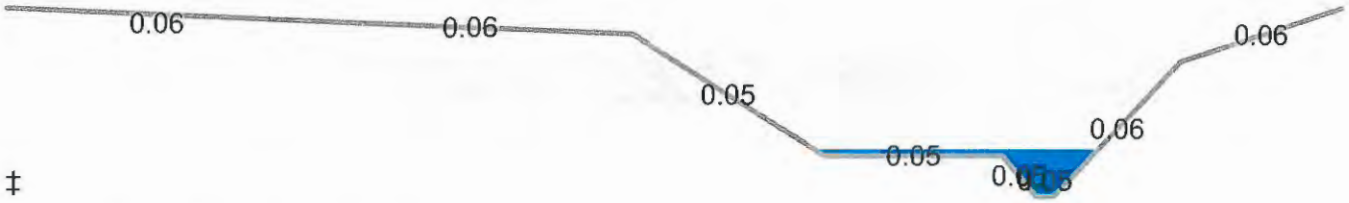
Summary for Reach 16R: Channel 16

Inflow Area = 8,780.800 ac, 19.29% Impervious, Inflow Depth > 0.87" for 6-HR 0.1 PMF event
Inflow = 671.10 cfs @ 6.49 hrs, Volume= 636.364 af
Outflow = 597.79 cfs @ 7.29 hrs, Volume= 622.575 af, Atten= 11%, Lag= 48.4 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.08 fps, Min. Travel Time= 60.0 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 85.6 min

Peak Storage= 2,997,748 cf @ 7.29 hrs
Average Depth at Peak Storage= 6.98'
Defined Flood Depth= 28.00', Capacity at Flood Depth= 42,389.29 cfs
Bank-Full Depth= 28.00', Capacity at Bank-Full= 42,389.29 cfs

Custom cross-section, Length= 7,500.0' Slope= 0.0010 '/' (104 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,006.00', Outlet Invert= 998.50'

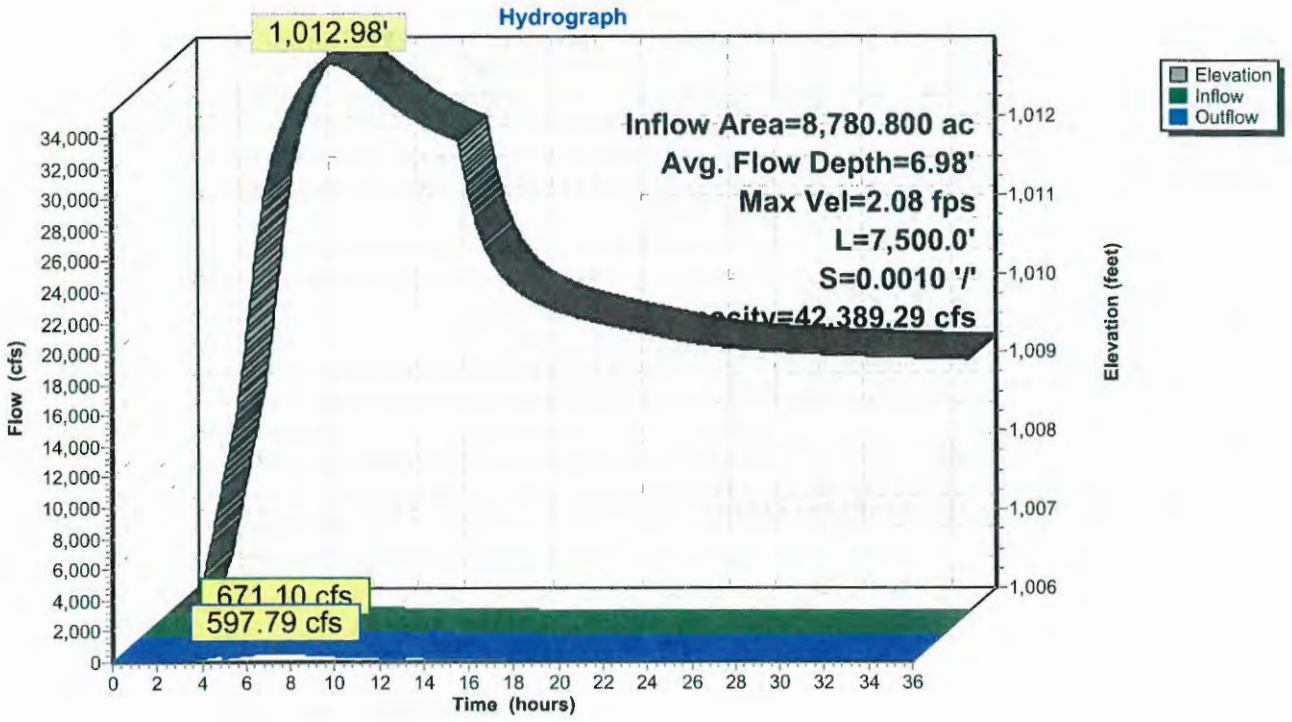


‡

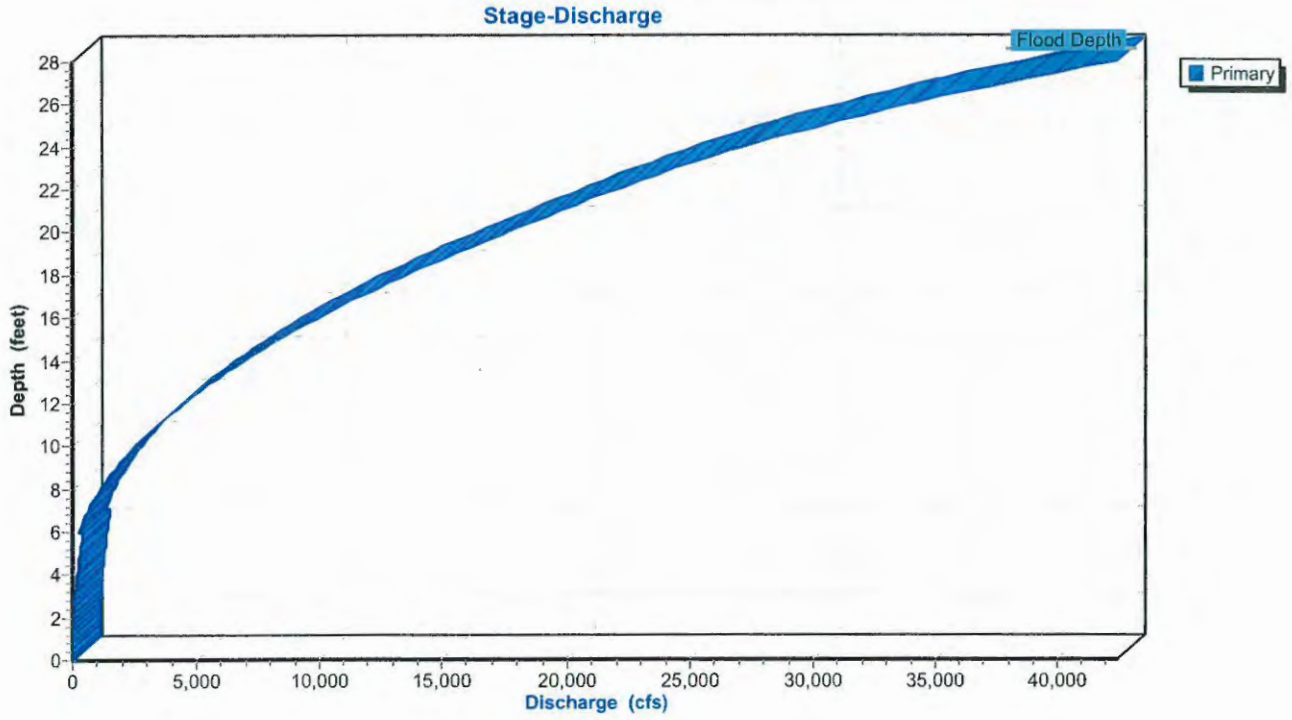
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,034.00	0.00		
200.00	1,032.00	2.00	0.060	
420.00	1,030.00	4.00	0.060	
550.00	1,012.00	22.00	0.050	
670.00	1,012.00	22.00	0.050	
693.00	1,006.00	28.00	0.050	
705.00	1,006.00	28.00	0.050	
790.00	1,026.00	8.00	0.060	
900.00	1,034.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	12.0	0	0.00
6.00	217.5	182.0	1,631,250	246.41
20.00	3,868.8	345.2	29,015,833	17,663.27
24.00	5,401.0	429.5	40,507,500	27,141.14
26.00	6,498.5	677.1	48,738,750	33,993.67
28.00	8,071.0	904.6	60,532,500	42,389.29

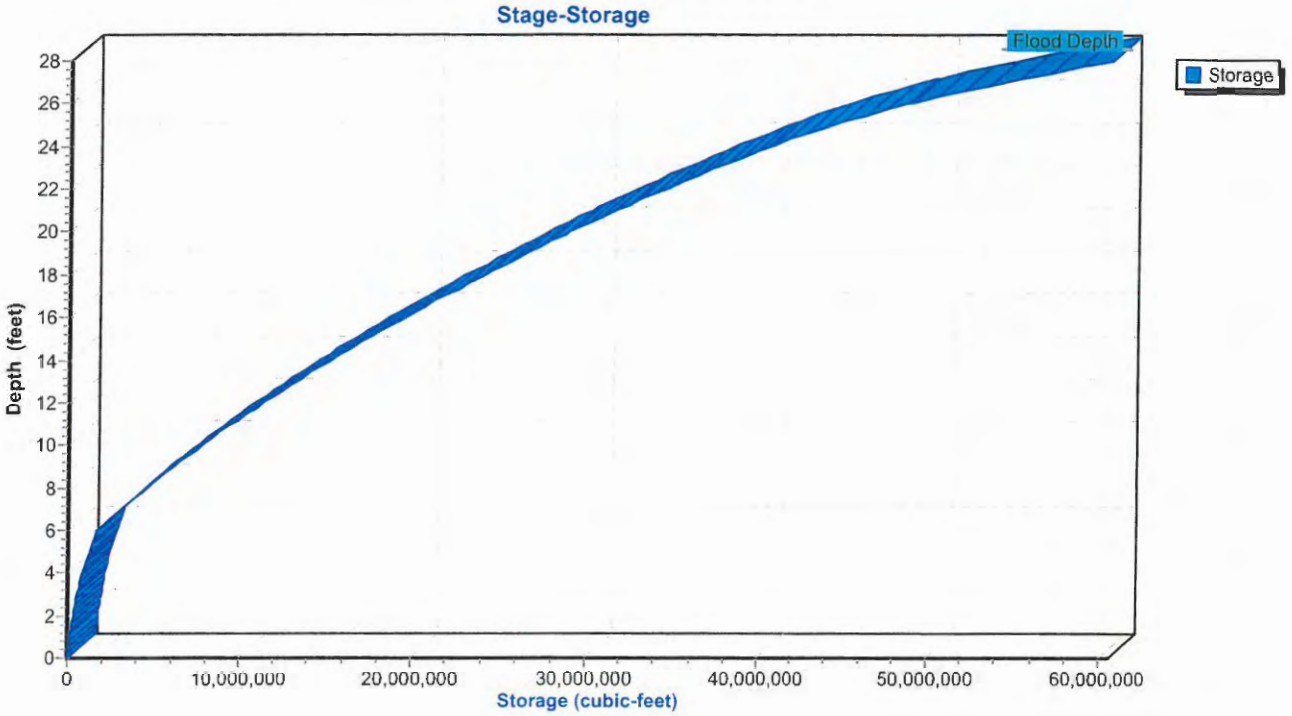
Reach 16R: Channel 16



Reach 16R: Channel 16



Reach 16R: Channel 16



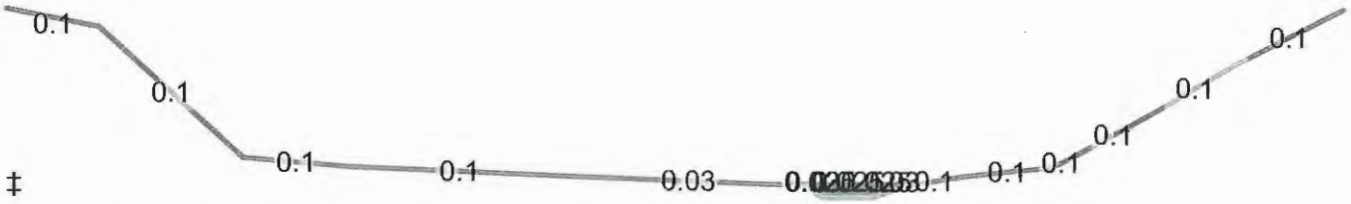
Summary for Reach 18R: Sippo Creek Channel Downstream of Lincoln Way

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 0.85" for 6-HR 0.1 PMF event
Inflow = 647.45 cfs @ 7.32 hrs, Volume= 669.947 af
Outflow = 647.44 cfs @ 7.33 hrs, Volume= 669.847 af, Atten= 0%, Lag= 0.9 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.09 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 7.20 fps, Avg. Travel Time= 1.0 min

Peak Storage= 32,212 cf @ 7.33 hrs
Average Depth at Peak Storage= 3.39'
Defined Flood Depth= 15.00', Capacity at Flood Depth= 28,360.41 cfs
Bank-Full Depth= 40.50', Capacity at Bank-Full= 200,707.82 cfs

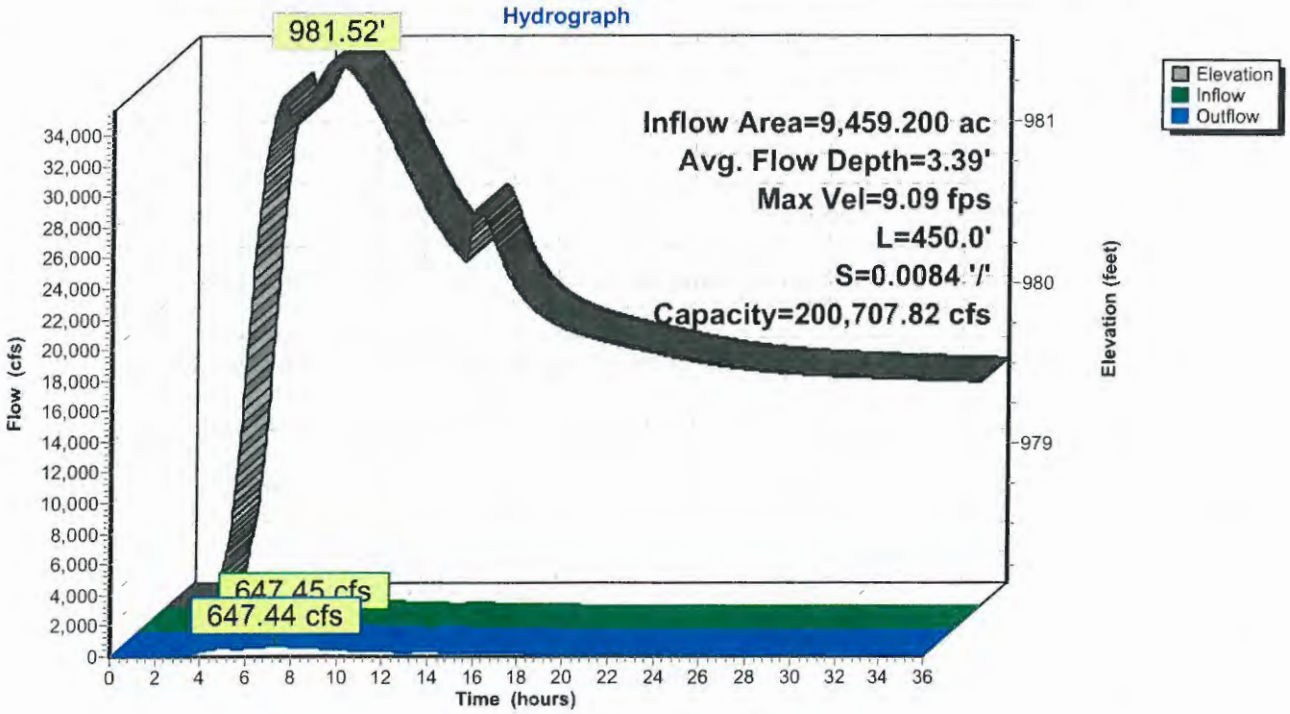
Custom cross-section, Length= 450.0' Slope= 0.0084 '/' (1006 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 978.13', Outlet Invert= 974.35'



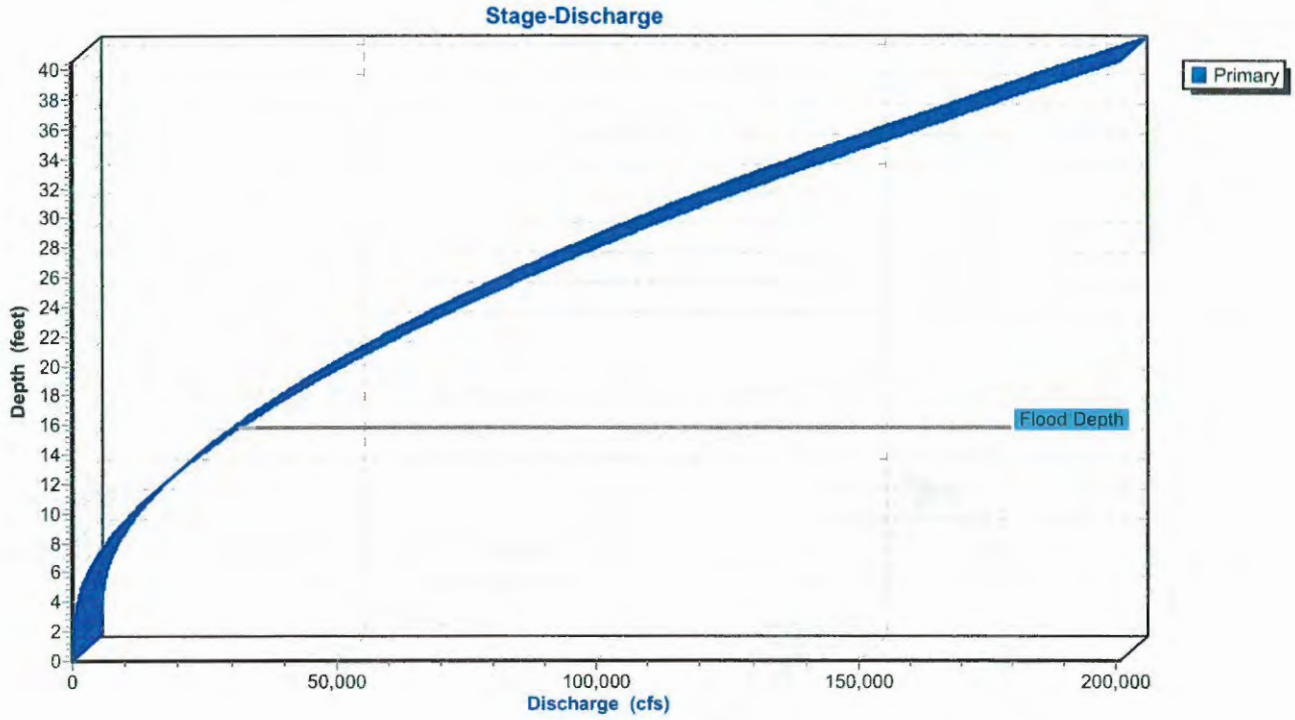
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,012.00	0.00		
20.00	1,008.00	4.00	0.100	Heavy timber, flow below branches
51.00	980.00	32.00	0.100	Heavy timber, flow below branches
74.00	978.00	34.00	0.100	Heavy timber, flow below branches
121.00	976.00	36.00	0.100	Heavy timber, flow below branches
173.00	974.00	38.00	0.030	Short grass
175.00	972.00	40.00	0.030	Short grass
176.00	971.50	40.50	0.025	Stream, clean & straight
187.00	971.50	40.50	0.025	Stream, clean & straight
188.00	972.00	40.00	0.025	Stream, clean & straight
194.00	974.00	38.00	0.030	Short grass
206.00	976.00	36.00	0.100	Heavy timber, flow below branches
225.50	978.00	34.00	0.100	Heavy timber, flow below branches
229.50	980.00	32.00	0.100	Heavy timber, flow below branches
248.00	990.00	22.00	0.100	Heavy timber, flow below branches
265.00	1,000.00	12.00	0.100	Heavy timber, flow below branches
289.00	1,012.00	0.00	0.100	Heavy timber, flow below branches

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	11.0	0	0.00
0.50	6.0	13.2	2,700	19.29
2.50	40.0	22.4	18,000	347.53
4.50	146.0	86.6	65,701	1,300.01
6.50	382.5	153.2	172,125	3,703.14
8.50	712.5	180.8	320,625	7,536.06
18.50	2,645.4	216.7	1,190,411	44,005.23
28.50	4,866.4	251.4	2,189,893	103,800.74
36.50	6,855.0	281.2	3,084,750	166,501.22
40.50	7,955.0	310.6	3,579,750	200,707.82

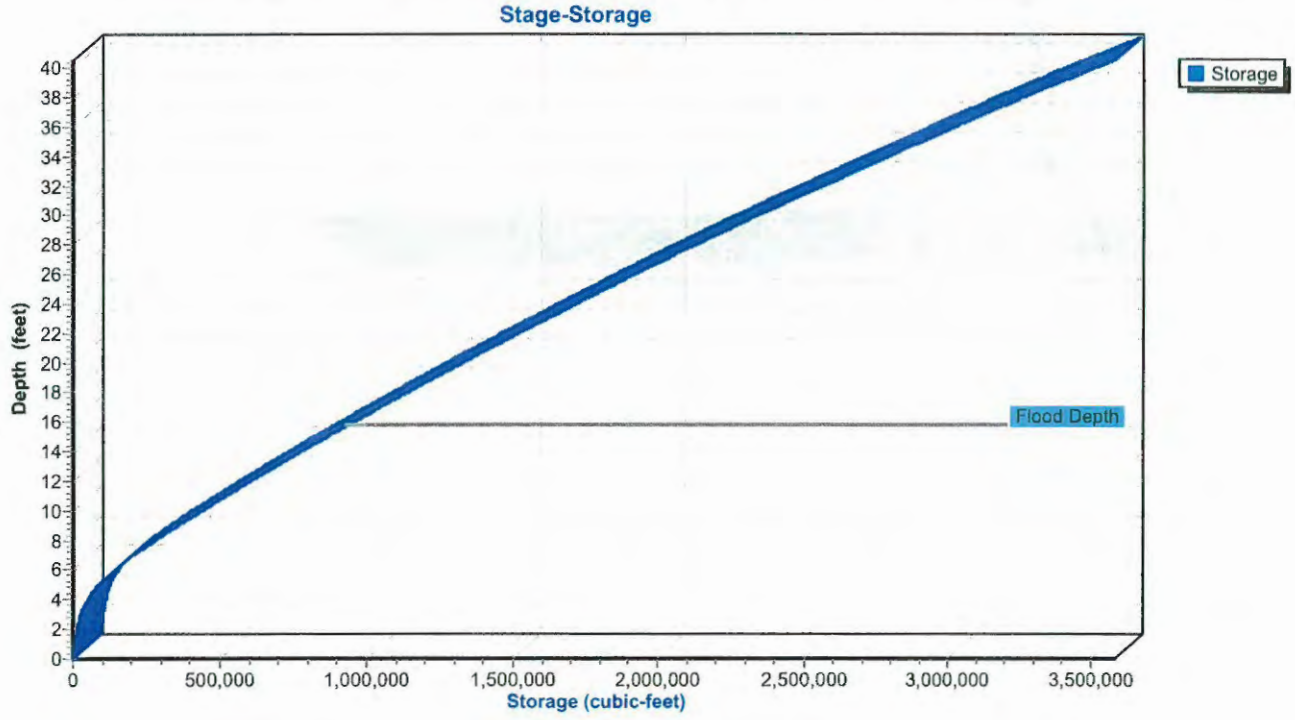
Reach 18R: Sippo Creek Channel Downstream of Lincoln Way



Reach 18R: Sippo Creek Channel Downstream of Lincoln Way



Reach 18R: Sippo Creek Channel Downstream of Lincoln Way

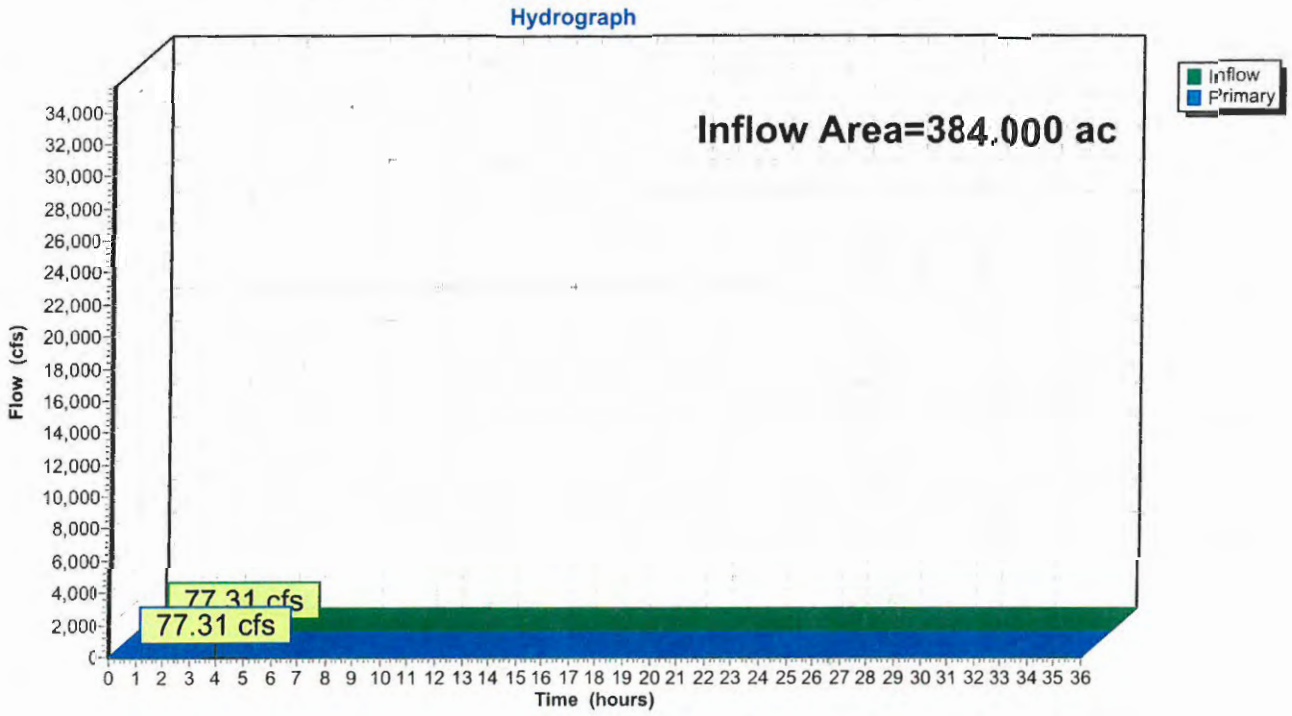


Summary for Pond 1C: CONF 1 Combined O'Springs and Eric

Inflow Area = 384.000 ac, 26.60% Impervious, Inflow Depth > 0.71" for 6-HR 0.1 PMF event
Inflow = 77.31 cfs @ 3.97 hrs, Volume= 22.597 af
Primary = 77.31 cfs @ 3.98 hrs, Volume= 22.597 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 1C: CONF 1 Combined O'Springs and Eric



Summary for Pond 1P: Sippo Creek Reservoir - Existing Conditions

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 0.86" for 6-HR 0.1 PMF event
Inflow = 663.19 cfs @ 6.74 hrs, Volume= 677.371 af
Outflow = 652.28 cfs @ 7.08 hrs, Volume= 670.490 af, Atten= 2%, Lag= 19.9 min
Primary = 649.85 cfs @ 7.08 hrs, Volume= 670.270 af
Secondary = 2.43 cfs @ 7.08 hrs, Volume= 0.219 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,001.64' Surf.Area= 7.050 ac Storage= 60.962 af
Peak Elev= 1,004.37' @ 7.08 hrs Surf.Area= 10.682 ac Storage= 84.063 af (23.101 af above start)
Flood Elev= 1,005.00' Surf.Area= 12.657 ac Storage= 91.431 af (30.469 af above start)

Plug-Flow detention time= 203.9 min calculated for 609.527 af (90% of inflow)
Center-of-Mass det. time= 19.6 min (873.2 - 853.6)

Volume	Invert	Avail.Storage	Storage Description
#1	985.00'	1,292.544 af	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
985.00	0.500	500.0	0.000	0.000	0.500
990.00	3.000	1,000.0	7.875	7.875	1.873
998.00	4.870	2,500.0	31.179	39.054	11.469
1,000.00	6.204	3,251.0	11.047	50.101	19.360
1,002.00	7.243	5,147.0	13.434	63.535	48.449
1,004.00	9.610	10,274.0	16.797	80.332	192.887
1,006.00	16.124	11,202.9	25.455	105.787	229.335
1,008.00	21.577	15,736.9	37.569	143.356	452.477
1,010.00	29.674	20,301.4	51.036	194.392	752.988
1,012.00	39.539	22,845.5	68.977	263.369	953.524
1,014.00	68.669	34,370.5	106.876	370.246	2,158.174
1,025.00	100.000	50,000.0	922.298	1,292.544	4,567.204

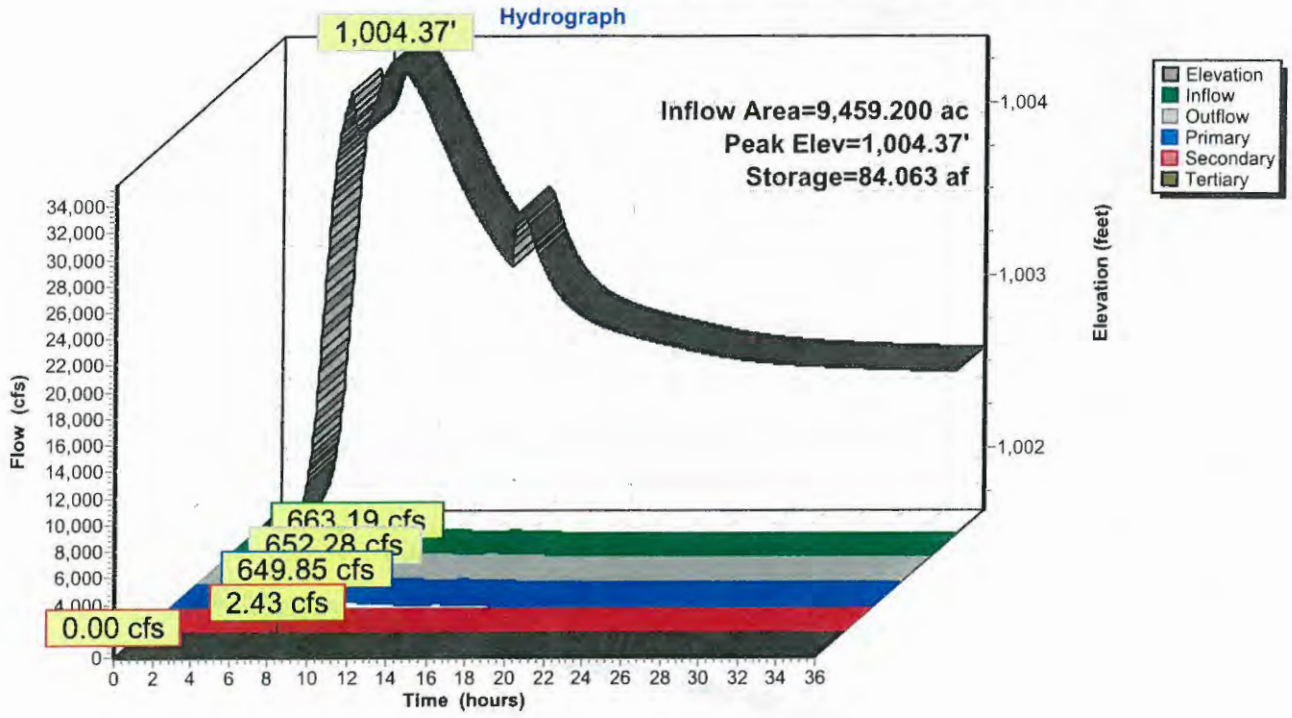
Device	Routing	Invert	Outlet Devices
#1	Primary	1,001.64'	**50.0' long x 2.9' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.45 2.58 2.66 2.66 2.65 2.64 2.65 2.69 2.69 2.73 2.83 2.95 3.01 3.12 3.32
#2	Secondary	1,005.00'	**Right Embankment Weir - Building side, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 1.60 20.00 Width (feet) 17.00 23.00 77.00 77.00
#3	Secondary	1,004.20'	**Left Embankment Weir - Playground side, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 1.80 3.80 5.80 15.80 Width (feet) 10.00 22.00 45.00 130.00 180.00 205.00
#4	Tertiary	1,008.00'	**Weir Flow around Bldg. X 0.50, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.00 4.00 6.00 8.00 10.00 12.00 Width (feet) 50.00 90.00 122.00 166.00 240.00 334.00 420.00

Primary OutFlow Max=649.85 cfs @ 7.08 hrs HW=1,004.37' TW=984.96' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 649.85 cfs @ 4.76 fps)

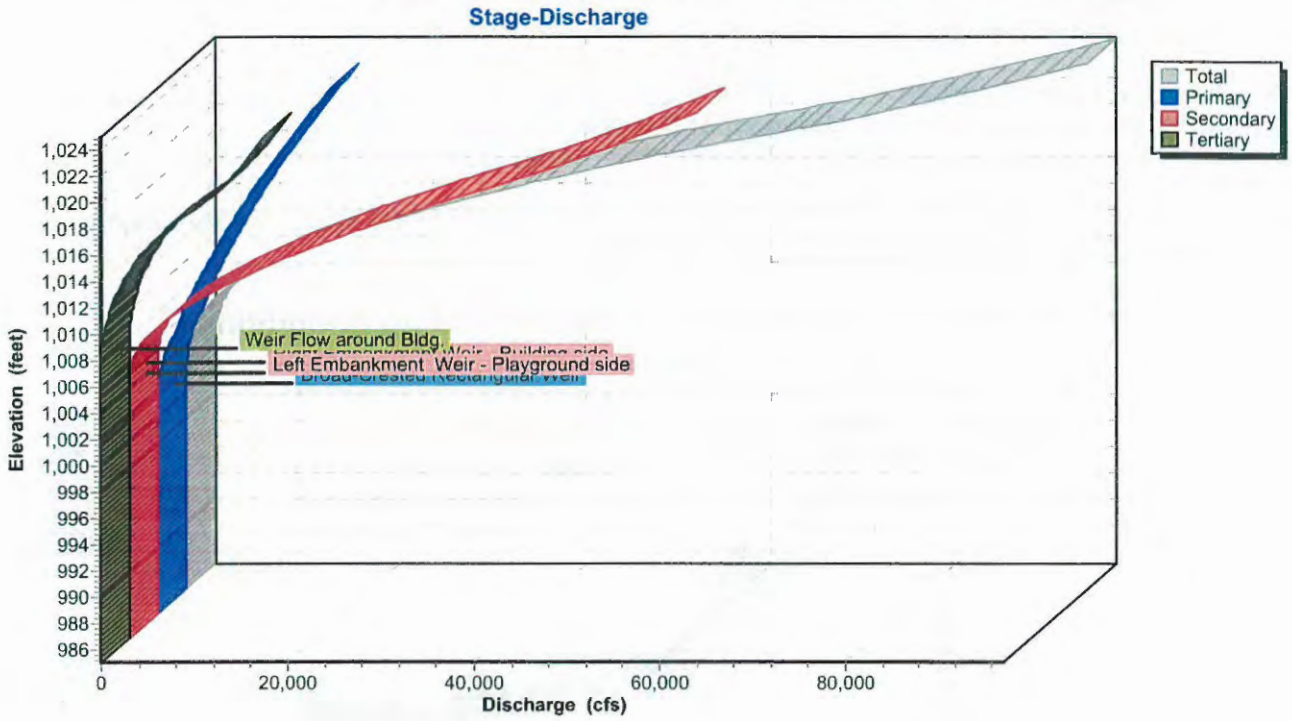
Secondary OutFlow Max=2.43 cfs @ 7.08 hrs HW=1,004.37' TW=984.96' (Dynamic Tailwater)
├─**2=Right Embankment Weir - Building side** (Controls 0.00 cfs)
└─**3=Left Embankment Weir - Playground side** (Weir Controls 2.43 cfs @ 1.32 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,001.64' TW=978.00' (Dynamic Tailwater)
└─**4=Weir Flow around Bldg.** (Controls 0.00 cfs)

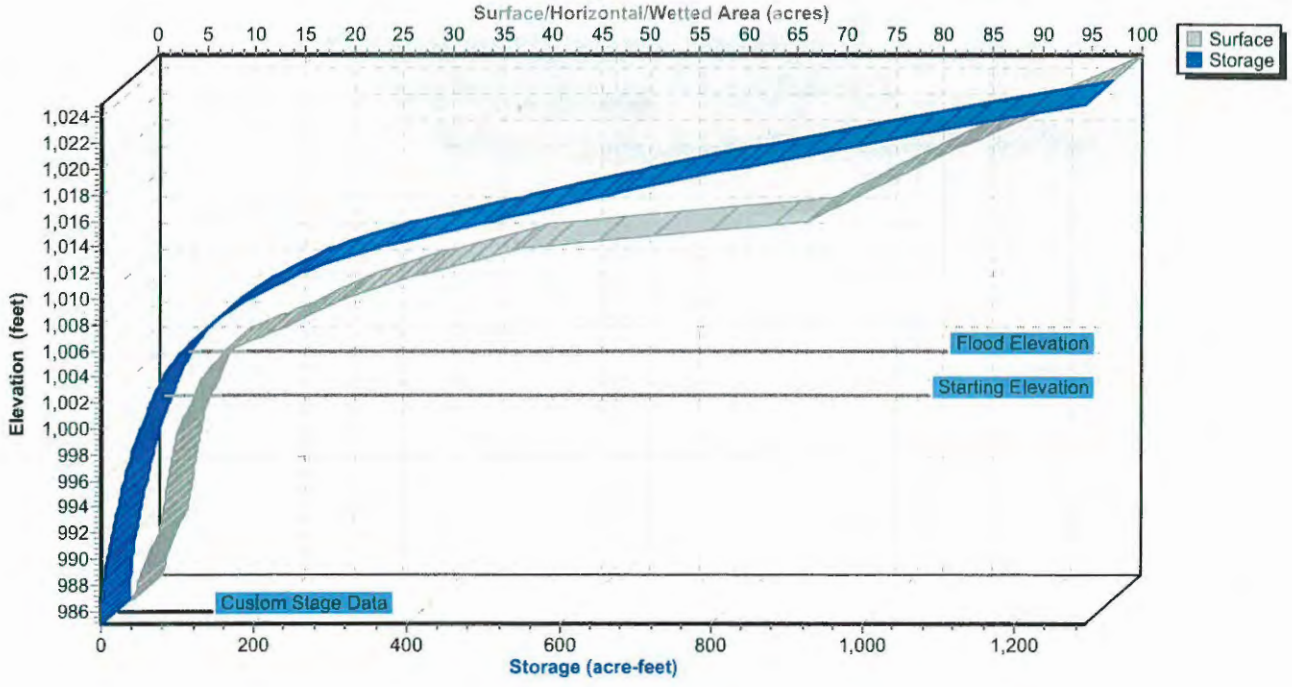
Pond 1P: Sippo Creek Reservoir - Existing Conditions



Pond 1P: Sippo Creek Reservoir - Existing Conditions



Pond 1P: Sippo Creek Reservoir - Existing Conditions

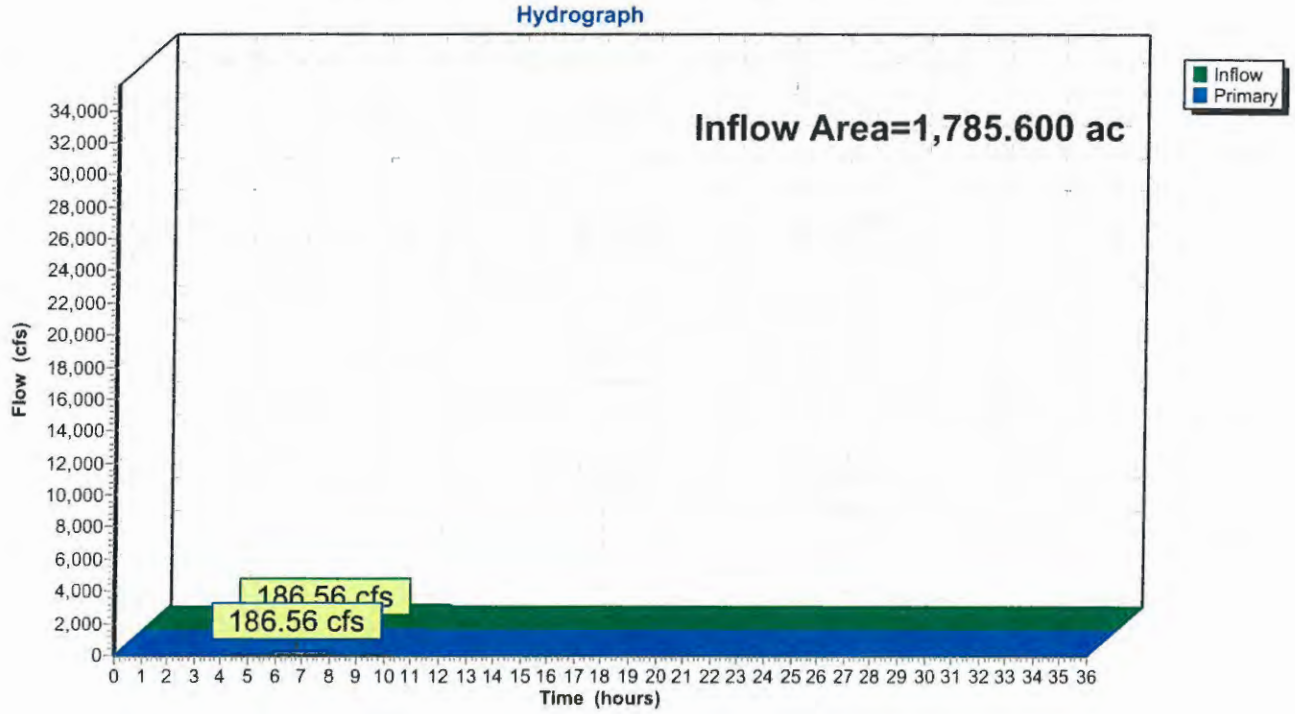


Summary for Pond 2C: CONF 2 Combined Cable and O'Springs

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 0.55" for 6-HR 0.1 PMF event
Inflow = 186.56 cfs @ 6.78 hrs, Volume= 82.400 af
Primary = 186.56 cfs @ 6.79 hrs, Volume= 82.400 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 2C: CONF 2 Combined Cable and O'Springs



Summary for Pond 3P: Lake Cable

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 0.55" for 6-HR 0.1 PMF event
Inflow = 186.56 cfs @ 6.79 hrs, Volume= 82.399 af
Outflow = 221.72 cfs @ 0.00 hrs, Volume= 428.129 af, Atten= 0%, Lag= 0.0 min
Primary = 221.72 cfs @ 0.00 hrs, Volume= 428.129 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,097.40' Surf.Area= 220.000 ac Storage= 1,914.000 af
Peak Elev= 1,097.40' @ 0.00 hrs Surf.Area= 220.000 ac Storage= 1,914.000 af
Flood Elev= 1,099.50' Surf.Area= 296.000 ac Storage= 2,455.800 af (541.800 af above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 449.6 min (963.5 - 513.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,080.00'	4,144.025 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

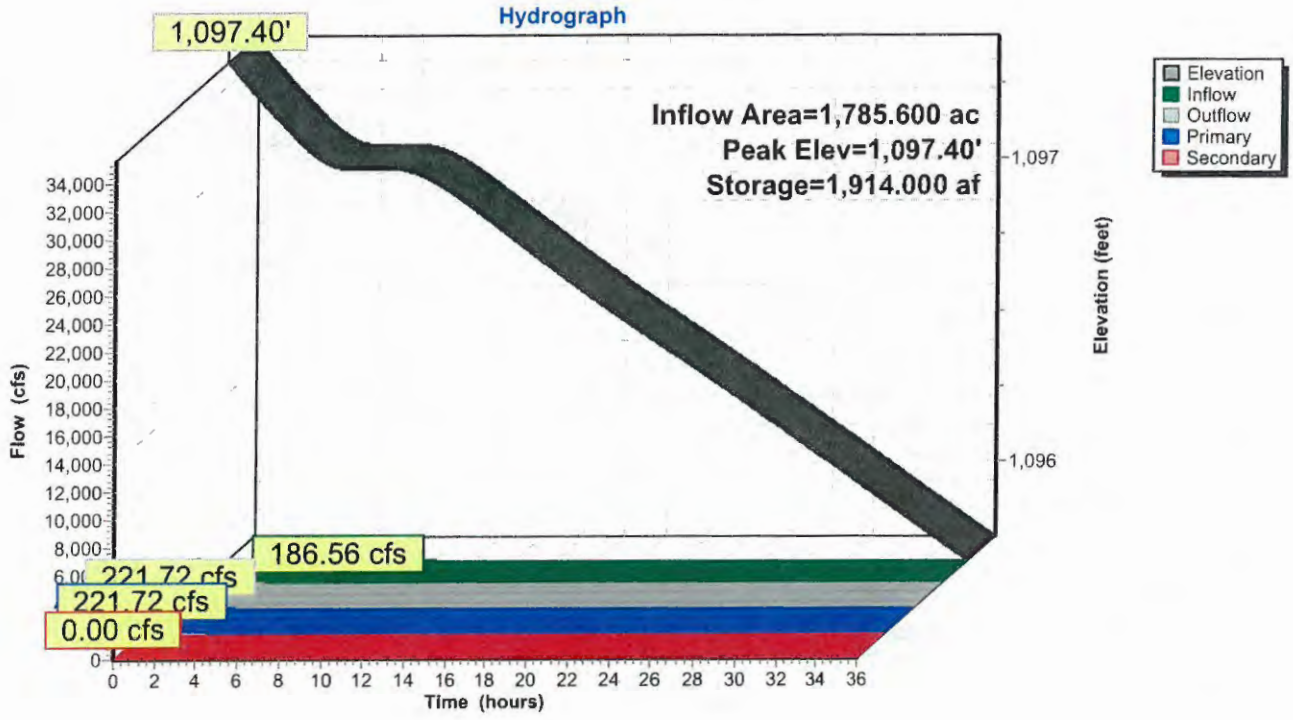
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,080.00	0.000	0.000	0.000
1,097.40	220.000	1,914.000	1,914.000
1,099.50	296.000	541.800	2,455.800
1,100.00	316.700	153.175	2,608.975
1,103.00	405.000	1,082.550	3,691.525
1,104.00	500.000	452.500	4,144.025

Device	Routing	Invert	Outlet Devices
#1	Primary	1,088.00'	**36.0" Round Culvert-RCP** L= 450.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 1,088.00' / 1,076.00' S= 0.0267 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished
#2	Primary	1,096.40'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 3.10 6.00 Width (feet) 30.00 30.00 30.00
#3	Secondary	1,099.50'	**Custom Weir/Orifice, Cv= 2.24 (C= 2.80)** Head (feet) 0.00 3.00 Width (feet) 1,000.00 1,000.00

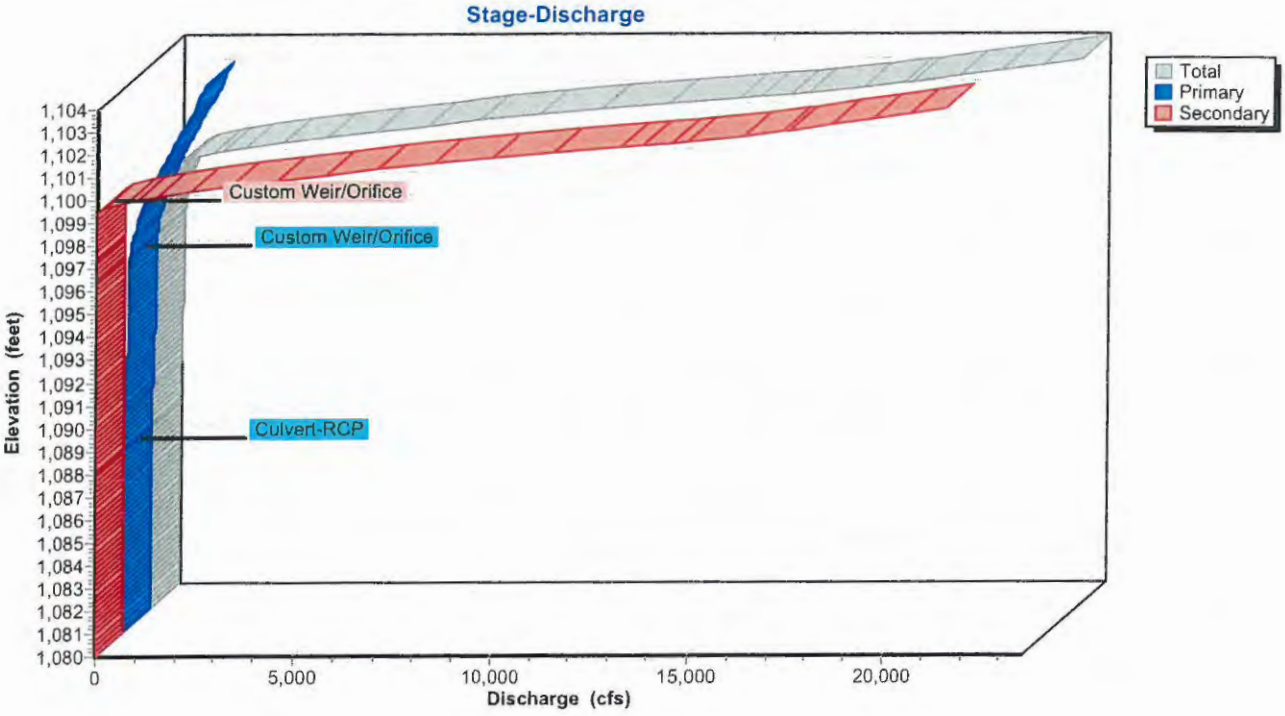
Primary OutFlow Max=221.72 cfs @ 0.00 hrs HW=1,097.40' TW=1,069.00' (Dynamic Tailwater)
└─**1=Culvert-RCP** (Barrel Controls 123.47 cfs @ 17.47 fps)
└─**2=Custom Weir/Orifice** (Weir Controls 98.25 cfs @ 3.27 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,097.40' TW=1,069.00' (Dynamic Tailwater)
└─**3=Custom Weir/Orifice** (Controls 0.00 cfs)

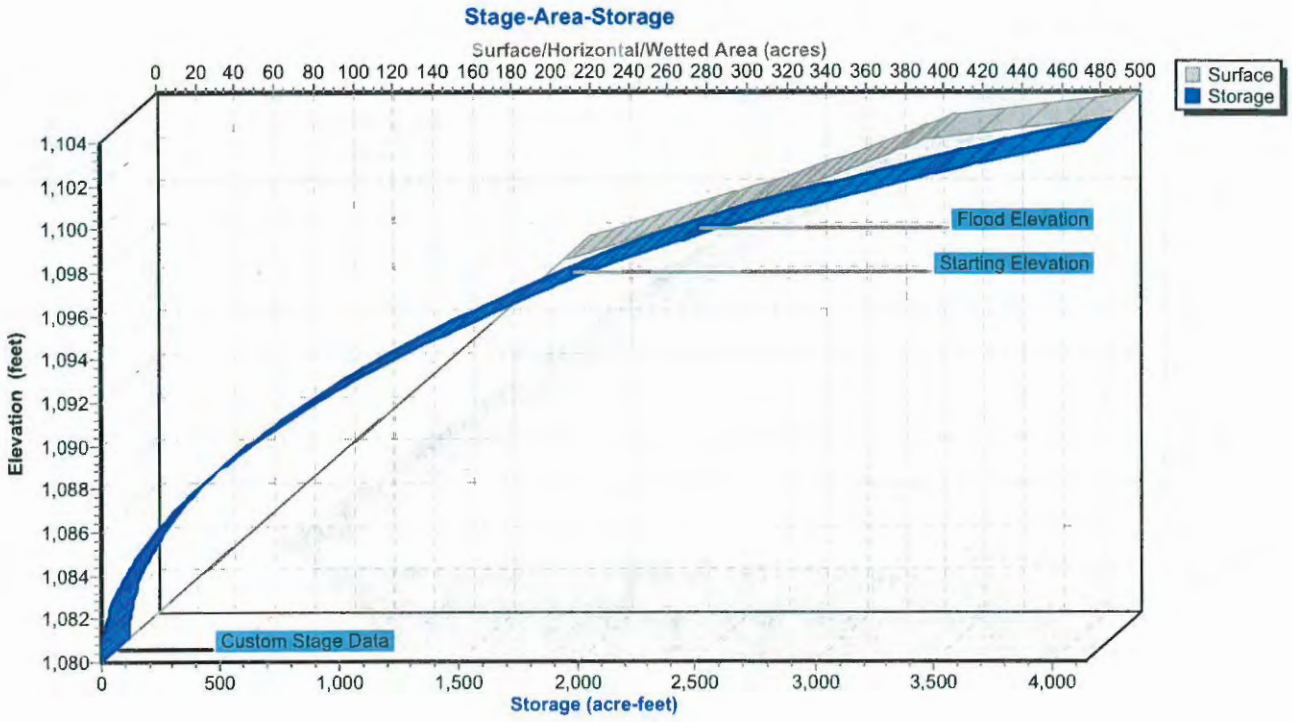
Pond 3P: Lake Cable



Pond 3P: Lake Cable



Pond 3P: Lake Cable

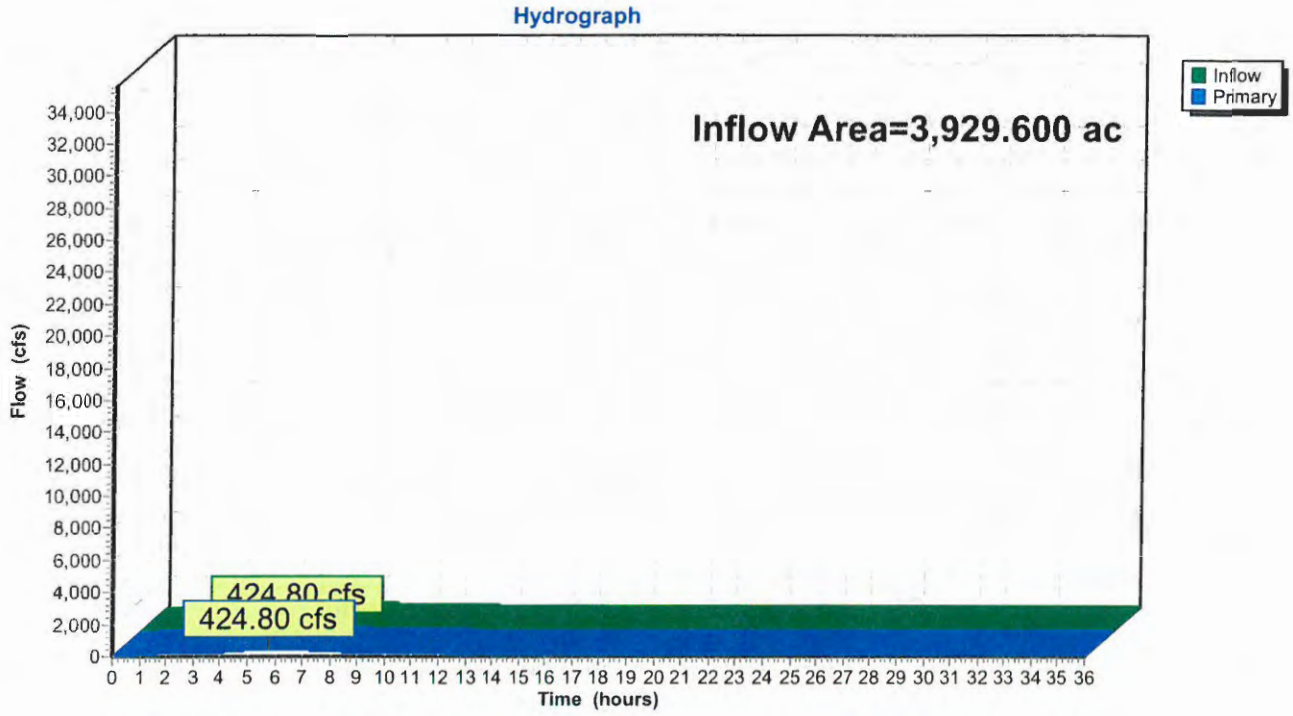


Summary for Pond 4C: Confluence 4

Inflow Area = 3,929.600 ac, 16.99% Impervious, Inflow Depth > 1.52" for 6-HR 0.1 PMF event
Inflow = 424.80 cfs @ 5.75 hrs, Volume= 496.375 af
Primary = 424.80 cfs @ 5.76 hrs, Volume= 496.375 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 4C: Confluence 4



Summary for Pond 4P: Lake O'Springs

Inflow Area = 384.000 ac, 26.60% Impervious, Inflow Depth > 0.71" for 6-HR 0.1 PMF event
Inflow = 77.31 cfs @ 3.98 hrs, Volume= 22.597 af
Outflow = 27.56 cfs @ 6.96 hrs, Volume= 22.390 af, Atten= 64%, Lag= 179.0 min
Primary = 27.56 cfs @ 6.96 hrs, Volume= 22.390 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,106.00' Surf.Area= 27.000 ac Storage= 24.300 af
Peak Elev= 1,106.46' @ 6.96 hrs Surf.Area= 27.510 ac Storage= 36.820 af (12.520 af above start)
Flood Elev= 1,108.70' Surf.Area= 30.000 ac Storage= 101.250 af (76.950 af above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 312.1 min (689.4 - 377.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,104.20'	268.550 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

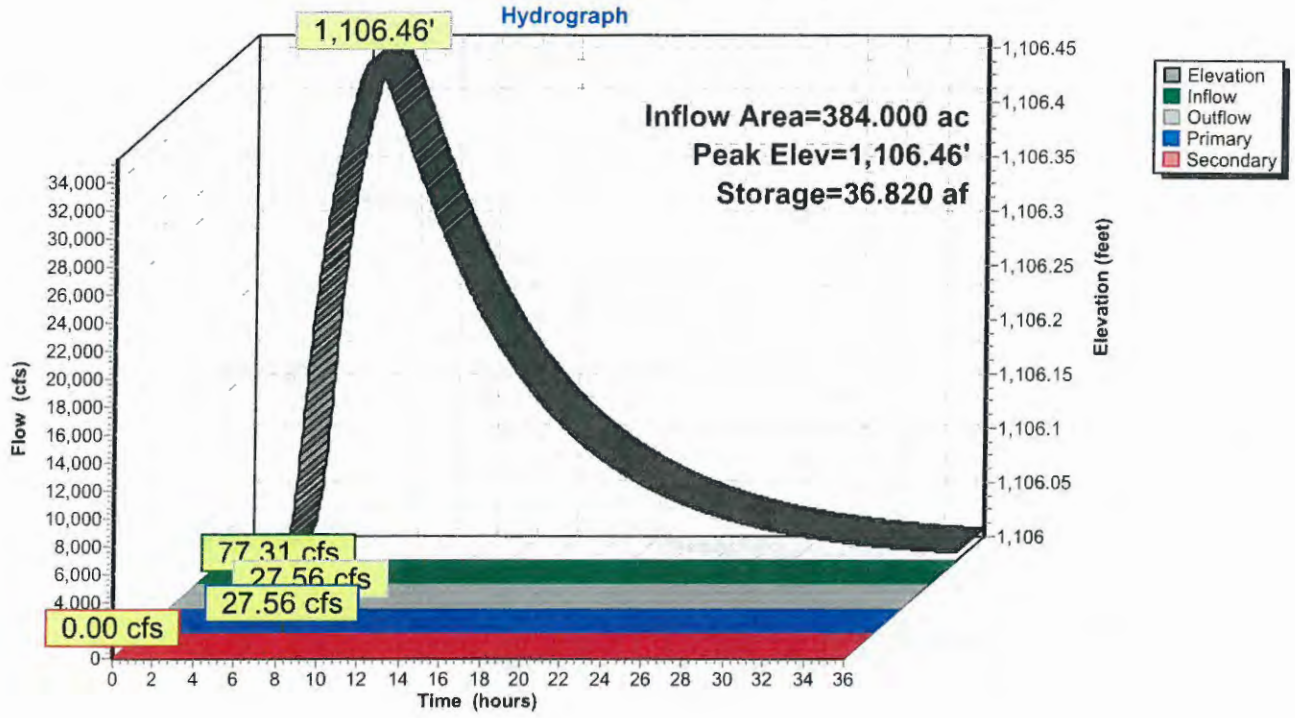
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,104.20	0.000	0.000	0.000
1,106.00	27.000	24.300	24.300
1,108.70	30.000	76.950	101.250
1,110.00	40.000	45.500	146.750
1,112.90	44.000	121.800	268.550

Device	Routing	Invert	Outlet Devices
#1	Primary	1,106.00'	**Lake Eric Special & User-Defined Outlet** Head (feet) 0.00 1.00 2.00 2.70 3.00 4.00 Disch. (cfs) 0.000 60.000 180.000 300.000 1,240.000 3,930.000
#2	Secondary	1,108.70'	**Custom Weir/Orifice, Cv= 2.24 (C= 2.80)** Head (feet) 0.00 1.30 Width (feet) 150.00 150.00

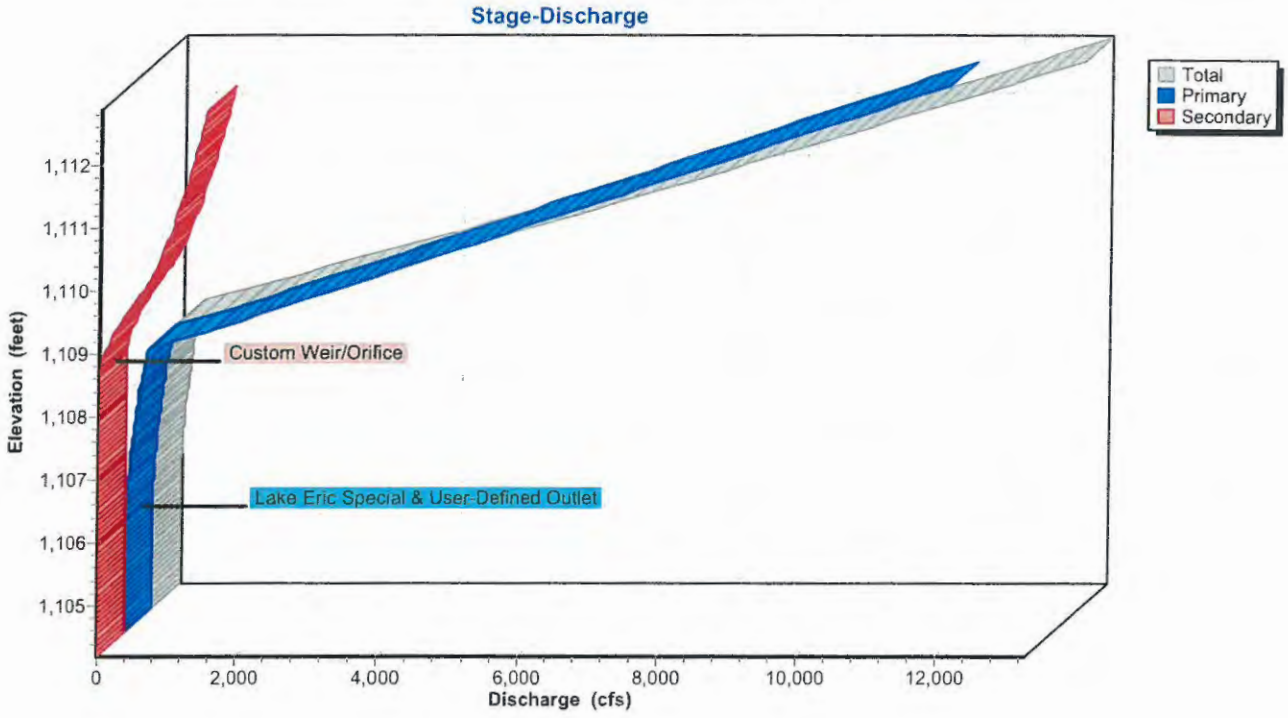
Primary OutFlow Max=27.56 cfs @ 6.96 hrs HW=1,106.46' TW=0.00' (Dynamic Tailwater)
↑—**1=Lake Eric Special & User-Defined Outlet**(Custom Controls 27.56 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,106.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Custom Weir/Orifice** (Controls 0.00 cfs)

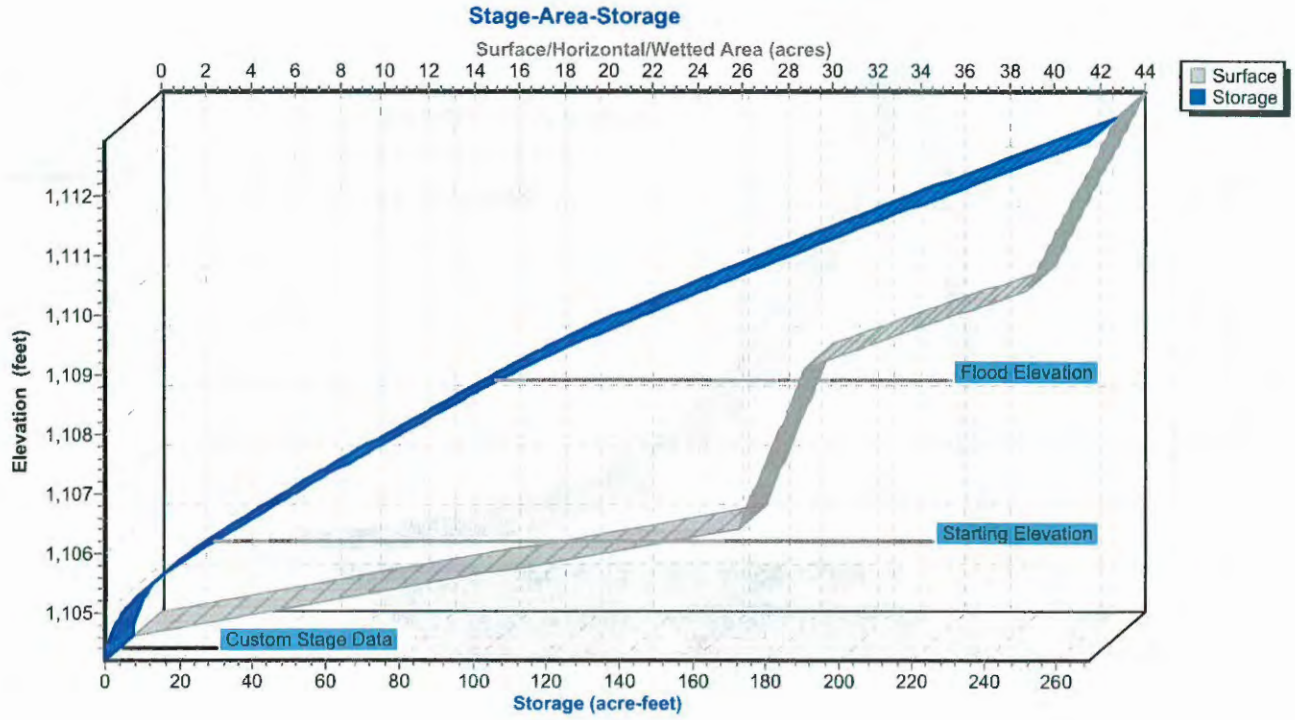
Pond 4P: Lake O'Springs



Pond 4P: Lake O'Springs



Pond 4P: Lake O'Springs

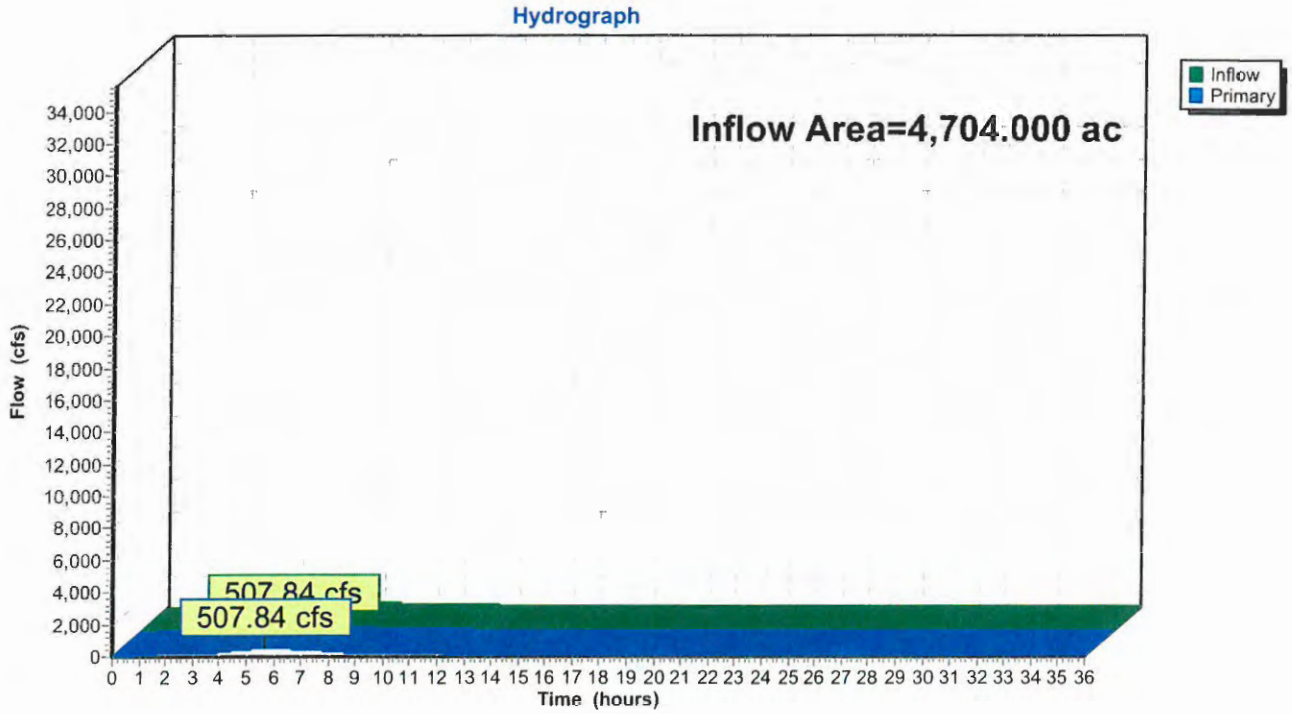


Summary for Pond 5C: Confluence 5

Inflow Area = 4,704.000 ac, 14.19% Impervious, Inflow Depth > 1.33" for 6-HR 0.1 PMF event
Inflow = 507.84 cfs @ 5.69 hrs, Volume= 522.573 af
Primary = 507.84 cfs @ 5.70 hrs, Volume= 522.573 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 5C: Confluence 5



Summary for Pond 5P: Lake Eric (Slagle)

Inflow Area = 115.200 ac, 0.00% Impervious, Inflow Depth = 0.68" for 6-HR 0.1 PMF event
Inflow = 32.83 cfs @ 3.58 hrs, Volume= 6.498 af
Outflow = 11.37 cfs @ 6.44 hrs, Volume= 6.431 af, Atten= 65%, Lag= 171.6 min
Primary = 11.37 cfs @ 6.44 hrs, Volume= 6.431 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,116.50' Surf.Area= 3.700 ac Storage= 13.690 af
Peak Elev= 1,117.60' @ 6.44 hrs Surf.Area= 3.846 ac Storage= 17.832 af (4.142 af above start)
Flood Elev= 1,120.00' Surf.Area= 4.200 ac Storage= 27.490 af (13.800 af above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 324.7 min (596.3 - 271.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,109.10'	88.990 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

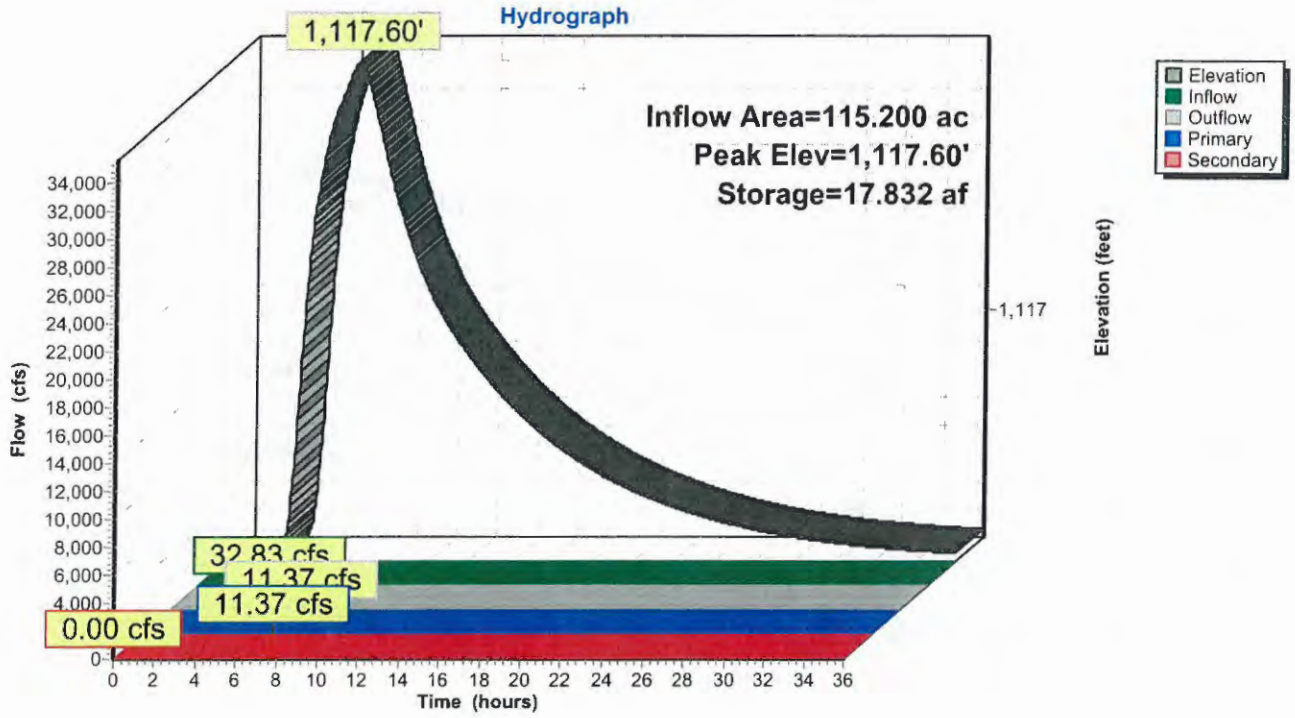
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,109.10	0.000	0.000	0.000
1,116.50	3.700	13.690	13.690
1,118.00	3.900	5.700	19.390
1,120.00	4.200	8.100	27.490
1,130.00	8.100	61.500	88.990

Device	Routing	Invert	Outlet Devices
#1	Primary	1,116.50'	**Special & User-Defined** Head (feet) 0.00 0.50 1.50 2.50 3.50 4.50 5.00 Disch. (cfs) 0.000 3.000 17.000 40.000 69.000 600.000 1,130.000
#2	Secondary	1,120.00'	**Custom Weir/Orifice, Cv= 2.24 (C= 2.80)** Head (feet) 0.00 10.00 Width (feet) 150.00 150.00

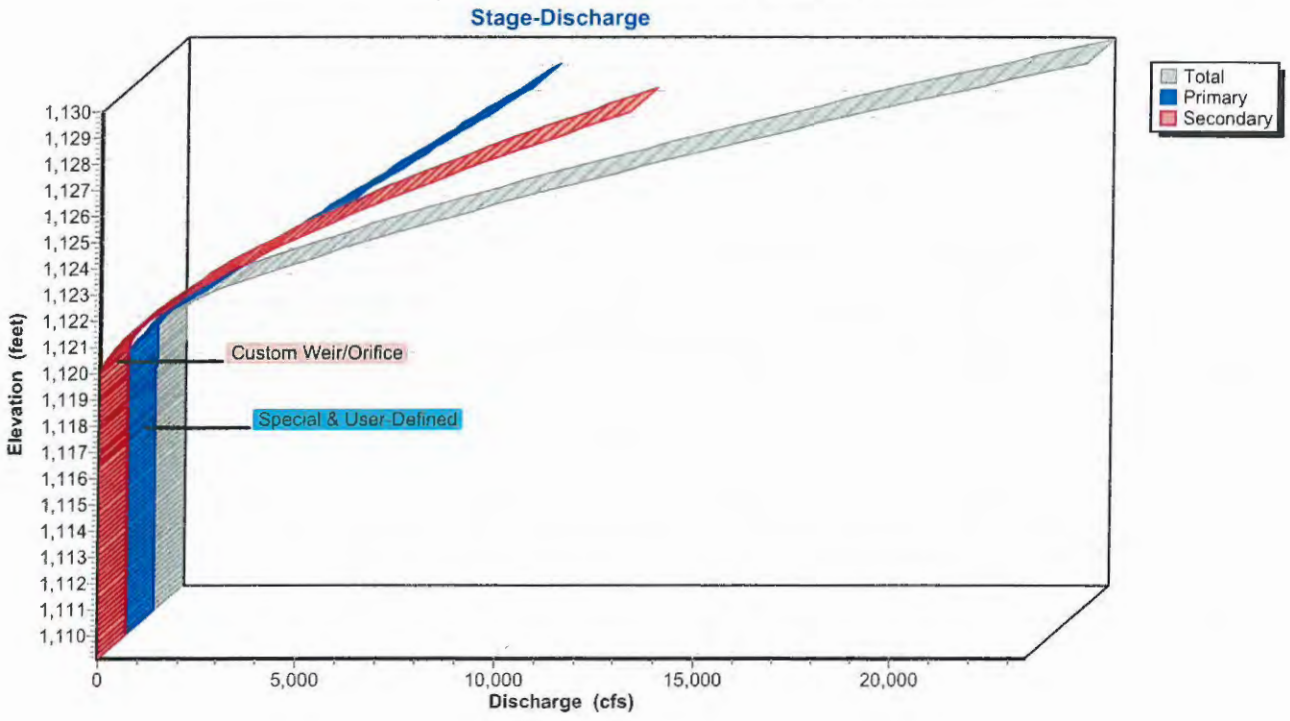
Primary OutFlow Max=11.37 cfs @ 6.44 hrs HW=1,117.60' TW=0.00' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 11.37 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,116.50' TW=0.00' (Dynamic Tailwater)
↑—**2=Custom Weir/Orifice** (Controls 0.00 cfs)

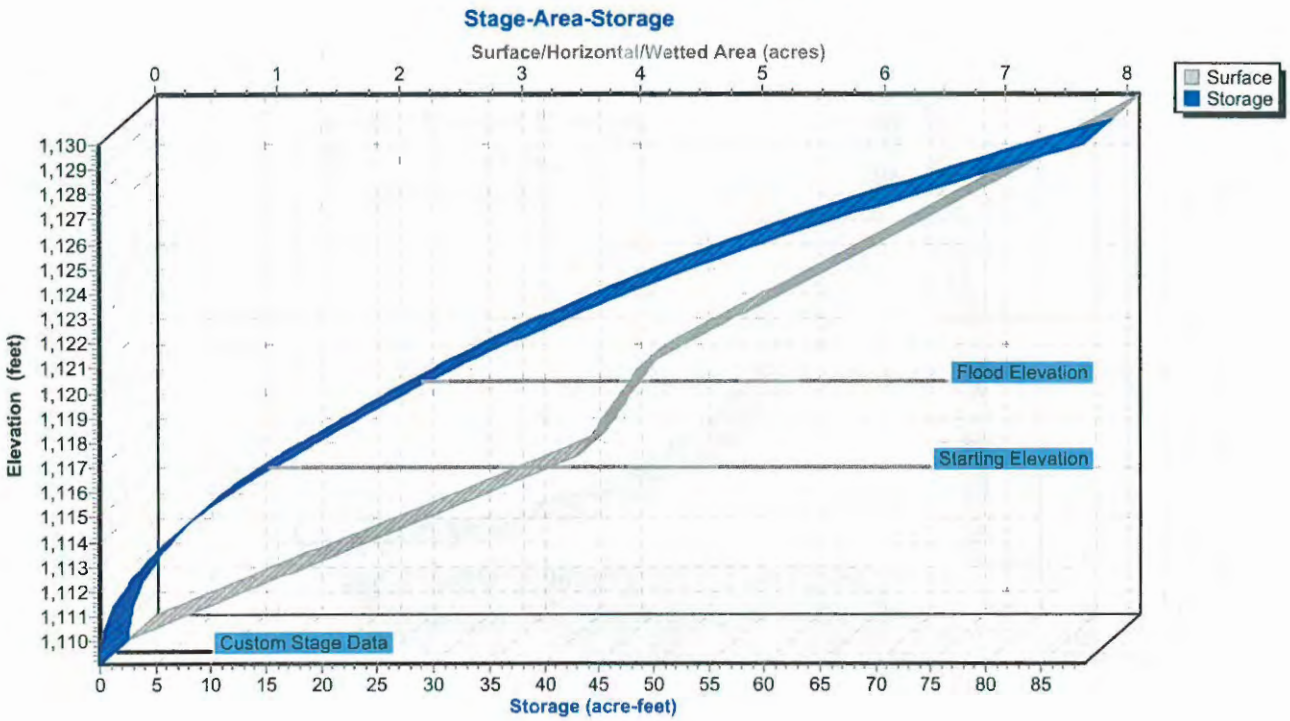
Pond 5P: Lake Eric (Slagle)



Pond 5P: Lake Eric (Slagle)



Pond 5P: Lake Eric (Slagle)

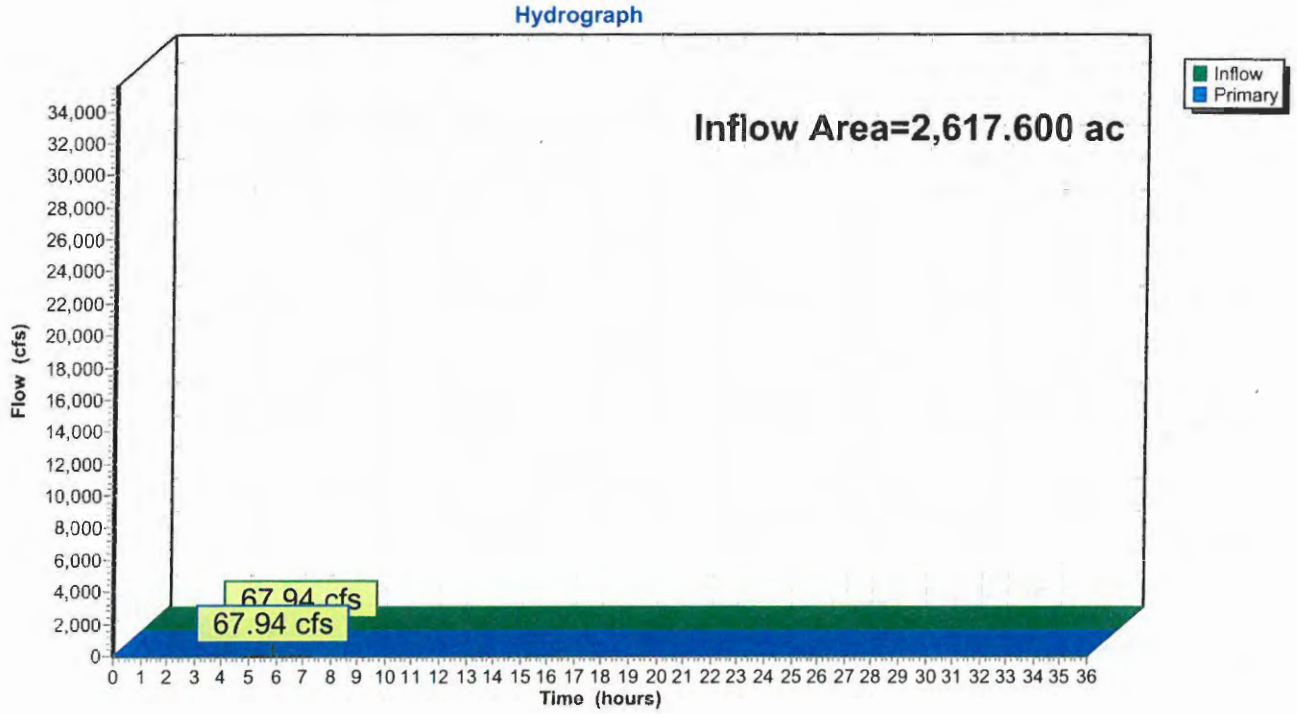


Summary for Pond 6C: Confluence 6

Inflow Area = 2,617.600 ac, 28.52% Impervious, Inflow Depth > 0.21" for 6-HR 0.1 PMF event
Inflow = 67.94 cfs @ 5.87 hrs, Volume= 45.891 af
Primary = 67.94 cfs @ 5.88 hrs, Volume= 45.891 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 6C: Confluence 6

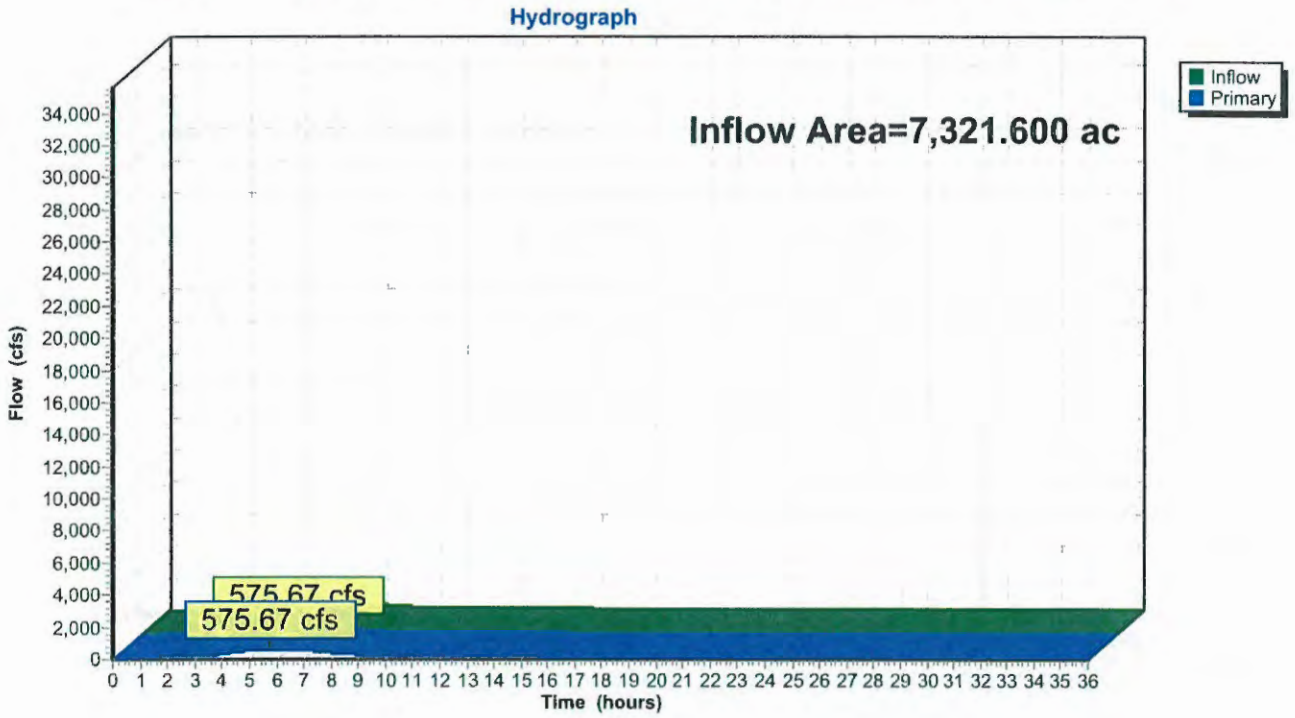


Summary for Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake

Inflow Area = 7,321.600 ac, 19.32% Impervious, Inflow Depth > 0.93" for 6-HR 0.1 PMF event
Inflow = 575.67 cfs @ 5.71 hrs, Volume= 568.365 af
Primary = 575.67 cfs @ 5.72 hrs, Volume= 568.365 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake

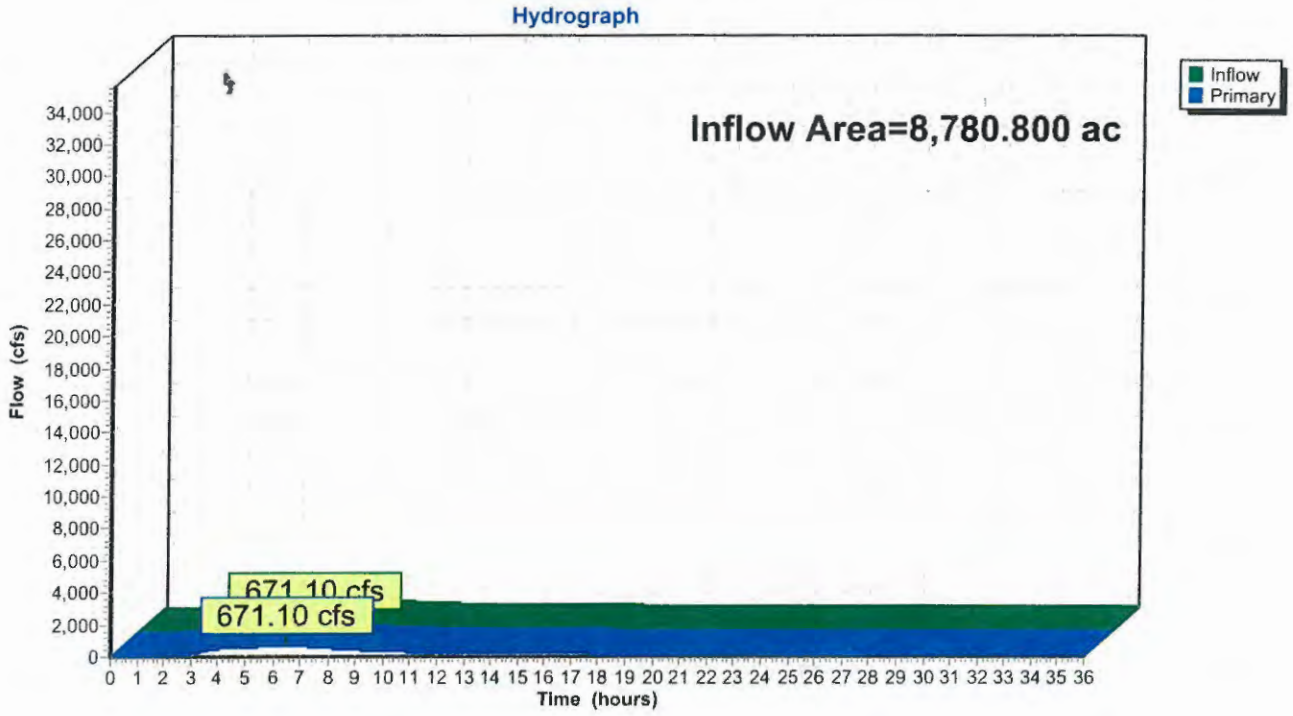


Summary for Pond 8C: Confluence 8

Inflow Area = 8,780.800 ac, 19.29% Impervious, Inflow Depth > 0.87" for 6-HR 0.1 PMF event
Inflow = 671.10 cfs @ 6.48 hrs, Volume= 636.464 af
Primary = 671.10 cfs @ 6.49 hrs, Volume= 636.464 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 8C: Confluence 8



Summary for Pond 8P: Storage Area Genoa Rd

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth > 0.16" for 6-HR 0.1 PMF event
Inflow = 55.00 cfs @ 9.24 hrs, Volume= 25.501 af
Outflow = 20.96 cfs @ 13.13 hrs, Volume= 23.792 af, Atten= 62%, Lag= 233.3 min
Primary = 20.96 cfs @ 13.13 hrs, Volume= 23.792 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 1,019.90' @ 13.16 hrs Surf.Area= 11.921 ac Storage= 11.686 af
Flood Elev= 1,028.00' Surf.Area= 213.745 ac Storage= 851.153 af

Plug-Flow detention time= 383.5 min calculated for 23.785 af (93% of inflow)
Center-of-Mass det. time= 323.3 min (1,083.8 - 760.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,018.00'	1,873.781 af	**Custom Stage Data (Irregular)**Listed below (Recalc)

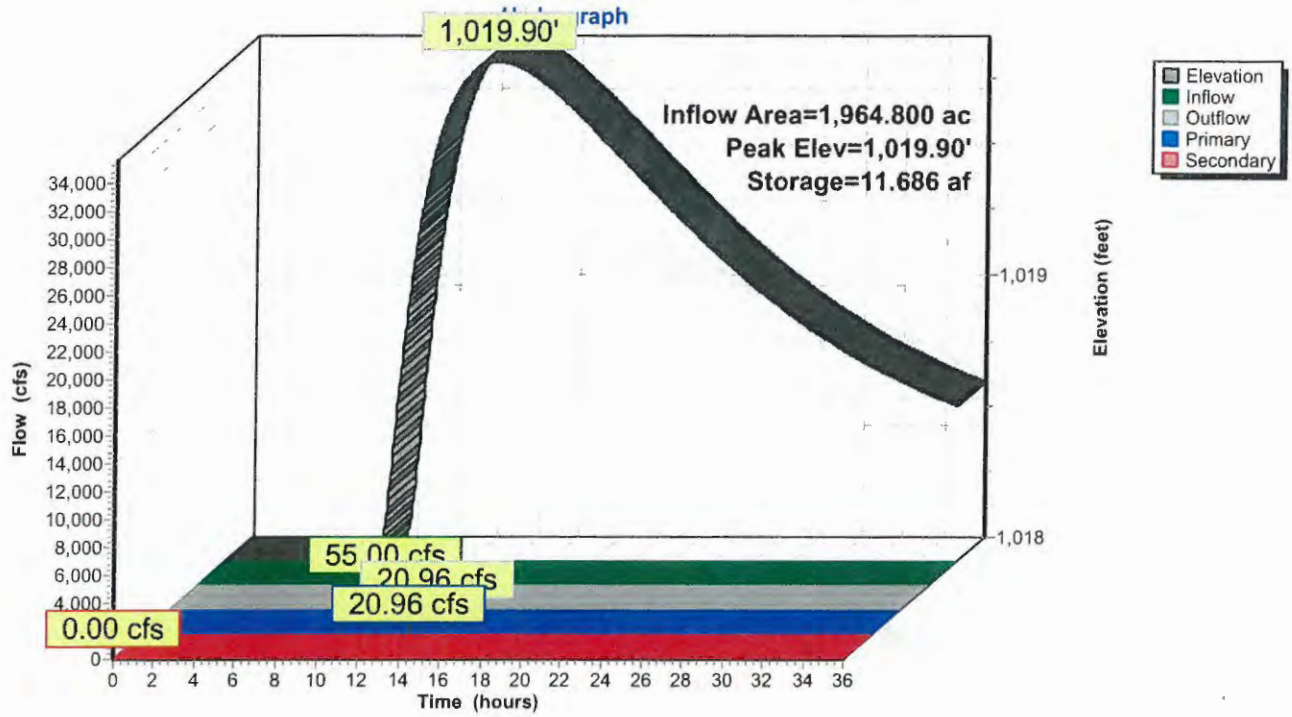
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
1,018.00	1.828	9,236.2	0.000	0.000	1.828
1,020.00	12.667	15,179.0	12.871	12.871	266.894
1,022.00	44.456	16,532.1	53.902	66.773	345.285
1,024.00	91.000	31,384.9	132.707	199.480	1,645.455
1,026.00	176.087	39,123.0	262.448	461.929	2,642.179
1,032.00	300.000	45,000.0	1,411.853	1,873.781	3,545.375

Device	Routing	Invert	Outlet Devices
#1	Primary	1,018.00'	**48.0" Round Culvert** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,018.00' / 1,017.00' S= 0.0167 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Secondary	1,025.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 3.00 5.00 Width (feet) 125.00 192.00 308.00 415.00

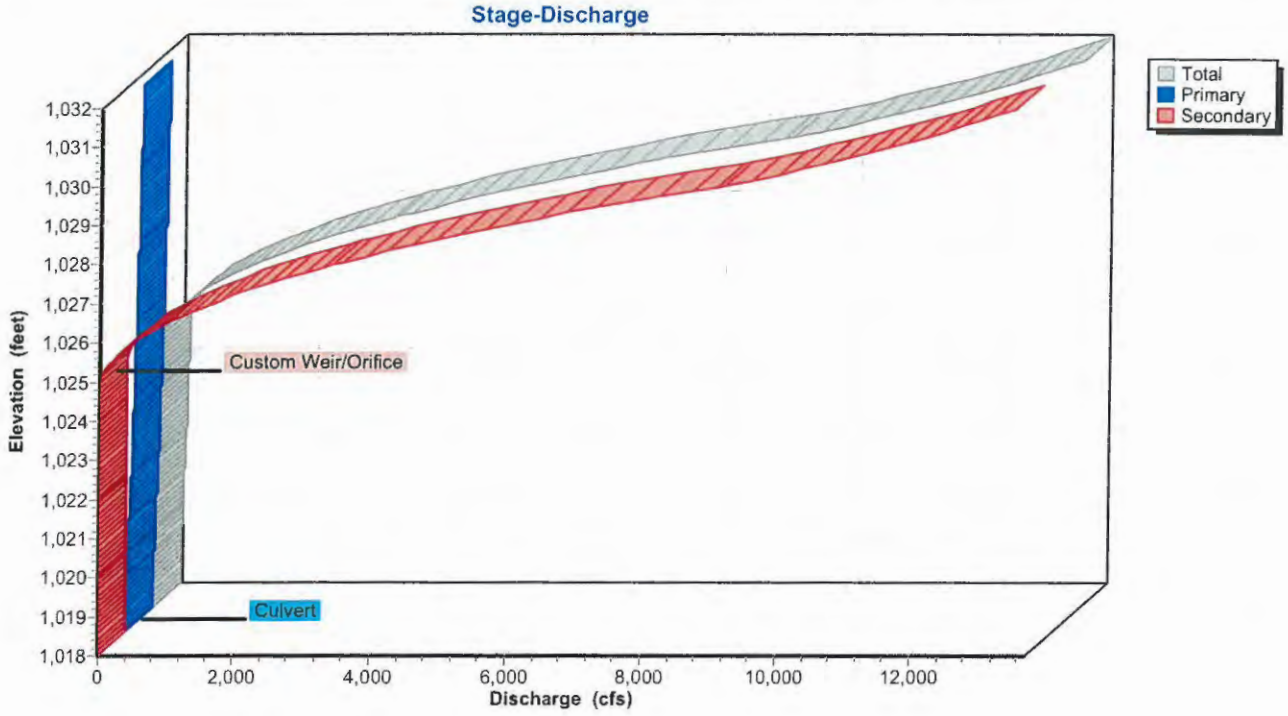
Primary OutFlow Max=20.96 cfs @ 13.13 hrs HW=1,019.90' TW=1,018.63' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 20.96 cfs @ 5.21 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,018.00' TW=1,017.50' (Dynamic Tailwater)
↑—**2=Custom Weir/Orifice** (Controls 0.00 cfs)

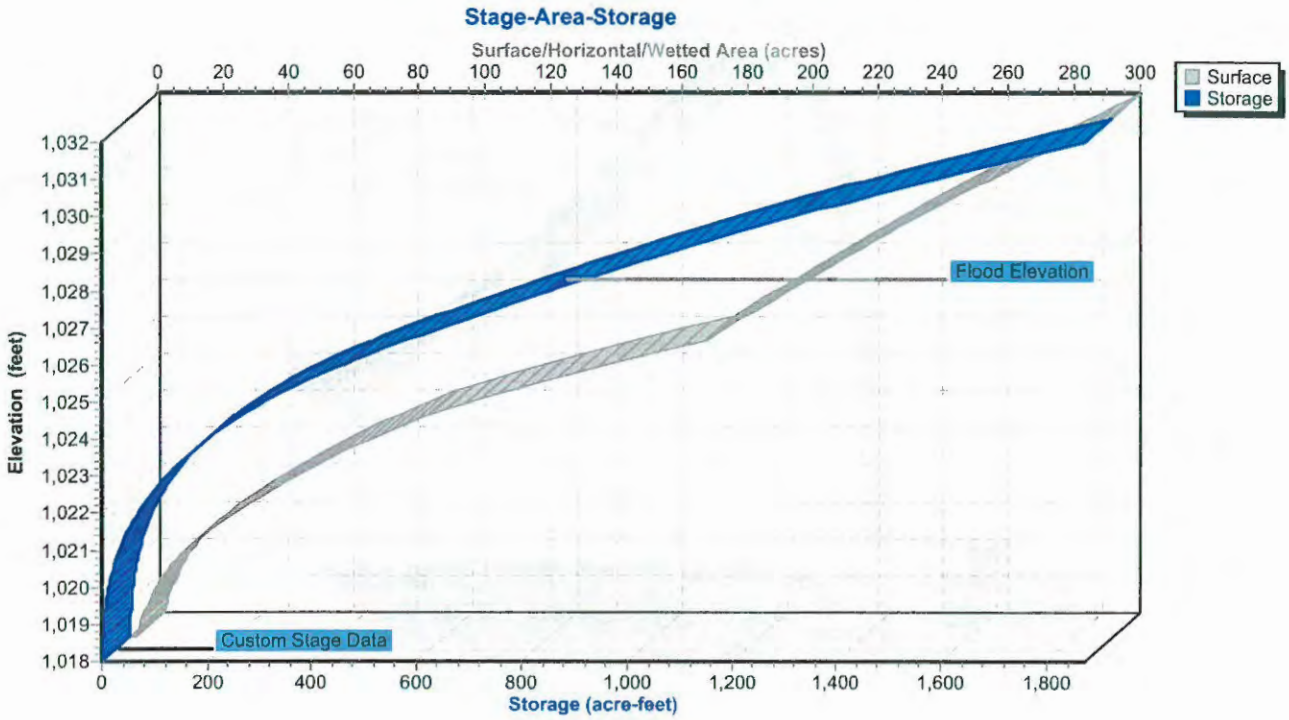
Pond 8P: Storage Area Genoa Rd



Pond 8P: Storage Area Genoa Rd



Pond 8P: Storage Area Genoa Rd



Summary for Pond 9P: Sippo Lake

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth = 0.72" for 6-HR 0.1 PMF event
Inflow = 365.52 cfs @ 5.37 hrs, Volume= 118.170 af
Outflow = 55.00 cfs @ 9.24 hrs, Volume= 25.501 af, Atten= 85%, Lag= 232.0 min
Primary = 55.00 cfs @ 9.24 hrs, Volume= 25.501 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,027.00' Surf.Area= 88.000 ac Storage= 220.000 af
Peak Elev= 1,028.17' @ 9.24 hrs Surf.Area= 97.135 ac Storage= 328.051 af (108.051 af above start)
Flood Elev= 1,029.30' Surf.Area= 106.000 ac Storage= 443.100 af (223.100 af above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 386.8 min (760.6 - 373.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,022.00'	1,220.300 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,022.00	0.000	0.000	0.000
1,027.00	88.000	220.000	220.000
1,029.30	106.000	223.100	443.100
1,036.00	126.000	777.200	1,220.300

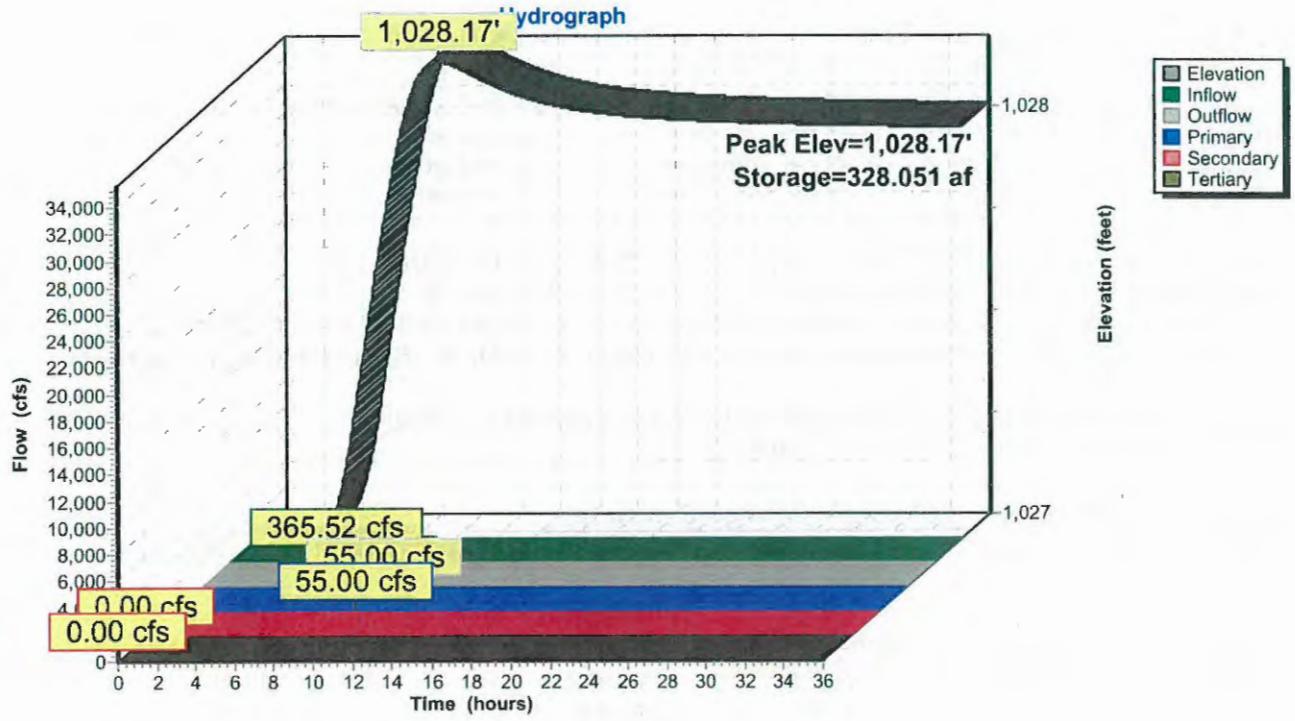
Device	Routing	Invert	Outlet Devices
#1	Primary	1,028.00'	**300.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	1,028.50'	**330.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Secondary	1,029.30'	**30.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)
#4	Tertiary	1,030.00'	**650.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=55.00 cfs @ 9.24 hrs HW=1,028.17' TW=1,019.19' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 55.00 cfs @ 1.10 fps)
└—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

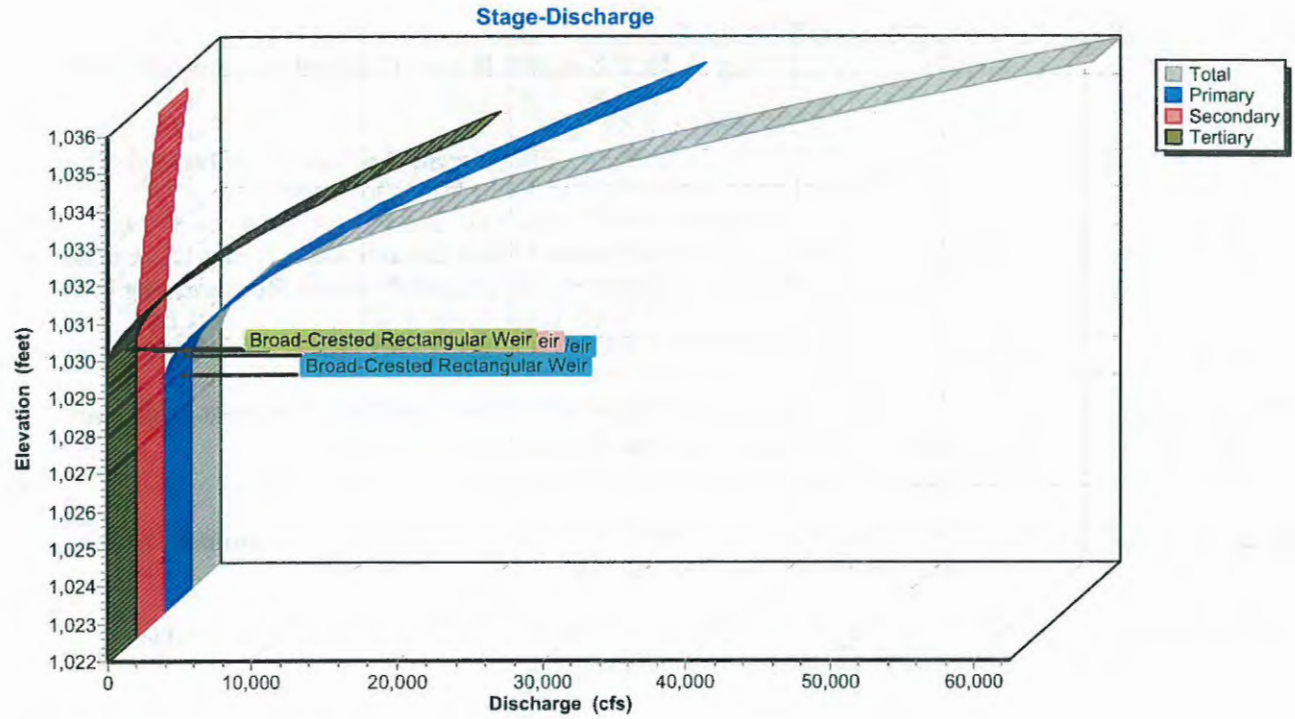
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,027.00' TW=1,018.00' (Dynamic Tailwater)
↑—**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,027.00' TW=1,018.00' (Dynamic Tailwater)
↑—**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

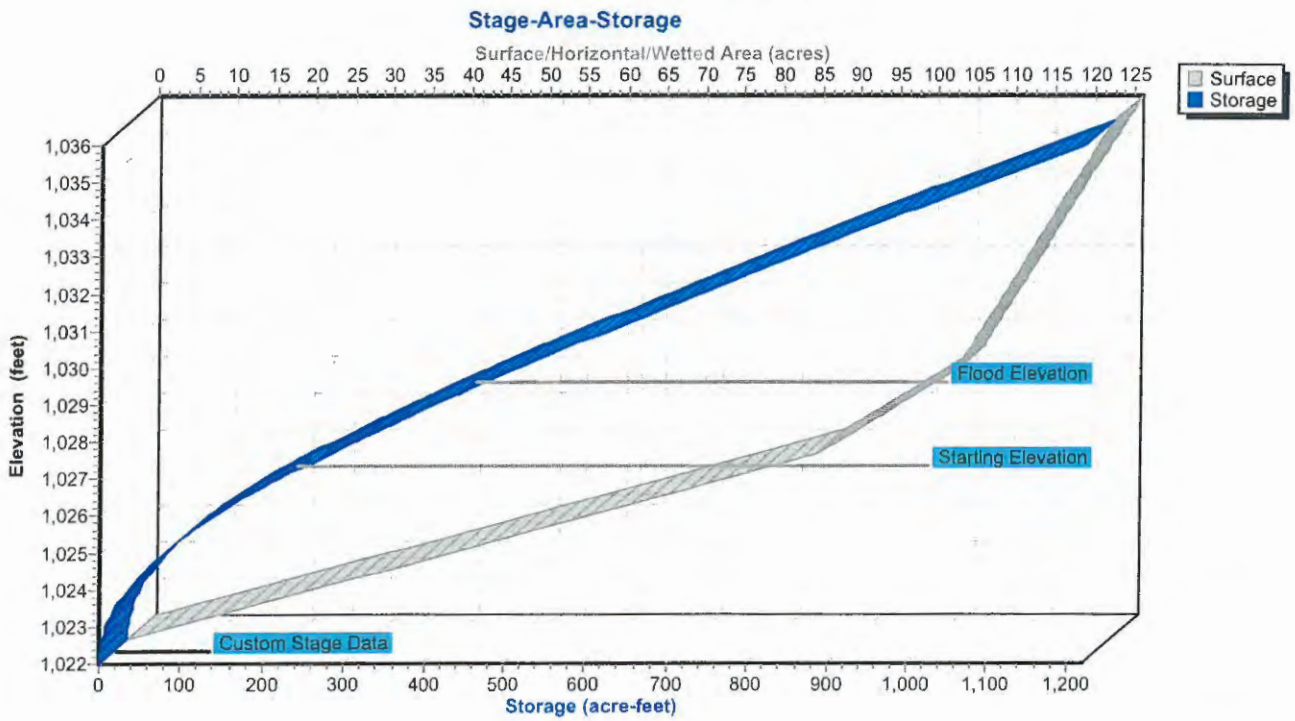
Pond 9P: Sippo Lake



Pond 9P: Sippo Lake



Pond 9P: Sippo Lake

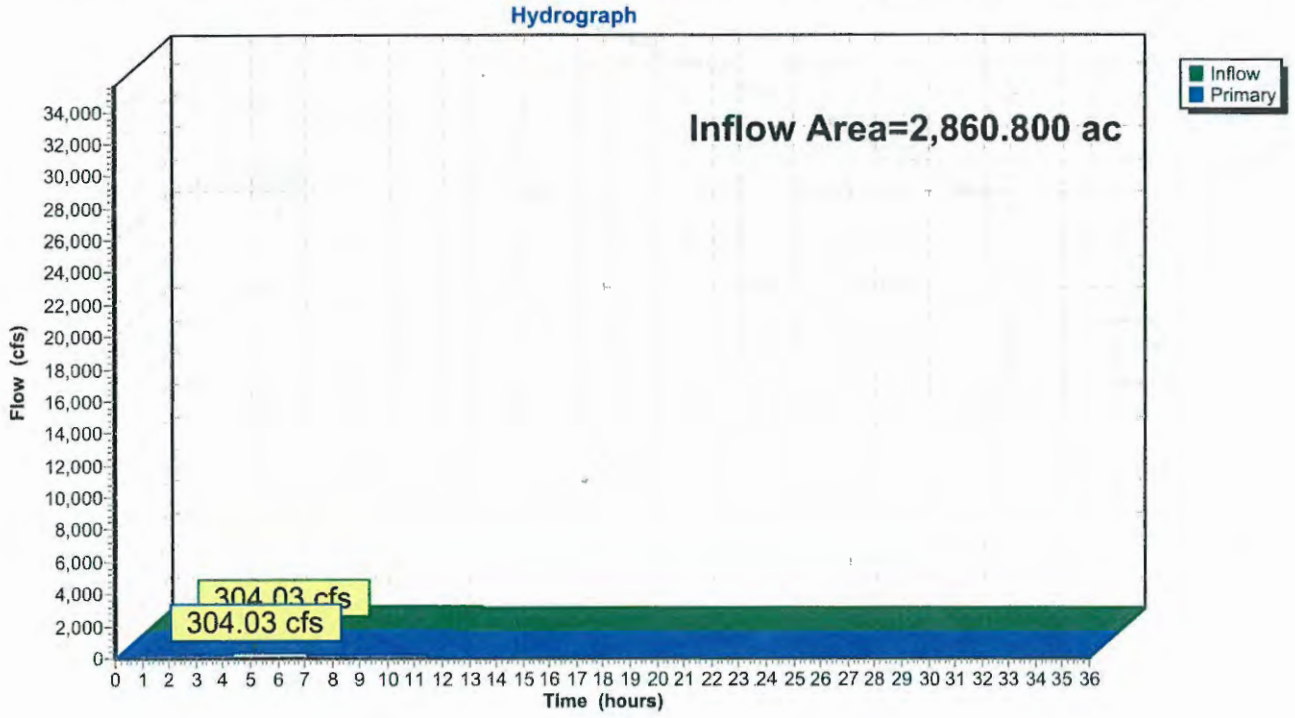


Summary for Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed

Inflow Area = 2,860.800 ac, 23.34% Impervious, Inflow Depth > 1.94" for 6-HR 0.1 PMF event
Inflow = 304.03 cfs @ 5.13 hrs, Volume= 462.379 af
Primary = 304.03 cfs @ 5.14 hrs, Volume= 462.379 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed



Summary for Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 0.85" for 6-HR 0.1 PMF event
Inflow = 652.28 cfs @ 7.08 hrs, Volume= 670.389 af
Outflow = 647.45 cfs @ 7.32 hrs, Volume= 670.047 af, Atten= 1%, Lag= 14.4 min
Primary = 647.45 cfs @ 7.32 hrs, Volume= 670.047 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 984.99' @ 7.32 hrs Surf.Area= 2.740 ac Storage= 5.949 af
Flood Elev= 1,008.00' Surf.Area= 13.465 ac Storage= 197.028 af

Plug-Flow detention time= 4.0 min calculated for 670.047 af (100% of inflow)
Center-of-Mass det. time= 3.4 min (876.4 - 873.1)

Volume	Invert	Avail.Storage	Storage Description
#1	978.00'	371.368 af	**Stage Storage in Sippo Park (Irregular)** Listed below (Recalc)

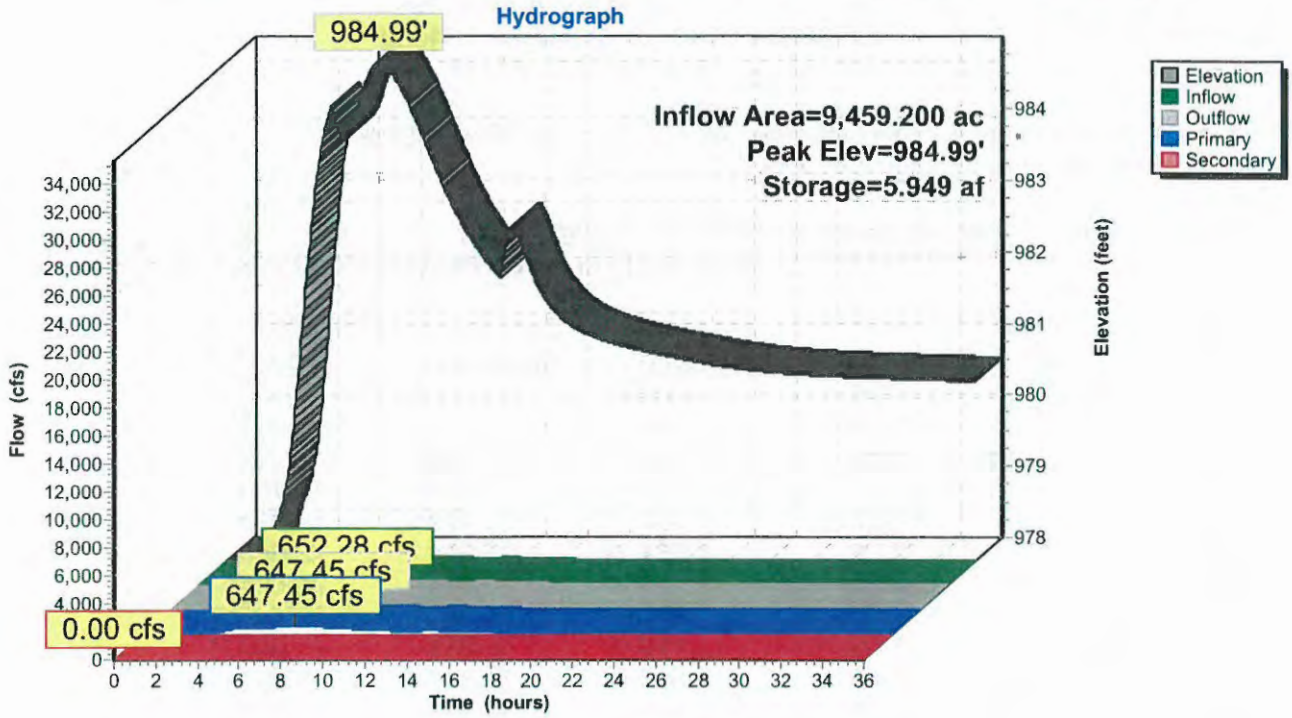
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
978.00	0.100	200.0	0.000	0.000	0.100
981.00	0.300	500.0	0.573	0.573	0.484
982.00	0.659	1,392.9	0.468	1.041	3.572
984.00	2.018	2,470.7	2.553	3.595	11.180
986.00	3.584	3,300.7	5.528	9.122	19.932
988.00	5.007	3,247.5	8.551	17.674	20.586
990.00	6.111	3,143.9	11.100	28.773	21.805
992.00	6.773	3,217.1	12.878	41.652	22.668
994.00	7.411	3,271.9	14.179	55.831	23.334
996.00	8.110	3,253.8	15.516	71.347	23.597
998.00	8.804	3,273.8	16.909	88.256	23.878
1,000.00	9.441	3,318.6	18.241	106.497	24.439
1,002.00	10.181	3,437.0	19.617	126.114	25.908
1,004.00	11.109	3,548.6	21.283	147.398	27.341
1,006.00	12.538	3,553.4	23.633	171.030	27.516
1,008.00	13.465	3,829.8	25.997	197.028	31.248
1,010.00	14.326	4,085.3	27.787	224.814	34.947
1,012.00	15.633	4,329.5	29.949	254.764	38.706
1,014.00	17.576	4,742.6	33.190	287.954	45.555
1,016.00	20.521	5,940.5	38.059	326.013	68.935
1,018.00	24.905	6,310.6	45.355	371.368	77.223

Device	Routing	Invert	Outlet Devices
#1	Primary	978.25'	**168.0" W x 98.0" H Box Box Culvert** L= 121.8' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 978.25' / 978.13' S= 0.0010 '/' Cc= 0.900 n= 0.015 Brickwork
#2	Secondary	1,008.00'	**Linclon Way (172), Cv= 2.63 (C= 3.29)** Head (feet) 0.00 1.00 2.00 4.00 6.00 8.00 10.00 Width (feet) 233.00 373.00 475.00 630.00 790.00 940.00 1,090.00

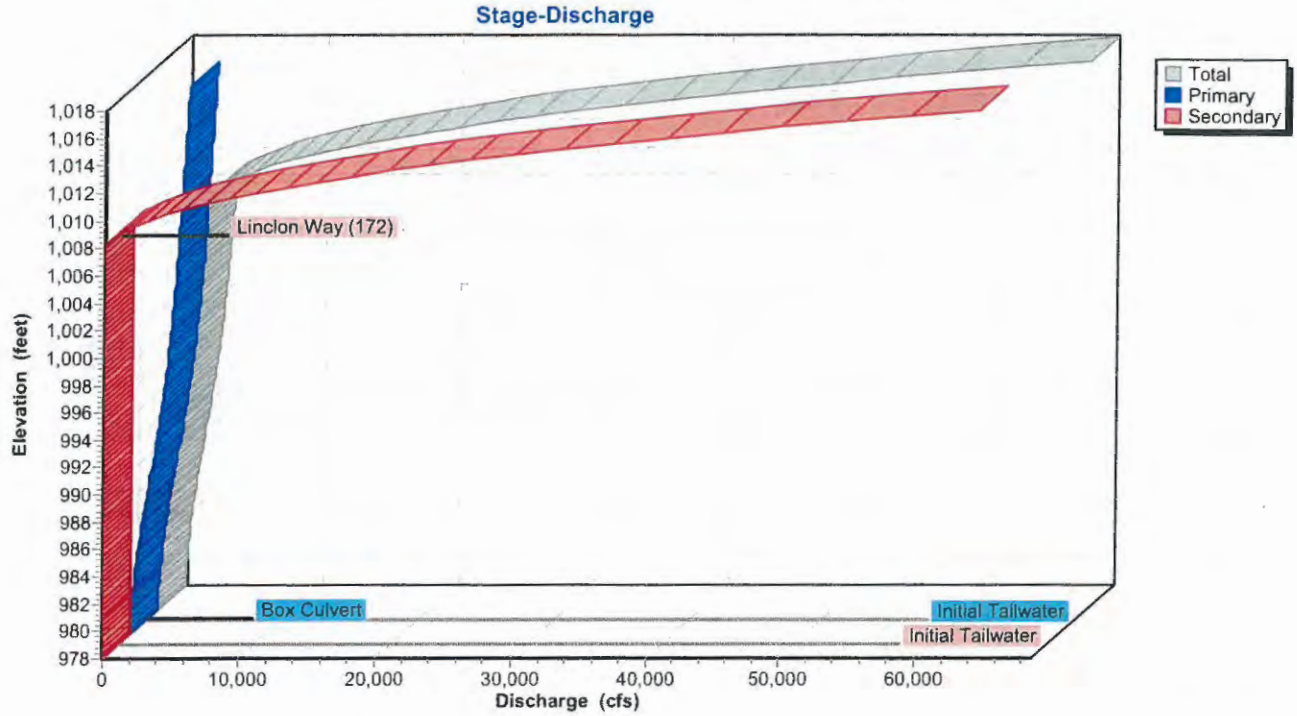
Primary OutFlow Max=647.45 cfs @ 7.32 hrs HW=984.99' TW=981.52' (Dynamic Tailwater)
└─**1=Box Culvert** (Barrel Controls 647.45 cfs @ 9.14 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=978.00' TW=978.13' (Dynamic Tailwater)
└─**2=Linclon Way (172)** (Controls 0.00 cfs)

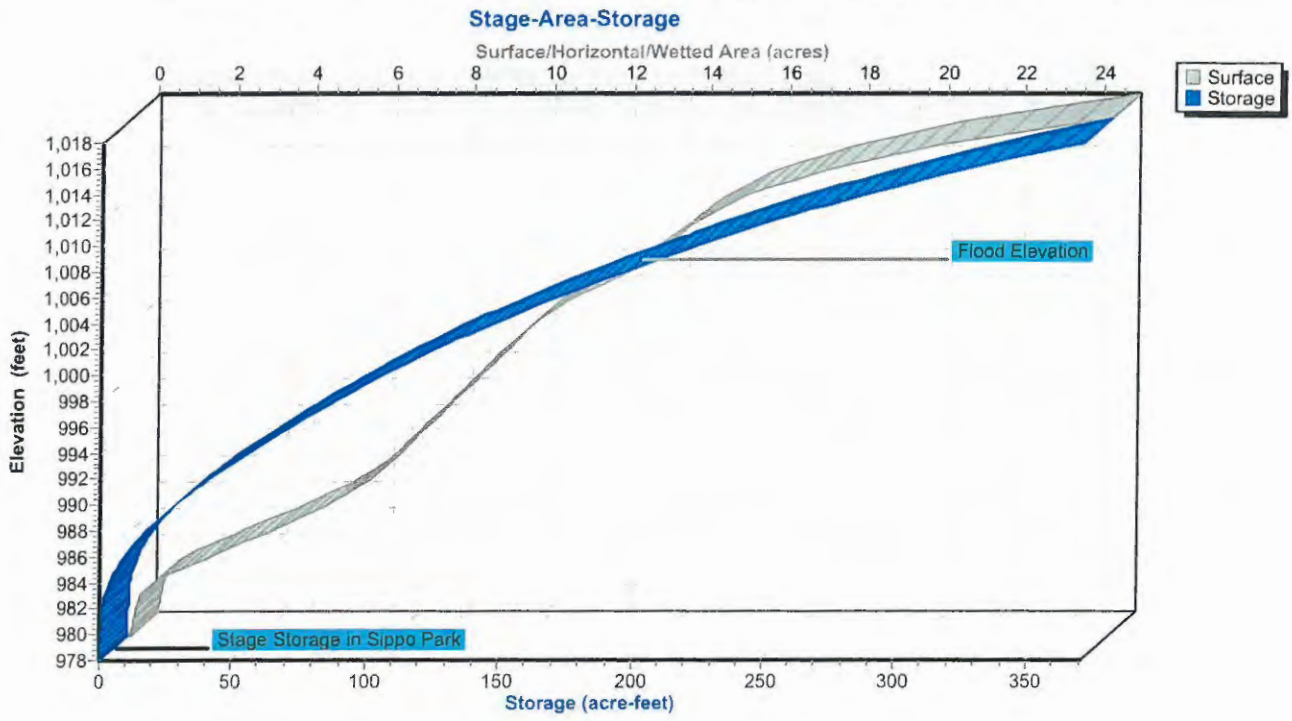
Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-



Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-



Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-

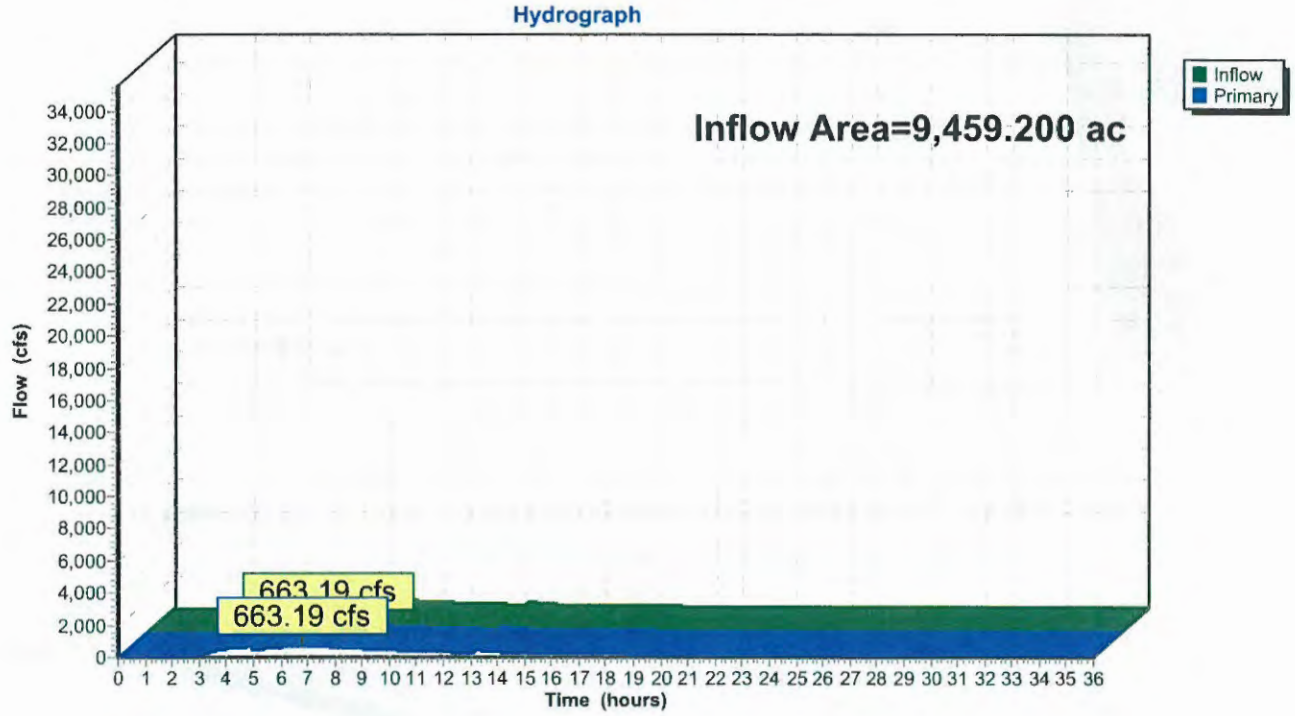


Summary for Pond 19C: Confluence 19

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 0.86" for 6-HR 0.1 PMF event
Inflow = 663.19 cfs @ 6.73 hrs, Volume= 677.471 af
Primary = 663.19 cfs @ 6.74 hrs, Volume= 677.471 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 19C: Confluence 19



Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment HYD 1: Lake Eric Drainage Runoff Area=115.200 ac 0.00% Impervious Runoff Depth=2.56"
Tc=44.0 min CN=74 Runoff=133.69 cfs 24.549 af

Subcatchment HYD 2: Lake O'Springs Runoff Area=268.800 ac 38.00% Impervious Runoff Depth=2.65"
Tc=65.0 min CN=75 Runoff=289.73 cfs 59.254 af

Subcatchment HYD 3: Lake Cable Runoff Area=1,401.600 ac 25.00% Impervious Runoff Depth=2.22"
Tc=226.0 min CN=70 Runoff=678.46 cfs 258.827 af

Subcatchment HYD 4: Hyd 4 Watershed Runoff Area=1,075.200 ac 20.00% Impervious Runoff Depth=2.05"
Tc=128.0 min CN=68 Runoff=644.59 cfs 183.881 af

Subcatchment HYD11: HYD11 Watershed Runoff Area=774.400 ac 0.00% Impervious Runoff Depth=1.97"
Tc=129.0 min CN=67 Runoff=442.67 cfs 127.266 af

Subcatchment HYD12: HYD12 Watershed Runoff Area=723.200 ac 0.00% Impervious Runoff Depth=2.56"
Tc=110.0 min CN=74 Runoff=596.17 cfs 154.110 af

Subcatchment HYD13: HYD13 Watershed Runoff Area=736.000 ac 38.00% Impervious Runoff Depth=2.65"
Tc=72.0 min CN=75 Runoff=763.91 cfs 162.244 af

Subcatchment HYD14: HYD14 Watershed Runoff Area=678.400 ac 25.00% Impervious Runoff Depth=3.10"
Tc=78.0 min CN=80 Runoff=812.80 cfs 175.438 af

Subcatchment HYD6: HYD6 Watershed Runoff Area=1,068.800 ac 0.00% Impervious Runoff Depth=2.13"
Tc=155.0 min CN=69 Runoff=604.65 cfs 190.028 af

Subcatchment HYD8: Sippo Lake Runoff Area=1,964.800 ac 38.00% Impervious Runoff Depth=2.65"
Tc=156.0 min CN=75 Runoff=1,401.47 cfs 433.121 af

Subcatchment HYD9: HYD9 Watershed Runoff Area=652.800 ac 0.00% Impervious Runoff Depth=1.97"
Tc=151.0 min CN=67 Runoff=344.35 cfs 107.282 af

Reach 5R: Channel 5 Avg. Flow Depth=2.84' Max Vel=5.77 fps Inflow=295.63 cfs 576.268 af
L=8,800.0' S=0.0240 '/' Capacity=106,015.62 cfs Outflow=295.12 cfs 571.044 af

Reach 7R: Channel 7 Avg. Flow Depth=7.49' Max Vel=3.01 fps Inflow=831.47 cfs 754.727 af
L=5,900.0' S=0.0017 '/' Capacity=195,473.52 cfs Outflow=788.78 cfs 746.261 af

Reach 10Ra: Channel 10 (Reach Avg. Flow Depth=2.96' Max Vel=2.52 fps Inflow=118.66 cfs 260.499 af
L=900.0' S=0.0028 '/' Capacity=36,685.79 cfs Outflow=118.66 cfs 259.824 af

Reach 15R: Channel 15 Avg. Flow Depth=7.97' Max Vel=2.06 fps Inflow=2,160.44 cfs 1,430.062 af
L=8,800.0' S=0.0010 '/' Capacity=189,892.92 cfs Outflow=1,838.38 cfs 1,400.421 af

Reach 16R: Channel 16 Avg. Flow Depth=9.81' Max Vel=2.42 fps Inflow=2,470.65 cfs 1,716.431 af
L=7,500.0' S=0.0010 '/' Capacity=42,389.29 cfs Outflow=2,392.05 cfs 1,695.440 af

Reach 18R: Sippo Creek Avg. Flow Depth=5.64' Max Vel=9.44 fps Inflow=2,499.46 cfs 1,859.198 af
L=450.0' S=0.0084 '/' Capacity=200,707.82 cfs Outflow=2,499.45 cfs 1,859.080 af

Pond 1C: CONF 1 Combined O'Springs and Eric Inflow=325.30 cfs 83.697 af
Primary=325.30 cfs 83.697 af

Pond 1P: Sippo Creek Reservoir Peak Elev=1,006.87' Storage=120.866 af Inflow=2,671.73 cfs 1,870.526 af
987.72 cfs 1,668.345 af Secondary=673.97 cfs 191.812 af Tertiary=0.00 cfs 0.000 af Outflow=2,661.69 cfs 1,860.157 af

Pond 2C: CONF 2 Combined Cable and O'Springs Inflow=806.72 cfs 342.070 af
Primary=806.72 cfs 342.070 af

Pond 3P: Lake Cable Peak Elev=1,097.85' Storage=2,015.502 af Inflow=806.72 cfs 342.070 af
Primary=295.63 cfs 576.367 af Secondary=0.00 cfs 0.000 af Outflow=295.63 cfs 576.367 af

Pond 4C: Confluence 4 Inflow=1,392.18 cfs 936.190 af
Primary=1,392.18 cfs 936.190 af

Pond 4P: Lake O'Springs Peak Elev=1,107.58' Storage=68.471 af Inflow=325.30 cfs 83.697 af
Primary=130.12 cfs 83.244 af Secondary=0.00 cfs 0.000 af Outflow=130.12 cfs 83.244 af

Pond 5C: Confluence 5 Inflow=1,813.02 cfs 1,063.357 af
Primary=1,813.02 cfs 1,063.357 af

Pond 5P: Lake Eric (Slagle) Peak Elev=1,119.52' Storage=25.473 af Inflow=133.69 cfs 24.549 af
Primary=54.95 cfs 24.443 af Secondary=0.00 cfs 0.000 af Outflow=54.95 cfs 24.443 af

Pond 6C: Confluence 6 Inflow=363.73 cfs 367.039 af
Primary=363.73 cfs 367.039 af

Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake Inflow=2,160.44 cfs 1,430.228 af
Primary=2,160.44 cfs 1,430.228 af

Pond 8C: Confluence 8 Inflow=2,470.65 cfs 1,716.603 af
Primary=2,470.65 cfs 1,716.603 af

Pond 8P: Storage Area Genoa Rd Peak Elev=1,024.60' Storage=260.332 af Inflow=1,050.31 cfs 340.298 af
Primary=118.66 cfs 260.567 af Secondary=0.00 cfs 0.000 af Outflow=118.66 cfs 260.567 af

Pond 9P: Sippo Lake Peak Elev=1,028.97' Storage=408.996 af Inflow=1,401.47 cfs 433.121 af
mary=1,050.31 cfs 340.299 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=1,050.31 cfs 340.299 af

Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed Inflow=831.47 cfs 754.826 af
Primary=831.47 cfs 754.826 af

Pond 16P: Lincoln Way Box Peak Elev=997.40' Storage=83.072 af Inflow=2,661.69 cfs 1,859.980 af
Primary=2,499.46 cfs 1,859.375 af Secondary=0.00 cfs 0.000 af Outflow=2,499.46 cfs 1,859.375 af

Pond 19C: Confluence 19 Inflow=2,671.73 cfs 1,870.702 af
Primary=2,671.73 cfs 1,870.702 af

Total Runoff Area = 9,459.200 ac Runoff Volume = 1,876.000 af Average Runoff Depth = 2.3
80.30% Pervious = 7,595.712 ac 19.70% Impervious = 1,863.488 ac

Summary for Subcatchment HYD 1: Lake Eric Drainage Area

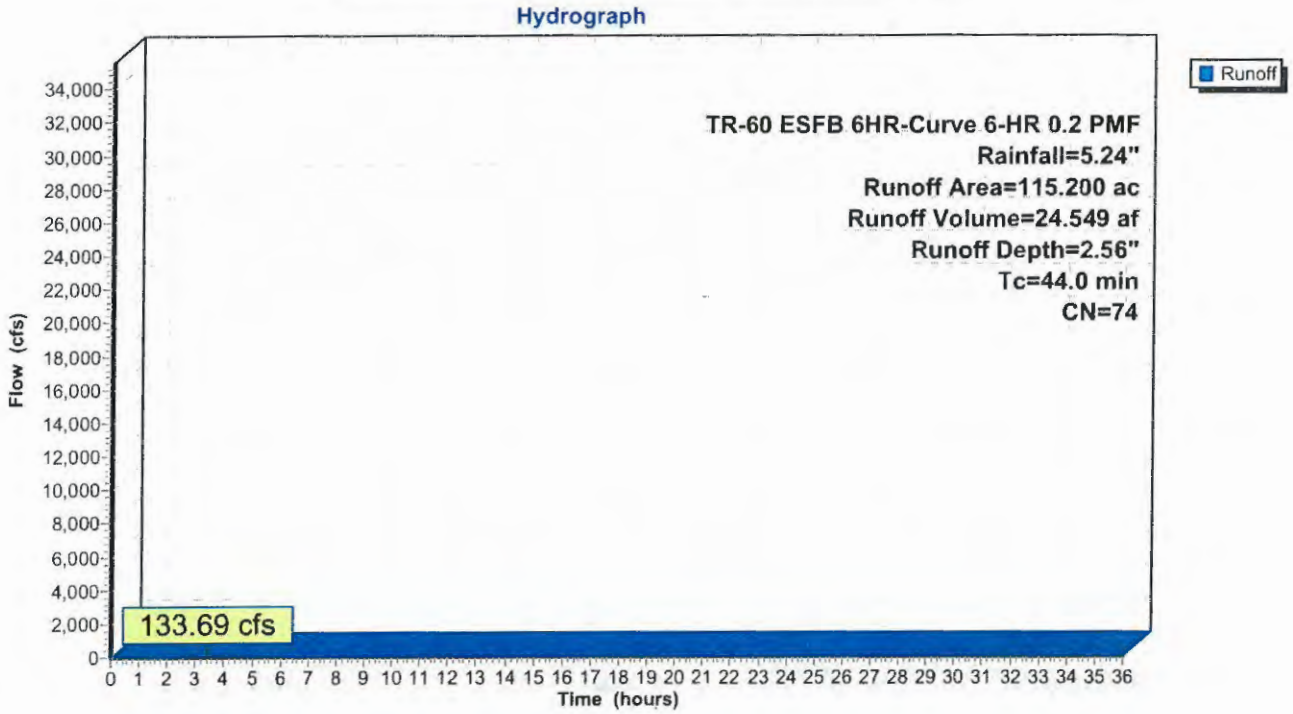
Runoff = 133.69 cfs @ 3.38 hrs, Volume= 24.549 af, Depth= 2.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.2 PMF Rainfall=5.24"

Area (ac)	CN	Description
115.200	74	>75% Grass cover, Good, HSG C
115.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.0					**Direct Entry, HEC-1 Lag Time = 0.44 hr**

Subcatchment HYD 1: Lake Eric Drainage Area



Summary for Subcatchment HYD 2: Lake O'Springs Watershed

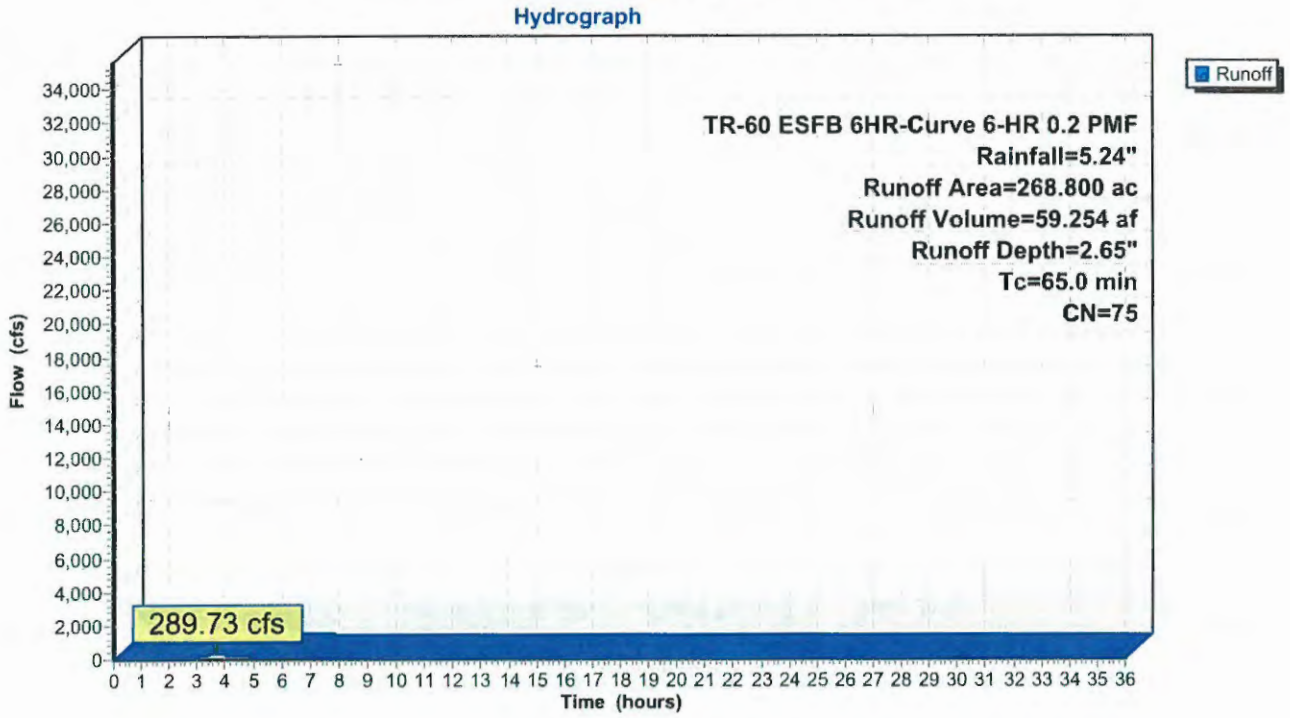
Runoff = 289.73 cfs @ 3.68 hrs, Volume= 59.254 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.2 PMF Rainfall=5.24"

Area (ac)	CN	Description
268.800	75	1/4 acre lots, 38% imp, HSG B
166.656		62.00% Pervious Area
102.144		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.0					**Direct Entry, HEC-1 Lag Time = 0.65 hours**

Subcatchment HYD 2: Lake O'Springs Watershed



Summary for Subcatchment HYD 3: Lake Cable Watershed

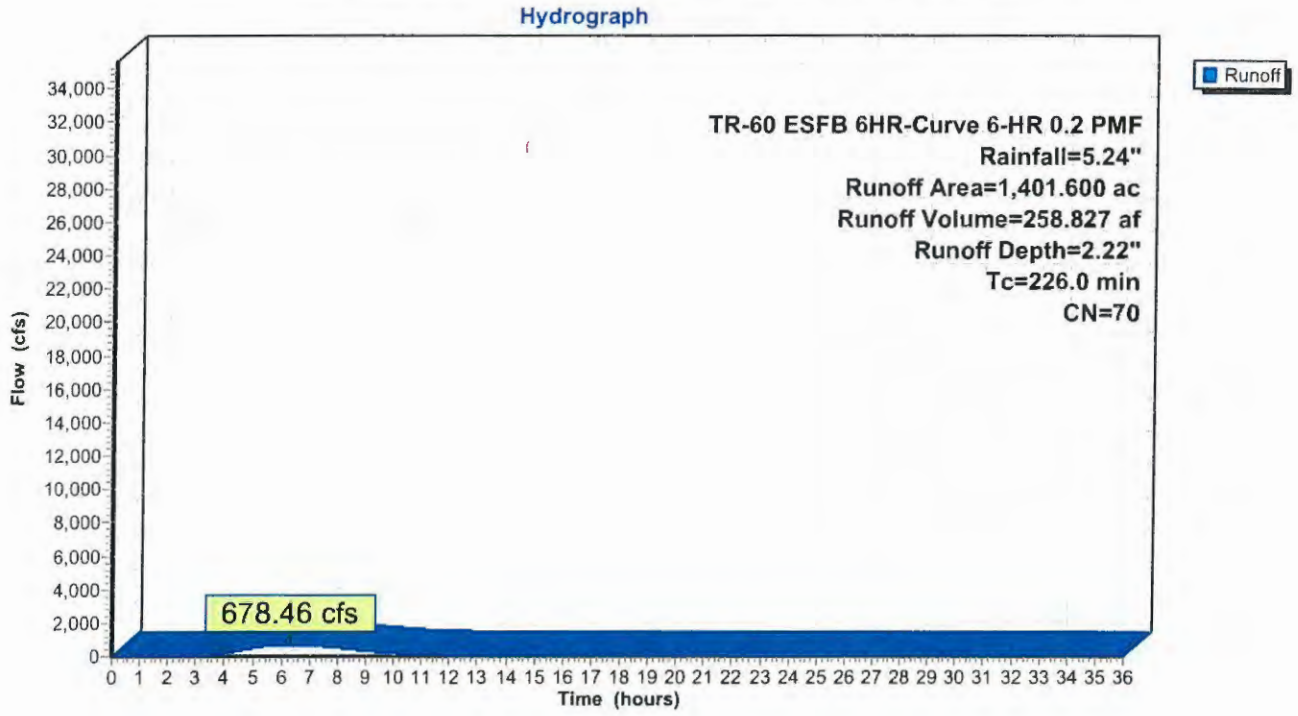
Runoff = 678.46 cfs @ 6.28 hrs, Volume= 258.827 af, Depth= 2.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.2 PMF Rainfall=5.24"

Area (ac)	CN	Description
1,401.600	70	1/2 acre lots, 25% imp, HSG B
1,051.200		75.00% Pervious Area
350.400		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
226.0					**Direct Entry, HEC-1 Lag time 2.26hr**

Subcatchment HYD 3: Lake Cable Watershed



Summary for Subcatchment HYD 4: Hyd 4 Watershed

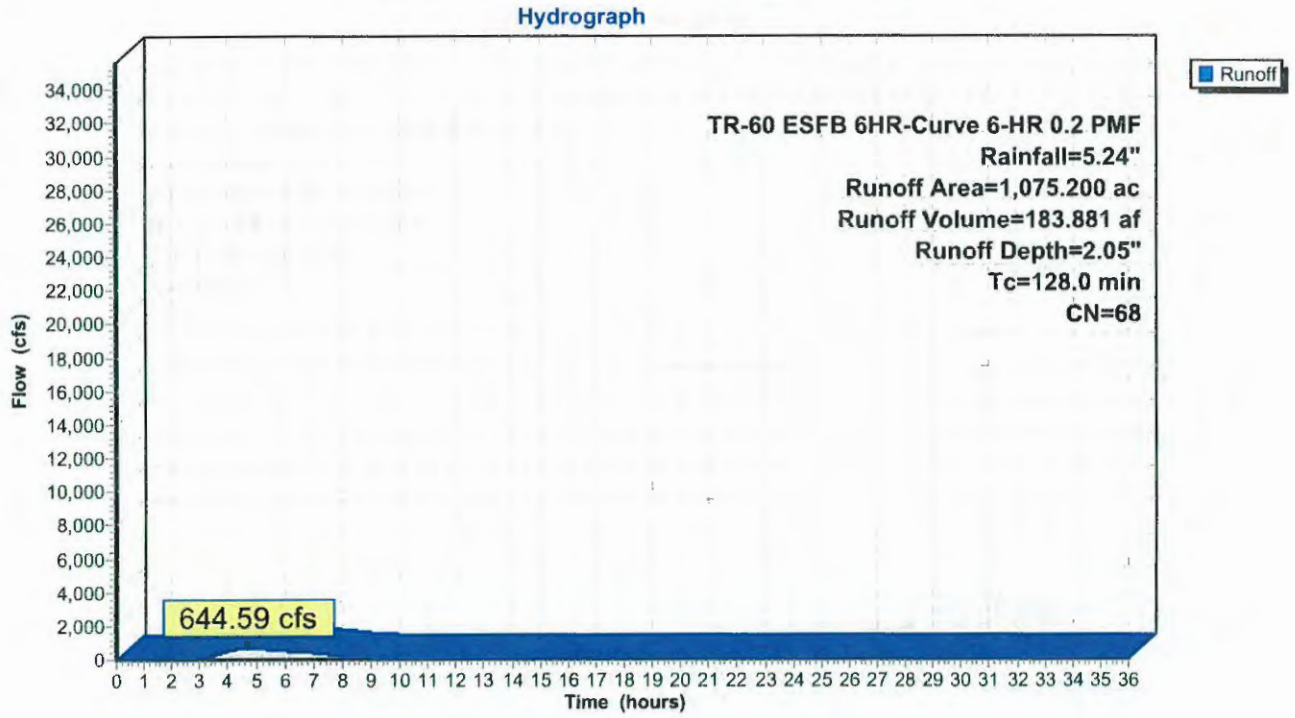
Runoff = 644.59 cfs @ 4.70 hrs, Volume= 183.881 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.2 PMF Rainfall=5.24"

Area (ac)	CN	Description
1,075.200	68	1 acre lots, 20% imp, HSG B
860.160		80.00% Pervious Area
215.040		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
128.0					**Direct Entry, HEC-1 Lag Time = 1.28 hr**

Subcatchment HYD 4: Hyd 4 Watershed



Summary for Subcatchment HYD11: HYD11 Watershed

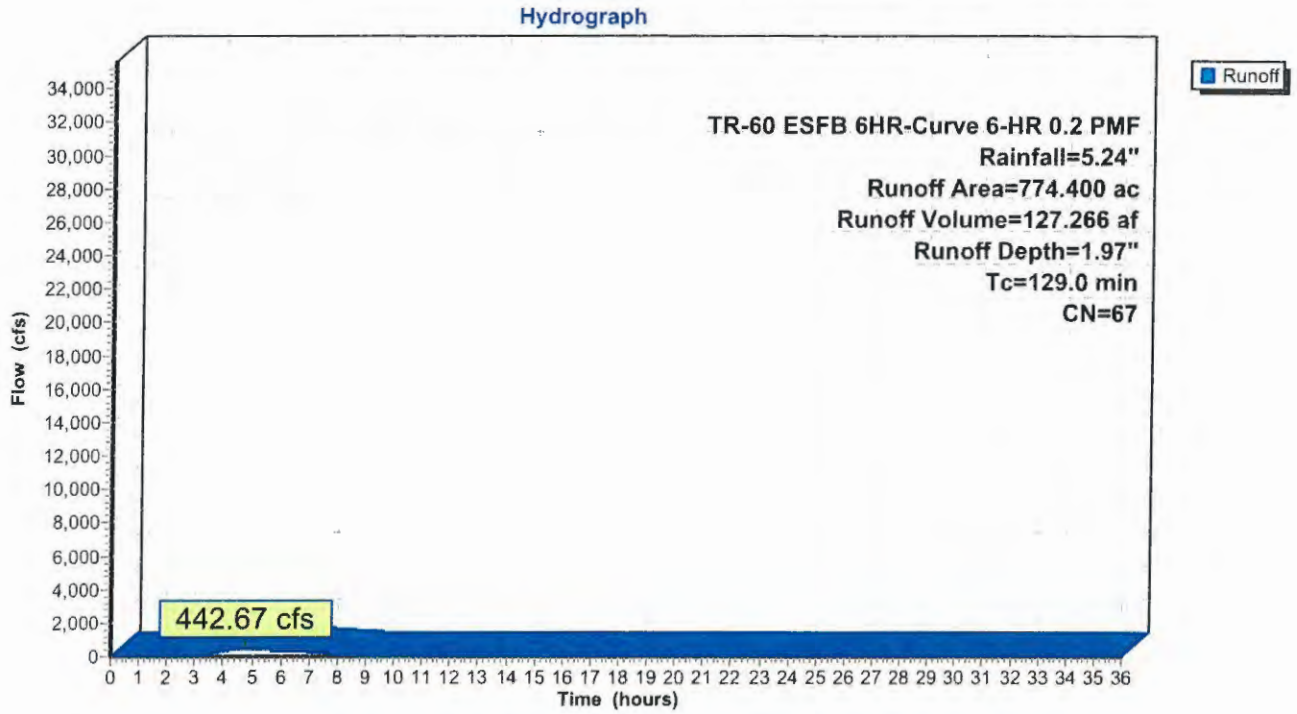
Runoff = 442.67 cfs @ 4.73 hrs, Volume= 127.266 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.2 PMF Rainfall=5.24"

	Area (ac)	CN	Description
*	774.400	67	
	774.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
129.0					**Direct Entry, HEC-1 Lag Time = 1.29 hr**

Subcatchment HYD11: HYD11 Watershed



Summary for Subcatchment HYD12: HYD12 Watershed

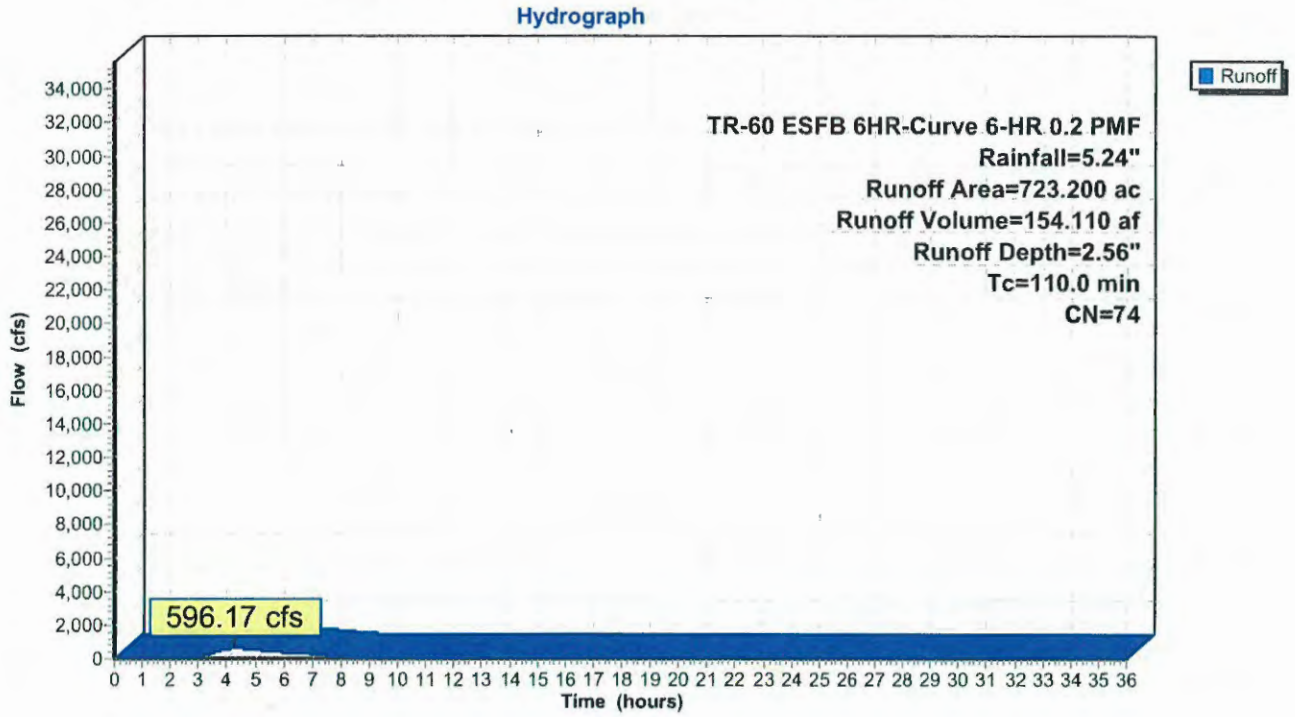
Runoff = 596.17 cfs @ 4.28 hrs, Volume= 154.110 af, Depth= 2.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.2 PMF Rainfall=5.24"

Area (ac)	CN	Description
723.200	74	>75% Grass cover, Good, HSG C
723.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
110.0					**Direct Entry, HEC-1 Lag Time = 1.10 hr**

Subcatchment HYD12: HYD12 Watershed



Summary for Subcatchment HYD13: HYD13 Watershed

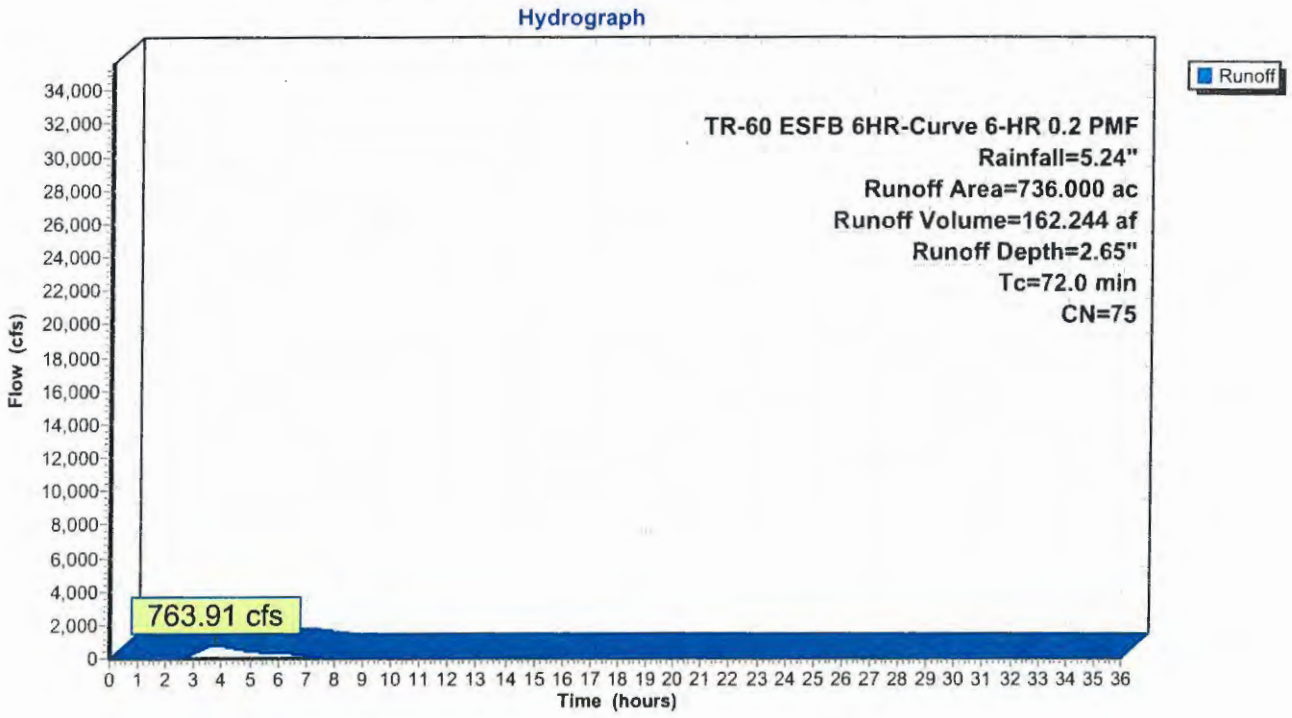
Runoff = 763.91 cfs @ 3.76 hrs, Volume= 162.244 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.2 PMF Rainfall=5.24"

Area (ac)	CN	Description
736.000	75	1/4 acre lots, 38% imp, HSG B
456.320		62.00% Pervious Area
279.680		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
72.0					**Direct Entry, HEC-1 Lag Time = 0.72 hr**

Subcatchment HYD13: HYD13 Watershed



Summary for Subcatchment HYD14: HYD14 Watershed

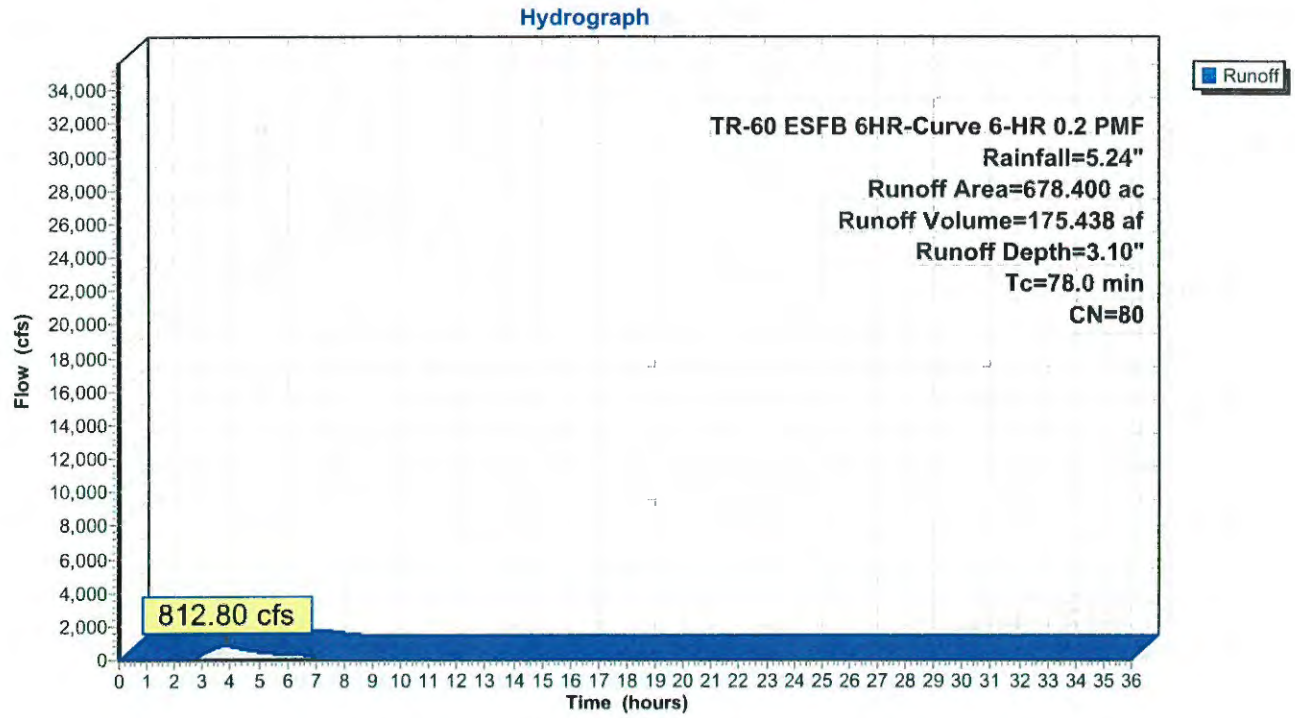
Runoff = 812.80 cfs @ 3.81 hrs, Volume= 175.438 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.2 PMF Rainfall=5.24"

Area (ac)	CN	Description
678.400	80	1/2 acre lots, 25% imp, HSG C
508.800		75.00% Pervious Area
169.600		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.0					**Direct Entry, HEC-1 Lag Time = 0.78 hr**

Subcatchment HYD14: HYD14 Watershed



Summary for Subcatchment HYD6: HYD6 Watershed

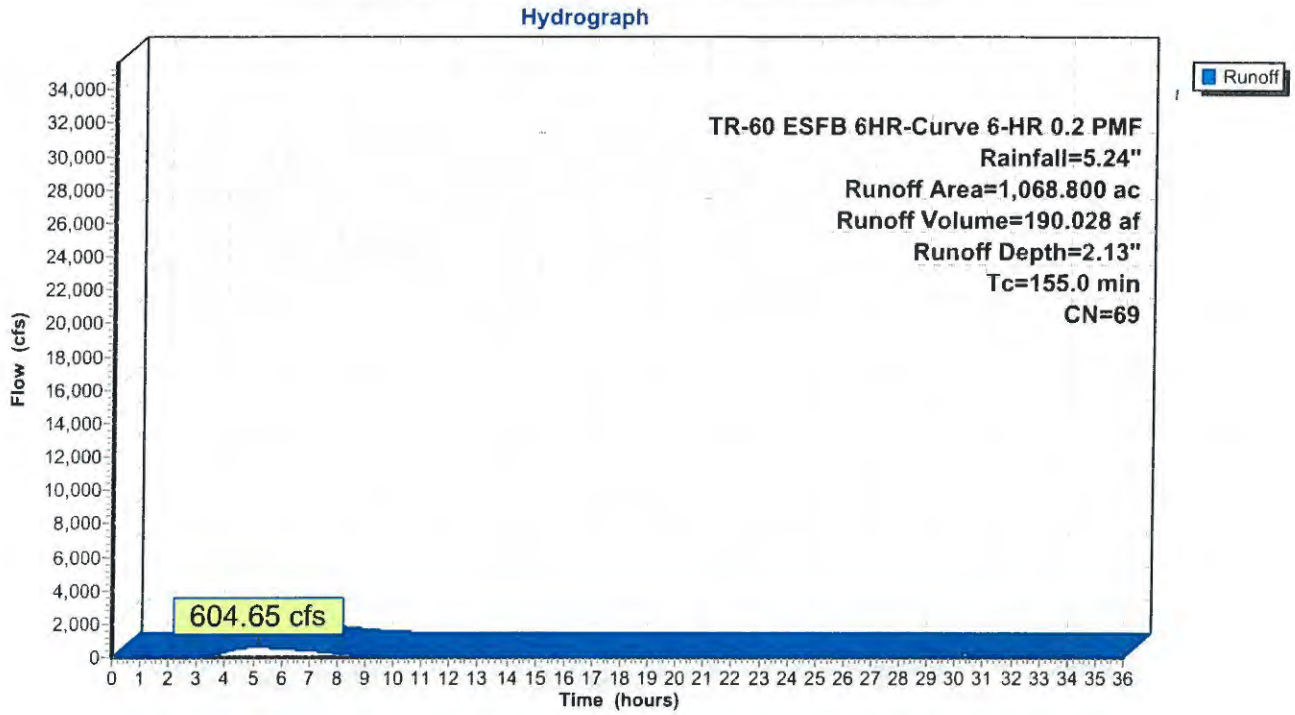
Runoff = 604.65 cfs @ 5.17 hrs, Volume= 190.028 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.2 PMF Rainfall=5.24"

Area (ac)	CN	Description
1,068.800	69	Pasture/grassland/range, Fair, HSG B
1,068.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
155.0					**Direct Entry, HEC-1 Lag Time = 1.55 hr**

Subcatchment HYD6: HYD6 Watershed



Summary for Subcatchment HYD8: Sippo Lake Watershed

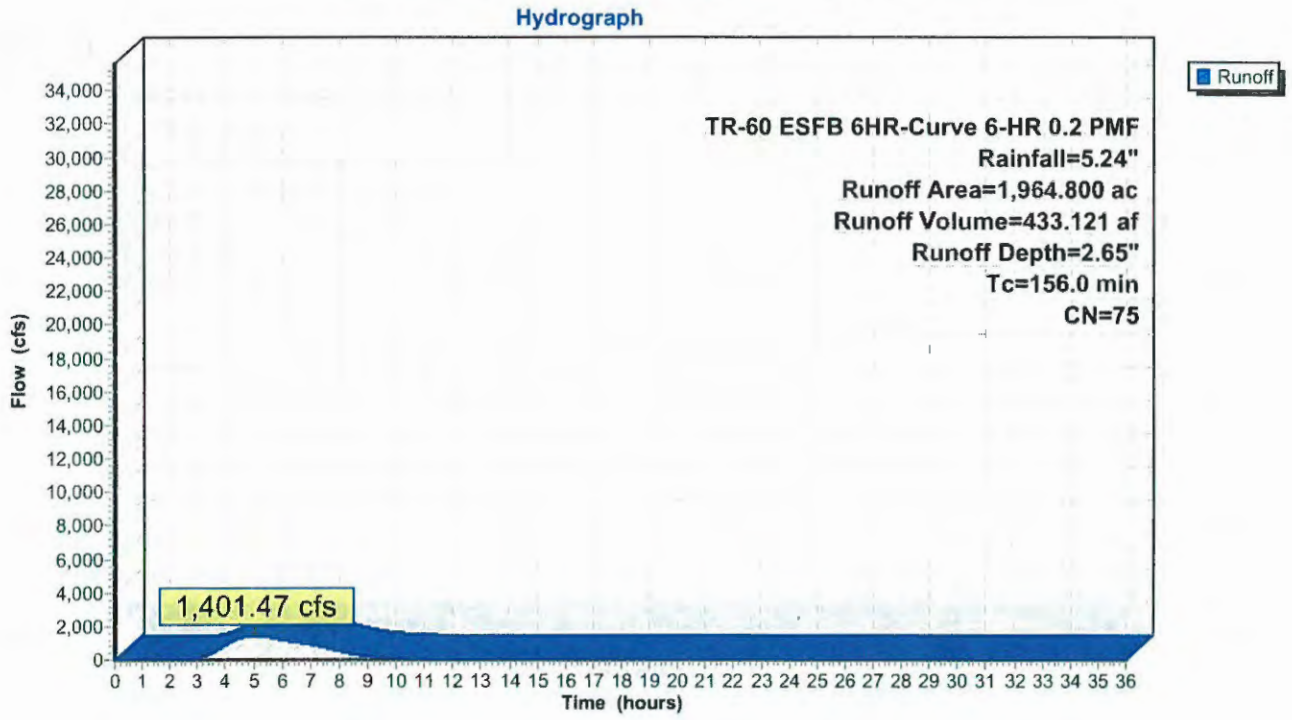
Runoff = 1,401.47 cfs @ 5.03 hrs, Volume= 433.121 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.2 PMF Rainfall=5.24"

Area (ac)	CN	Description
1,964.800	75	1/4 acre lots, 38% imp, HSG B
1,218.176		62.00% Pervious Area
746.624		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
156.0					**Direct Entry, HEC-1 Lag Time = 1.56hr**

Subcatchment HYD8: Sippo Lake Watershed



Summary for Subcatchment HYD9: HYD9 Watershed

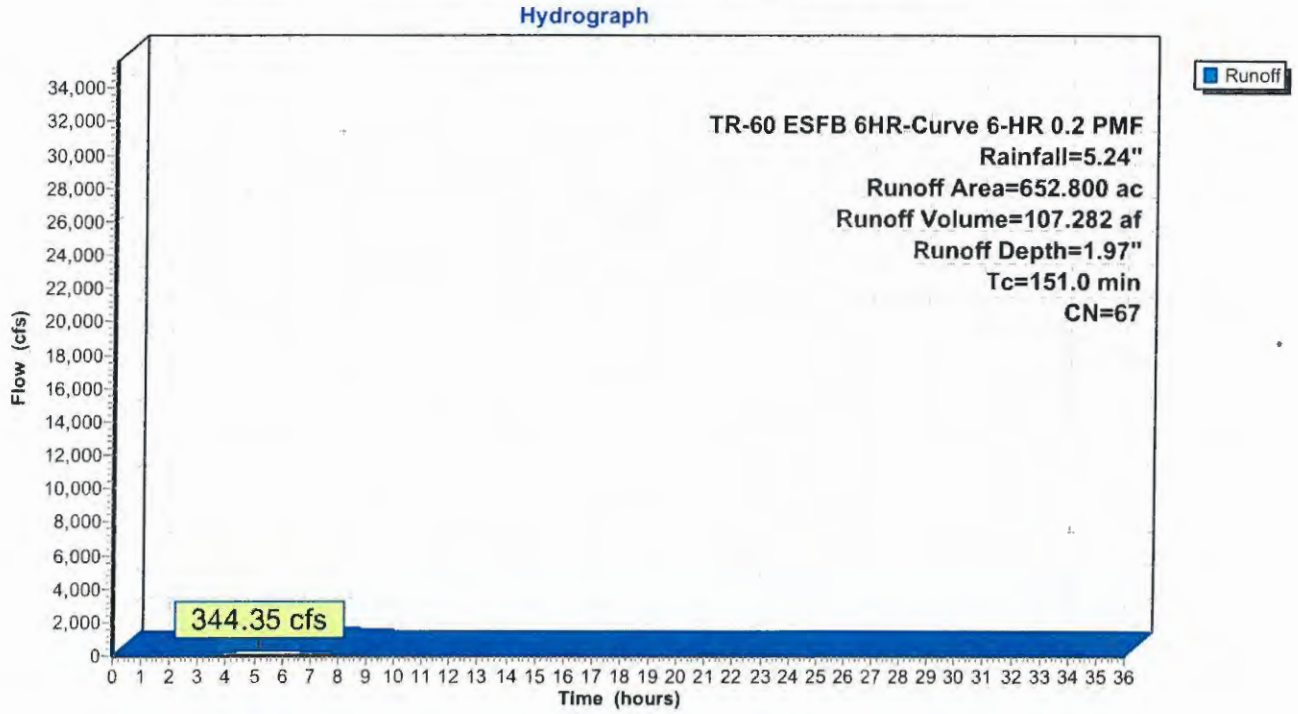
Runoff = 344.35 cfs @ 5.20 hrs, Volume= 107.282 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.2 PMF Rainfall=5.24"

	Area (ac)	CN	Description
*	652.800	67	
	652.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
151.0					**Direct Entry, HEC-1 Lag Time = 1.51hr**

Subcatchment HYD9: HYD9 Watershed



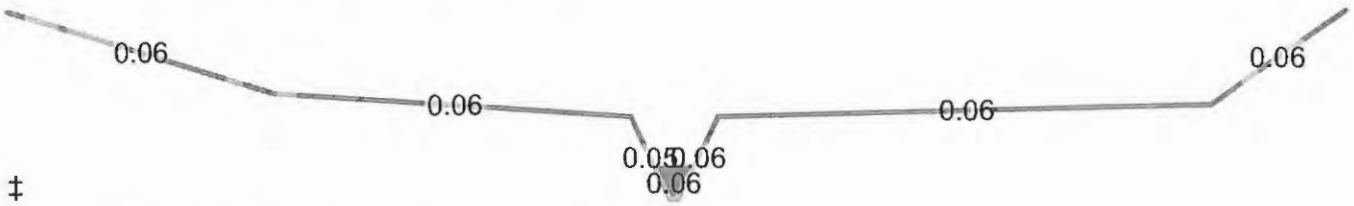
Summary for Reach 5R: Channel 5

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 3.87" for 6-HR 0.2 PMF event
Inflow = 295.63 cfs @ 9.56 hrs, Volume= 576.268 af
Outflow = 295.12 cfs @ 9.90 hrs, Volume= 571.044 af, Atten= 0%, Lag= 20.0 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.77 fps, Min. Travel Time= 25.4 min
Avg. Velocity = 5.11 fps, Avg. Travel Time= 28.7 min

Peak Storage= 450,248 cf @ 9.90 hrs
Average Depth at Peak Storage= 2.84'
Defined Flood Depth= 16.00', Capacity at Flood Depth= 106,015.62 cfs
Bank-Full Depth= 16.00', Capacity at Bank-Full= 106,015.62 cfs

Custom cross-section, Length= 8,800.0' Slope= 0.0240 '/' (102 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,069.00', Outlet Invert= 857.80'

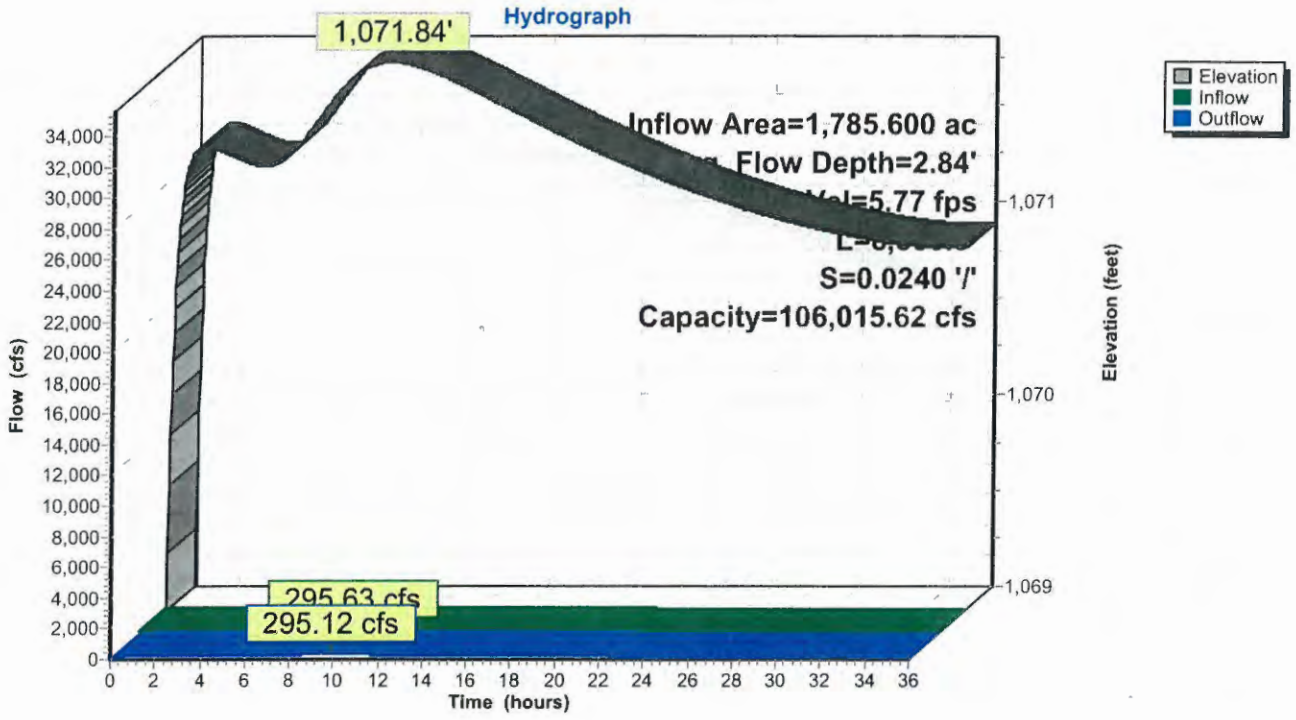


‡

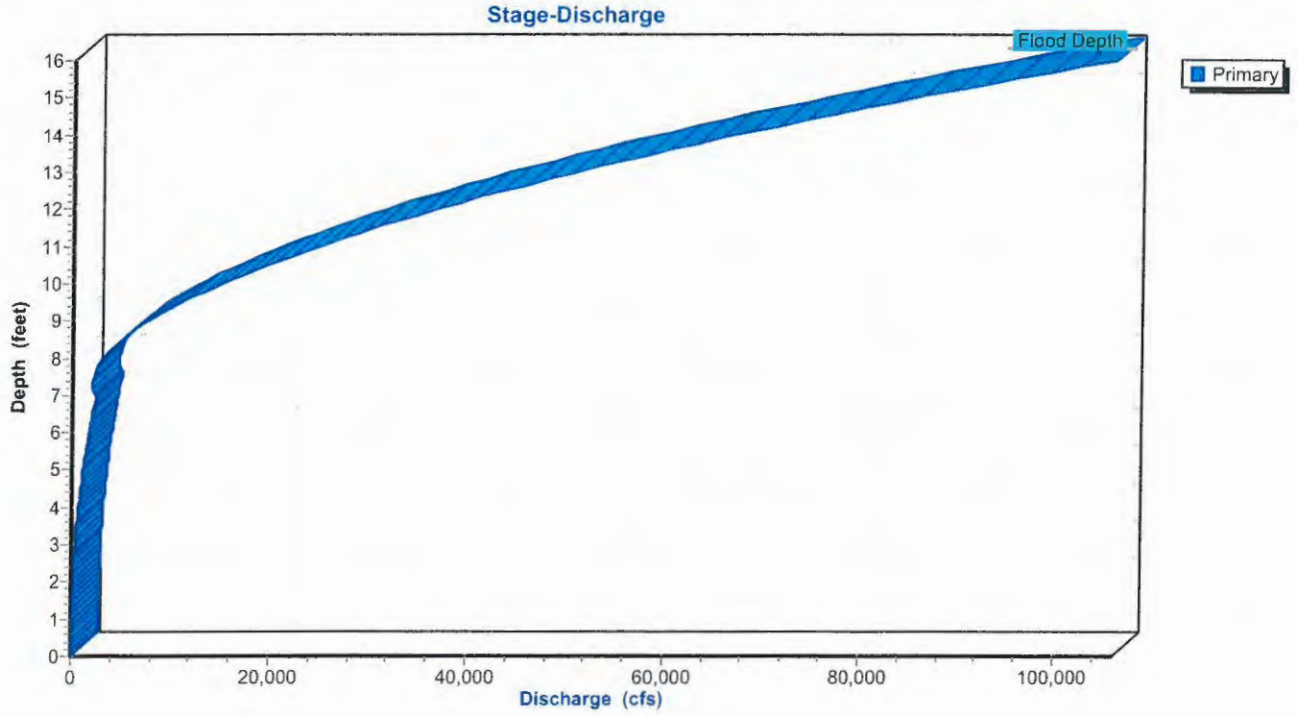
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,085.00	0.00		
200.00	1,078.00	7.00	0.060	
465.00	1,076.00	9.00	0.060	
494.00	1,069.00	16.00	0.050	
500.00	1,069.00	16.00	0.060	
530.00	1,076.00	9.00	0.060	
900.00	1,077.00	8.00	0.060	
1,000.00	1,085.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	6.0	0	0.00
7.00	248.5	66.6	2,186,800	2,476.94
8.00	564.8	569.1	4,969,800	3,087.89
9.00	1,204.8	714.2	10,601,800	7,790.91
16.00	7,198.5	1,002.1	63,346,800	106,015.62

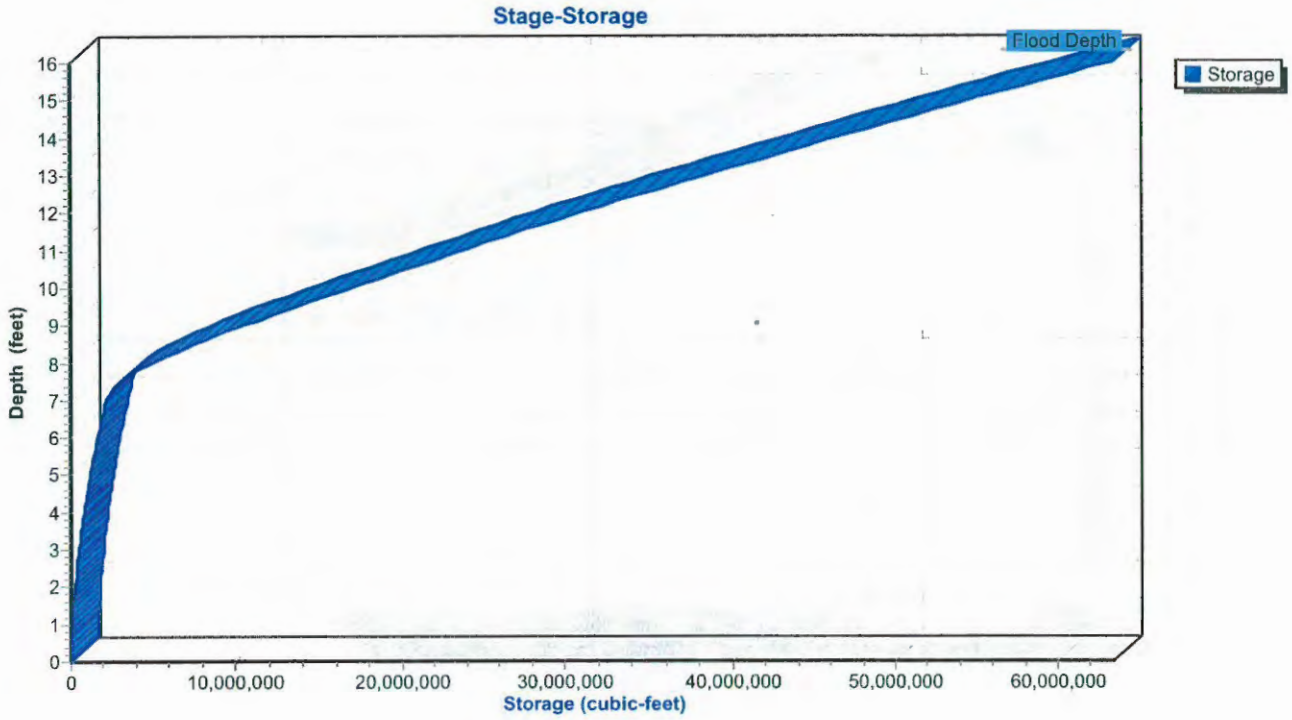
Reach 5R: Channel 5



Reach 5R: Channel 5



Reach 5R: Channel 5



Summary for Reach 7R: Channel 7

Inflow Area = 2,860.800 ac, 23.34% Impervious, Inflow Depth > 3.17" for 6-HR 0.2 PMF event
Inflow = 831.47 cfs @ 4.71 hrs, Volume= 754.727 af
Outflow = 788.78 cfs @ 5.26 hrs, Volume= 746.261 af, Atten= 5%, Lag= 33.0 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.01 fps, Min. Travel Time= 32.7 min
Avg. Velocity = 2.20 fps, Avg. Travel Time= 44.8 min

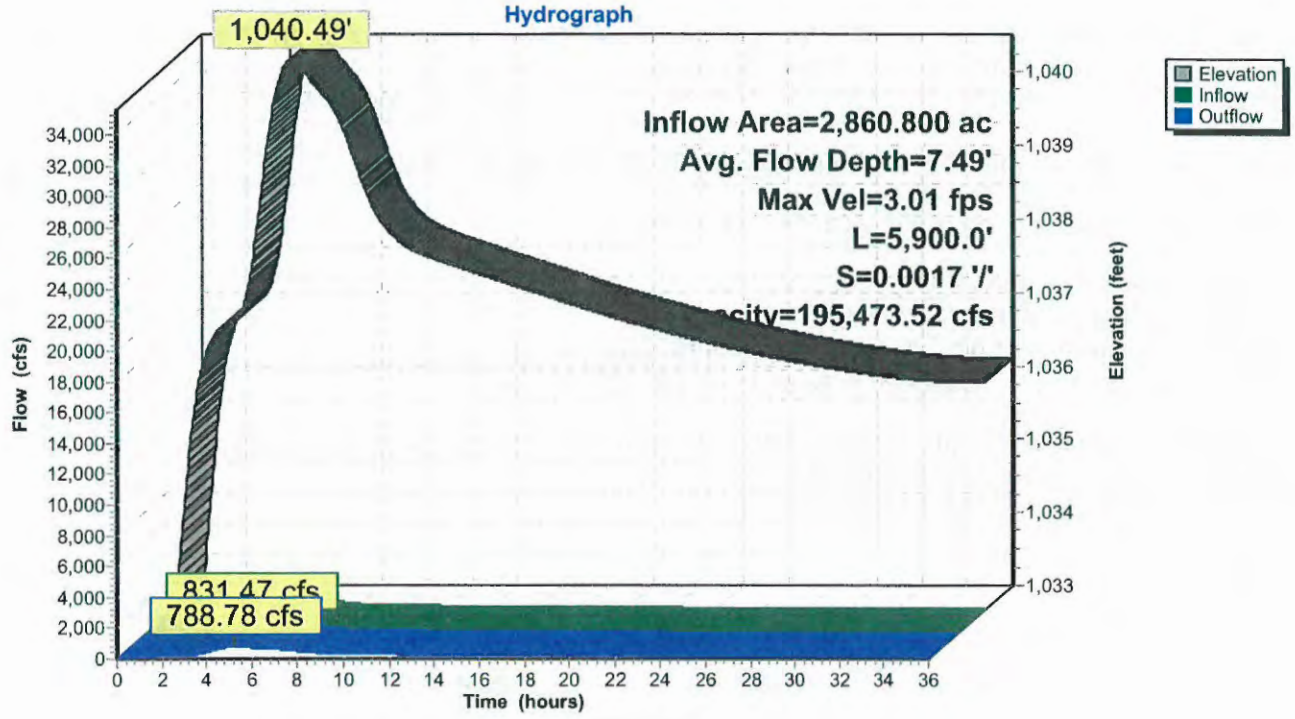
Peak Storage= 1,545,607 cf @ 5.26 hrs
Average Depth at Peak Storage= 7.49'
Defined Flood Depth= 47.00', Capacity at Flood Depth= 195,473.52 cfs
Bank-Full Depth= 47.00', Capacity at Bank-Full= 195,473.52 cfs

Custom cross-section, Length= 5,900.0' Slope= 0.0017 '/' (104 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,033.00', Outlet Invert= 1,022.97'

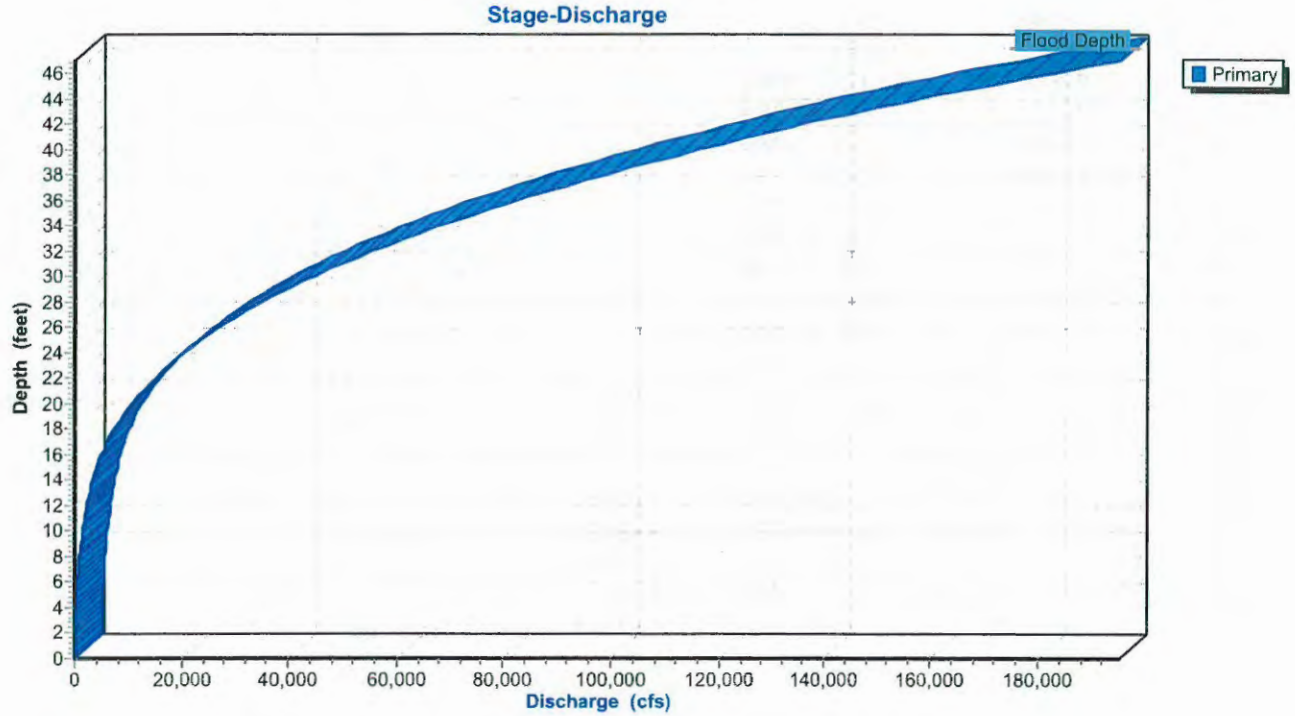
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,080.00	0.00		
100.00	1,065.00	15.00	0.060	
350.00	1,052.00	28.00	0.060	
460.00	1,045.00	35.00	0.060	
490.00	1,033.00	47.00	0.050	
500.00	1,033.00	47.00	0.050	
550.00	1,045.00	35.00	0.060	
700.00	1,052.00	28.00	0.060	
1,000.00	1,075.00	5.00	0.060	
1,005.00	1,080.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	10.0	0	0.00
12.00	600.0	93.7	3,540,000	2,349.60
19.00	2,140.0	354.1	12,626,000	8,862.05
32.00	9,417.2	774.5	55,561,326	55,339.93
42.00	18,098.3	972.7	106,780,167	135,620.34
47.00	23,027.5	1,013.5	135,862,250	195,473.52

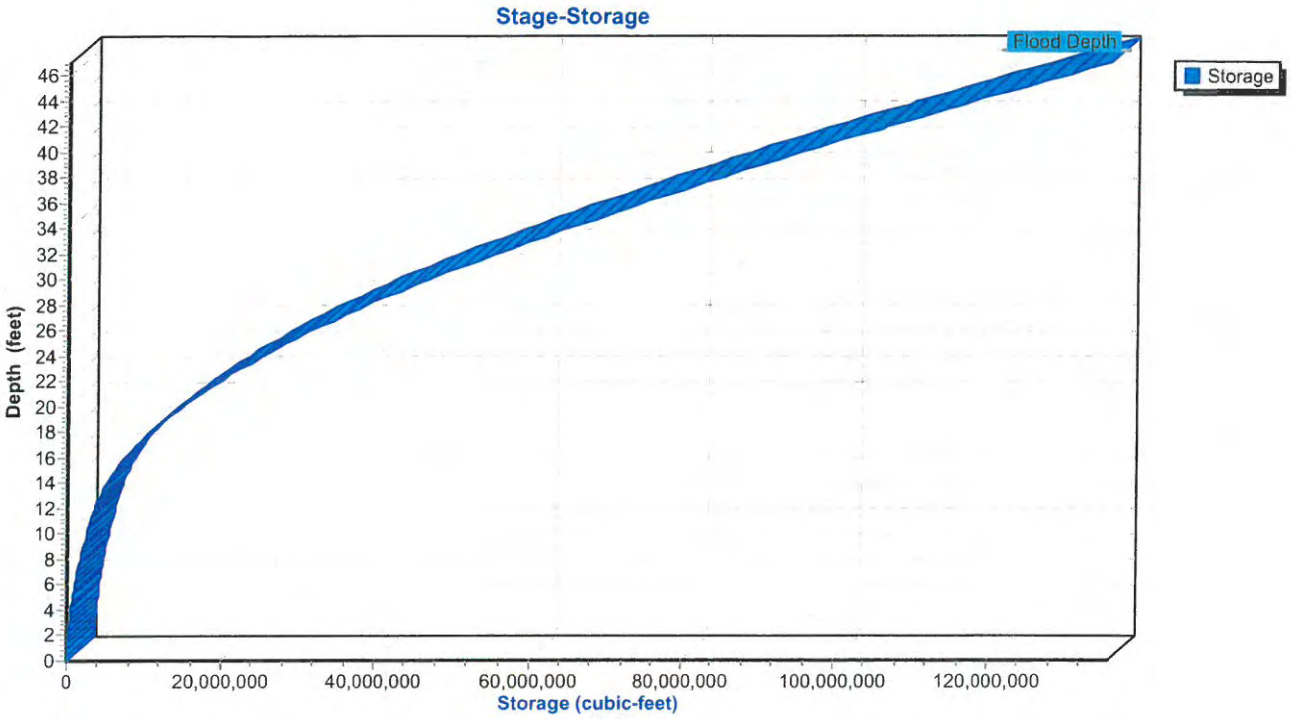
Reach 7R: Channel 7



Reach 7R: Channel 7



Reach 7R: Channel 7



Summary for Reach 10Ra: Channel 10 (Reach West of Genoa Rd)

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth > 1.59" for 6-HR 0.2 PMF event
Inflow = 118.66 cfs @ 11.58 hrs, Volume= 260.499 af
Outflow = 118.66 cfs @ 11.65 hrs, Volume= 259.824 af, Atten= 0%, Lag= 4.4 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.52 fps, Min. Travel Time= 6.0 min
Avg. Velocity = 2.37 fps, Avg. Travel Time= 6.3 min

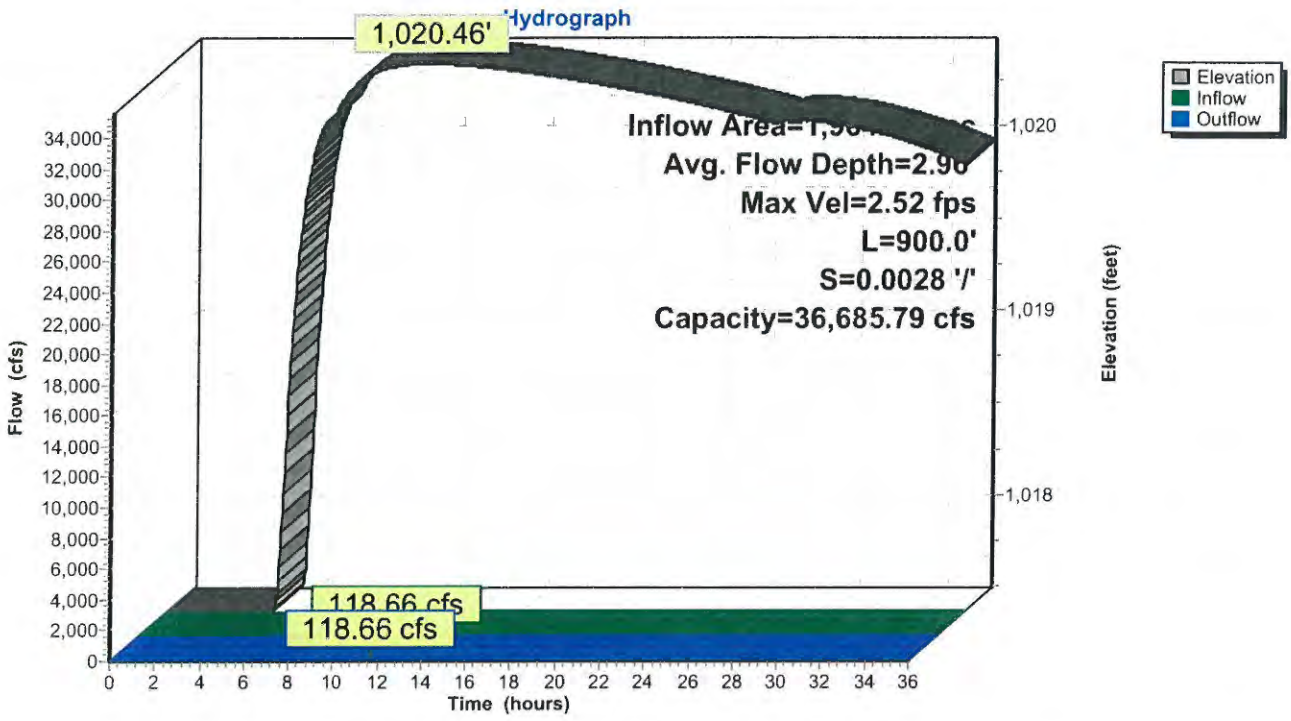
Peak Storage= 42,397 cf @ 11.65 hrs
Average Depth at Peak Storage= 2.96'
Defined Flood Depth= 15.00', Capacity at Flood Depth= 36,685.79 cfs
Bank-Full Depth= 15.00', Capacity at Bank-Full= 36,685.79 cfs

Custom cross-section, Length= 900.0' Slope= 0.0028 '/' (103 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,017.50', Outlet Invert= 1,015.00'

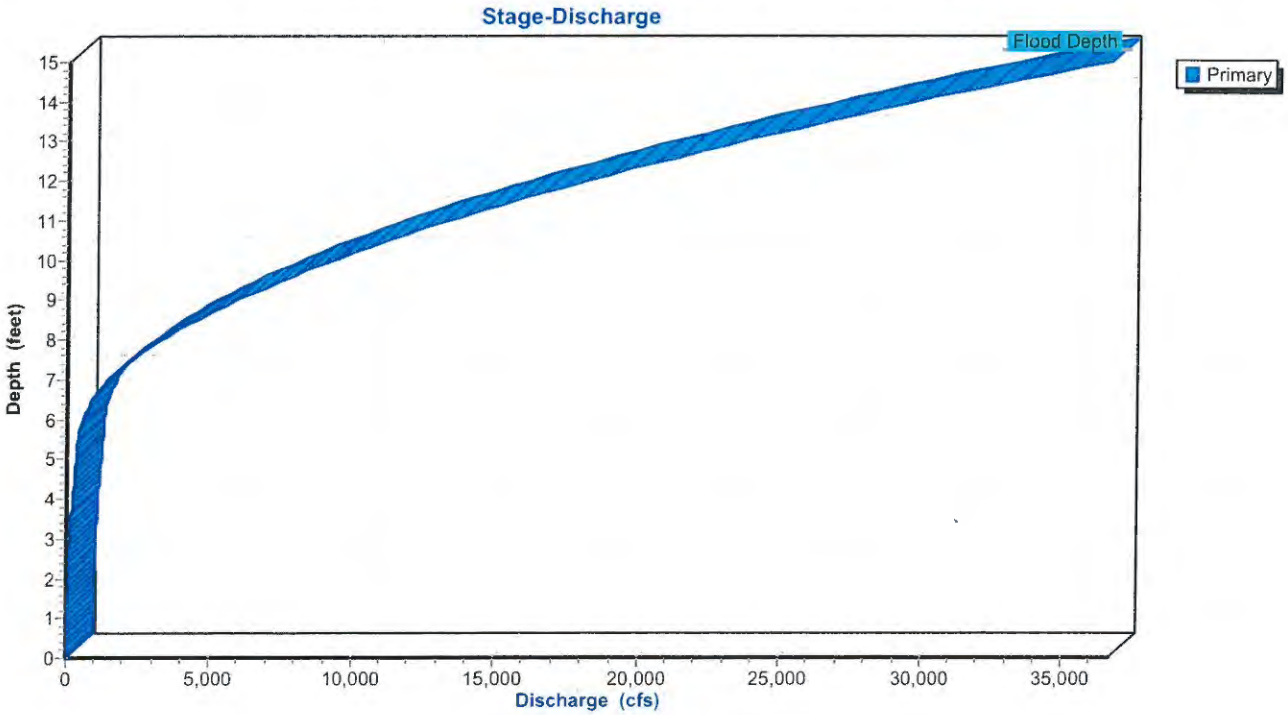
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,032.00	0.00		
190.00	1,024.00	8.00	0.060	
485.00	1,022.00	10.00	0.060	
495.00	1,017.00	15.00	0.050	
505.00	1,017.00	15.00	0.050	
515.00	1,022.00	10.00	0.060	
820.00	1,024.00	8.00	0.060	
900.00	1,027.00	5.00	0.060	
1,000.00	1,032.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	10.0	0	0.00
5.00	100.0	32.4	90,000	328.73
7.00	760.0	632.4	684,000	1,430.41
10.00	2,876.9	783.7	2,589,188	9,317.36
15.00	7,330.0	1,002.7	6,597,000	36,685.79

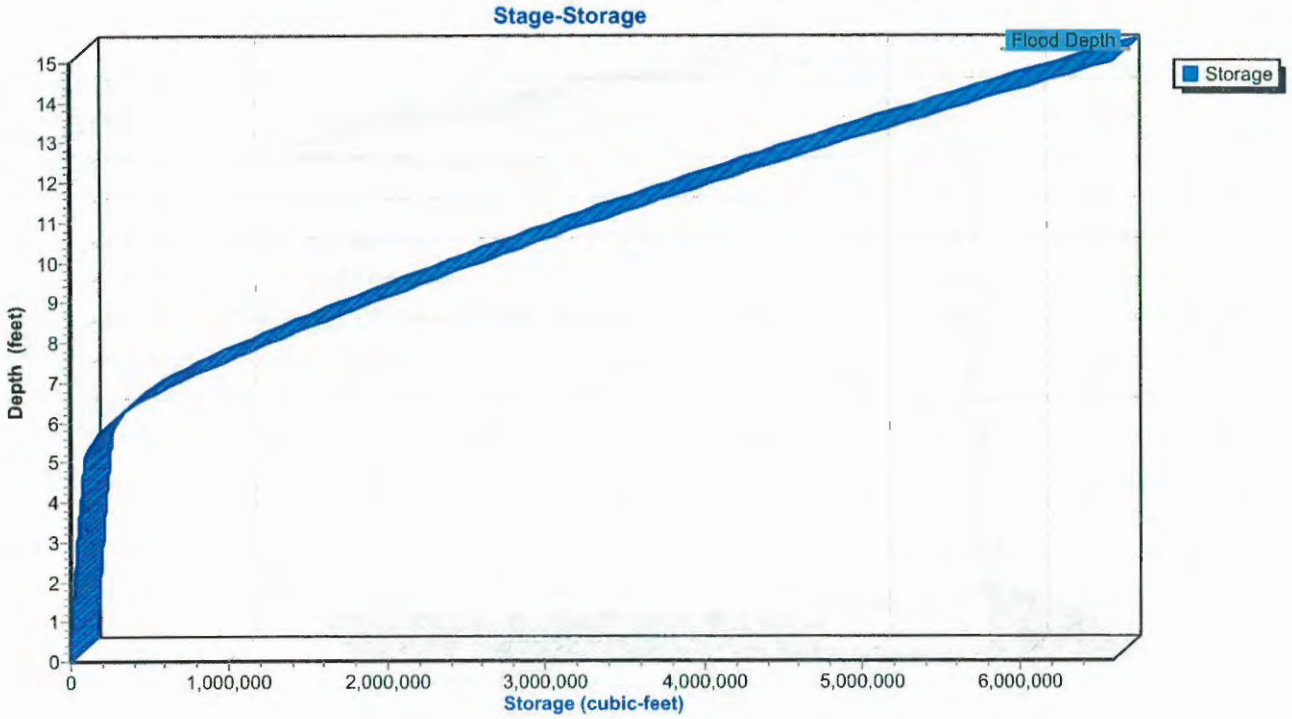
Reach 10Ra: Channel 10 (Reach West of Genoa Rd)



Reach 10Ra: Channel 10 (Reach West of Genoa Rd)



Reach 10Ra: Channel 10 (Reach West of Genoa Rd)



Summary for Reach 15R: Channel 15

Inflow Area = 7,321.600 ac, 19.32% Impervious, Inflow Depth > 2.34" for 6-HR 0.2 PMF event
Inflow = 2,160.44 cfs @ 5.19 hrs, Volume= 1,430.062 af
Outflow = 1,838.38 cfs @ 6.48 hrs, Volume= 1,400.421 af, Atten= 15%, Lag= 77.4 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.06 fps, Min. Travel Time= 71.1 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 98.7 min

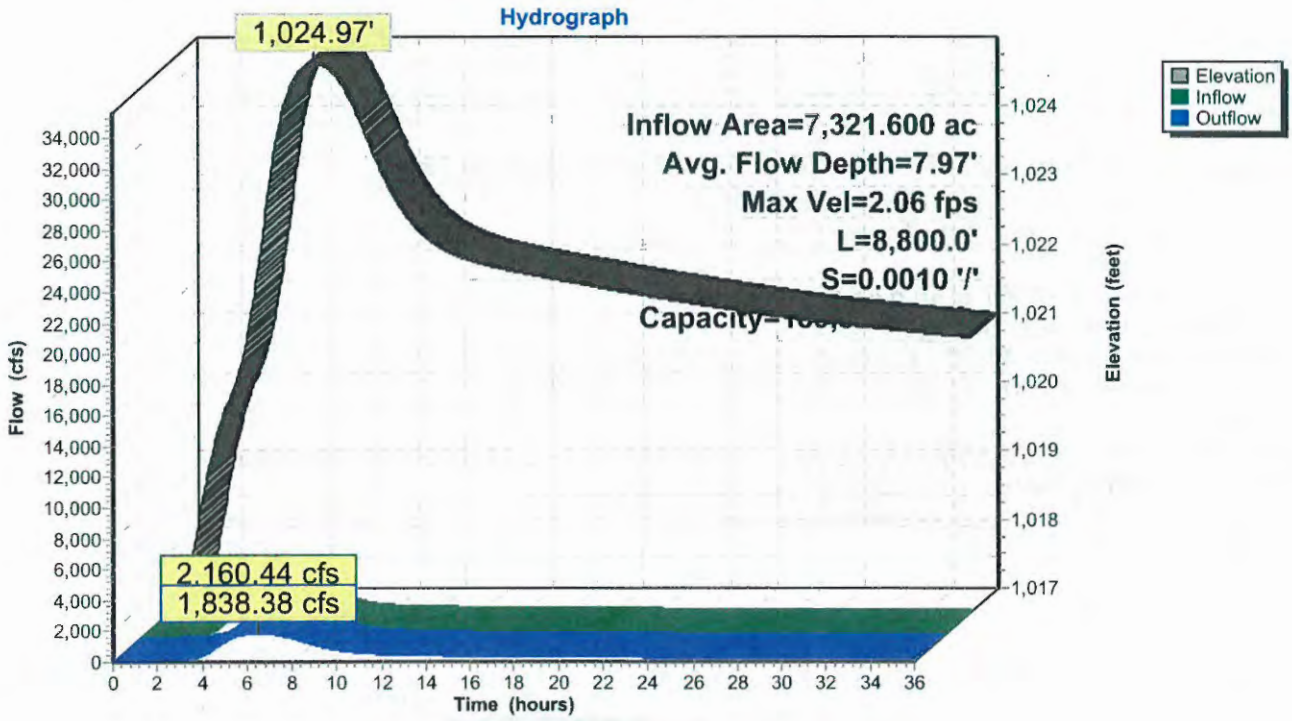
Peak Storage= 7,854,067 cf @ 6.48 hrs
Average Depth at Peak Storage= 7.97'
Defined Flood Depth= 43.00', Capacity at Flood Depth= 189,892.92 cfs
Bank-Full Depth= 43.00', Capacity at Bank-Full= 189,892.92 cfs

Custom cross-section, Length= 8,800.0' Slope= 0.0010 '/' (106 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,017.00', Outlet Invert= 1,008.20'

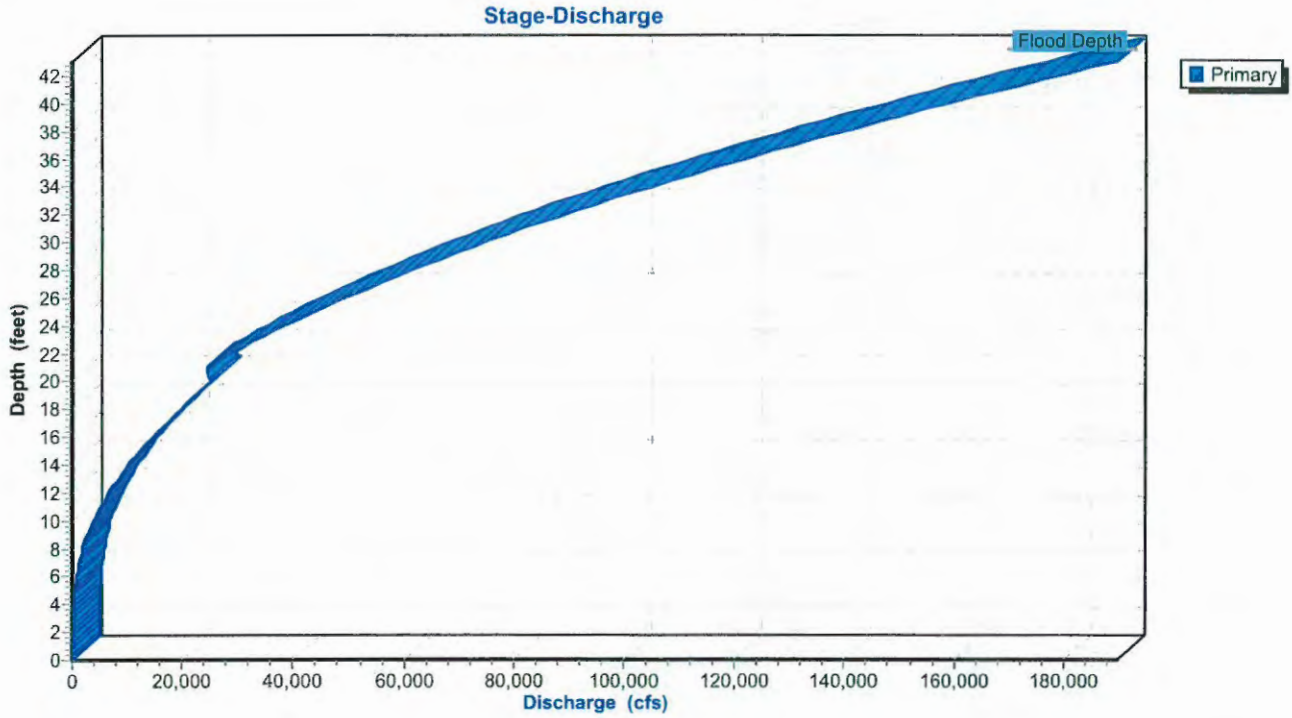
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,060.00	0.00		
300.00	1,026.00	34.00	0.060	
470.00	1,023.00	37.00	0.060	
493.00	1,017.00	43.00	0.050	
507.00	1,017.00	43.00	0.050	
520.00	1,020.00	40.00	0.060	
630.00	1,022.00	38.00	0.060	
750.00	1,037.00	23.00	0.060	
1,000.00	1,038.00	22.00	0.060	
1,010.00	1,060.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	14.0	0	0.00
3.00	78.8	39.2	693,000	116.39
5.00	273.4	157.2	2,406,067	396.99
6.00	435.5	169.2	3,832,400	733.92
9.00	1,230.5	363.4	10,828,400	2,703.81
20.00	6,230.3	549.8	54,826,847	25,737.78
21.00	6,906.8	808.7	60,779,788	24,784.16
43.00	26,881.5	1,028.2	236,557,200	189,892.92

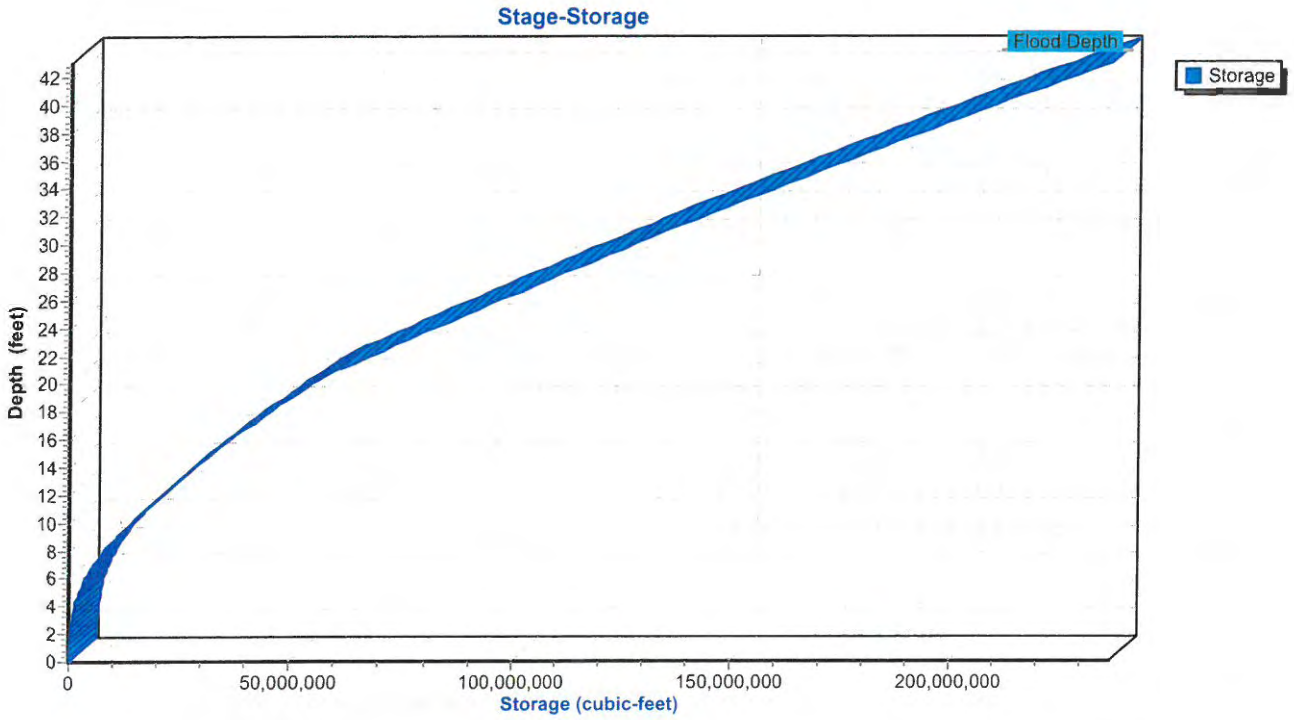
Reach 15R: Channel 15



Reach 15R: Channel 15



Reach 15R: Channel 15



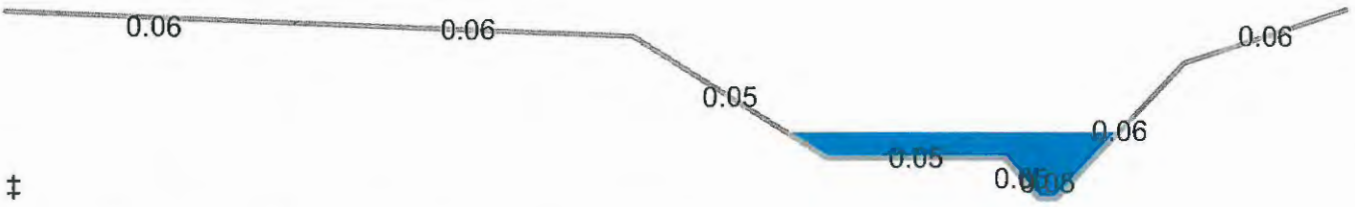
Summary for Reach 16R: Channel 16

Inflow Area = 8,780.800 ac, 19.29% Impervious, Inflow Depth > 2.35" for 6-HR 0.2 PMF event
Inflow = 2,470.65 cfs @ 6.14 hrs, Volume= 1,716.431 af
Outflow = 2,392.05 cfs @ 6.60 hrs, Volume= 1,695.440 af, Atten= 3%, Lag= 27.4 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.42 fps, Min. Travel Time= 51.6 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 84.3 min

Peak Storage= 7,410,184 cf @ 6.60 hrs
Average Depth at Peak Storage= 9.81'
Defined Flood Depth= 28.00', Capacity at Flood Depth= 42,389.29 cfs
Bank-Full Depth= 28.00', Capacity at Bank-Full= 42,389.29 cfs

Custom cross-section, Length= 7,500.0' Slope= 0.0010 '/' (104 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,006.00', Outlet Invert= 998.50'

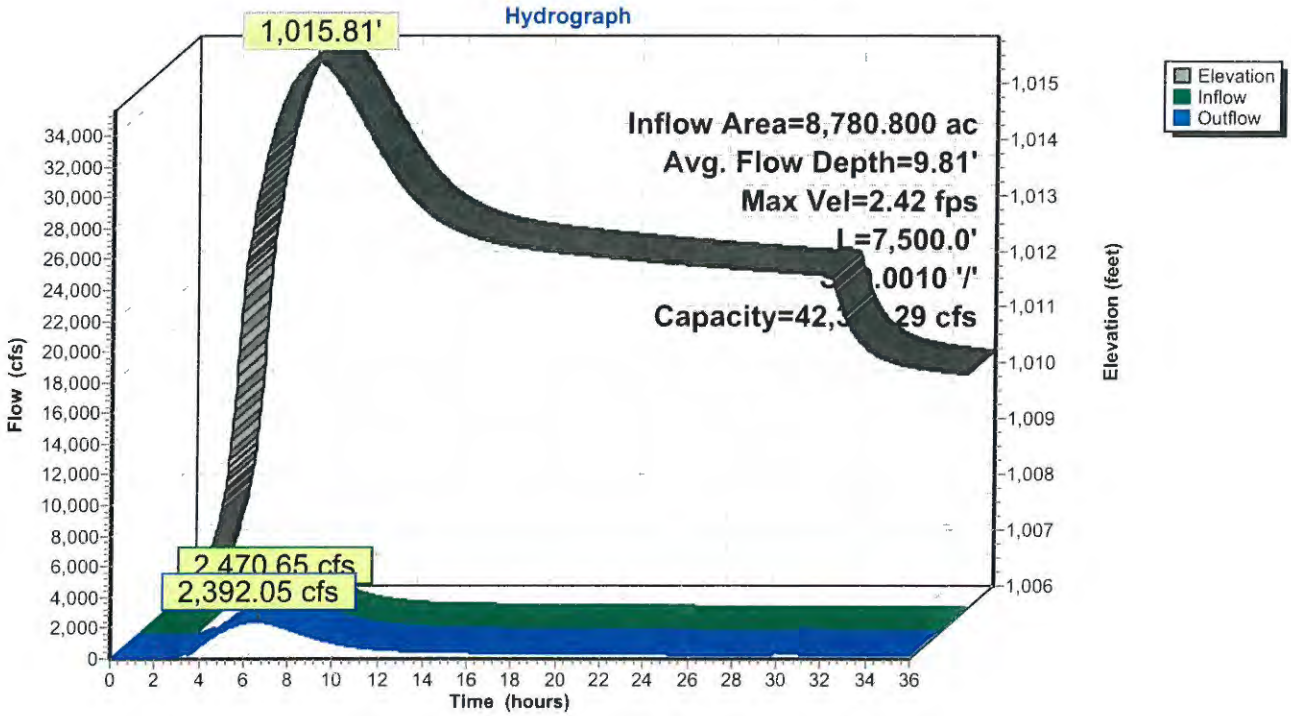


‡

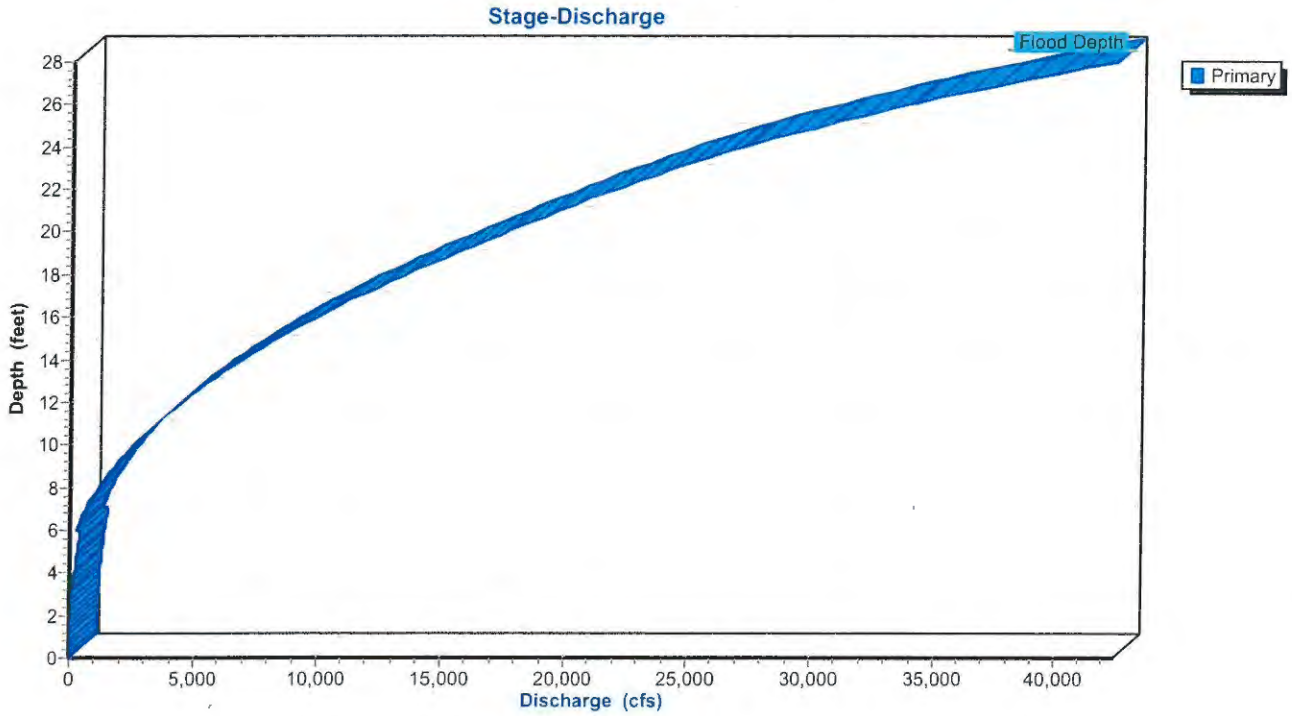
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,034.00	0.00		
200.00	1,032.00	2.00	0.060	
420.00	1,030.00	4.00	0.060	
550.00	1,012.00	22.00	0.050	
670.00	1,012.00	22.00	0.050	
693.00	1,006.00	28.00	0.050	
705.00	1,006.00	28.00	0.050	
790.00	1,026.00	8.00	0.060	
900.00	1,034.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	12.0	0	0.00
6.00	217.5	182.0	1,631,250	246.41
20.00	3,868.8	345.2	29,015,833	17,663.27
24.00	5,401.0	429.5	40,507,500	27,141.14
26.00	6,498.5	677.1	48,738,750	33,993.67
28.00	8,071.0	904.6	60,532,500	42,389.29

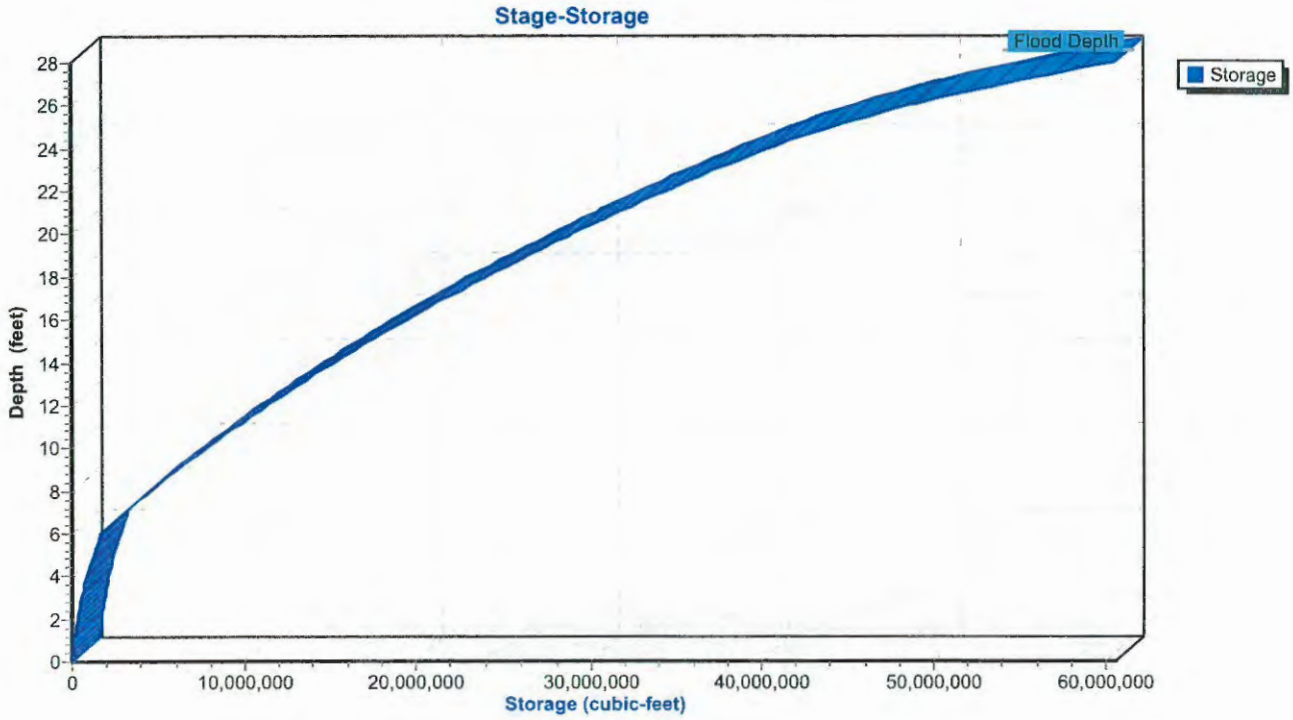
Reach 16R: Channel 16



Reach 16R: Channel 16



Reach 16R: Channel 16



Summary for Reach 18R: Sippo Creek Channel Downstream of Lincoln Way

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 2.36" for 6-HR 0.2 PMF event
Inflow = 2,499.46 cfs @ 7.18 hrs, Volume= 1,859.198 af
Outflow = 2,499.45 cfs @ 7.19 hrs, Volume= 1,859.080 af, Atten= 0%, Lag= 0.7 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.44 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 8.45 fps, Avg. Travel Time= 0.9 min

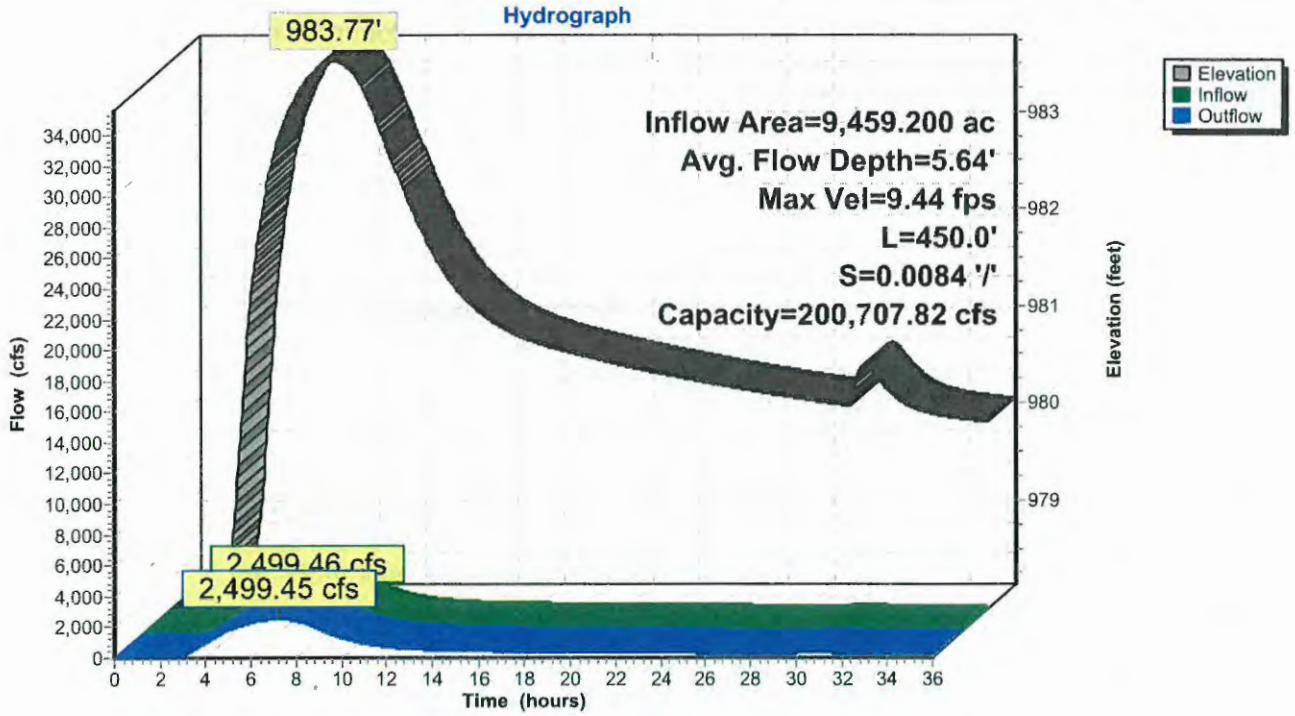
Peak Storage= 119,118 cf @ 7.19 hrs
Average Depth at Peak Storage= 5.64'
Defined Flood Depth= 15.00', Capacity at Flood Depth= 28,360.41 cfs
Bank-Full Depth= 40.50', Capacity at Bank-Full= 200,707.82 cfs

Custom cross-section, Length= 450.0' Slope= 0.0084 '/' (1006 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 978.13', Outlet Invert= 974.35'

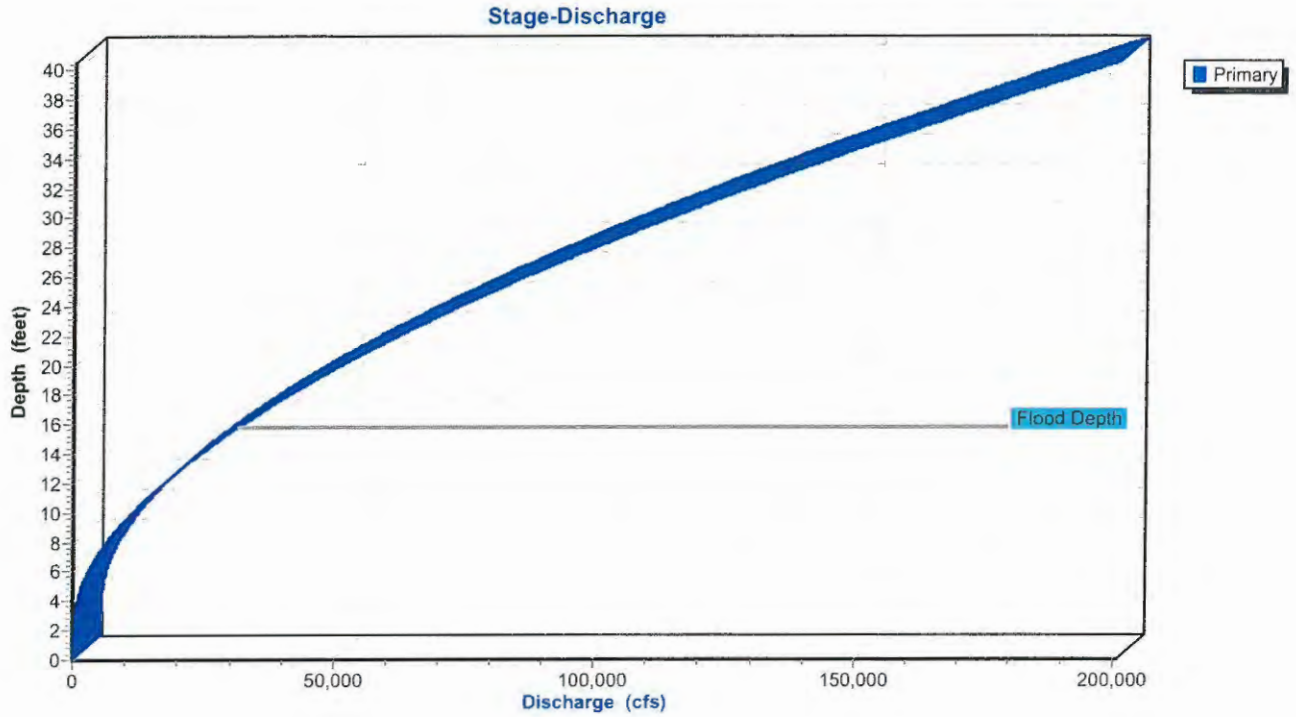
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,012.00	0.00		
20.00	1,008.00	4.00	0.100	Heavy timber, flow below branches
51.00	980.00	32.00	0.100	Heavy timber, flow below branches
74.00	978.00	34.00	0.100	Heavy timber, flow below branches
121.00	976.00	36.00	0.100	Heavy timber, flow below branches
173.00	974.00	38.00	0.030	Short grass
175.00	972.00	40.00	0.030	Short grass
176.00	971.50	40.50	0.025	Stream, clean & straight
187.00	971.50	40.50	0.025	Stream, clean & straight
188.00	972.00	40.00	0.025	Stream, clean & straight
194.00	974.00	38.00	0.030	Short grass
206.00	976.00	36.00	0.100	Heavy timber, flow below branches
225.50	978.00	34.00	0.100	Heavy timber, flow below branches
229.50	980.00	32.00	0.100	Heavy timber, flow below branches
248.00	990.00	22.00	0.100	Heavy timber, flow below branches
265.00	1,000.00	12.00	0.100	Heavy timber, flow below branches
289.00	1,012.00	0.00	0.100	Heavy timber, flow below branches

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	11.0	0	0.00
0.50	6.0	13.2	2,700	19.29
2.50	40.0	22.4	18,000	347.53
4.50	146.0	86.6	65,701	1,300.01
6.50	382.5	153.2	172,125	3,703.14
8.50	712.5	180.8	320,625	7,536.06
18.50	2,645.4	216.7	1,190,411	44,005.23
28.50	4,866.4	251.4	2,189,893	103,800.74
36.50	6,855.0	281.2	3,084,750	166,501.22
40.50	7,955.0	310.6	3,579,750	200,707.82

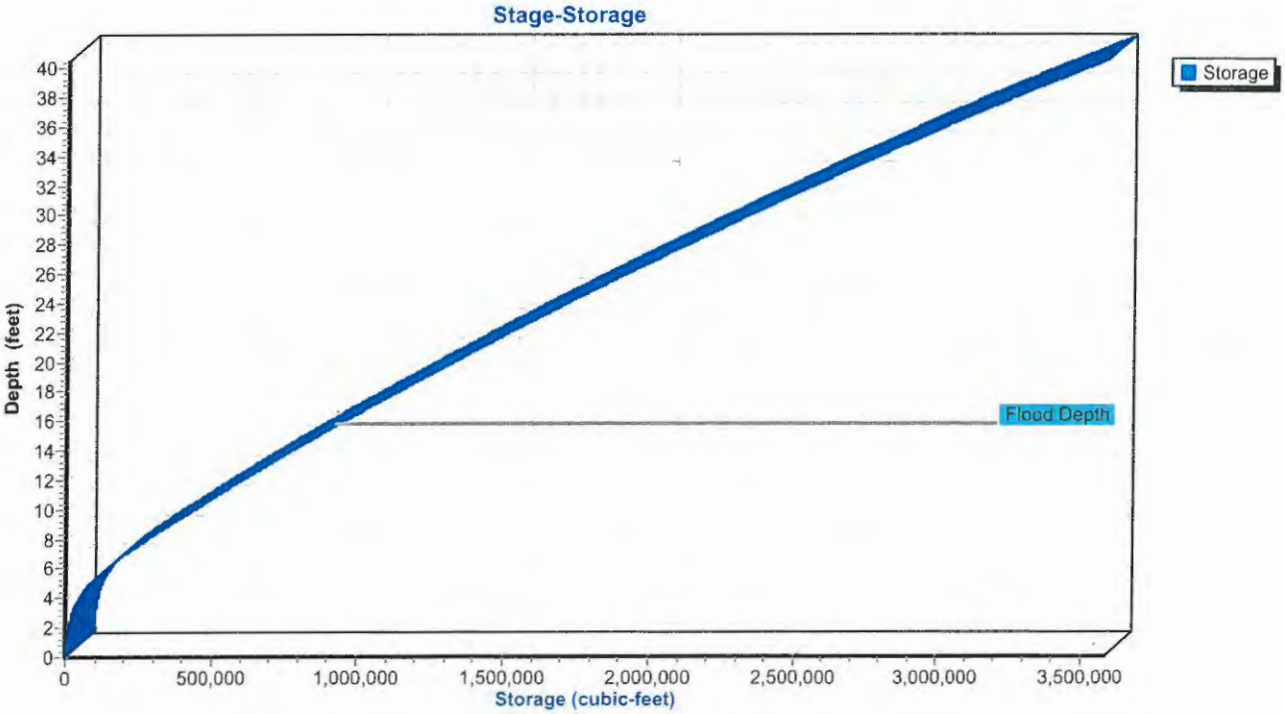
Reach 18R: Sippo Creek Channel Downstream of Lincoln Way



Reach 18R: Sippo Creek Channel Downstream of Lincoln Way



Reach 18R: Sippo Creek Channel Downstream of Lincoln Way

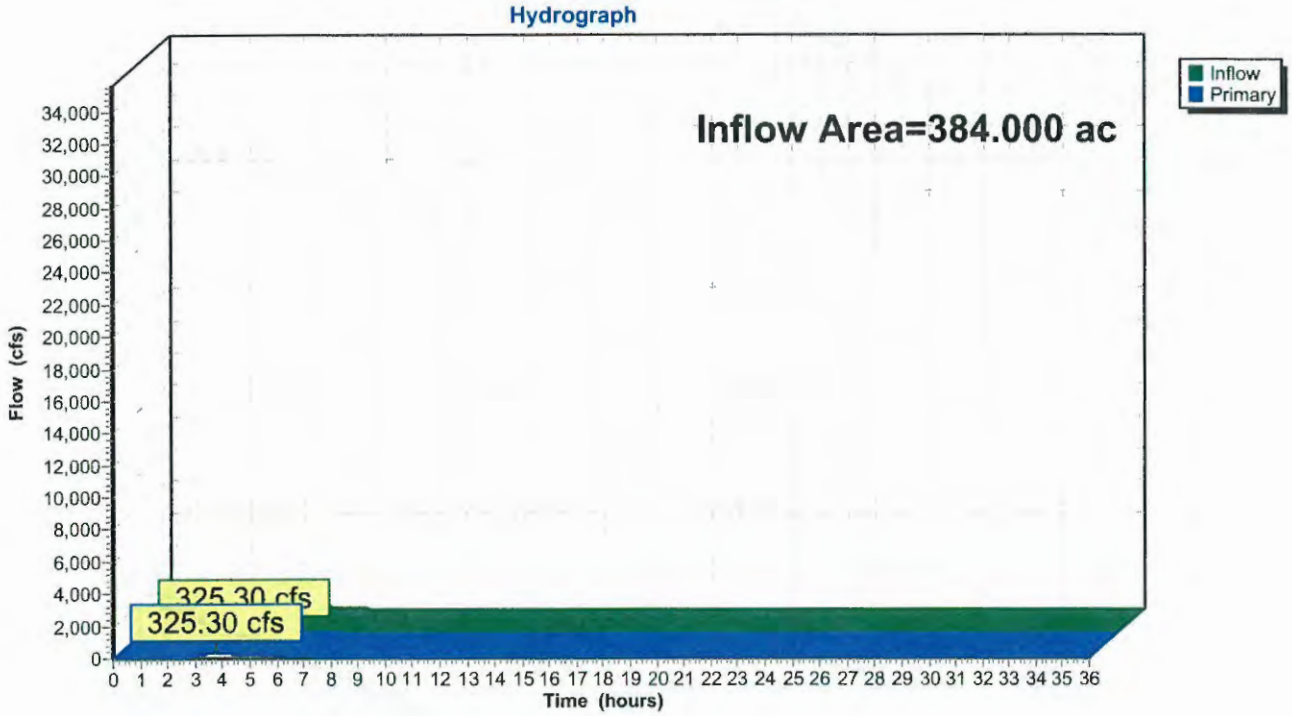


Summary for Pond 1C: CONF 1 Combined O'Springs and Eric

Inflow Area = 384.000 ac, 26.60% Impervious, Inflow Depth > 2.62" for 6-HR 0.2 PMF event
Inflow = 325.30 cfs @ 3.76 hrs, Volume= 83.697 af
Primary = 325.30 cfs @ 3.77 hrs, Volume= 83.697 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 1C: CONF 1 Combined O'Springs and Eric



Summary for Pond 1P: Sippo Creek Reservoir - Existing Conditions

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 2.37" for 6-HR 0.2 PMF event
Inflow = 2,671.73 cfs @ 6.42 hrs, Volume= 1,870.526 af
Outflow = 2,661.69 cfs @ 6.56 hrs, Volume= 1,860.157 af, Atten= 0%, Lag= 8.7 min
Primary = 1,987.72 cfs @ 6.56 hrs, Volume= 1,668.345 af
Secondary = 673.97 cfs @ 6.56 hrs, Volume= 191.812 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,001.64' Surf.Area= 7.050 ac Storage= 60.962 af
Peak Elev= 1,006.87' @ 6.56 hrs Surf.Area= 18.409 ac Storage= 120.866 af (59.904 af above start)
Flood Elev= 1,005.00' Surf.Area= 12.657 ac Storage= 91.431 af (30.469 af above start)

Plug-Flow detention time= 85.3 min calculated for 1,798.695 af (96% of inflow)
Center-of-Mass det. time= 15.4 min (748.7 - 733.3)

Volume	Invert	Avail.Storage	Storage Description
#1	985.00'	1,292.544 af	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
985.00	0.500	500.0	0.000	0.000	0.500
990.00	3.000	1,000.0	7.875	7.875	1.873
998.00	4.870	2,500.0	31.179	39.054	11.469
1,000.00	6.204	3,251.0	11.047	50.101	19.360
1,002.00	7.243	5,147.0	13.434	63.535	48.449
1,004.00	9.610	10,274.0	16.797	80.332	192.887
1,006.00	16.124	11,202.9	25.455	105.787	229.335
1,008.00	21.577	15,736.9	37.569	143.356	452.477
1,010.00	29.674	20,301.4	51.036	194.392	752.988
1,012.00	39.539	22,845.5	68.977	263.369	953.524
1,014.00	68.669	34,370.5	106.876	370.246	2,158.174
1,025.00	100.000	50,000.0	922.298	1,292.544	4,567.204

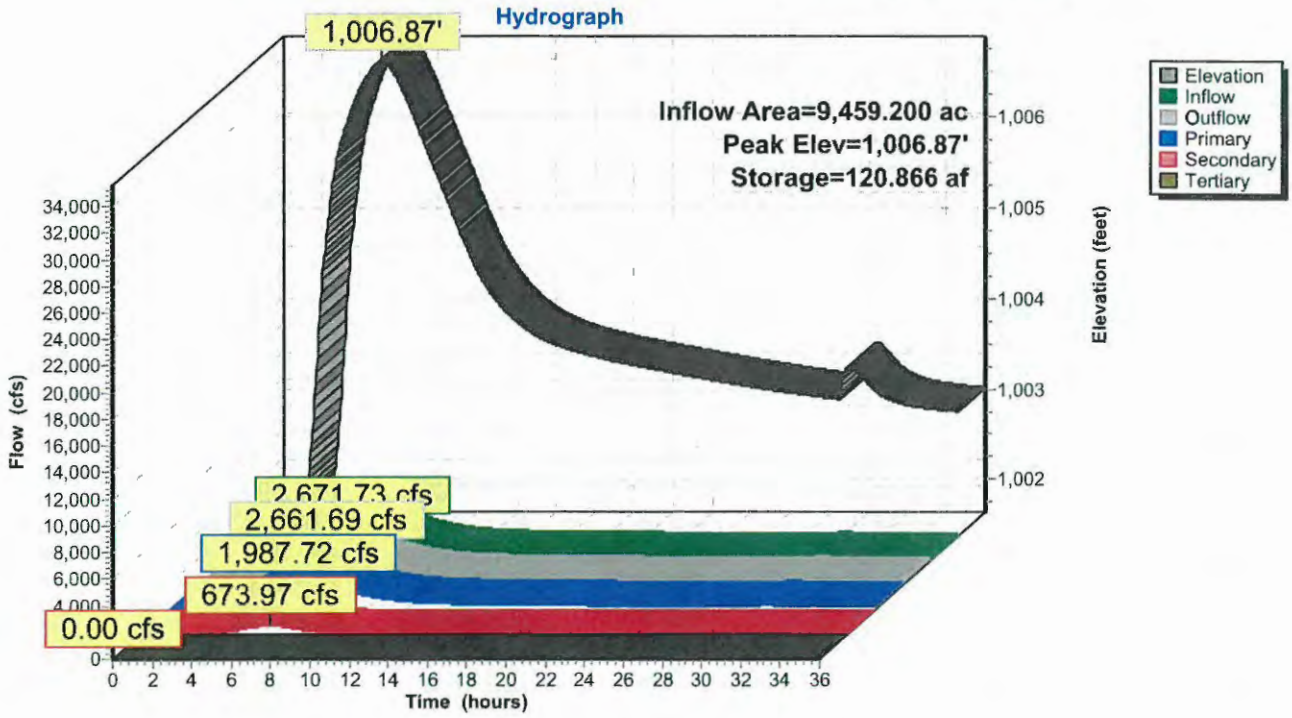
Device	Routing	Invert	Outlet Devices
#1	Primary	1,001.64'	**50.0' long x 2.9' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.45 2.58 2.66 2.66 2.65 2.64 2.65 2.69 2.69 2.73 2.83 2.95 3.01 3.12 3.32
#2	Secondary	1,005.00'	**Right Embankment Weir - Building side, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 1.60 20.00 Width (feet) 17.00 23.00 77.00 77.00
#3	Secondary	1,004.20'	**Left Embankment Weir - Playground side, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 1.80 3.80 5.80 15.80 Width (feet) 10.00 22.00 45.00 130.00 180.00 205.00
#4	Tertiary	1,008.00'	**Weir Flow around Bldg. X 0.50, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.00 4.00 6.00 8.00 10.00 12.00 Width (feet) 50.00 90.00 122.00 166.00 240.00 334.00 420.00

Primary OutFlow Max=1,987.72 cfs @ 6.56 hrs HW=1,006.87' TW=996.61' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 1,987.72 cfs @ 7.60 fps)

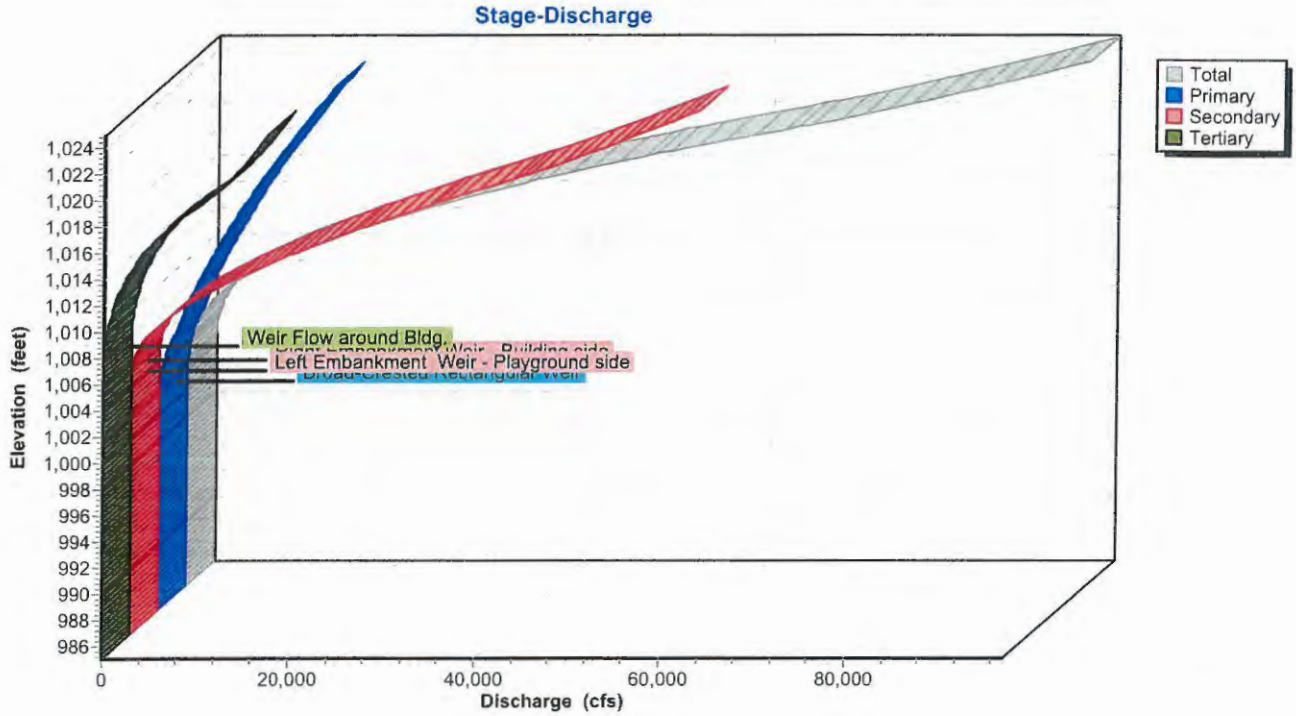
Secondary OutFlow Max=673.97 cfs @ 6.56 hrs HW=1,006.87' TW=996.61' (Dynamic Tailwater)
├─**2=Right Embankment Weir - Building side** (Weir Controls 254.56 cfs @ 3.58 fps)
└─**3=Left Embankment Weir - Playground side** (Weir Controls 419.42 cfs @ 4.26 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,001.64' TW=978.00' (Dynamic Tailwater)
└─**4=Weir Flow around Bldg.** (Controls 0.00 cfs)

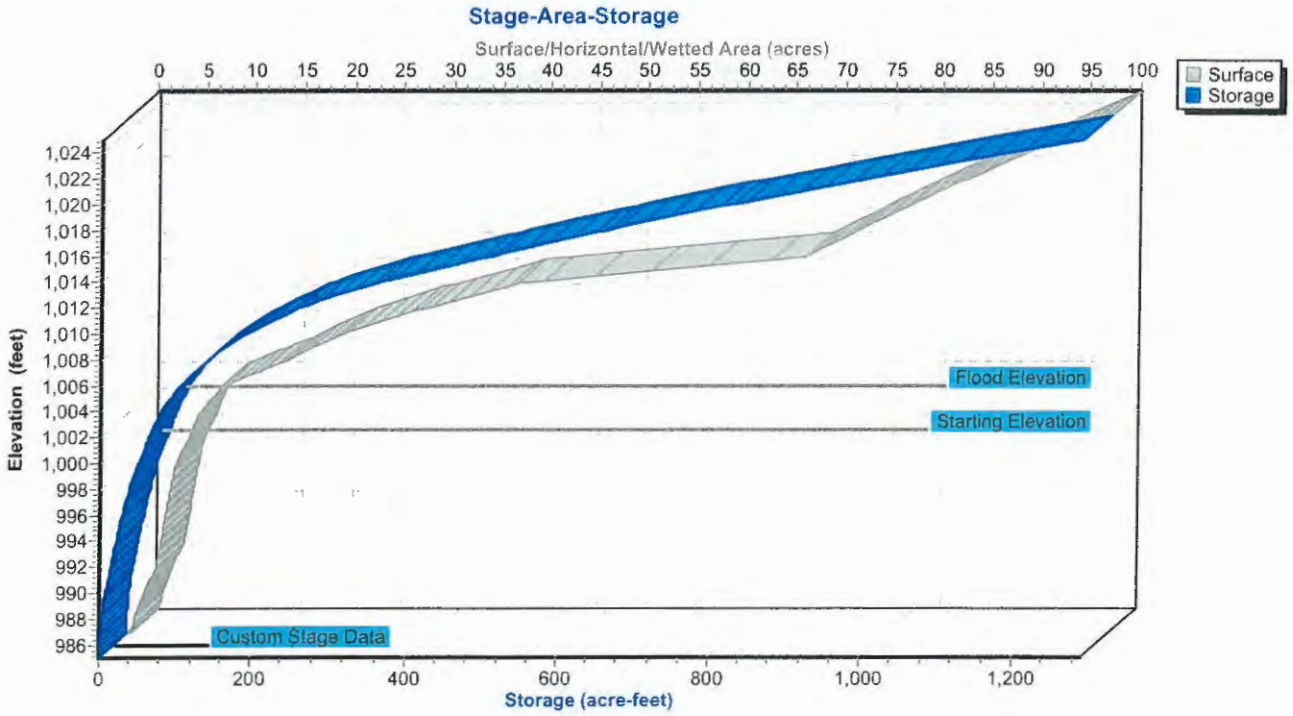
Pond 1P: Sippo Creek Reservoir - Existing Conditions



Pond 1P: Sippo Creek Reservoir - Existing Conditions



Pond 1P: Sippo Creek Reservoir - Existing Conditions

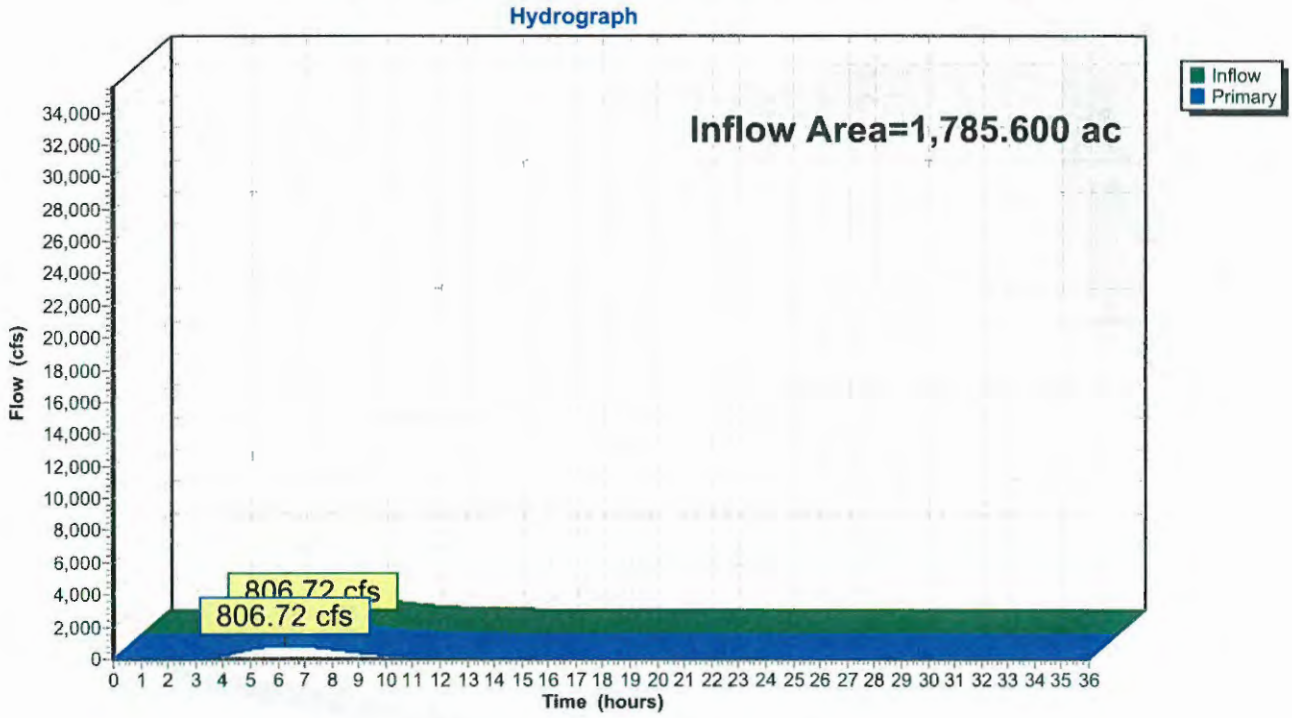


Summary for Pond 2C: CONF 2 Combined Cable and O'Springs

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 2.30" for 6-HR 0.2 PMF event
Inflow = 806.72 cfs @ 6.28 hrs, Volume= 342.070 af
Primary = 806.72 cfs @ 6.29 hrs, Volume= 342.070 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 2C: CONF 2 Combined Cable and O'Springs



Summary for Pond 3P: Lake Cable

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 2.30" for 6-HR 0.2 PMF event
Inflow = 806.72 cfs @ 6.29 hrs, Volume= 342.070 af
Outflow = 295.63 cfs @ 9.56 hrs, Volume= 576.367 af, Atten= 63%, Lag= 196.2 min
Primary = 295.63 cfs @ 9.56 hrs, Volume= 576.367 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,097.40' Surf.Area= 220.000 ac Storage= 1,914.000 af
Peak Elev= 1,097.85' @ 9.56 hrs Surf.Area= 236.108 ac Storage= 2,015.502 af (101.502 af above start)
Flood Elev= 1,099.50' Surf.Area= 296.000 ac Storage= 2,455.800 af (541.800 af above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 472.9 min (944.7 - 471.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,080.00'	4,144.025 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

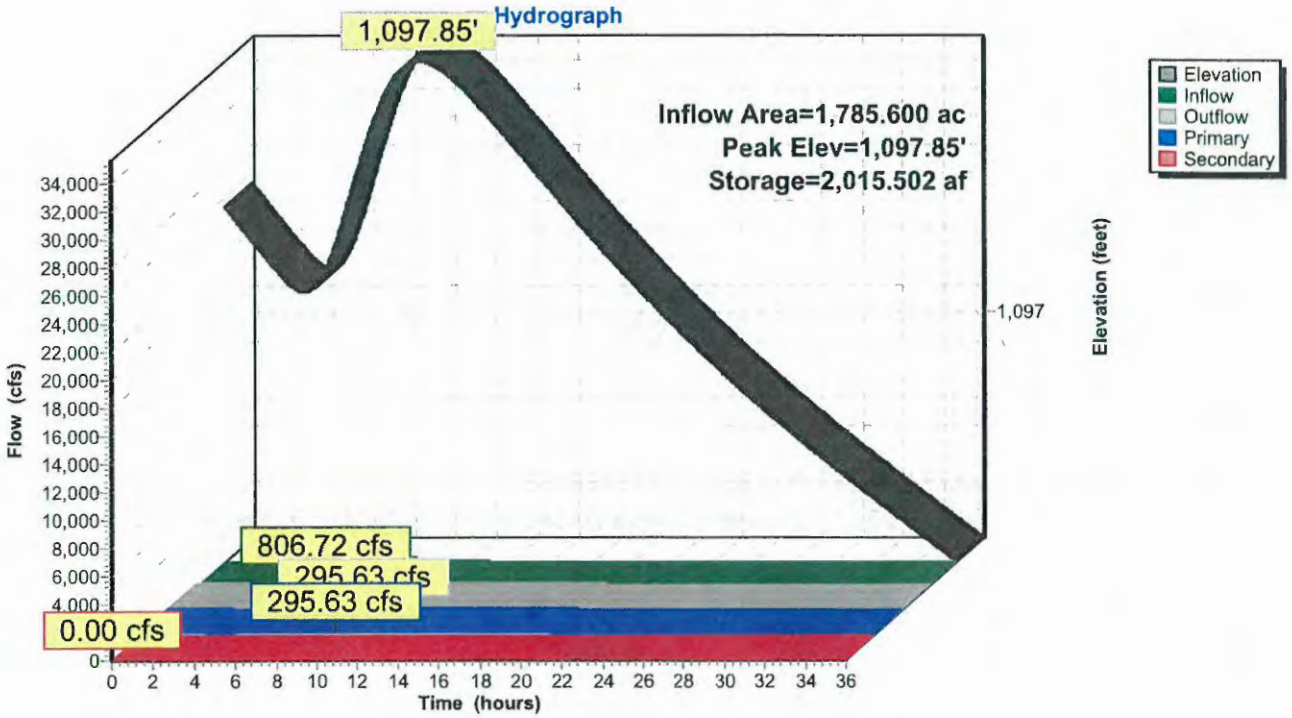
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,080.00	0.000	0.000	0.000
1,097.40	220.000	1,914.000	1,914.000
1,099.50	296.000	541.800	2,455.800
1,100.00	316.700	153.175	2,608.975
1,103.00	405.000	1,082.550	3,691.525
1,104.00	500.000	452.500	4,144.025

Device	Routing	Invert	Outlet Devices
#1	Primary	1,088.00'	**36.0" Round Culvert-RCP** L= 450.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 1,088.00' / 1,076.00' S= 0.0267 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished
#2	Primary	1,096.40'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 3.10 6.00 Width (feet) 30.00 30.00 30.00
#3	Secondary	1,099.50'	**Custom Weir/Orifice, Cv= 2.24 (C= 2.80)** Head (feet) 0.00 3.00 Width (feet) 1,000.00 1,000.00

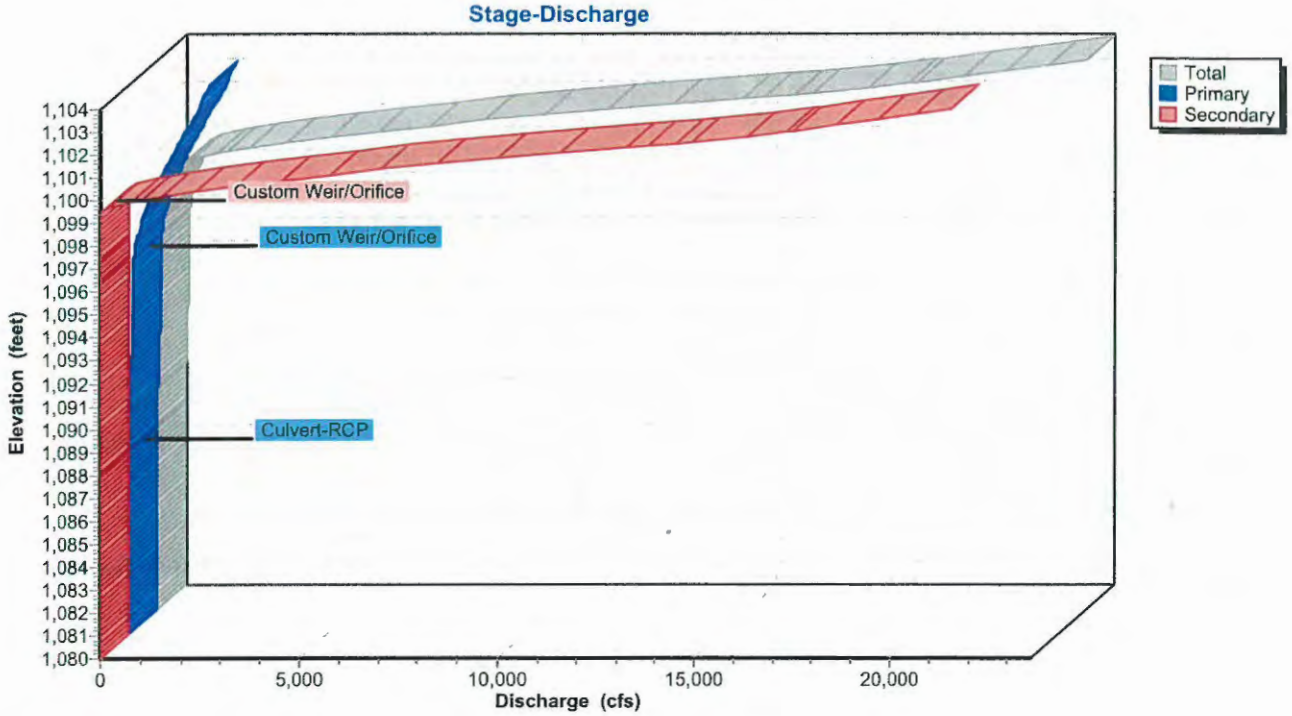
Primary OutFlow Max=295.63 cfs @ 9.56 hrs HW=1,097.85' TW=1,071.84' (Dynamic Tailwater)
↑—**1=Culvert-RCP** (Barrel Controls 124.96 cfs @ 17.68 fps)
└—**2=Custom Weir/Orifice** (Weir Controls 170.67 cfs @ 3.94 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,097.40' TW=1,069.00' (Dynamic Tailwater)
↑—**3=Custom Weir/Orifice** (Controls 0.00 cfs)

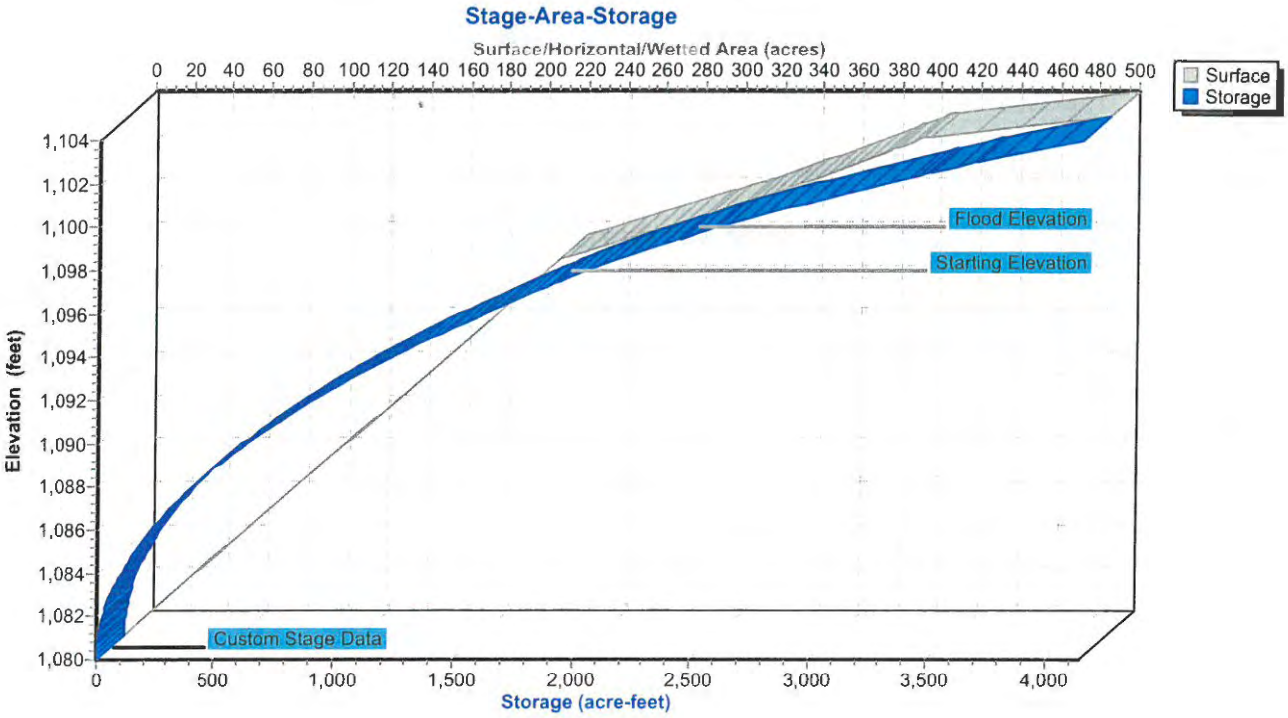
Pond 3P: Lake Cable



Pond 3P: Lake Cable



Pond 3P: Lake Cable

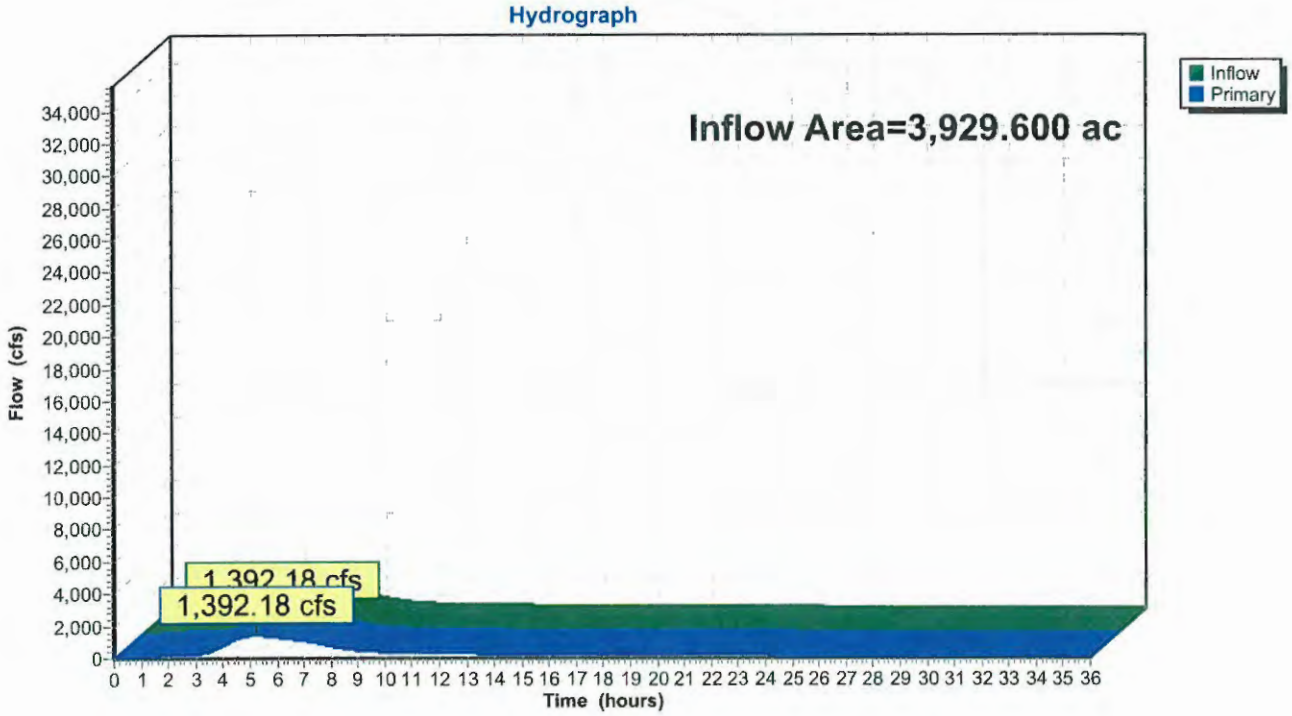


Summary for Pond 4C: Confluence 4

Inflow Area = 3,929.600 ac, 16.99% Impervious, Inflow Depth > 2.86" for 6-HR 0.2 PMF event
Inflow = 1,392.18 cfs @ 5.19 hrs, Volume= 936.190 af
Primary = 1,392.18 cfs @ 5.20 hrs, Volume= 936.190 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 4C: Confluence 4



Summary for Pond 4P: Lake O'Springs

Inflow Area = 384.000 ac, 26.60% Impervious, Inflow Depth > 2.62" for 6-HR 0.2 PMF event
Inflow = 325.30 cfs @ 3.77 hrs, Volume= 83.697 af
Outflow = 130.12 cfs @ 6.62 hrs, Volume= 83.244 af, Atten= 60%, Lag= 170.9 min
Primary = 130.12 cfs @ 6.62 hrs, Volume= 83.244 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,106.00' Surf.Area= 27.000 ac Storage= 24.300 af
Peak Elev= 1,107.58' @ 6.62 hrs Surf.Area= 28.760 ac Storage= 68.471 af (44.171 af above start)
Flood Elev= 1,108.70' Surf.Area= 30.000 ac Storage= 101.250 af (76.950 af above start)

Plug-Flow detention time= 478.3 min calculated for 58.928 af (70% of inflow)
Center-of-Mass det. time= 283.4 min (610.0 - 326.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,104.20'	268.550 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

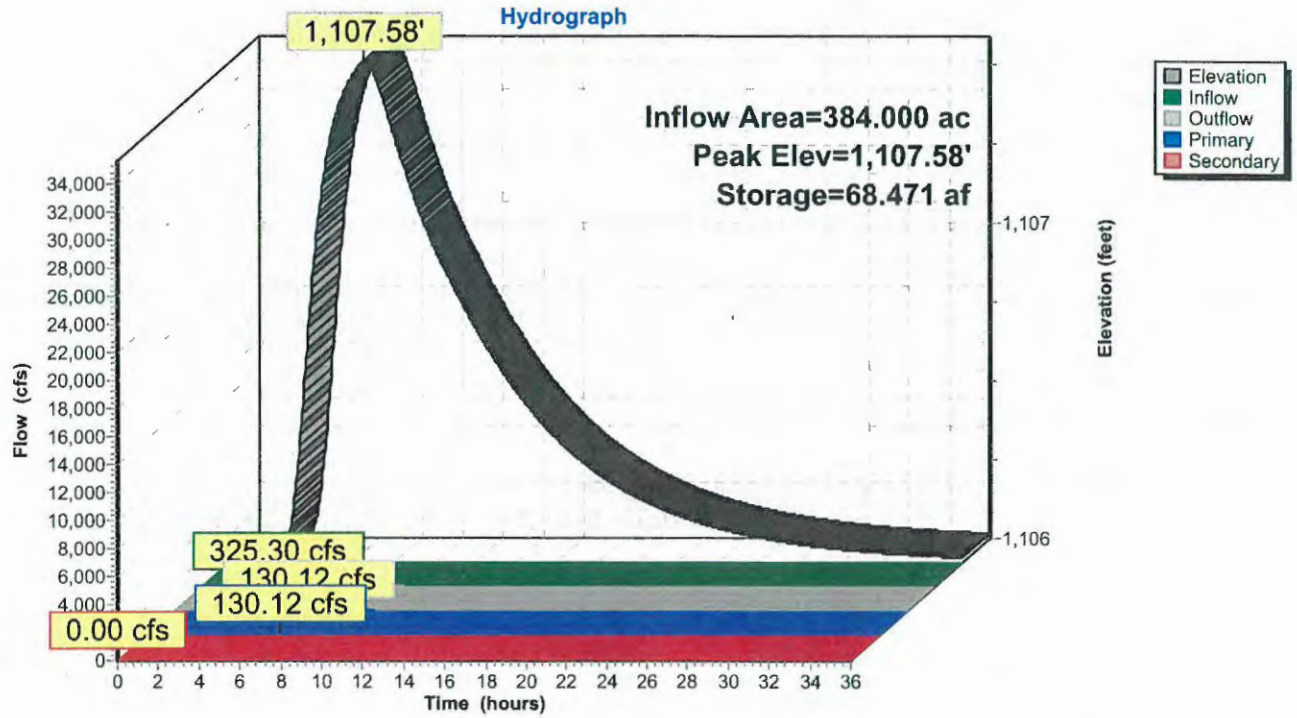
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,104.20	0.000	0.000	0.000
1,106.00	27.000	24.300	24.300
1,108.70	30.000	76.950	101.250
1,110.00	40.000	45.500	146.750
1,112.90	44.000	121.800	268.550

Device	Routing	Invert	Outlet Devices
#1	Primary	1,106.00'	**Lake Eric Special & User-Defined Outlet** Head (feet) 0.00 1.00 2.00 2.70 3.00 4.00 Disch. (cfs) 0.000 60.000 180.000 300.000 1,240.000 3,930.000
#2	Secondary	1,108.70'	**Custom Weir/Orifice, Cv= 2.24 (C= 2.80)** Head (feet) 0.00 1.30 Width (feet) 150.00 150.00

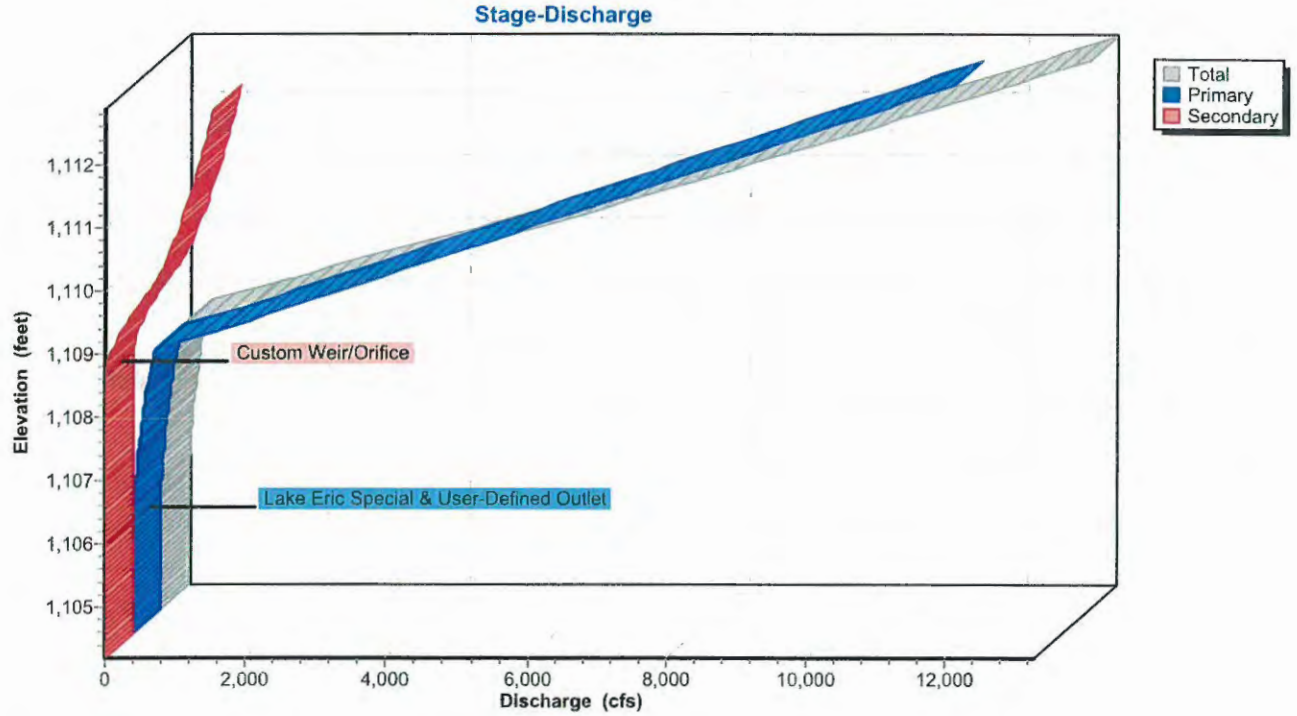
Primary OutFlow Max=130.12 cfs @ 6.62 hrs HW=1,107.58' TW=0.00' (Dynamic Tailwater)
↑—**1=Lake Eric Special & User-Defined Outlet**(Custom Controls 130.12 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,106.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Custom Weir/Orifice** (Controls 0.00 cfs)

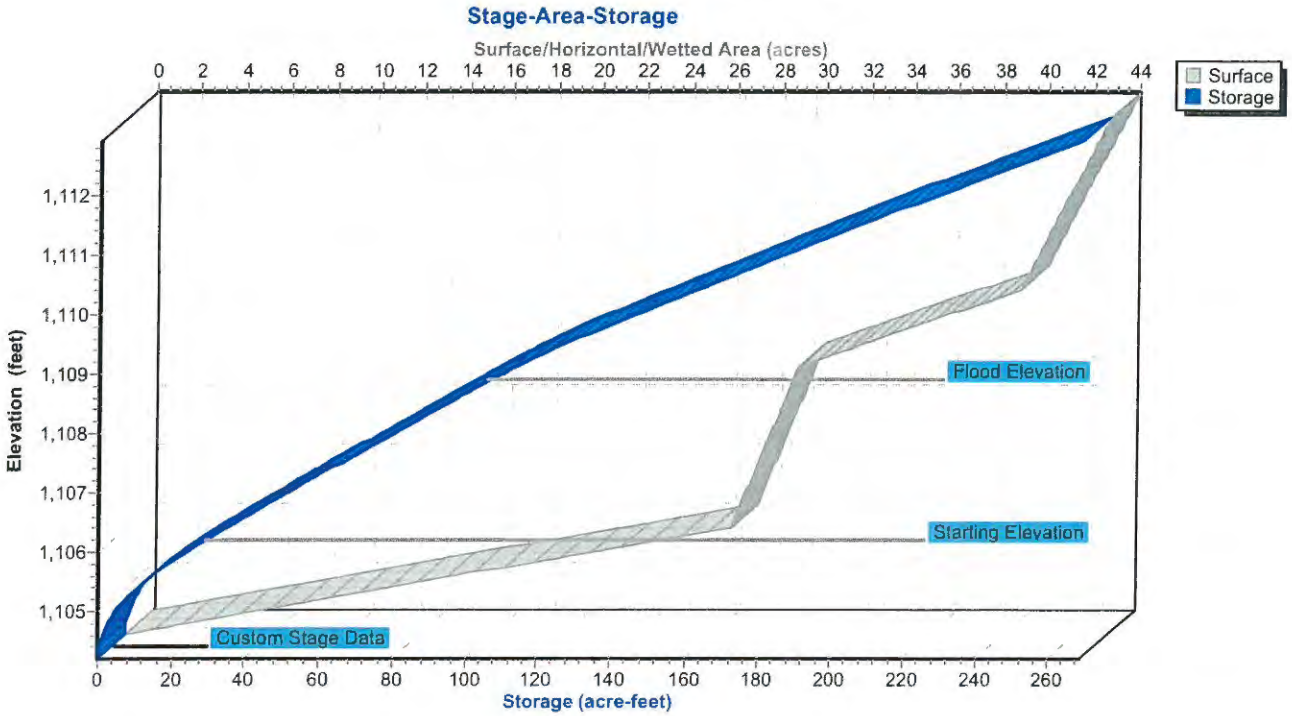
Pond 4P: Lake O'Springs



Pond 4P: Lake O'Springs



Pond 4P: Lake O'Springs

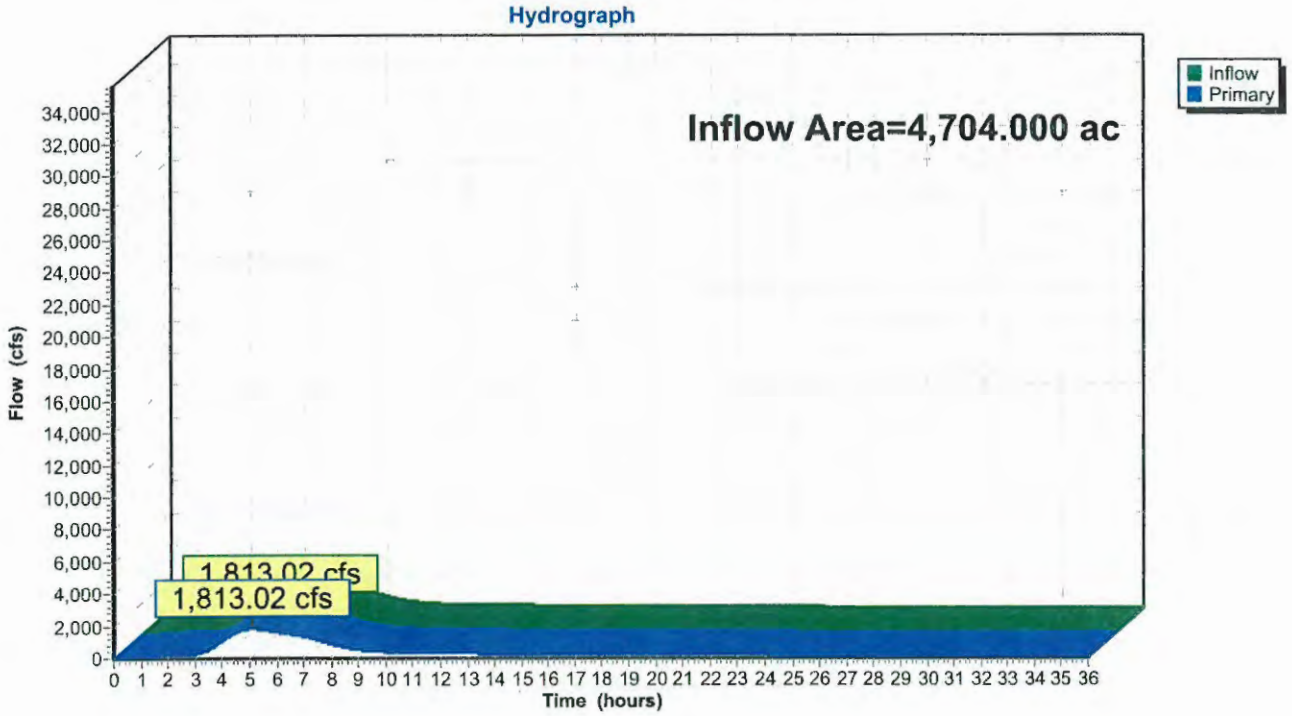


Summary for Pond 5C: Confluence 5

Inflow Area = 4,704.000 ac, 14.19% Impervious, Inflow Depth > 2.71" for 6-HR 0.2 PMF event
Inflow = 1,813.02 cfs @ 5.08 hrs, Volume= 1,063.357 af
Primary = 1,813.02 cfs @ 5.09 hrs, Volume= 1,063.357 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 5C: Confluence 5



Summary for Pond 5P: Lake Eric (Slagle)

Inflow Area = 115.200 ac, 0.00% Impervious, Inflow Depth = 2.56" for 6-HR 0.2 PMF event
Inflow = 133.69 cfs @ 3.38 hrs, Volume= 24.549 af
Outflow = 54.95 cfs @ 4.89 hrs, Volume= 24.443 af, Atten= 59%, Lag= 90.6 min
Primary = 54.95 cfs @ 4.89 hrs, Volume= 24.443 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,116.50' Surf.Area= 3.700 ac Storage= 13.690 af
Peak Elev= 1,119.52' @ 4.89 hrs Surf.Area= 4.127 ac Storage= 25.473 af (11.783 af above start)
Flood Elev= 1,120.00' Surf.Area= 4.200 ac Storage= 27.490 af (13.800 af above start)

Plug-Flow detention time= 459.3 min calculated for 10.750 af (44% of inflow)
Center-of-Mass det. time= 203.8 min (457.3 - 253.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,109.10'	88.990 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

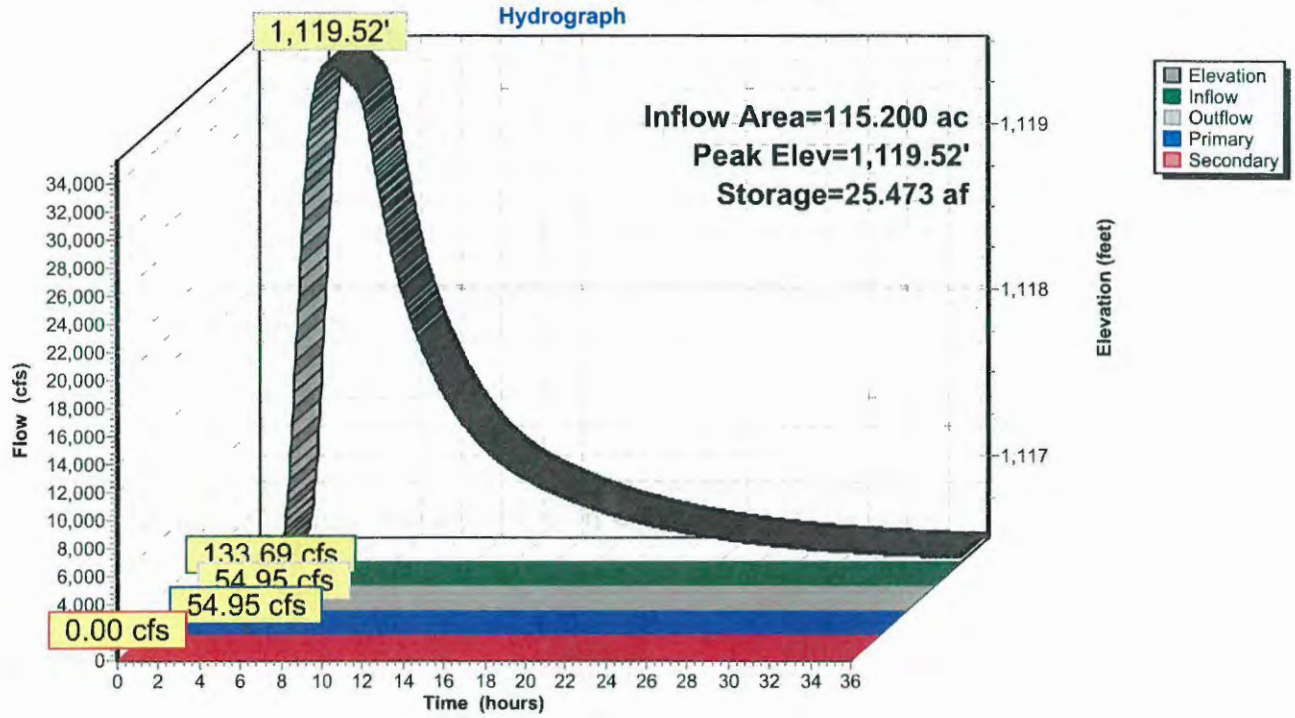
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,109.10	0.000	0.000	0.000
1,116.50	3.700	13.690	13.690
1,118.00	3.900	5.700	19.390
1,120.00	4.200	8.100	27.490
1,130.00	8.100	61.500	88.990

Device	Routing	Invert	Outlet Devices
#1	Primary	1,116.50'	**Special & User-Defined** Head (feet) 0.00 0.50 1.50 2.50 3.50 4.50 5.00 Disch. (cfs) 0.000 3.000 17.000 40.000 69.000 600.000 1,130.000
#2	Secondary	1,120.00'	**Custom Weir/Orifice, Cv= 2.24 (C= 2.80)** Head (feet) 0.00 10.00 Width (feet) 150.00 150.00

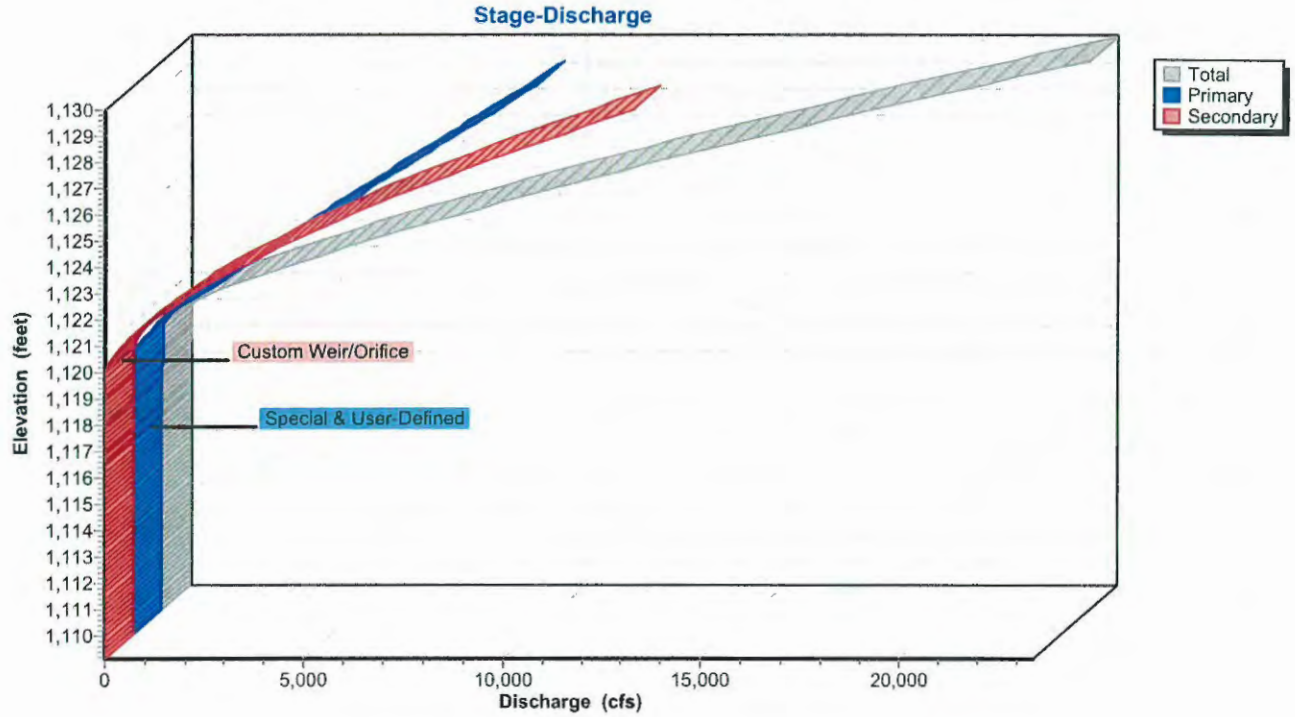
Primary OutFlow Max=54.95 cfs @ 4.89 hrs HW=1,119.52' TW=0.00' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 54.95 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,116.50' TW=0.00' (Dynamic Tailwater)
↑—**2=Custom Weir/Orifice** (Controls 0.00 cfs)

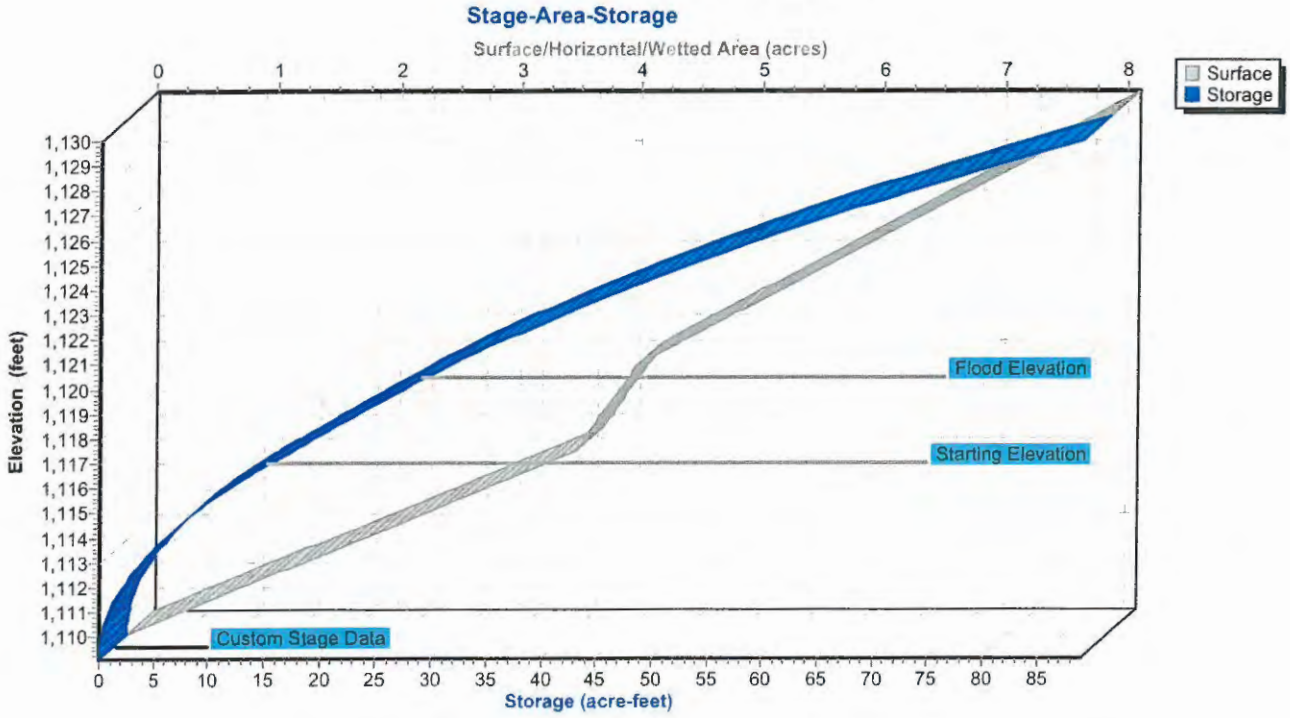
Pond 5P: Lake Eric (Slagle)



Pond 5P: Lake Eric (Slagle)



Pond 5P: Lake Eric (Slagle)

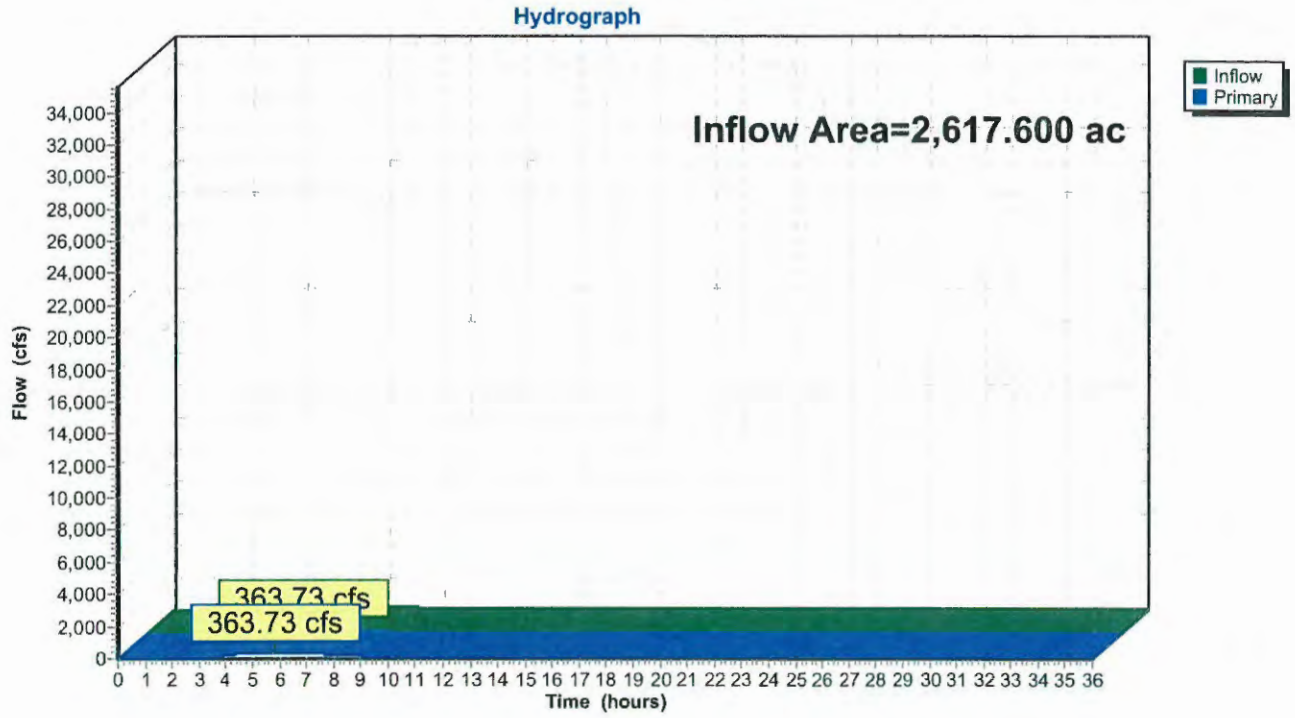


Summary for Pond 6C: Confluence 6

Inflow Area = 2,617.600 ac, 28.52% Impervious, Inflow Depth > 1.68" for 6-HR 0.2 PMF event
Inflow = 363.73 cfs @ 5.84 hrs, Volume= 367.039 af
Primary = 363.73 cfs @ 5.85 hrs, Volume= 367.039 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 6C: Confluence 6

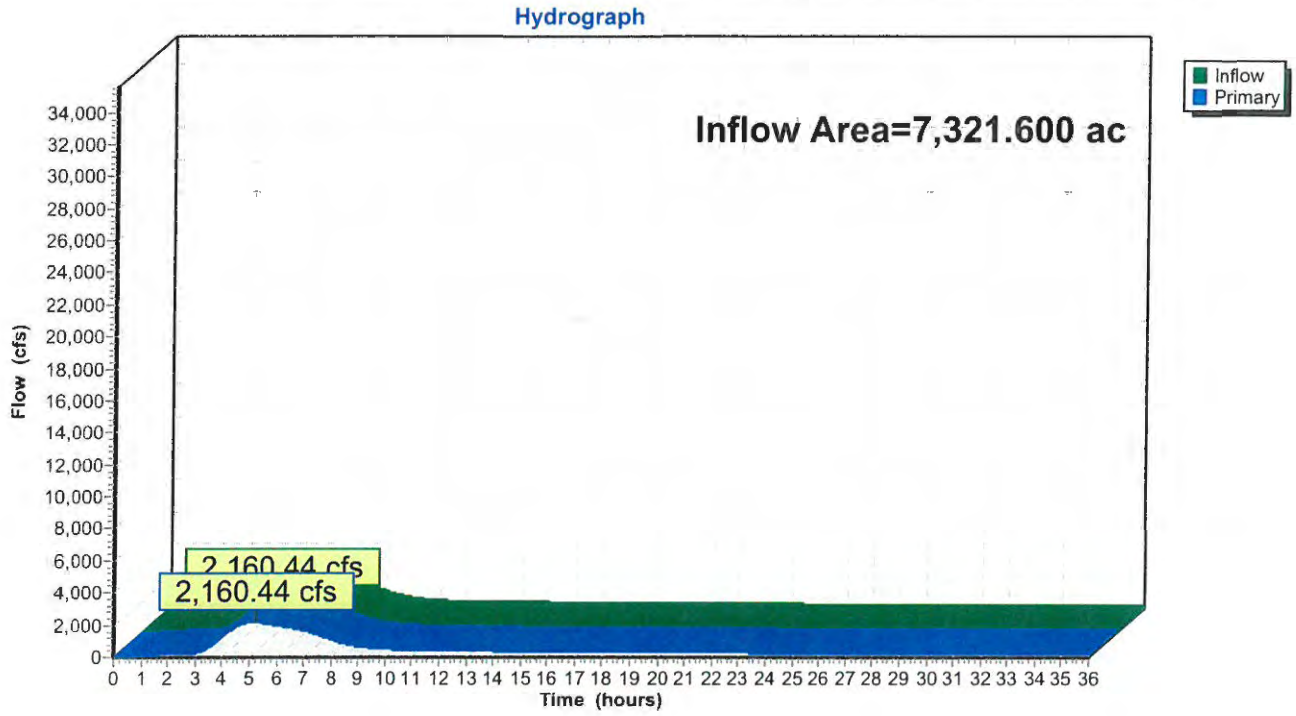


Summary for Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake

Inflow Area = 7,321.600 ac, 19.32% Impervious, Inflow Depth > 2.34" for 6-HR 0.2 PMF event
Inflow = 2,160.44 cfs @ 5.18 hrs, Volume= 1,430.228 af
Primary = 2,160.44 cfs @ 5.19 hrs, Volume= 1,430.228 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake

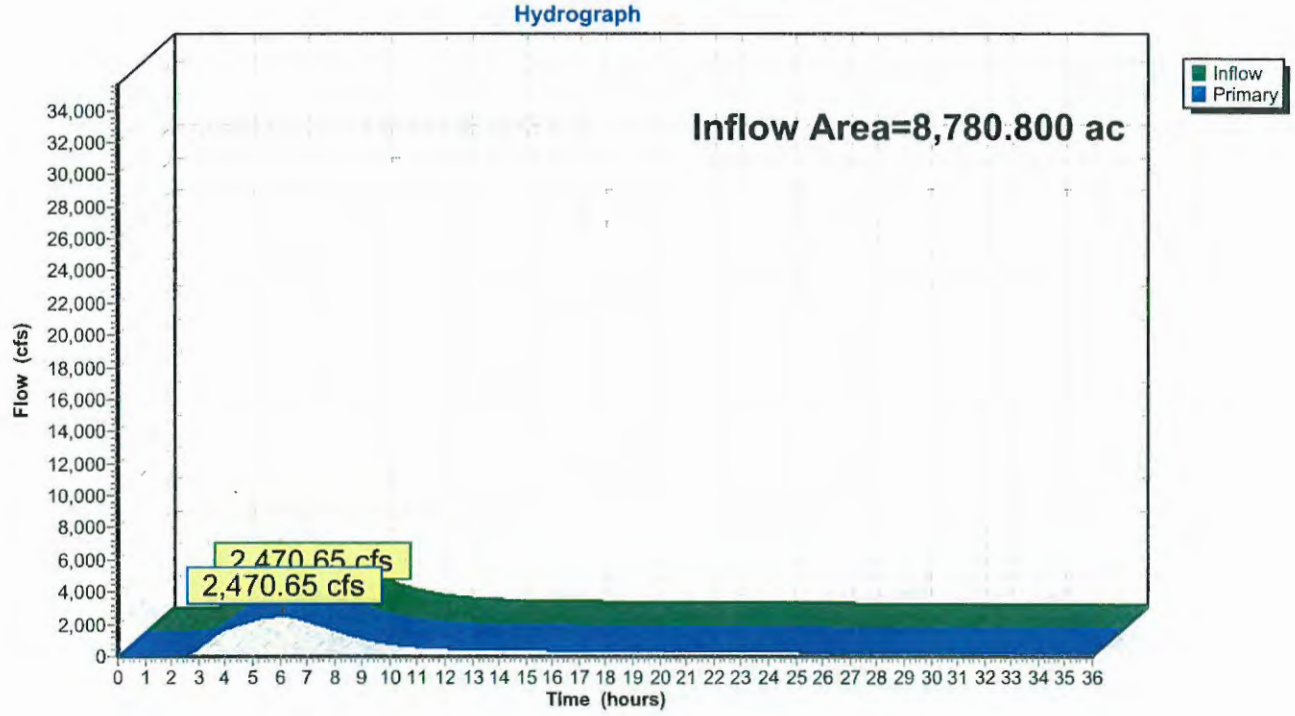


Summary for Pond 8C: Confluence 8

Inflow Area = 8,780.800 ac, 19.29% Impervious, Inflow Depth > 2.35" for 6-HR 0.2 PMF event
Inflow = 2,470.65 cfs @ 6.13 hrs, Volume= 1,716.603 af
Primary = 2,470.65 cfs @ 6.14 hrs, Volume= 1,716.603 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 8C: Confluence 8



Summary for Pond 8P: Storage Area Genoa Rd

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth > 2.08" for 6-HR 0.2 PMF event
Inflow = 1,050.31 cfs @ 6.42 hrs, Volume= 340.298 af
Outflow = 118.66 cfs @ 11.58 hrs, Volume= 260.567 af, Atten= 89%, Lag= 309.5 min
Primary = 118.66 cfs @ 11.58 hrs, Volume= 260.567 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 1,024.60' @ 11.58 hrs Surf.Area= 113.462 ac Storage= 260.332 af
Flood Elev= 1,028.00' Surf.Area= 213.745 ac Storage= 851.153 af

Plug-Flow detention time= 797.0 min calculated for 260.567 af (77% of inflow)
Center-of-Mass det. time= 727.9 min (1,210.6 - 482.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,018.00'	1,873.781 af	**Custom Stage Data (Irregular)**Listed below (Recalc)

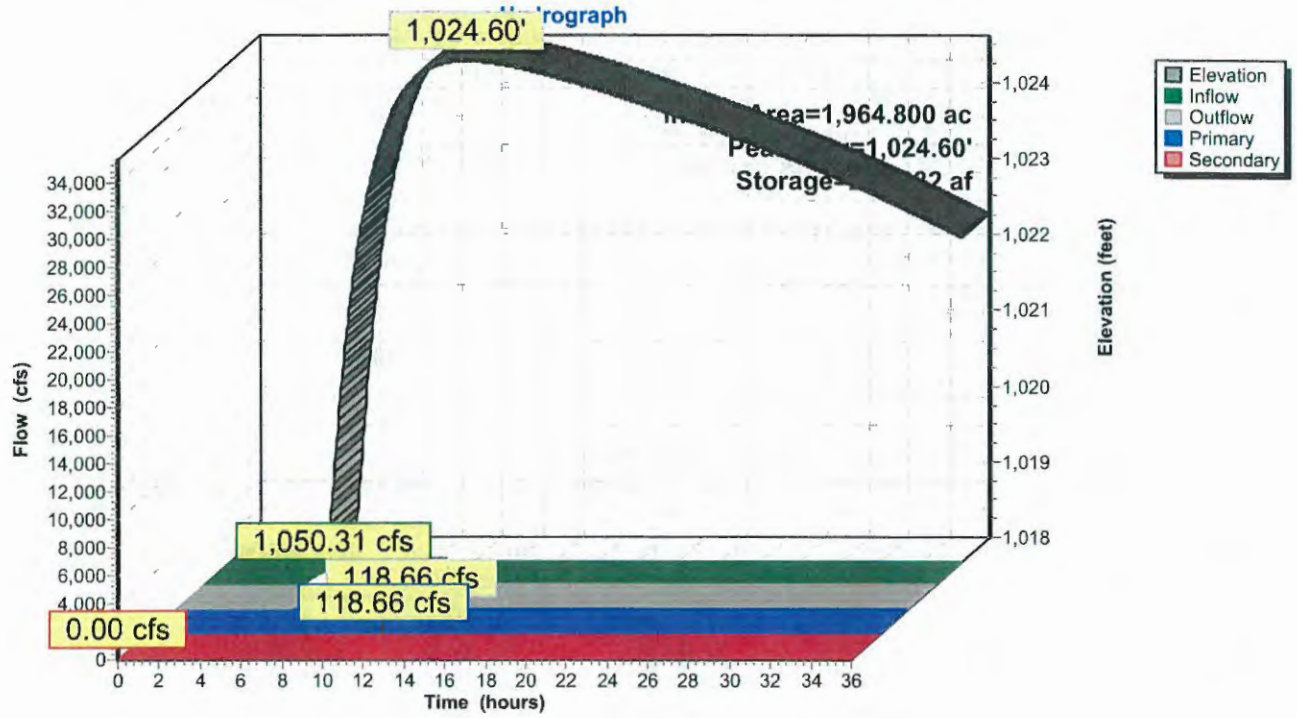
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
1,018.00	1.828	9,236.2	0.000	0.000	1.828
1,020.00	12.667	15,179.0	12.871	12.871	266.894
1,022.00	44.456	16,532.1	53.902	66.773	345.285
1,024.00	91.000	31,384.9	132.707	199.480	1,645.455
1,026.00	176.087	39,123.0	262.448	461.929	2,642.179
1,032.00	300.000	45,000.0	1,411.853	1,873.781	3,545.375

Device	Routing	Invert	Outlet Devices
#1	Primary	1,018.00'	**48.0" Round Culvert** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,018.00' / 1,017.00' S= 0.0167 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Secondary	1,025.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 3.00 5.00 Width (feet) 125.00 192.00 308.00 415.00

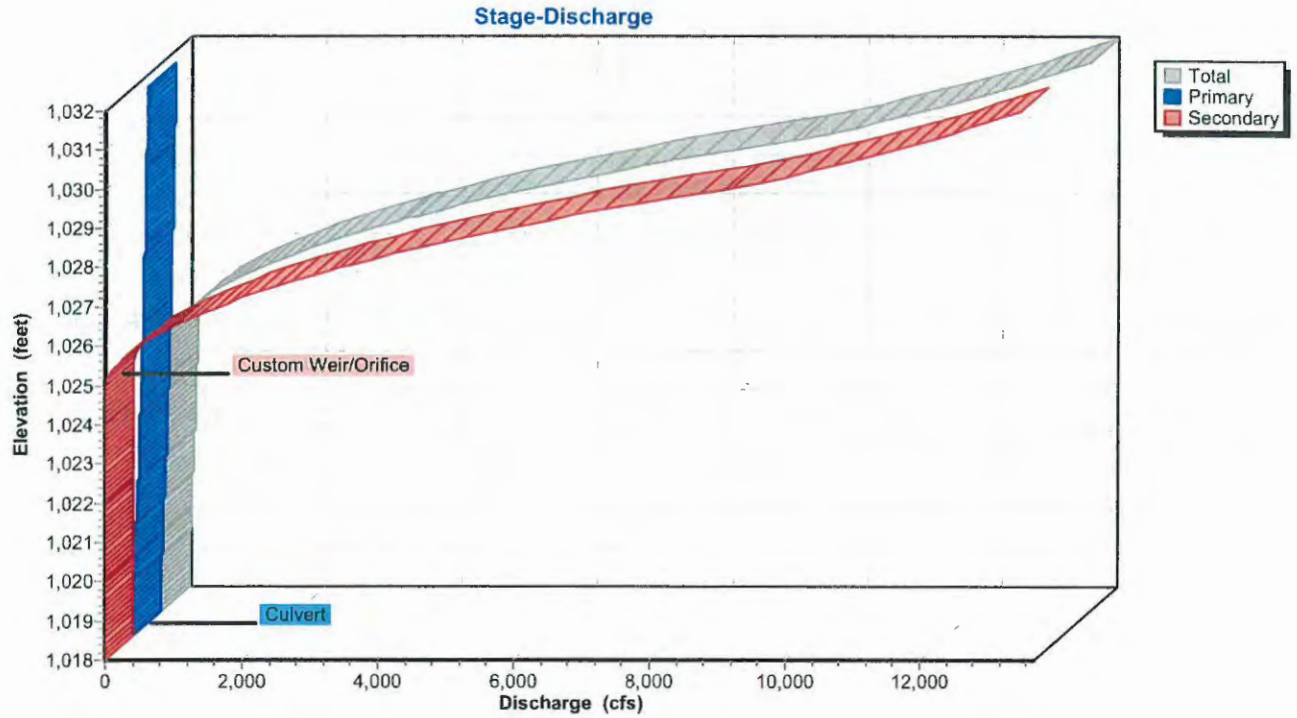
Primary OutFlow Max=118.66 cfs @ 11.58 hrs HW=1,024.60' TW=1,020.46' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 118.66 cfs @ 9.44 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,018.00' TW=1,017.50' (Dynamic Tailwater)
↑—**2=Custom Weir/Orifice** (Controls 0.00 cfs)

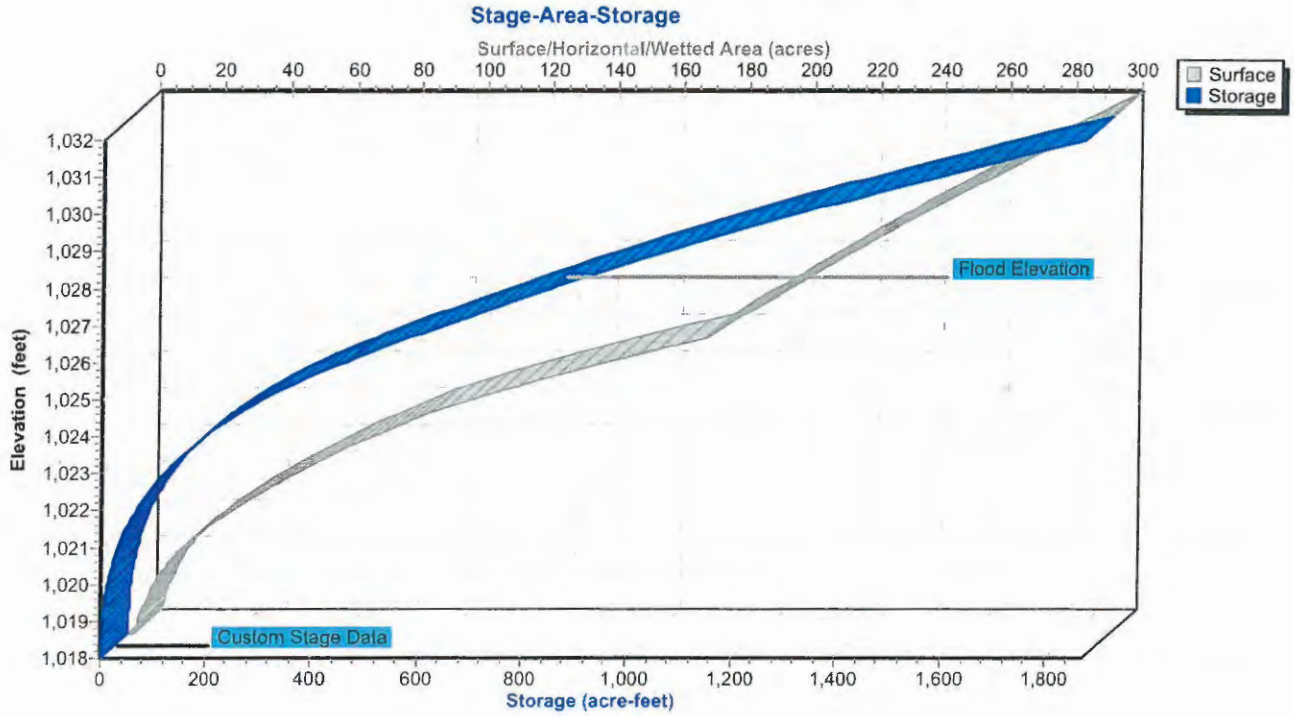
Pond 8P: Storage Area Genoa Rd



Pond 8P: Storage Area Genoa Rd



Pond 8P: Storage Area Genoa Rd



Summary for Pond 9P: Sippo Lake

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth = 2.65" for 6-HR 0.2 PMF event
Inflow = 1,401.47 cfs @ 5.03 hrs, Volume= 433.121 af
Outflow = 1,050.31 cfs @ 6.42 hrs, Volume= 340.299 af, Atten= 25%, Lag= 83.5 min
Primary = 1,050.31 cfs @ 6.42 hrs, Volume= 340.299 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,027.00' Surf.Area= 88.000 ac Storage= 220.000 af
Peak Elev= 1,028.97' @ 6.42 hrs Surf.Area= 103.451 ac Storage= 408.996 af (188.996 af above start)
Flood Elev= 1,029.30' Surf.Area= 106.000 ac Storage= 443.100 af (223.100 af above start)

Plug-Flow detention time= 388.4 min calculated for 120.299 af (28% of inflow)
Center-of-Mass det. time= 126.3 min (482.7 - 356.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,022.00'	1,220.300 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,022.00	0.000	0.000	0.000
1,027.00	88.000	220.000	220.000
1,029.30	106.000	223.100	443.100
1,036.00	126.000	777.200	1,220.300

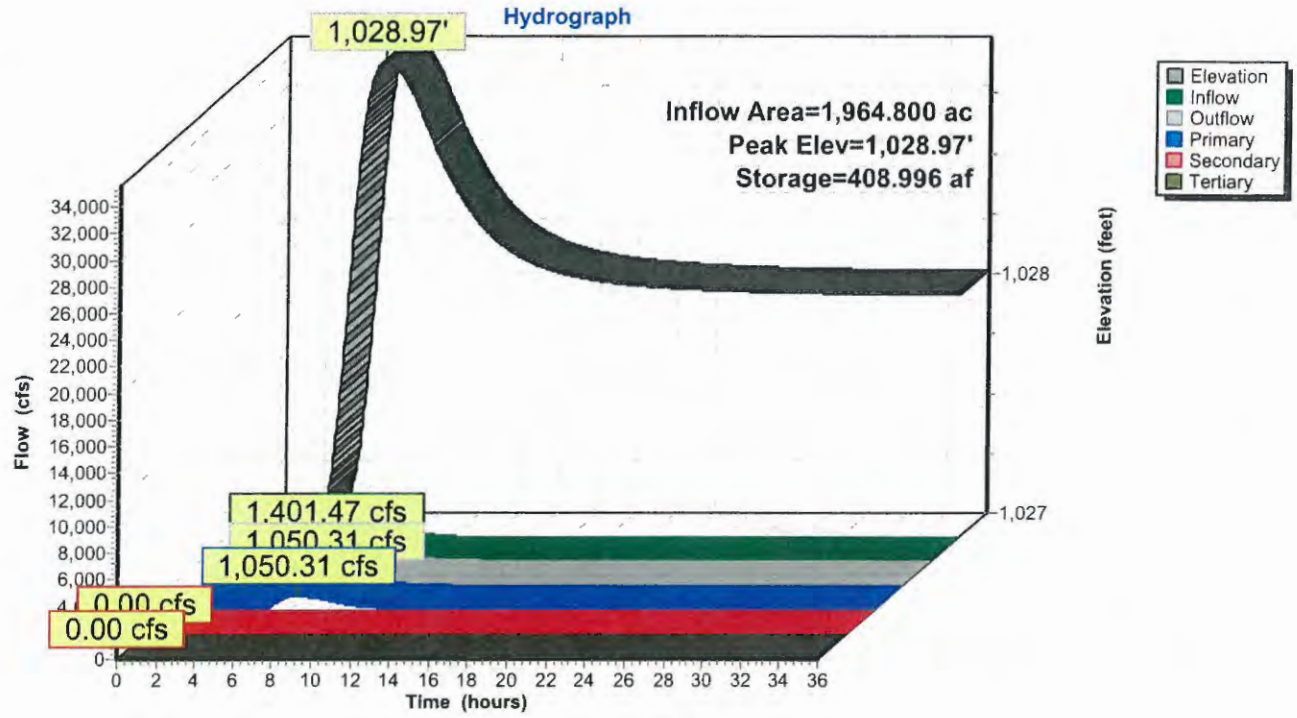
Device	Routing	Invert	Outlet Devices
#1	Primary	1,028.00'	**300.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	1,028.50'	**330.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Secondary	1,029.30'	**30.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)
#4	Tertiary	1,030.00'	**650.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1,050.30 cfs @ 6.42 hrs HW=1,028.97' TW=1,022.44' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 759.21 cfs @ 2.60 fps)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 291.09 cfs @ 1.86 fps)

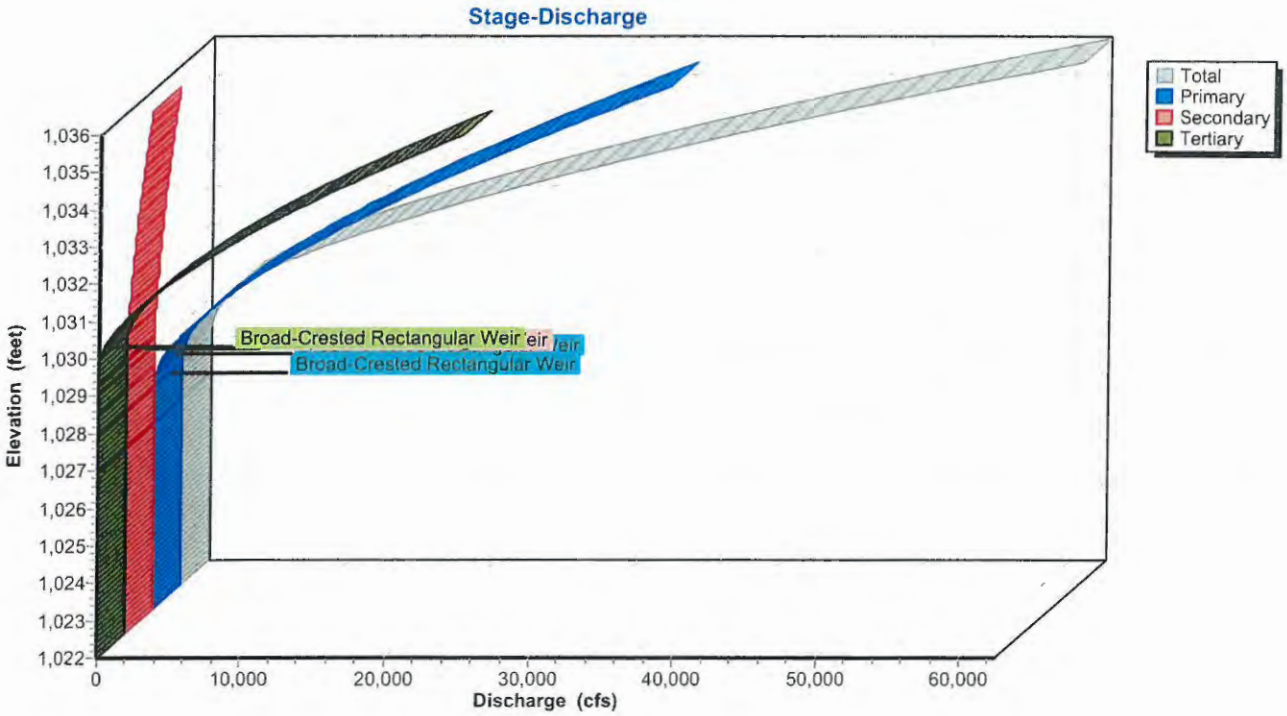
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,027.00' TW=1,018.00' (Dynamic Tailwater)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,027.00' TW=1,018.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

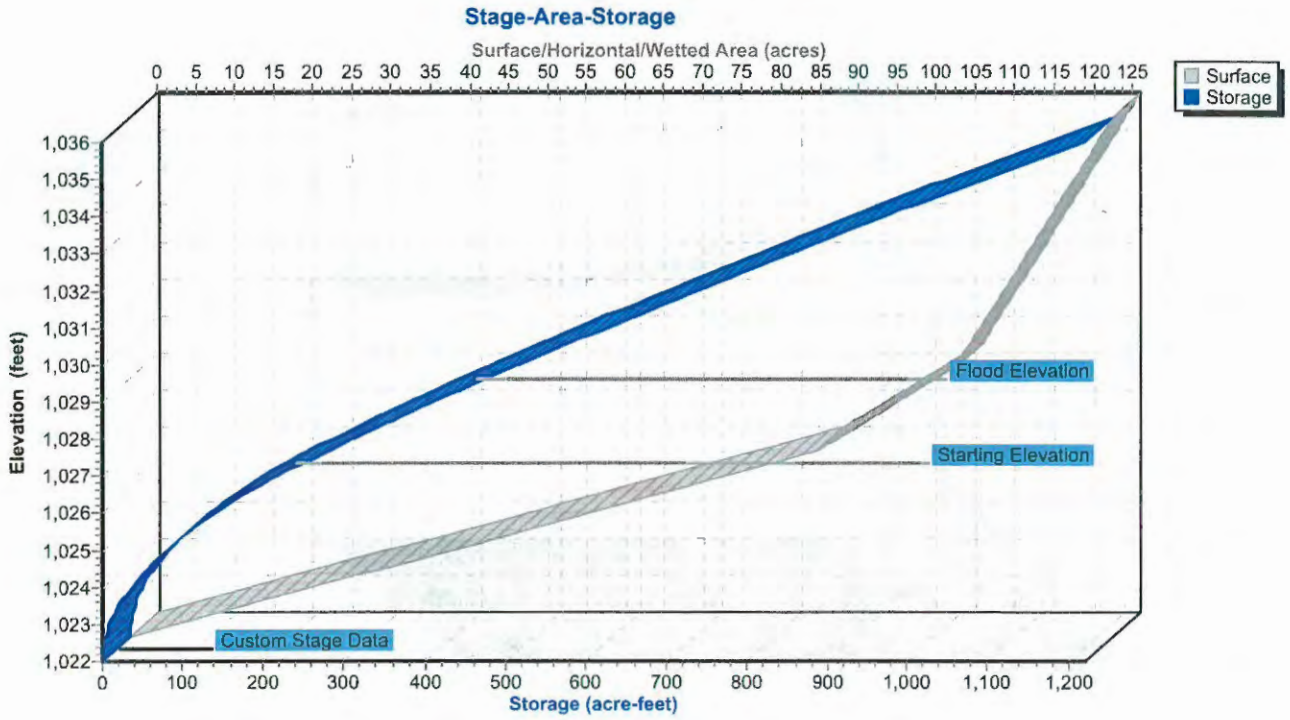
Pond 9P: Sippo Lake



Pond 9P: Sippo Lake



Pond 9P: Sippo Lake

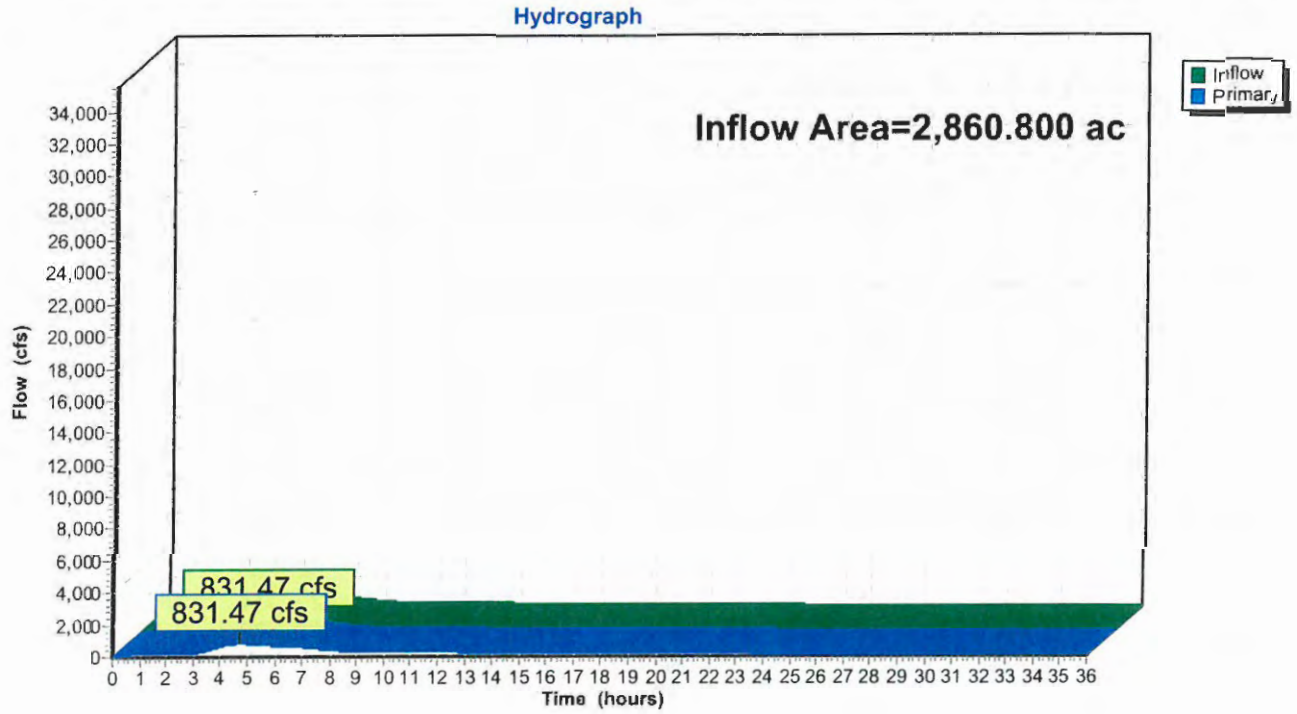


Summary for Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed

Inflow Area = 2,860.800 ac, 23.34% Impervious, Inflow Depth > 3.17" for 6-HR 0.2 PMF event
Inflow = 831.47 cfs @ 4.70 hrs, Volume= 754.826 af
Primary = 831.47 cfs @ 4.71 hrs, Volume= 754.826 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed



Summary for Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 2.36" for 6-HR 0.2 PMF event
Inflow = 2,661.69 cfs @ 6.56 hrs, Volume= 1,859.980 af
Outflow = 2,499.46 cfs @ 7.18 hrs, Volume= 1,859.375 af, Atten= 6%, Lag= 37.1 min
Primary = 2,499.46 cfs @ 7.18 hrs, Volume= 1,859.375 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 997.40' @ 7.18 hrs Surf.Area= 8.594 ac Storage= 83.072 af
Flood Elev= 1,008.00' Surf.Area= 13.465 ac Storage= 197.028 af

Plug-Flow detention time= 12.7 min calculated for 1,859.375 af (100% of inflow)
Center-of-Mass det. time= 12.3 min (760.8 - 748.6)

Volume	Invert	Avail.Storage	Storage Description
#1	978.00'	371.368 af	**Stage Storage in Sippo Park (Irregular)** Listed below (Recalc)

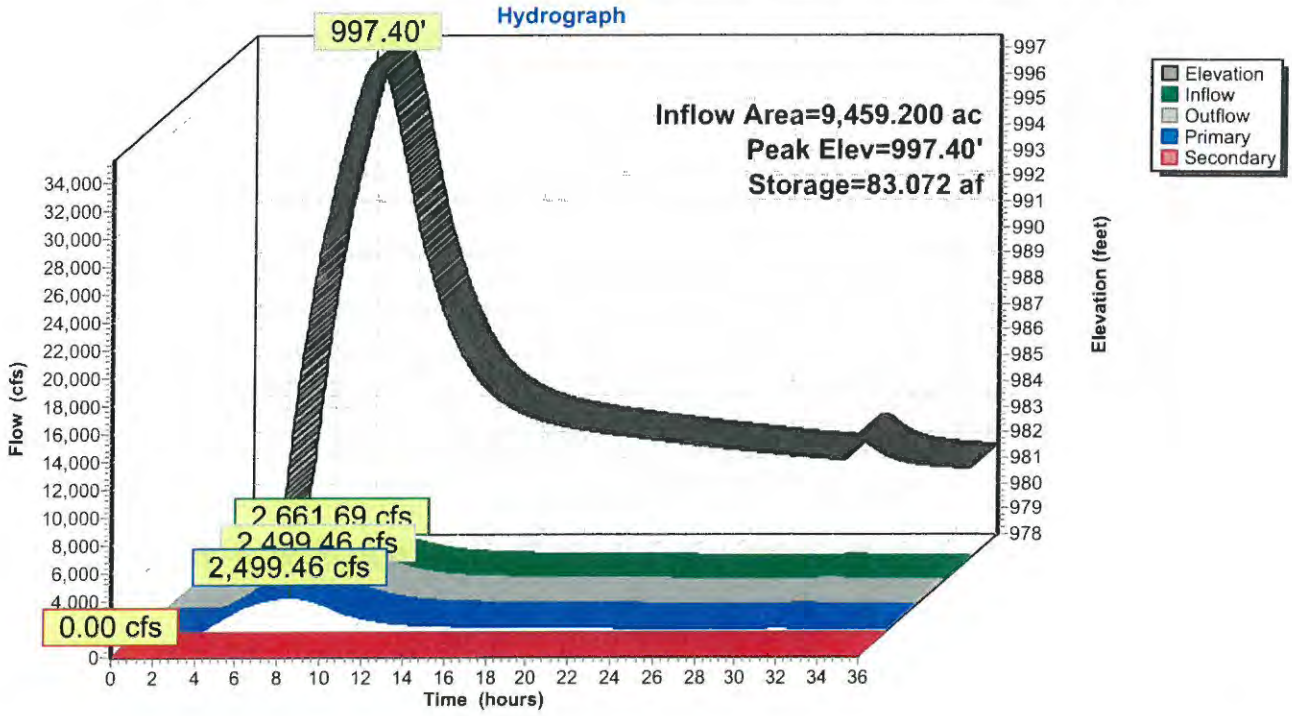
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
978.00	0.100	200.0	0.000	0.000	0.100
981.00	0.300	500.0	0.573	0.573	0.484
982.00	0.659	1,392.9	0.468	1.041	3.572
984.00	2.018	2,470.7	2.553	3.595	11.180
986.00	3.584	3,300.7	5.528	9.122	19.932
988.00	5.007	3,247.5	8.551	17.674	20.586
990.00	6.111	3,143.9	11.100	28.773	21.805
992.00	6.773	3,217.1	12.878	41.652	22.668
994.00	7.411	3,271.9	14.179	55.831	23.334
996.00	8.110	3,253.8	15.516	71.347	23.597
998.00	8.804	3,273.8	16.909	88.256	23.878
1,000.00	9.441	3,318.6	18.241	106.497	24.439
1,002.00	10.181	3,437.0	19.617	126.114	25.908
1,004.00	11.109	3,548.6	21.283	147.398	27.341
1,006.00	12.538	3,553.4	23.633	171.030	27.516
1,008.00	13.465	3,829.8	25.997	197.028	31.248
1,010.00	14.326	4,085.3	27.787	224.814	34.947
1,012.00	15.633	4,329.5	29.949	254.764	38.706
1,014.00	17.576	4,742.6	33.190	287.954	45.555
1,016.00	20.521	5,940.5	38.059	326.013	68.935
1,018.00	24.905	6,310.6	45.355	371.368	77.223

Device	Routing	Invert	Outlet Devices
#1	Primary	978.25'	**168.0" W x 98.0" H Box Box Culvert** L= 121.8' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 978.25' / 978.13' S= 0.0010 '/' Cc= 0.900 n= 0.015 Brickwork
#2	Secondary	1,008.00'	**Linclon Way (172), Cv= 2.63 (C= 3.29)** Head (feet) 0.00 1.00 2.00 4.00 6.00 8.00 10.00 Width (feet) 233.00 373.00 475.00 630.00 790.00 940.00 1,090.00

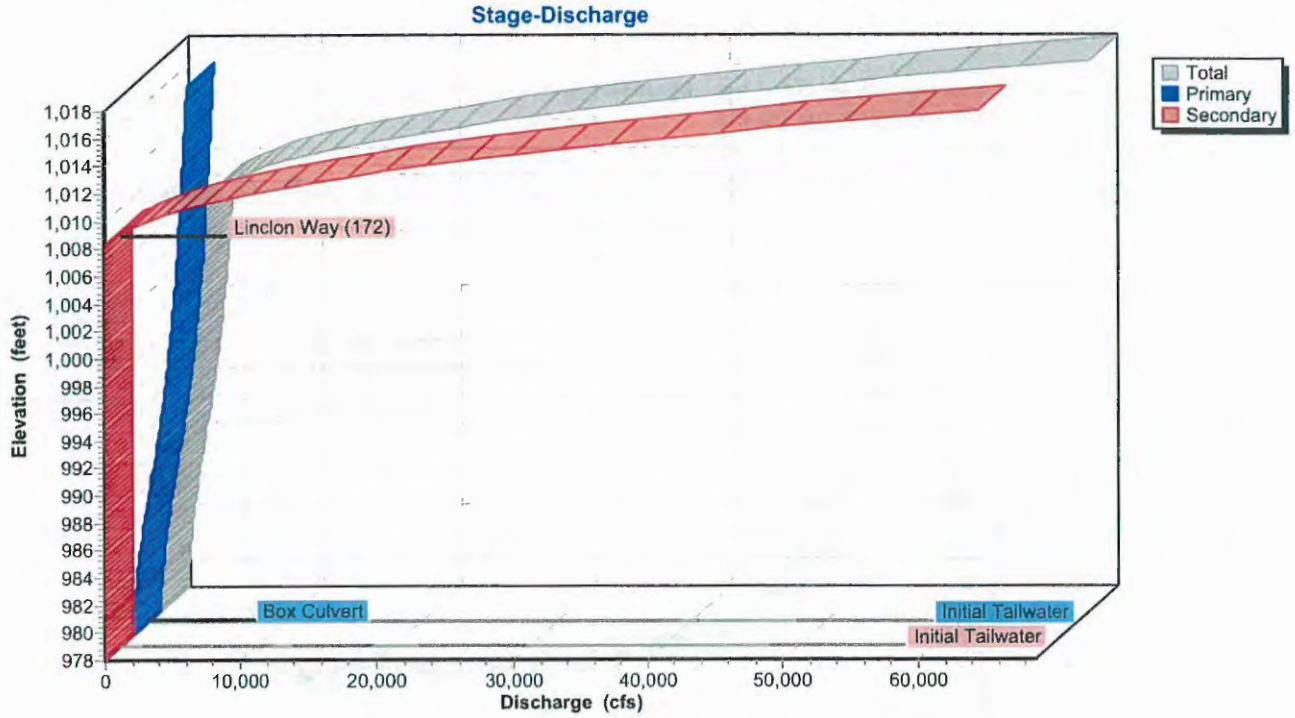
Primary OutFlow Max=2,499.45 cfs @ 7.18 hrs HW=997.40' TW=983.77' (Dynamic Tailwater)
└─**1=Box Culvert** (Inlet Controls 2,499.45 cfs @ 21.86 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=978.00' TW=978.13' (Dynamic Tailwater)
└─**2=Linclon Way (172)** (Controls 0.00 cfs)

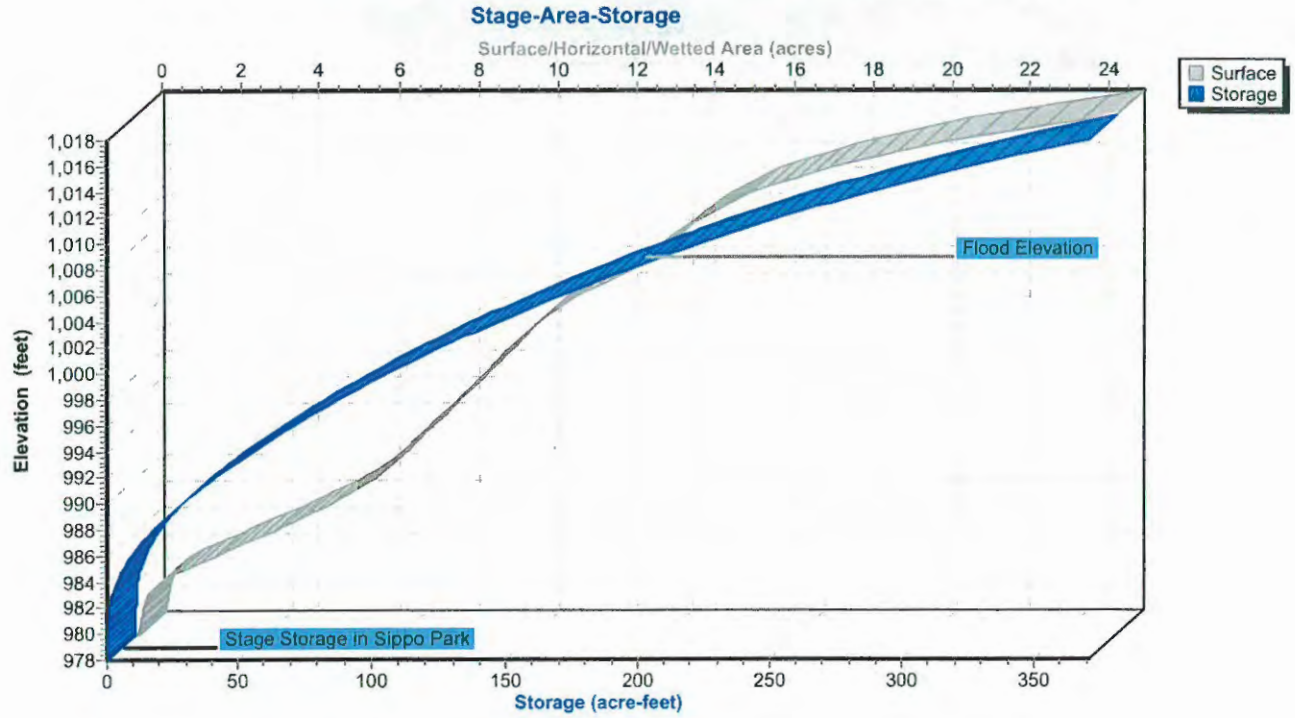
Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-



Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-



Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-

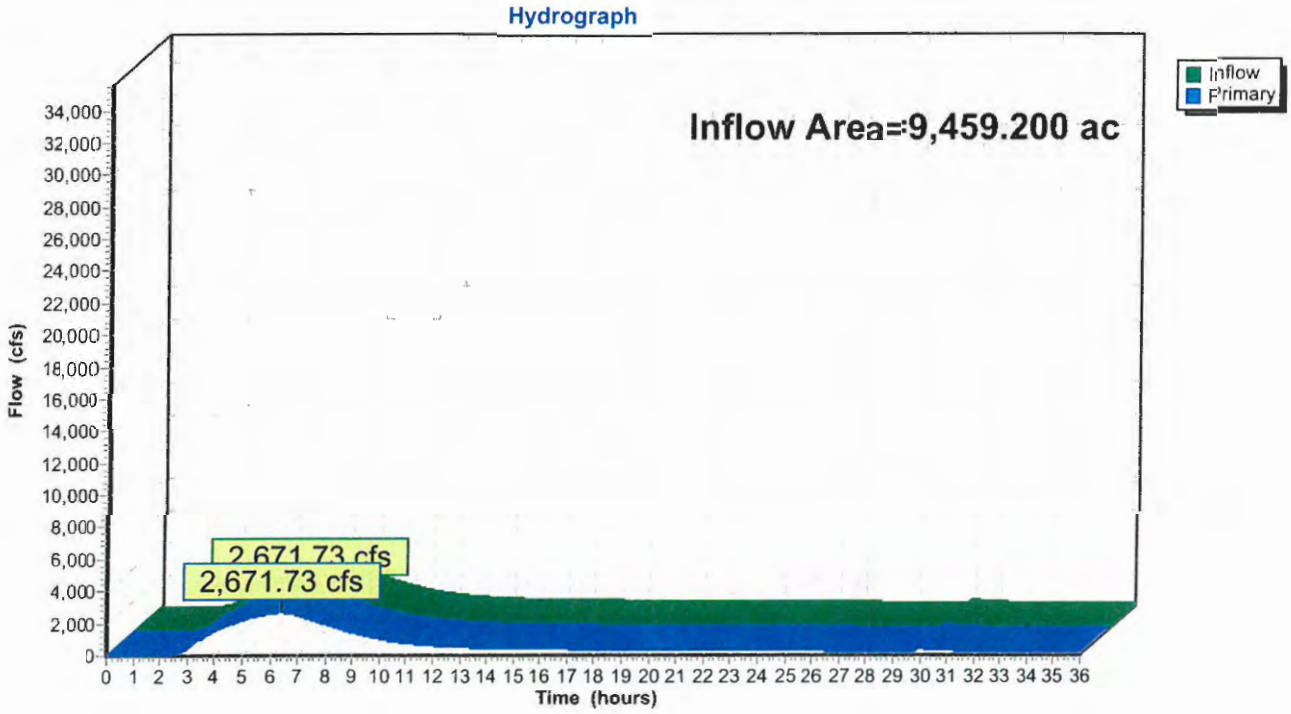


Summary for Pond 19C: Confluence 19

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 2.37" for 6-HR 0.2 PMF event
Inflow = 2,671.73 cfs @ 6.41 hrs, Volume= 1,870.702 af
Primary = 2,671.73 cfs @ 6.42 hrs, Volume= 1,870.702 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 19C: Confluence 19



Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment HYD 1: Lake Eric Drainage Runoff Area=115.200 ac 0.00% Impervious Runoff Depth=2.77"
Tc=44.0 min CN=74 Runoff=145.29 cfs 26.584 af

Subcatchment HYD 2: Lake O'Springs Runoff Area=268.800 ac 38.00% Impervious Runoff Depth=2.86"
Tc=65.0 min CN=75 Runoff=314.33 cfs 64.076 af

Subcatchment HYD 3: Lake Cable Runoff Area=1,401.600 ac 25.00% Impervious Runoff Depth=2.41"
Tc=226.0 min CN=70 Runoff=739.79 cfs 281.989 af

Subcatchment HYD 4: Hyd 4 Watershed Runoff Area=1,075.200 ac 20.00% Impervious Runoff Depth=2.24"
Tc=128.0 min CN=68 Runoff=707.91 cfs 200.993 af

Subcatchment HYD11: HYD11 Watershed Runoff Area=774.400 ac 0.00% Impervious Runoff Depth=2.16"
Tc=129.0 min CN=67 Runoff=487.01 cfs 139.348 af

Subcatchment HYD12: HYD12 Watershed Runoff Area=723.200 ac 0.00% Impervious Runoff Depth=2.77"
Tc=110.0 min CN=74 Runoff=648.60 cfs 166.889 af

Subcatchment HYD13: HYD13 Watershed Runoff Area=736.000 ac 38.00% Impervious Runoff Depth=2.86"
Tc=72.0 min CN=75 Runoff=829.17 cfs 175.447 af

Subcatchment HYD14: HYD14 Watershed Runoff Area=678.400 ac 25.00% Impervious Runoff Depth=3.33"
Tc=78.0 min CN=80 Runoff=875.00 cfs 188.444 af

Subcatchment HYD6: HYD6 Watershed Runoff Area=1,068.800 ac 0.00% Impervious Runoff Depth=2.33"
Tc=155.0 min CN=69 Runoff=661.66 cfs 207.367 af

Subcatchment HYD8: Sippo Lake Runoff Area=1,964.800 ac 38.00% Impervious Runoff Depth=2.86"
Tc=156.0 min CN=75 Runoff=1,519.45 cfs 468.366 af

Subcatchment HYD9: HYD9 Watershed Runoff Area=652.800 ac 0.00% Impervious Runoff Depth=2.16"
Tc=151.0 min CN=67 Runoff=377.91 cfs 117.467 af

Reach 5R: Channel 5 Avg. Flow Depth=2.91' Max Vel=5.85 fps Inflow=312.45 cfs 597.515 af
L=8,800.0' S=0.0240 '/' Capacity=106,015.62 cfs Outflow=311.88 cfs 592.286 af

Reach 7R: Channel 7 Avg. Flow Depth=7.74' Max Vel=3.07 fps Inflow=896.03 cfs 793.081 af
L=5,900.0' S=0.0017 '/' Capacity=195,473.52 cfs Outflow=849.13 cfs 784.598 af

Reach 10Ra: Channel 10 (Reach Avg. Flow Depth=3.02' Max Vel=2.54 fps Inflow=122.97 cfs 273.563 af
L=900.0' S=0.0028 '/' Capacity=36,685.79 cfs Outflow=122.96 cfs 272.839 af

Reach 15R: Channel 15 Avg. Flow Depth=8.18' Max Vel=2.09 fps Inflow=2,357.23 cfs 1,520.997 af
L=8,800.0' S=0.0010 '/' Capacity=189,892.92 cfs Outflow=2,002.22 cfs 1,490.151 af

Reach 16R: Channel 16 Avg. Flow Depth=10.06' Max Vel=2.49 fps Inflow=2,686.65 cfs 1,832.129 af
L=7,500.0' S=0.0010 '/' Capacity=42,389.29 cfs Outflow=2,605.14 cfs 1,810.509 af

Reach 18R: Sippo Creek Avg. Flow Depth=5.78' Max Vel=9.49 fps Inflow=2,680.30 cfs 1,986.915 af
L=450.0' S=0.0084 '/' Capacity=200,707.82 cfs Outflow=2,680.30 cfs 1,986.796 af

Pond 1C: CONF 1 Combined O'Springs and Eric Inflow=354.58 cfs 90.553 af
Primary=354.58 cfs 90.553 af

Pond 1P: Sippo Creek Reservoir Peak Elev=1,007.05' Storage=124.055 af Inflow=2,906.45 cfs 1,998.588 af
085.96 cfs 1,753.004 af Secondary=810.45 cfs 234.917 af Tertiary=0.00 cfs 0.000 af Outflow=2,896.41 cfs 1,987.921 af

Pond 2C: CONF 2 Combined Cable and O'Springs Inflow=881.11 cfs 372.072 af
Primary=881.11 cfs 372.072 af

Pond 3P: Lake Cable Peak Elev=1,097.94' Storage=2,037.321 af Inflow=881.11 cfs 372.071 af
Primary=312.45 cfs 597.614 af Secondary=0.00 cfs 0.000 af Outflow=312.45 cfs 597.614 af

Pond 4C: Confluence 4 Inflow=1,510.05 cfs 991.866 af
Primary=1,510.05 cfs 991.866 af

Pond 4P: Lake O'Springs Peak Elev=1,107.69' Storage=71.540 af Inflow=354.58 cfs 90.552 af
Primary=142.90 cfs 90.084 af Secondary=0.00 cfs 0.000 af Outflow=142.90 cfs 90.084 af

Pond 5C: Confluence 5 Inflow=1,973.41 cfs 1,131.114 af
Primary=1,973.41 cfs 1,131.114 af

Pond 5P: Lake Eric (Slagle) Peak Elev=1,119.71' Storage=26.284 af Inflow=145.29 cfs 26.584 af
Primary=60.63 cfs 26.476 af Secondary=0.00 cfs 0.000 af Outflow=60.63 cfs 26.476 af

Pond 6C: Confluence 6 Inflow=402.54 cfs 390.231 af
Primary=402.54 cfs 390.231 af

Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake Inflow=2,357.23 cfs 1,521.171 af
Primary=2,357.23 cfs 1,521.171 af

Pond 8C: Confluence 8 Inflow=2,686.65 cfs 1,832.308 af
Primary=2,686.65 cfs 1,832.308 af

Pond 8P: Storage Area Genoa Rd Peak Elev=1,024.86' Storage=291.935 af Inflow=1,166.04 cfs 375.539 af
Primary=122.97 cfs 273.638 af Secondary=0.00 cfs 0.000 af Outflow=122.97 cfs 273.638 af

Pond 9P: Sippo Lake Peak Elev=1,029.03' Storage=414.624 af Inflow=1,519.45 cfs 468.366 af
mary=1,166.04 cfs 375.540 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=1,166.04 cfs 375.540 af

Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed Inflow=896.03 cfs 793.180 af
Primary=896.03 cfs 793.180 af

Pond 16P: Lincoln Way Box Peak Elev=999.48' Storage=101.598 af Inflow=2,896.41 cfs 1,987.736 af
Primary=2,680.30 cfs 1,987.099 af Secondary=0.00 cfs 0.000 af Outflow=2,680.30 cfs 1,987.099 af

Pond 19C: Confluence 19 Inflow=2,906.45 cfs 1,998.771 af
Primary=2,906.45 cfs 1,998.771 af

Total Runoff Area = 9,459.200 ac Runoff Volume = 2,036.970 af Average Runoff Depth = 2.58"
80.30% Pervious = 7,595.712 ac 19.70% Impervious = 1,863.488 ac

Summary for Subcatchment HYD 1: Lake Eric Drainage Area

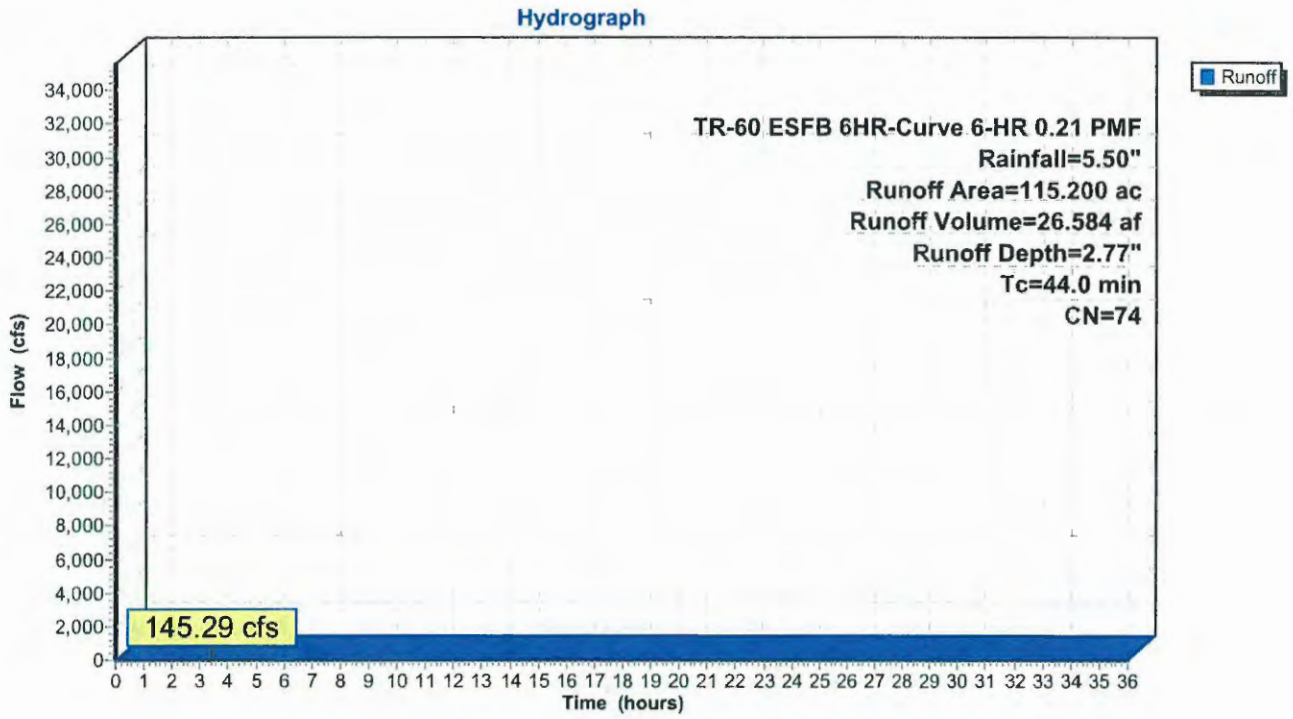
Runoff = 145.29 cfs @ 3.37 hrs, Volume= 26.584 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.21 PMF Rainfall=5.50"

Area (ac)	CN	Description
115.200	74	>75% Grass cover, Good, HSG C
115.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.0					**Direct Entry, HEC-1 Lag Time = 0.44 hr**

Subcatchment HYD 1: Lake Eric Drainage Area



Summary for Subcatchment HYD 2: Lake O'Springs Watershed

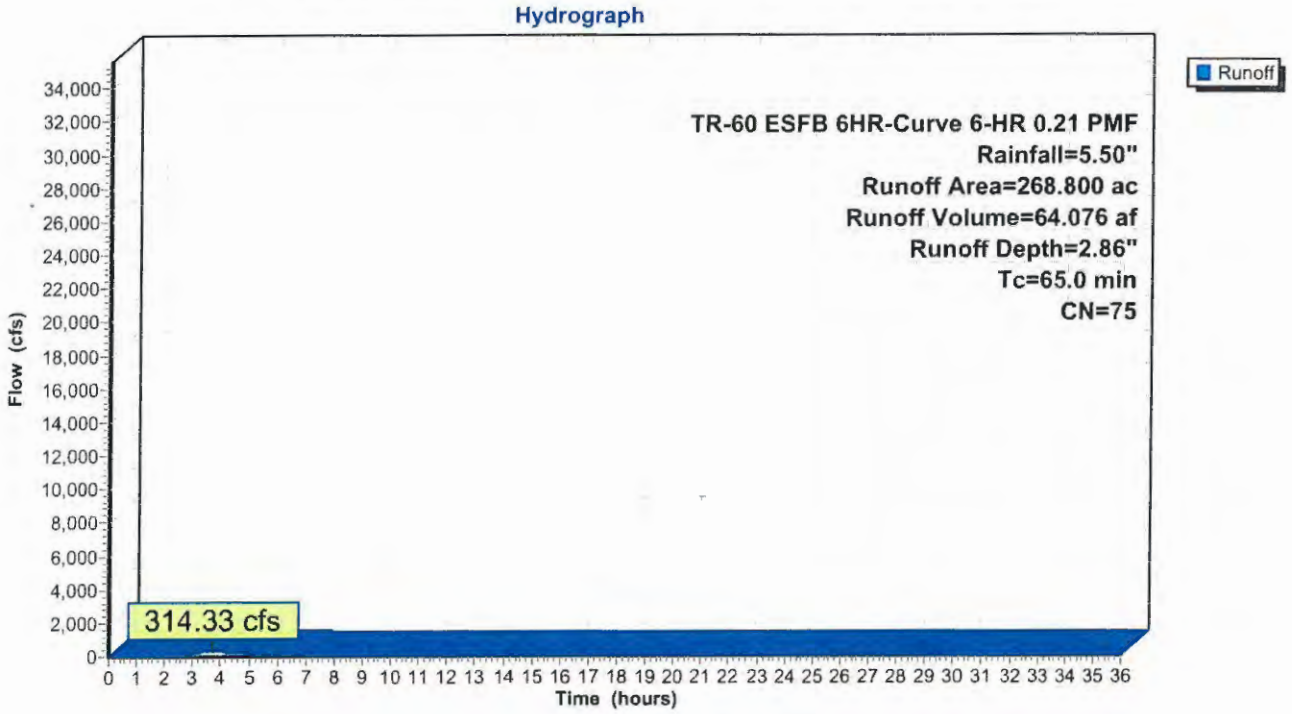
Runoff = 314.33 cfs @ 3.68 hrs, Volume= 64.076 af, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.21 PMF Rainfall=5.50"

Area (ac)	CN	Description
268.800	75	1/4 acre lots, 38% imp, HSG B
166.656		62.00% Pervious Area
102.144		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.0					**Direct Entry, HEC-1 Lag Time = 0.65 hours**

Subcatchment HYD 2: Lake O'Springs Watershed



Summary for Subcatchment HYD 3: Lake Cable Watershed

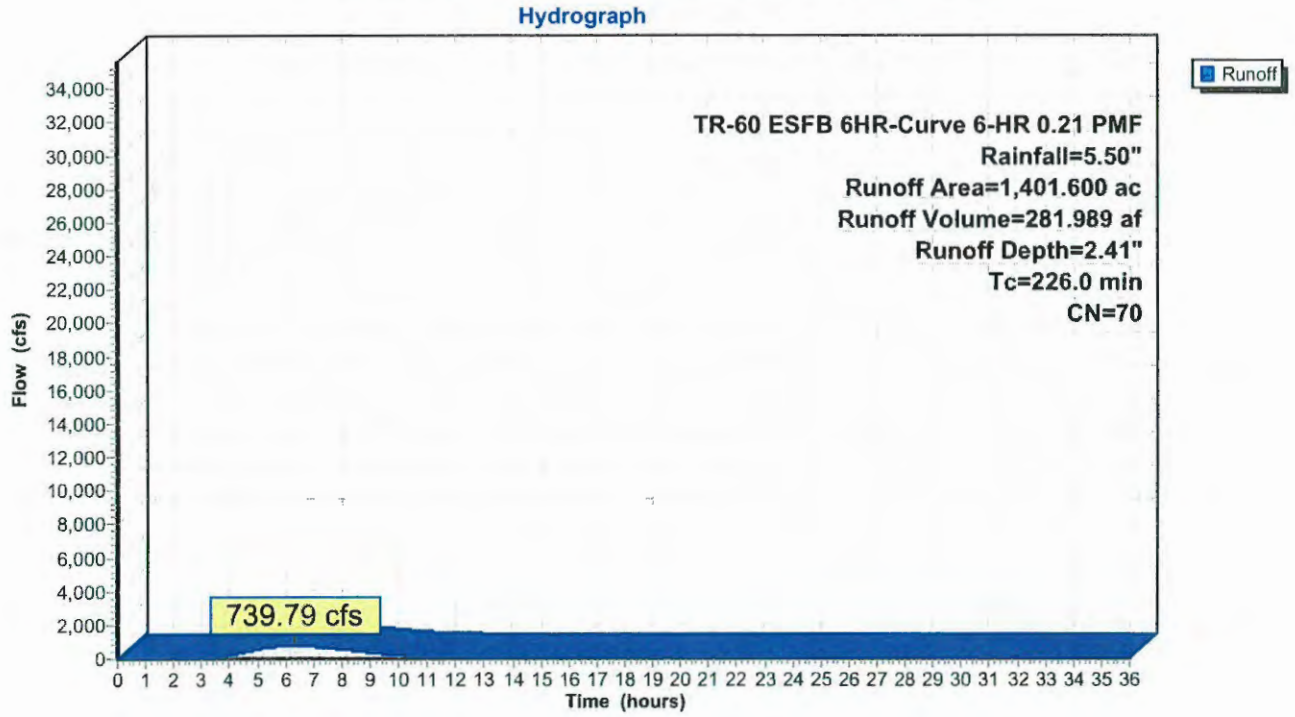
Runoff = 739.79 cfs @ 6.28 hrs, Volume= 281.989 af, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.21 PMF Rainfall=5.50"

Area (ac)	CN	Description
1,401.600	70	1/2 acre lots, 25% imp, HSG B
1,051.200		75.00% Pervious Area
350.400		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
226.0					**Direct Entry, HEC-1 Lag time 2.26hr**

Subcatchment HYD 3: Lake Cable Watershed



Summary for Subcatchment HYD 4: Hyd 4 Watershed

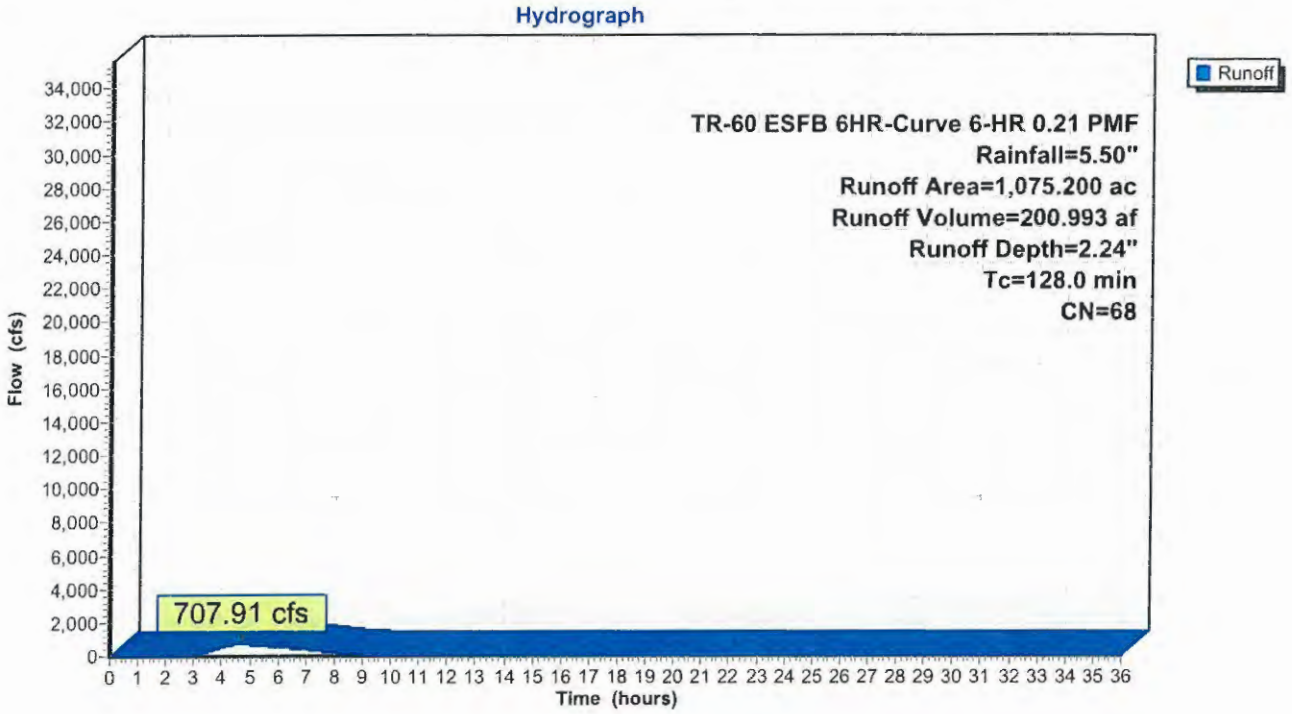
Runoff = 707.91 cfs @ 4.69 hrs, Volume= 200.993 af, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.21 PMF Rainfall=5.50"

Area (ac)	CN	Description
1,075.200	68	1 acre lots, 20% imp, HSG B
860.160		80.00% Pervious Area
215.040		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
128.0					**Direct Entry, HEC-1 Lag Time = 1.28 hr**

Subcatchment HYD 4: Hyd 4 Watershed



Summary for Subcatchment HYD11: HYD11 Watershed

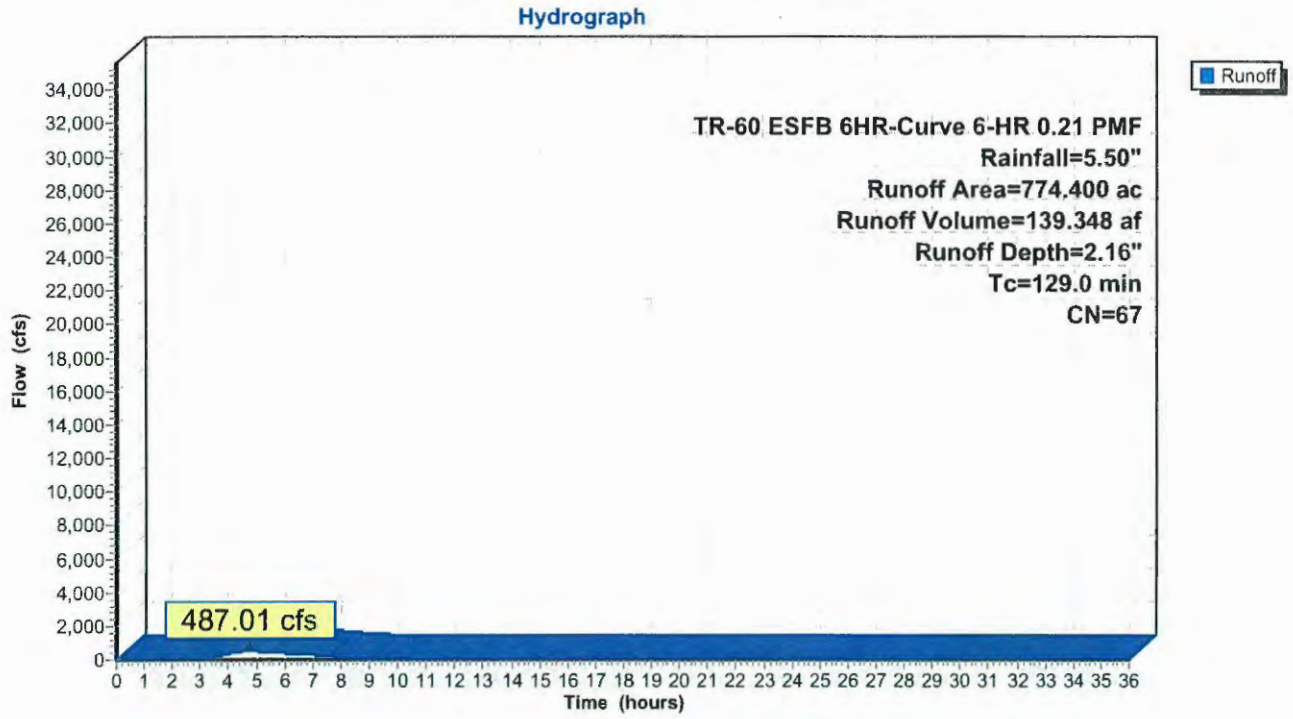
Runoff = 487.01 cfs @ 4.73 hrs, Volume= 139.348 af, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.21 PMF Rainfall=5.50"

	Area (ac)	CN	Description
*	774.400	67	
	774.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
129.0					**Direct Entry, HEC-1 Lag Time = 1.29 hr**

Subcatchment HYD11: HYD11 Watershed



Summary for Subcatchment HYD12: HYD12 Watershed

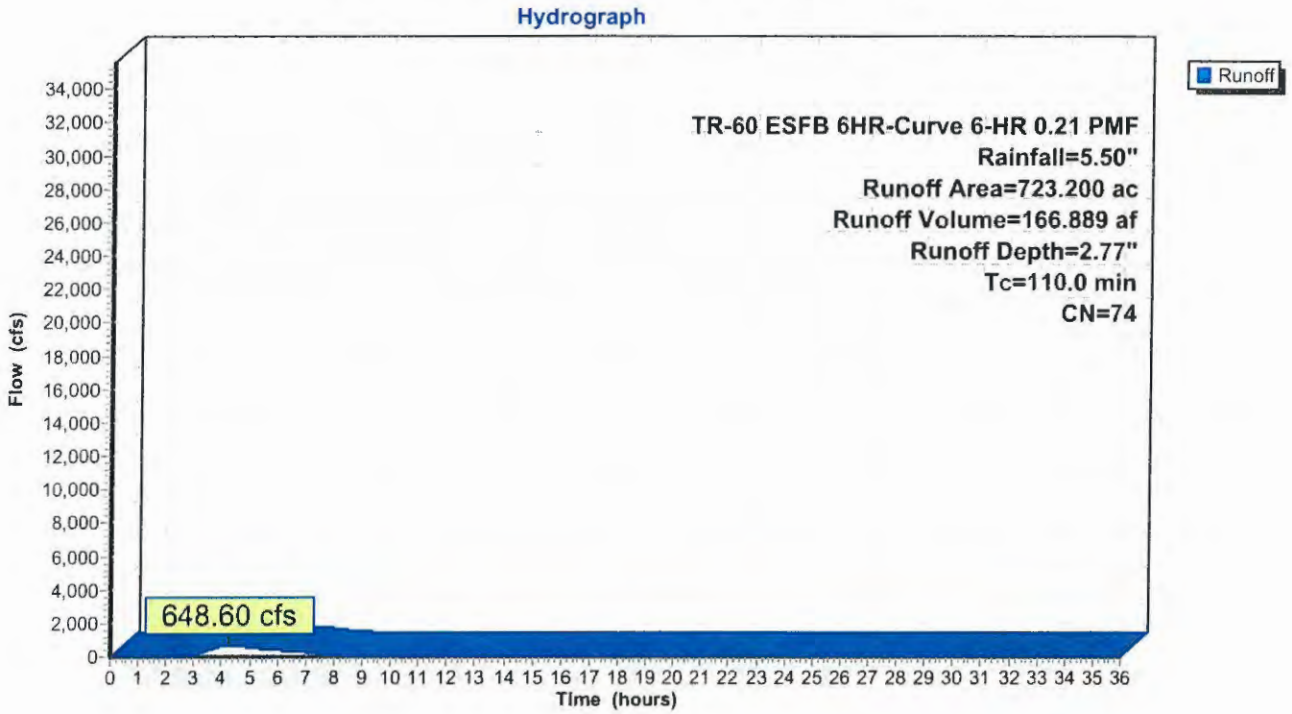
Runoff = 648.60 cfs @ 4.28 hrs, Volume= 166.889 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.21 PMF Rainfall=5.50"

Area (ac)	CN	Description
723.200	74	>75% Grass cover, Good, HSG C
723.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
110.0					**Direct Entry, HEC-1 Lag Time = 1.10 hr**

Subcatchment HYD12: HYD12 Watershed



Summary for Subcatchment HYD13: HYD13 Watershed

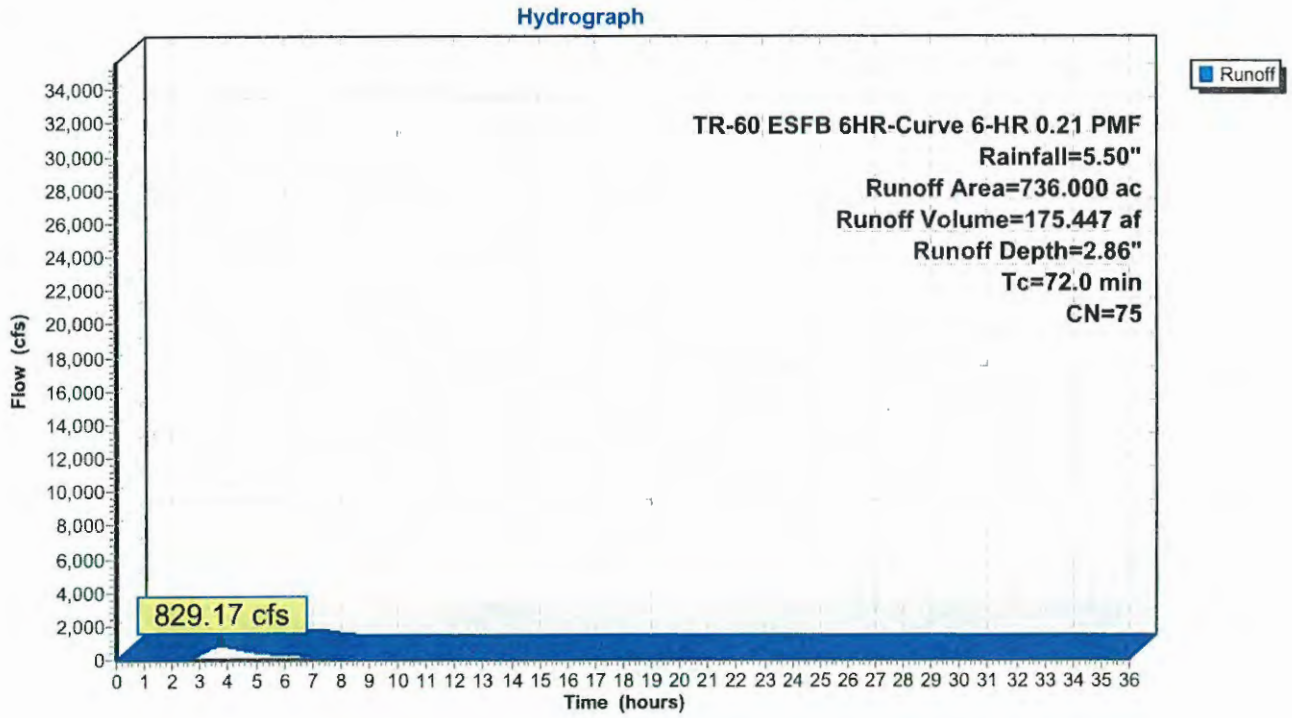
Runoff = 829.17 cfs @ 3.76 hrs, Volume= 175.447 af, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.21 PMF Rainfall=5.50"

Area (ac)	CN	Description
736.000	75	1/4 acre lots, 38% imp, HSG B
456.320		62.00% Pervious Area
279.680		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
72.0					**Direct Entry, HEC-1 Lag Time = 0.72 hr**

Subcatchment HYD13: HYD13 Watershed



Summary for Subcatchment HYD14: HYD14 Watershed

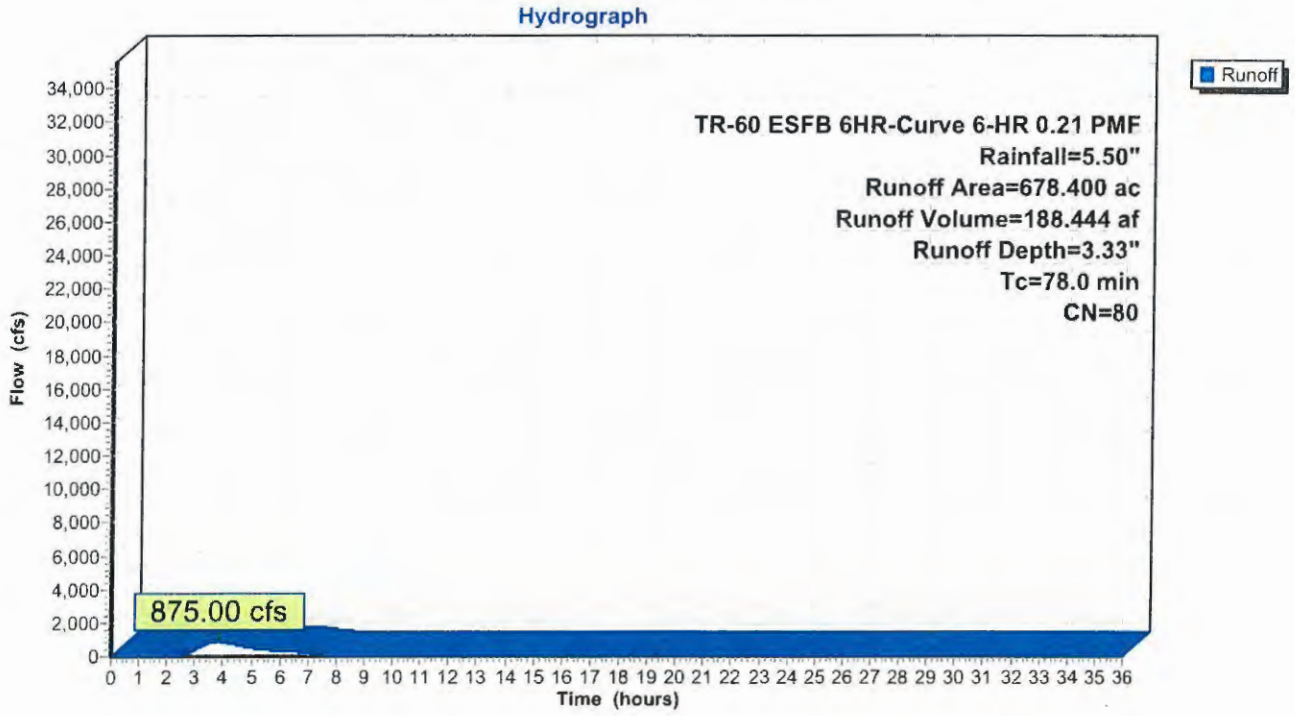
Runoff = 875.00 cfs @ 3.81 hrs, Volume= 188.444 af, Depth= 3.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.21 PMF Rainfall=5.50"

Area (ac)	CN	Description
678.400	80	1/2 acre lots, 25% imp, HSG C
508.800		75.00% Pervious Area
169.600		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.0					**Direct Entry, HEC-1 Lag Time = 0.78 hr**

Subcatchment HYD14: HYD14 Watershed



Summary for Subcatchment HYD6: HYD6 Watershed

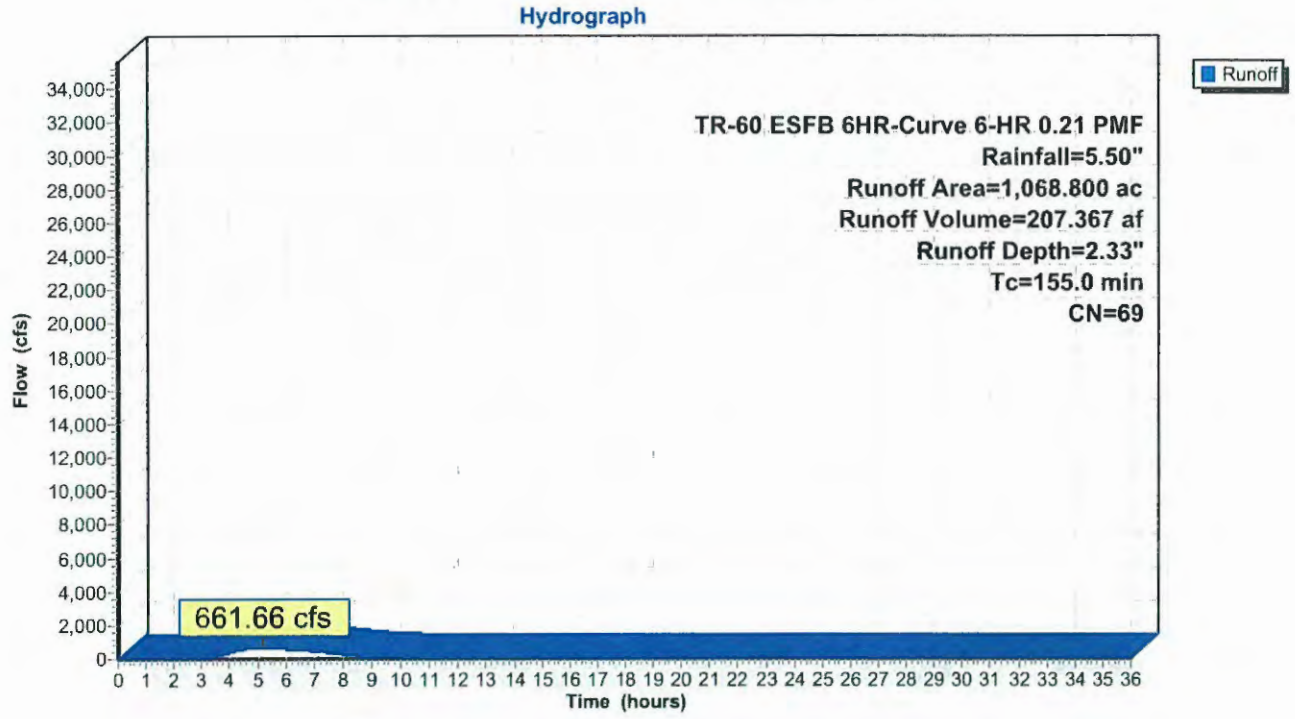
Runoff = 661.66 cfs @ 5.16 hrs, Volume= 207.367 af, Depth= 2.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.21 PMF Rainfall=5.50"

Area (ac)	CN	Description
1,068.800	69	Pasture/grassland/range, Fair, HSG B
1,068.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
155.0					**Direct Entry, HEC-1 Lag Time = 1.55 hr**

Subcatchment HYD6: HYD6 Watershed



Summary for Subcatchment HYD8: Sippo Lake Watershed

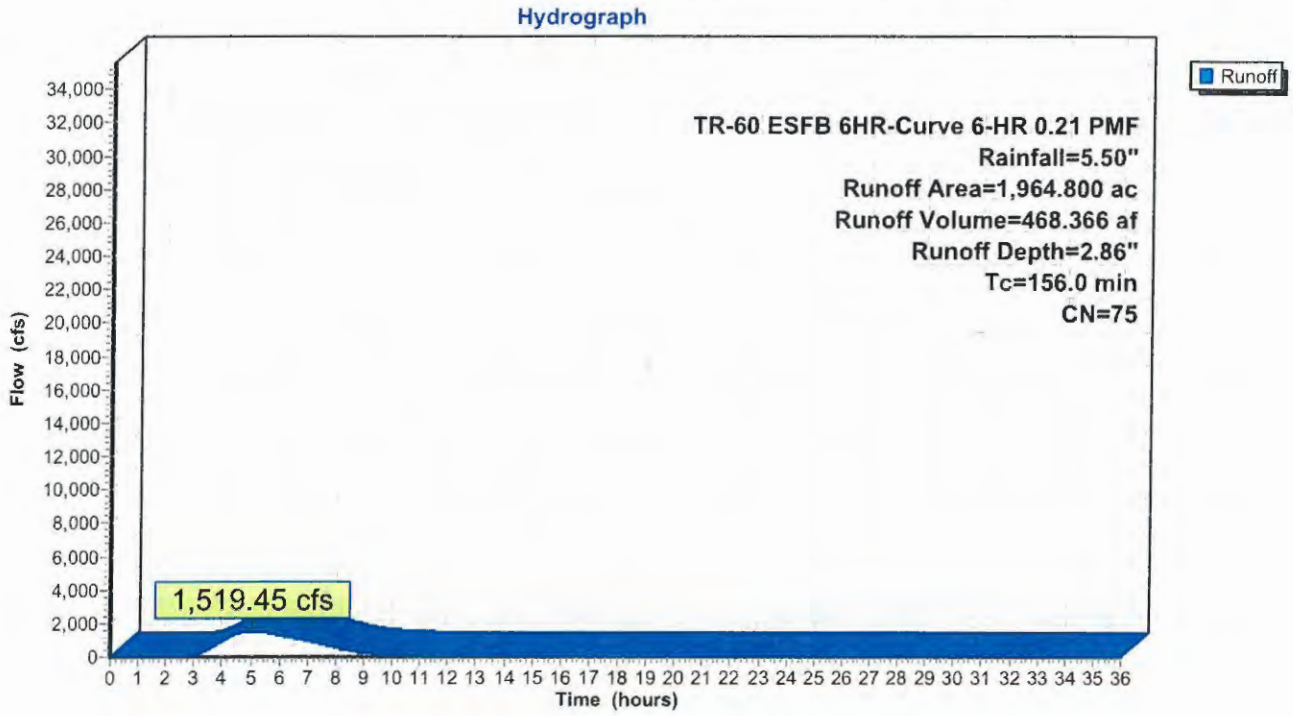
Runoff = 1,519.45 cfs @ 5.03 hrs, Volume= 468.366 af, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.21 PMF Rainfall=5.50"

Area (ac)	CN	Description
1,964.800	75	1/4 acre lots, 38% imp, HSG B
1,218.176		62.00% Pervious Area
746.624		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
156.0					**Direct Entry, HEC-1 Lag Time = 1.56hr**

Subcatchment HYD8: Sippo Lake Watershed



Summary for Subcatchment HYD9: HYD9 Watershed

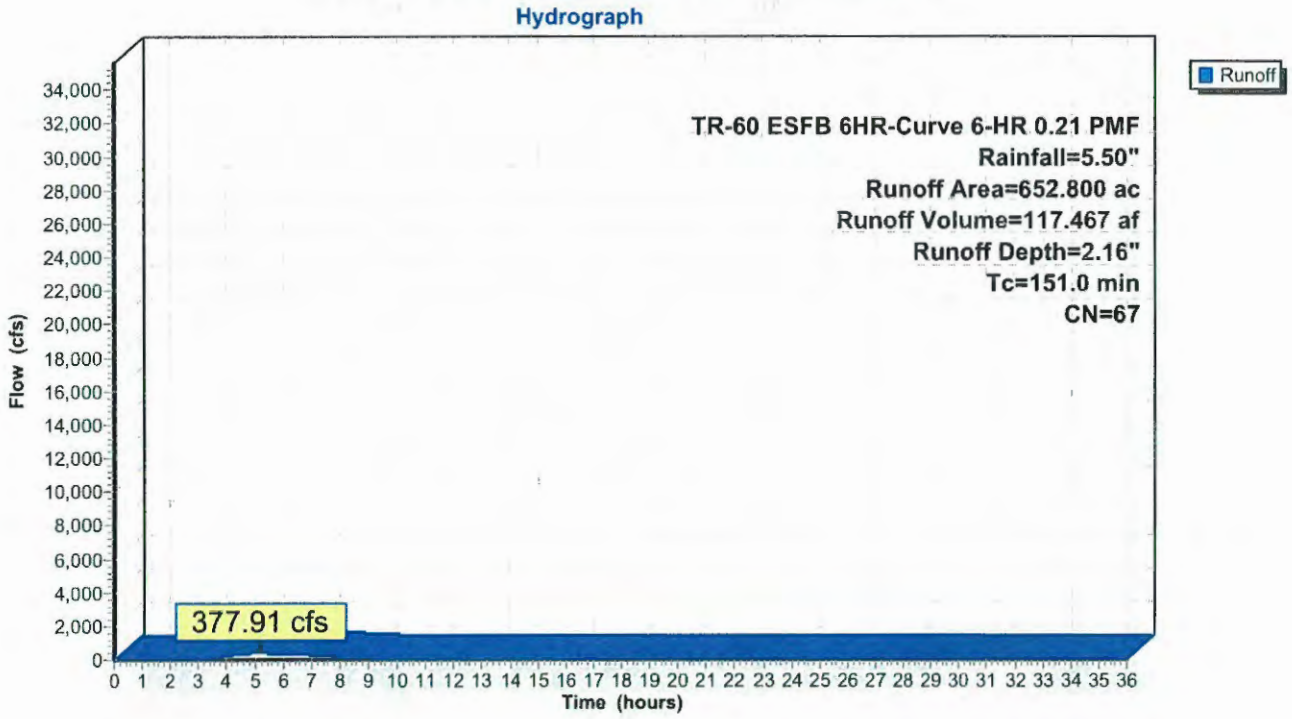
Runoff = 377.91 cfs @ 5.20 hrs, Volume= 117.467 af, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.21 PMF Rainfall=5.50"

	Area (ac)	CN	Description
*	652.800	67	
	652.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
151.0					**Direct Entry, HEC-1 Lag Time = 1.51hr**

Subcatchment HYD9: HYD9 Watershed



Summary for Reach 5R: Channel 5

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 4.02" for 6-HR 0.21 PMF event
Inflow = 312.45 cfs @ 9.60 hrs, Volume= 597.515 af
Outflow = 311.88 cfs @ 9.94 hrs, Volume= 592.286 af, Atten= 0%, Lag= 20.1 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.85 fps, Min. Travel Time= 25.1 min
Avg. Velocity = 5.15 fps, Avg. Travel Time= 28.5 min

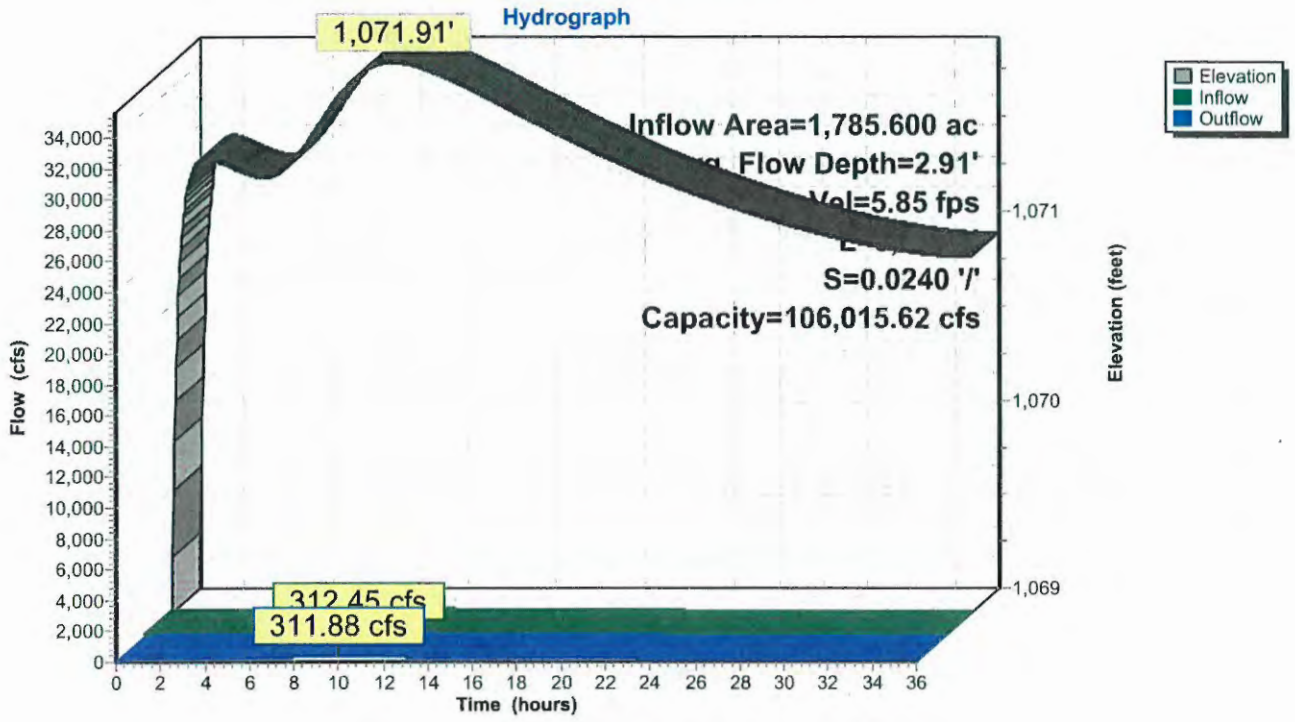
Peak Storage= 469,006 cf @ 9.94 hrs
Average Depth at Peak Storage= 2.91'
Defined Flood Depth= 16.00', Capacity at Flood Depth= 106,015.62 cfs
Bank-Full Depth= 16.00', Capacity at Bank-Full= 106,015.62 cfs

Custom cross-section, Length= 8,800.0' Slope= 0.0240 '/' (102 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,069.00', Outlet Invert= 857.80'

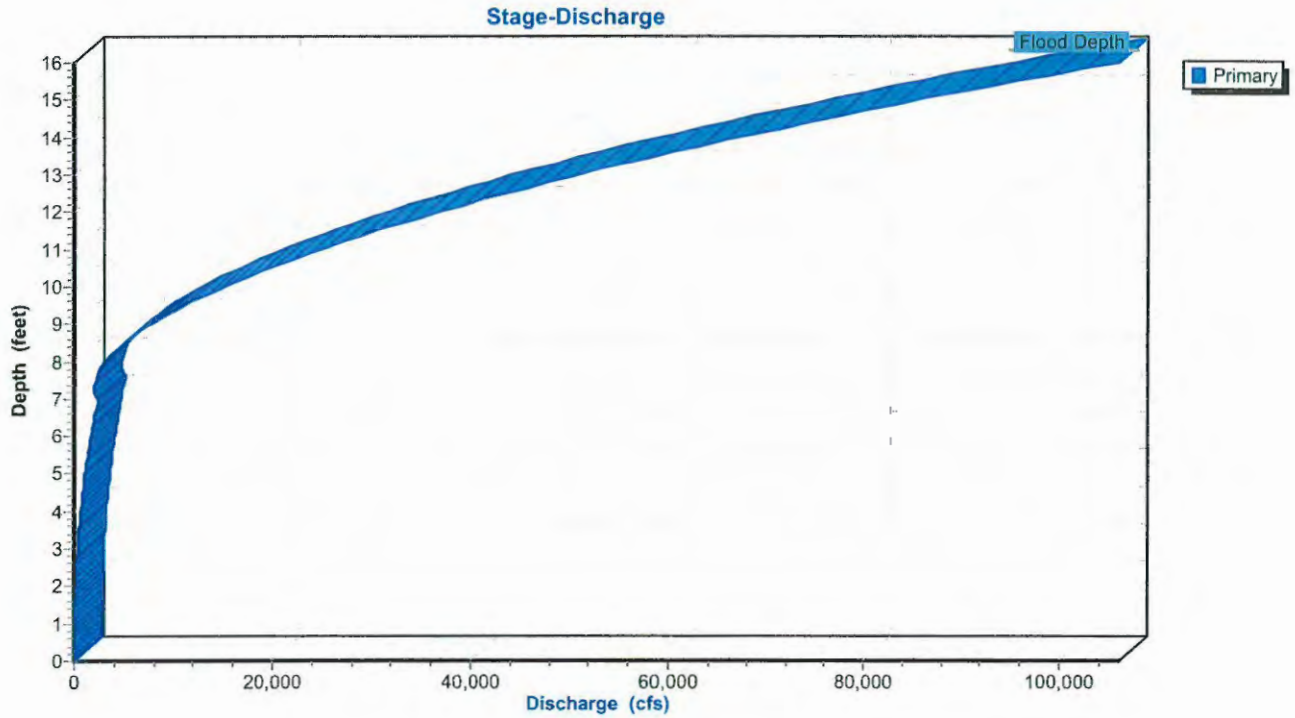
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,085.00	0.00		
200.00	1,078.00	7.00	0.060	
465.00	1,076.00	9.00	0.060	
494.00	1,069.00	16.00	0.050	
500.00	1,069.00	16.00	0.060	
530.00	1,076.00	9.00	0.060	
900.00	1,077.00	8.00	0.060	
1,000.00	1,085.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	6.0	0	0.00
7.00	248.5	66.6	2,186,800	2,476.94
8.00	564.8	569.1	4,969,800	3,087.89
9.00	1,204.8	714.2	10,601,800	7,790.91
16.00	7,198.5	1,002.1	63,346,800	106,015.62

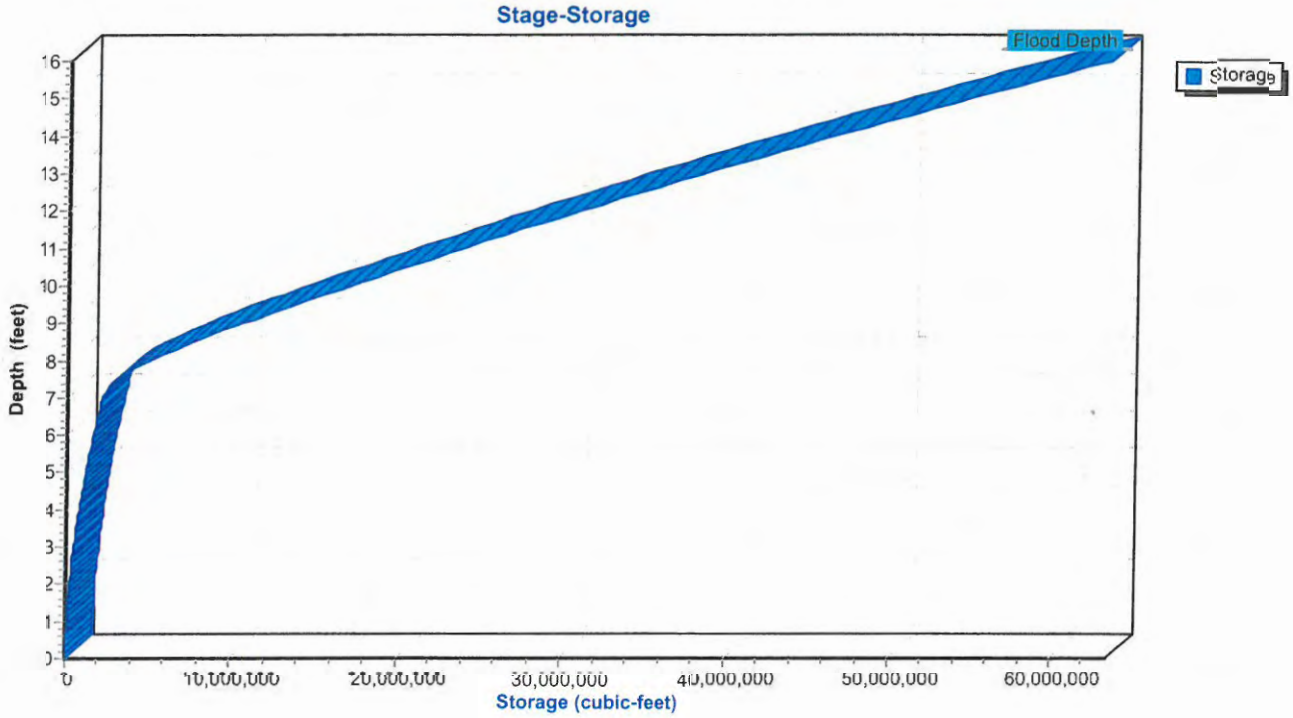
Reach 5R: Channel 5



Reach 5R: Channel 5



Reach 5R: Channel 5



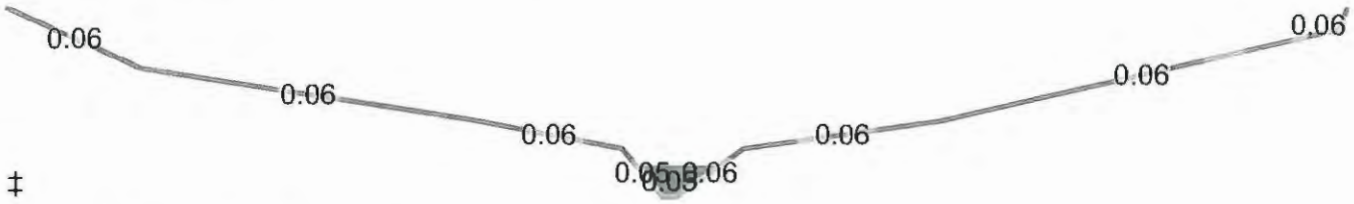
Summary for Reach 7R: Channel 7

Inflow Area = 2,860.800 ac, 23.34% Impervious, Inflow Depth > 3.33" for 6-HR 0.21 PMF event
Inflow = 896.03 cfs @ 4.71 hrs, Volume= 793.081 af
Outflow = 849.13 cfs @ 5.23 hrs, Volume= 784.598 af, Atten= 5%, Lag= 31.5 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.07 fps, Min. Travel Time= 32.1 min
Avg. Velocity = 2.22 fps, Avg. Travel Time= 44.3 min

Peak Storage= 1,635,462 cf @ 5.23 hrs
Average Depth at Peak Storage= 7.74'
Defined Flood Depth= 47.00', Capacity at Flood Depth= 195,473.52 cfs
Bank-Full Depth= 47.00', Capacity at Bank-Full= 195,473.52 cfs

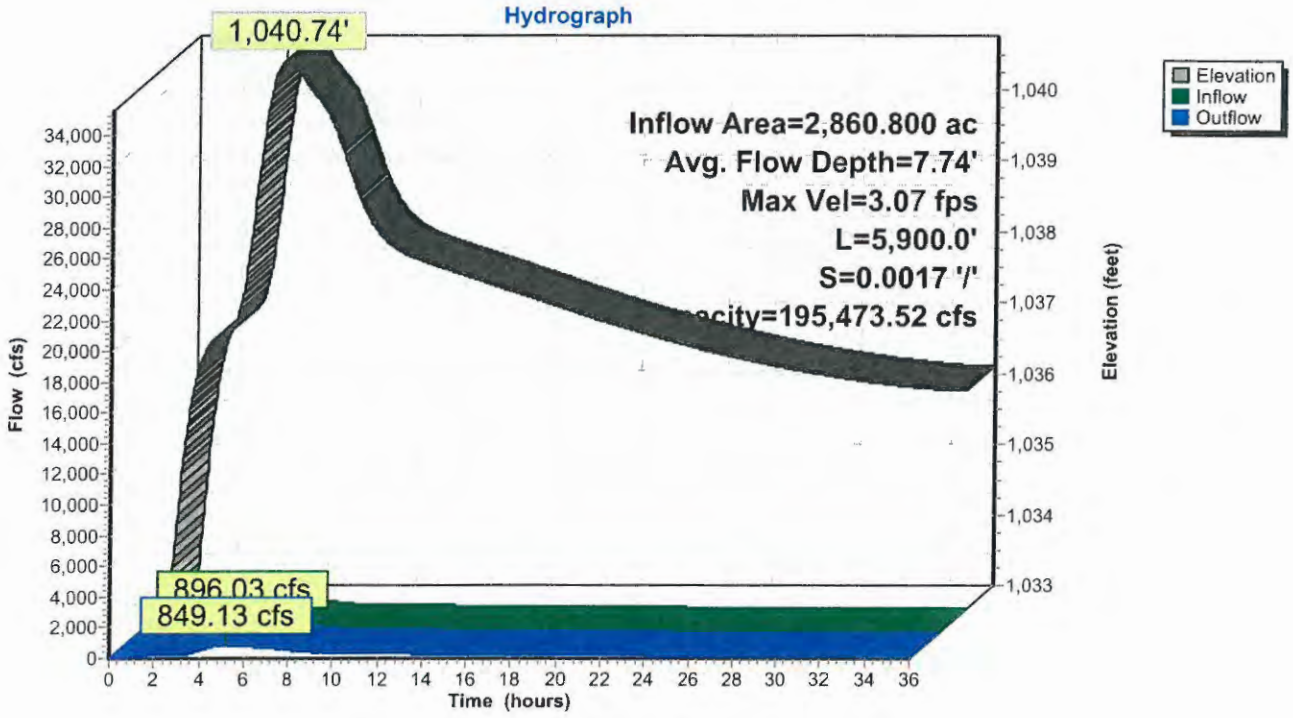
Custom cross-section, Length= 5,900.0' Slope= 0.0017 '/' (104 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,033.00', Outlet Invert= 1,022.97'



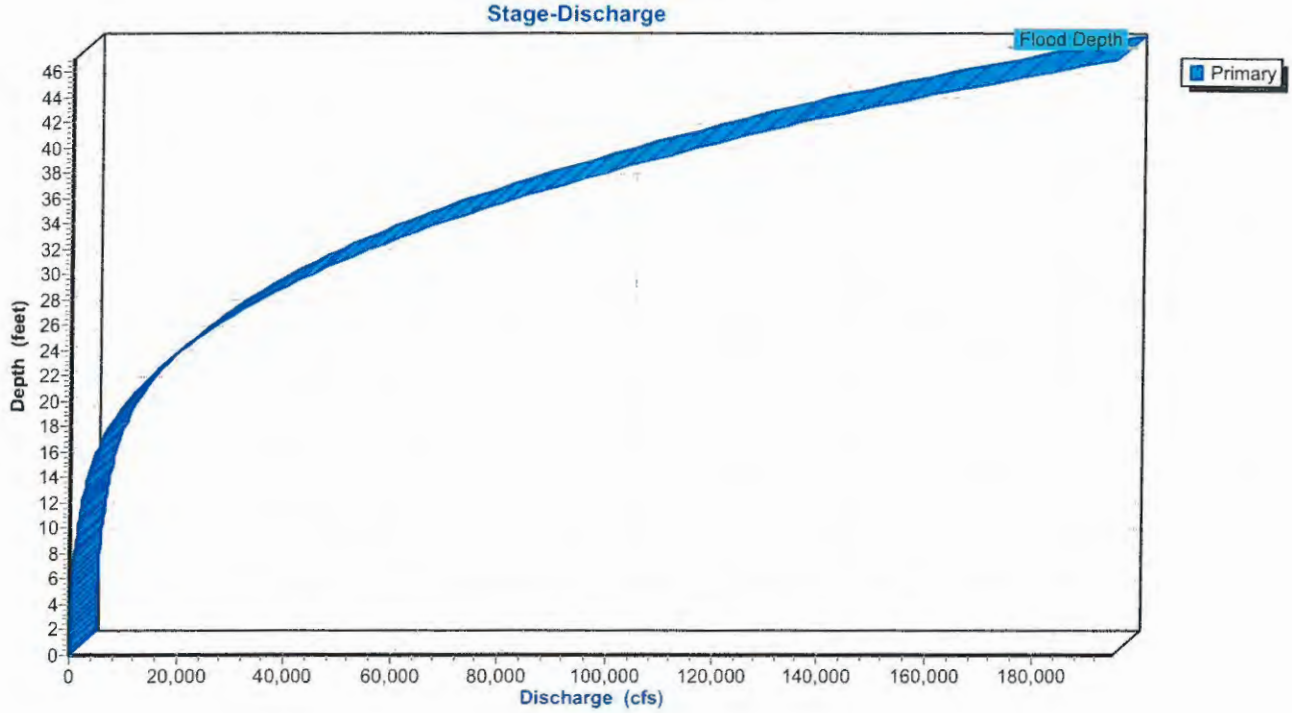
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,080.00	0.00		
100.00	1,065.00	15.00	0.060	
350.00	1,052.00	28.00	0.060	
460.00	1,045.00	35.00	0.060	
490.00	1,033.00	47.00	0.050	
500.00	1,033.00	47.00	0.050	
550.00	1,045.00	35.00	0.060	
700.00	1,052.00	28.00	0.060	
1,000.00	1,075.00	5.00	0.060	
1,005.00	1,080.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	10.0	0	0.00
12.00	600.0	93.7	3,540,000	2,349.60
19.00	2,140.0	354.1	12,626,000	8,862.05
32.00	9,417.2	774.5	55,561,326	55,339.93
42.00	18,098.3	972.7	106,780,167	135,620.34
47.00	23,027.5	1,013.5	135,862,250	195,473.52

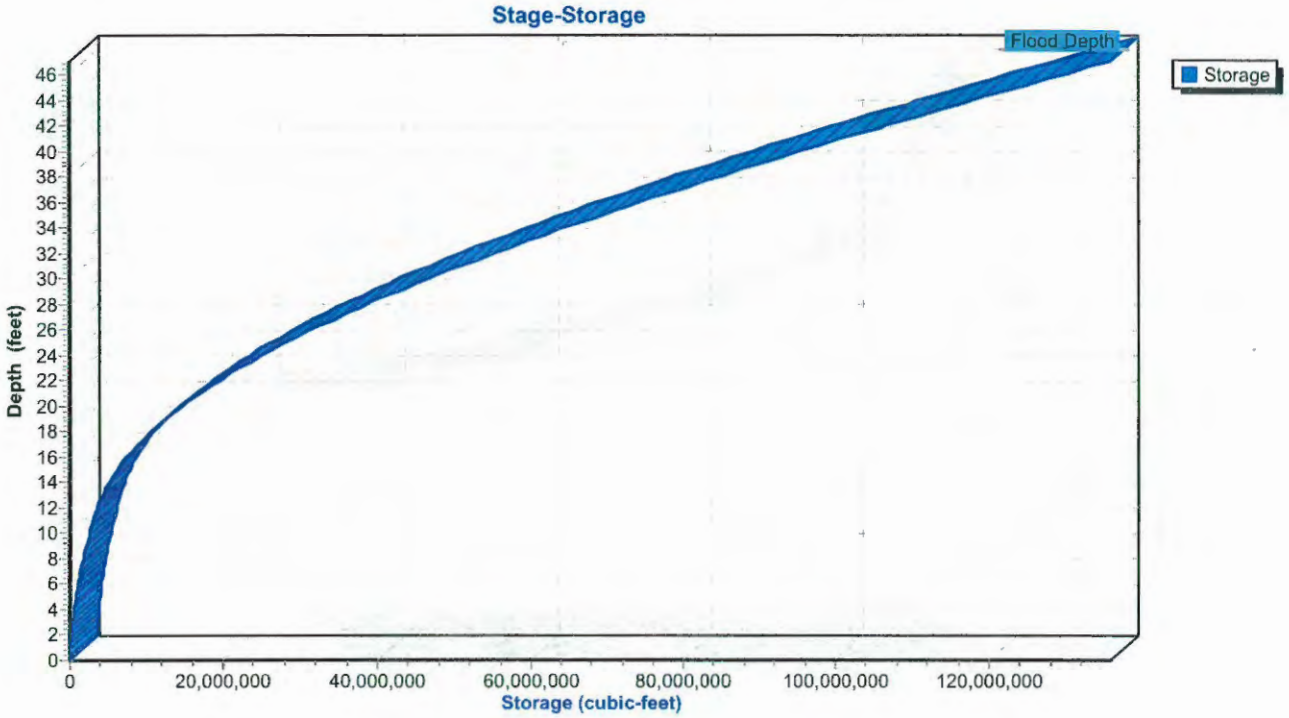
Reach 7R: Channel 7



Reach 7R: Channel 7



Reach 7R: Channel 7



Summary for Reach 10Ra: Channel 10 (Reach West of Genoa Rd)

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth > 1.67" for 6-HR 0.21 PMF event
Inflow = 122.97 cfs @ 11.58 hrs, Volume= 273.563 af
Outflow = 122.96 cfs @ 11.65 hrs, Volume= 272.839 af, Atten= 0%, Lag= 4.4 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.54 fps, Min. Travel Time= 5.9 min
Avg. Velocity = 2.41 fps, Avg. Travel Time= 6.2 min

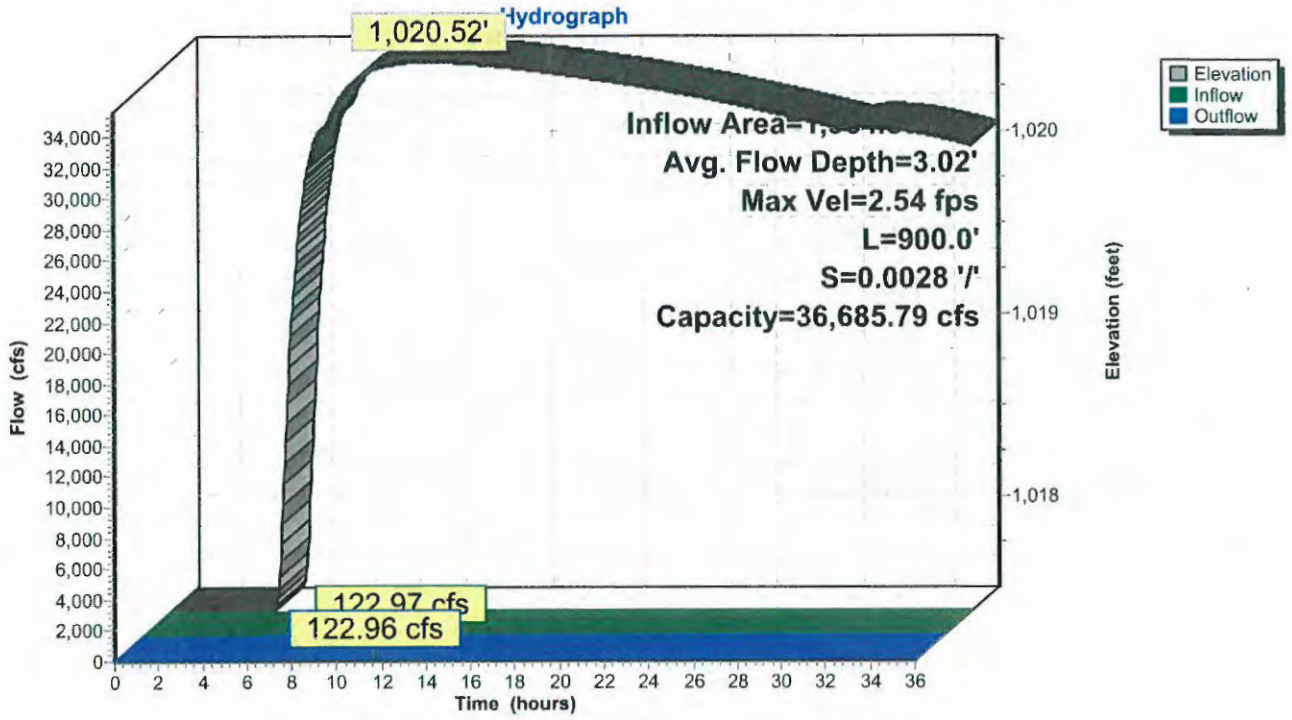
Peak Storage= 43,508 cf @ 11.65 hrs
Average Depth at Peak Storage= 3.02'
Defined Flood Depth= 15.00', Capacity at Flood Depth= 36,685.79 cfs
Bank-Full Depth= 15.00', Capacity at Bank-Full= 36,685.79 cfs

Custom cross-section, Length= 900.0' Slope= 0.0028 '/' (103 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,017.50', Outlet Invert= 1,015.00'

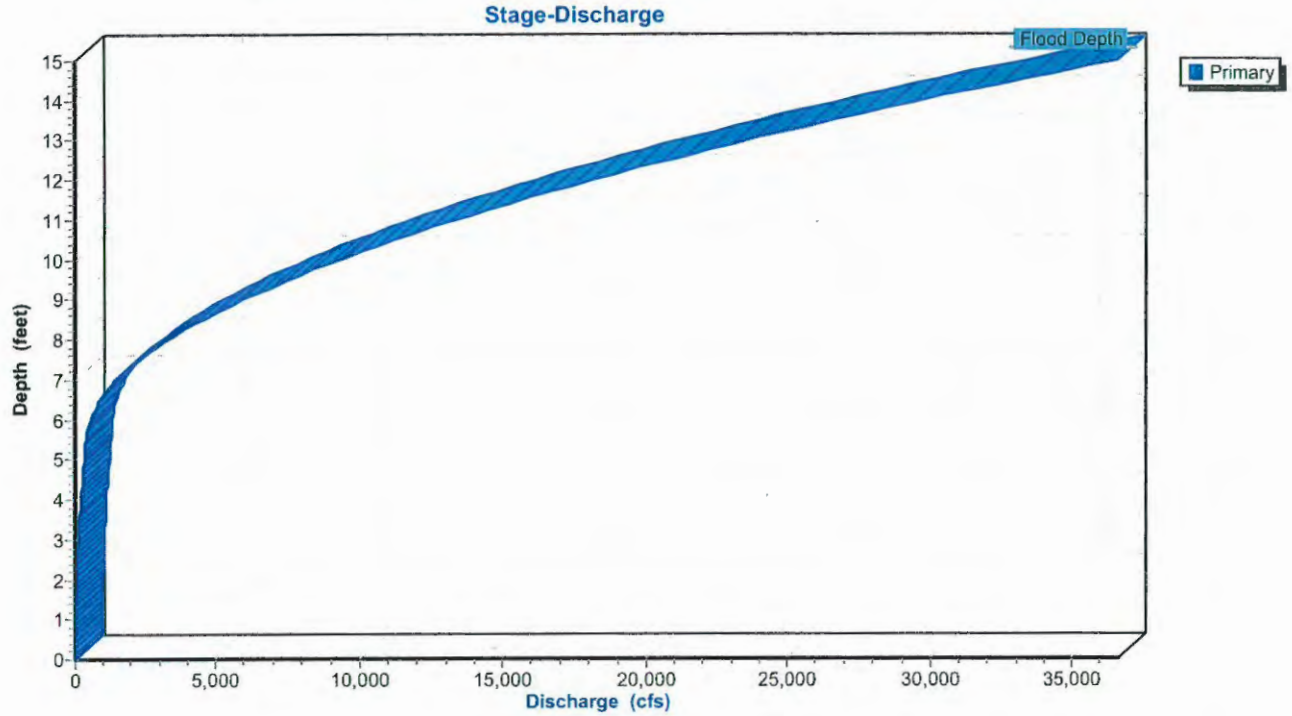
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,032.00	0.00		
190.00	1,024.00	8.00	0.060	
485.00	1,022.00	10.00	0.060	
495.00	1,017.00	15.00	0.050	
505.00	1,017.00	15.00	0.050	
515.00	1,022.00	10.00	0.060	
820.00	1,024.00	8.00	0.060	
900.00	1,027.00	5.00	0.060	
1,000.00	1,032.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	10.0	0	0.00
5.00	100.0	32.4	90,000	328.73
7.00	760.0	632.4	684,000	1,430.41
10.00	2,876.9	783.7	2,589,188	9,317.36
15.00	7,330.0	1,002.7	6,597,000	36,685.79

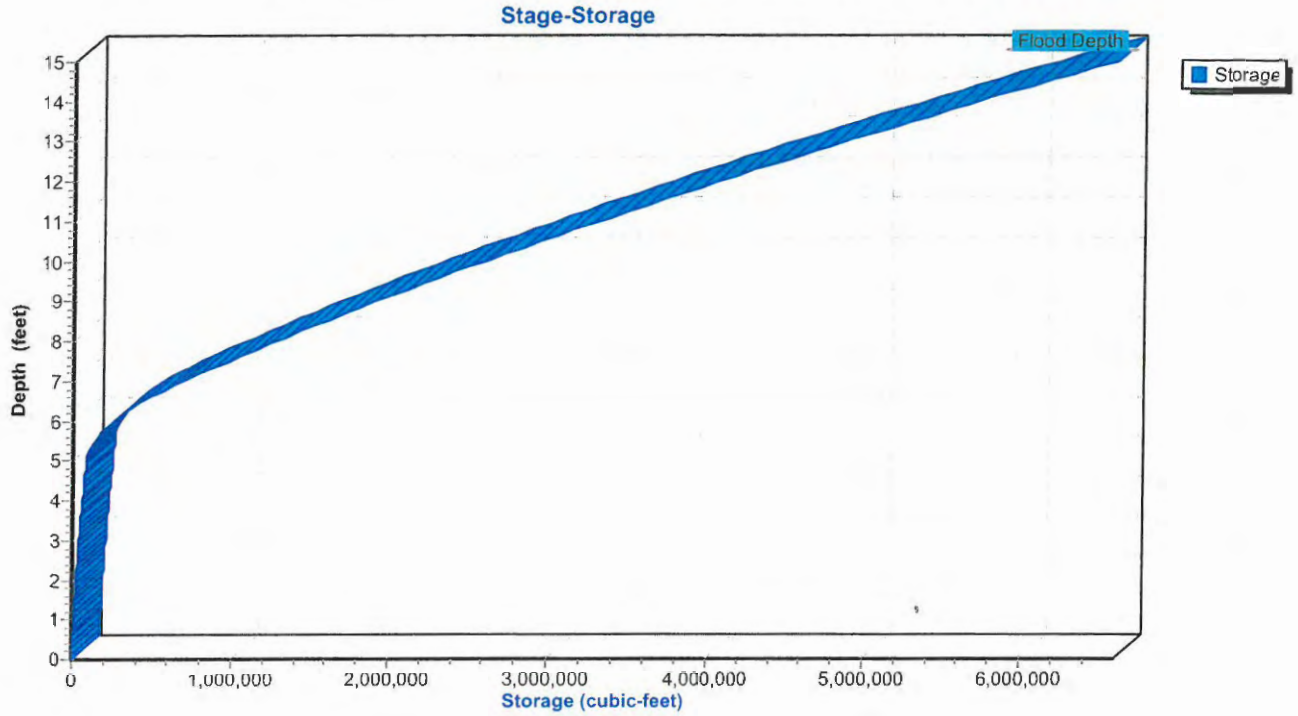
Reach 10Ra: Channel 10 (Reach West of Genoa Rd)



Reach 10Ra: Channel 10 (Reach West of Genoa Rd)



Reach 10Ra: Channel 10 (Reach West of Genoa Rd)



Summary for Reach 15R: Channel 15

Inflow Area = 7,321.600 ac, 19.32% Impervious, Inflow Depth > 2.49" for 6-HR 0.21 PMF event
Inflow = 2,357.23 cfs @ 5.19 hrs, Volume= 1,520.997 af
Outflow = 2,002.22 cfs @ 6.40 hrs, Volume= 1,490.151 af, Atten= 15%, Lag= 73.1 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.09 fps, Min. Travel Time= 70.1 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 98.1 min

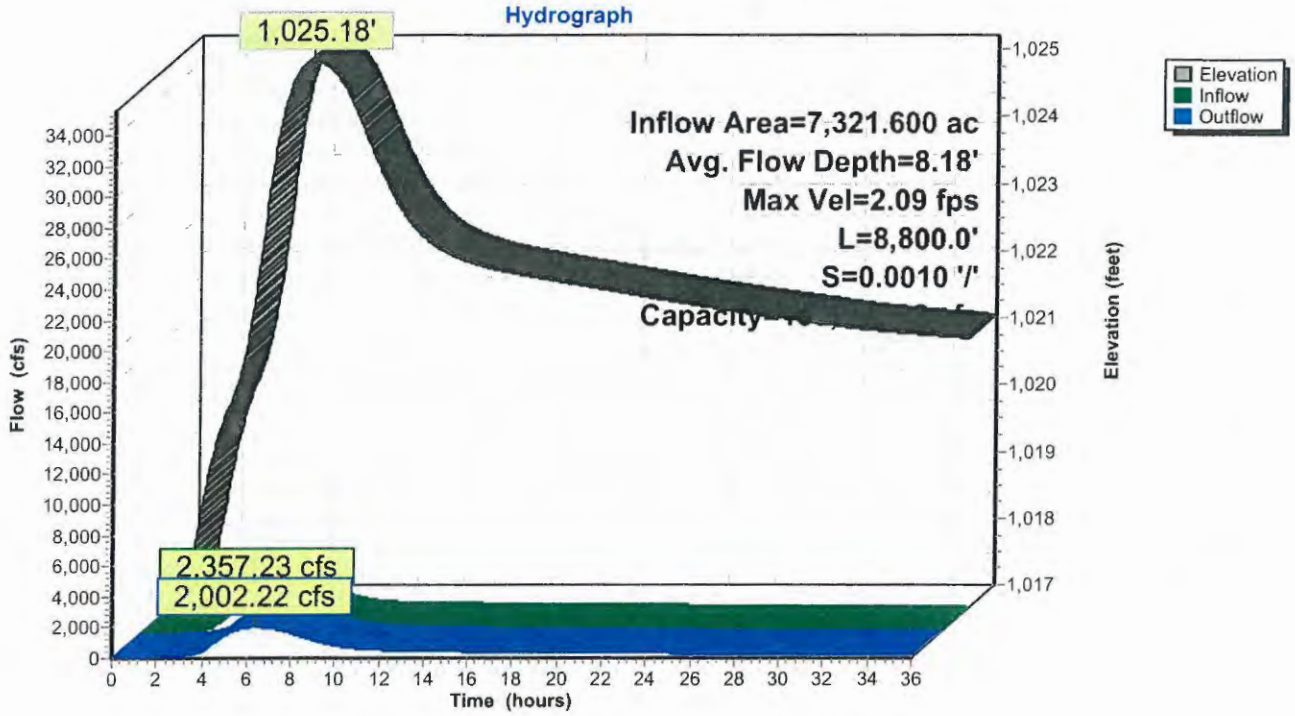
Peak Storage= 8,421,268 cf @ 6.40 hrs
Average Depth at Peak Storage= 8.18'
Defined Flood Depth= 43.00', Capacity at Flood Depth= 189,892.92 cfs
Bank-Full Depth= 43.00', Capacity at Bank-Full= 189,892.92 cfs

Custom cross-section, Length= 8,800.0' Slope= 0.0010 '/' (106 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,017.00', Outlet Invert= 1,008.20'

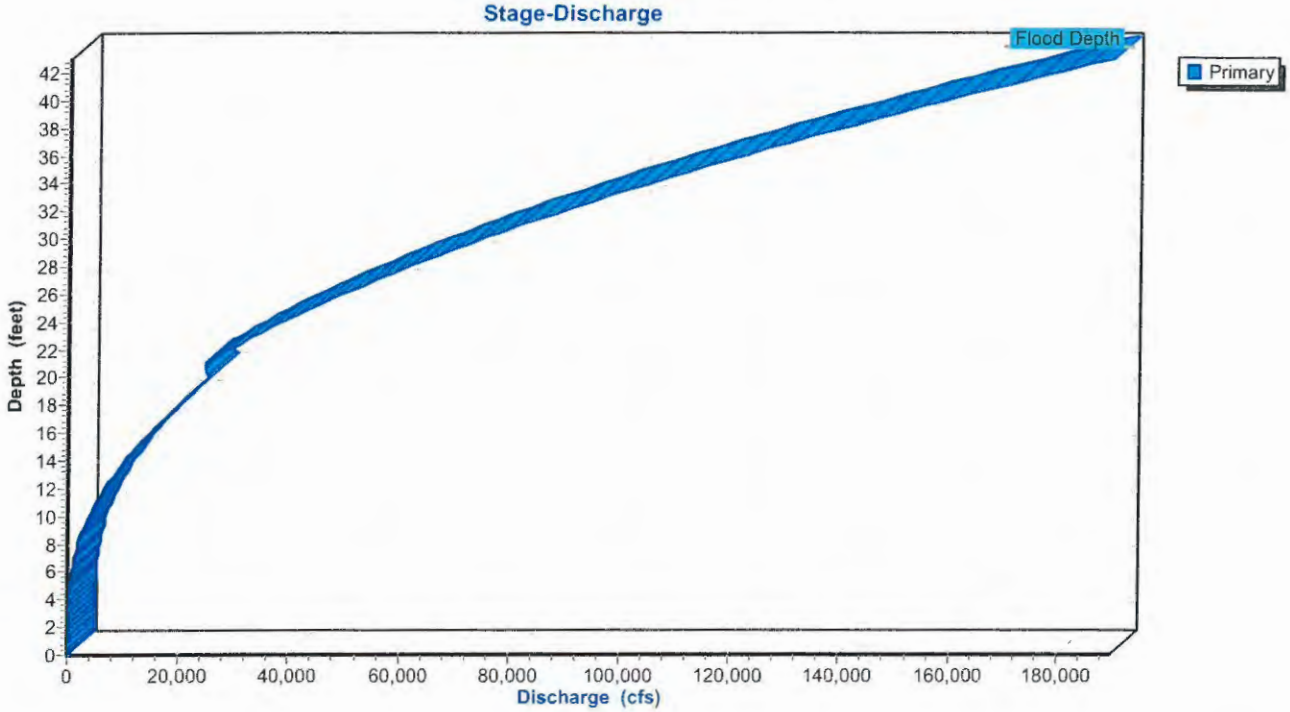
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,060.00	0.00		
300.00	1,026.00	34.00	0.060	
470.00	1,023.00	37.00	0.060	
493.00	1,017.00	43.00	0.050	
507.00	1,017.00	43.00	0.050	
520.00	1,020.00	40.00	0.060	
630.00	1,022.00	38.00	0.060	
750.00	1,037.00	23.00	0.060	
1,000.00	1,038.00	22.00	0.060	
1,010.00	1,060.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	14.0	0	0.00
3.00	78.8	39.2	693,000	116.39
5.00	273.4	157.2	2,406,067	396.99
6.00	435.5	169.2	3,832,400	733.92
9.00	1,230.5	363.4	10,828,400	2,703.81
20.00	6,230.3	549.8	54,826,847	25,737.78
21.00	6,906.8	808.7	60,779,788	24,784.16
43.00	26,881.5	1,028.2	236,557,200	189,892.92

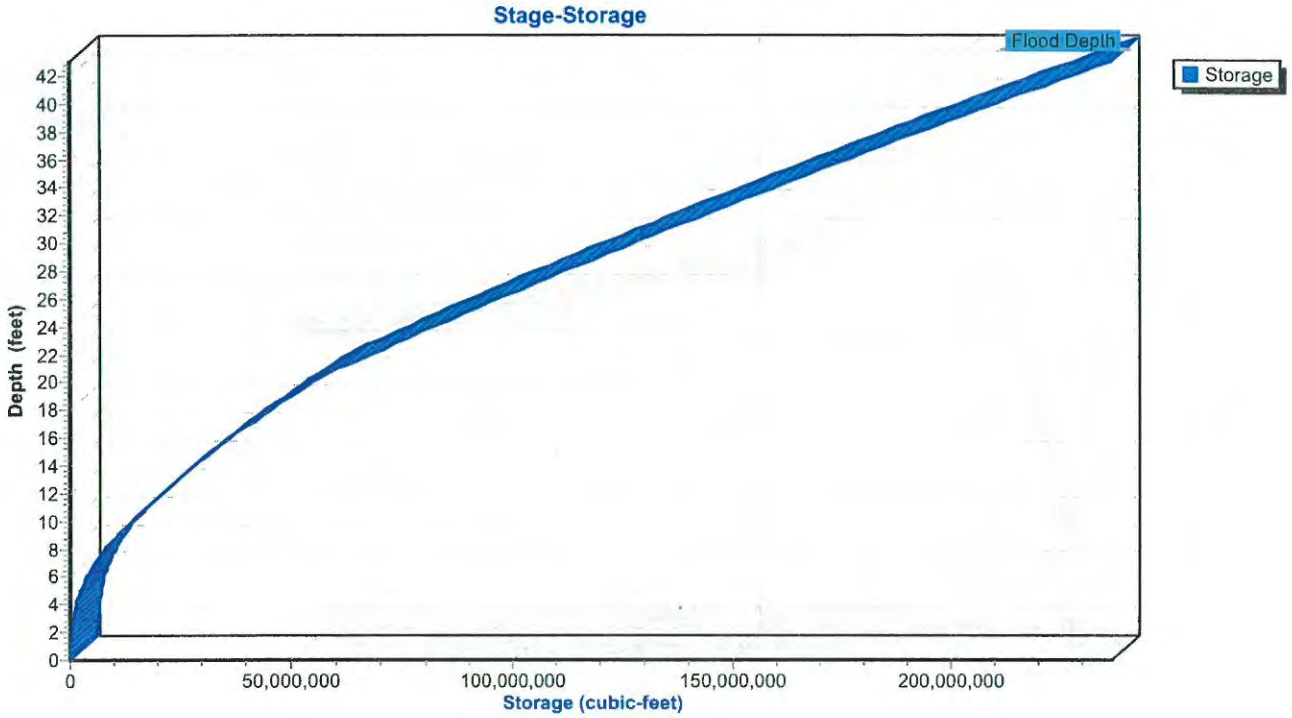
Reach 15R: Channel 15



Reach 15R: Channel 15



Reach 15R: Channel 15



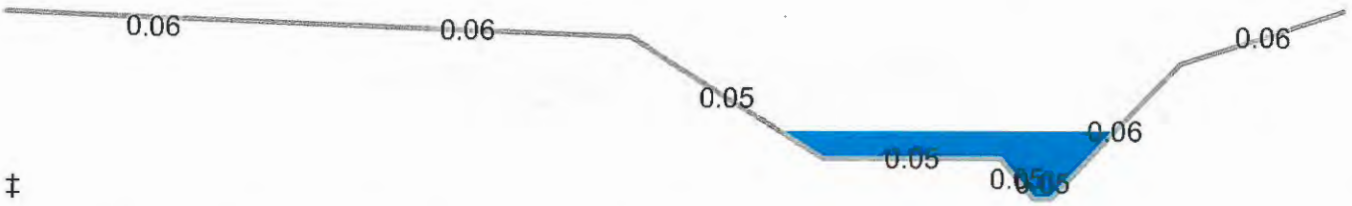
Summary for Reach 16R: Channel 16

Inflow Area = 8,780.800 ac, 19.29% Impervious, Inflow Depth > 2.50" for 6-HR 0.21 PMF event
Inflow = 2,686.65 cfs @ 6.07 hrs, Volume= 1,832.129 af
Outflow = 2,605.14 cfs @ 6.56 hrs, Volume= 1,810.509 af, Atten= 3%, Lag= 29.7 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.49 fps, Min. Travel Time= 50.1 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 84.4 min

Peak Storage= 7,839,074 cf @ 6.56 hrs
Average Depth at Peak Storage= 10.06'
Defined Flood Depth= 28.00', Capacity at Flood Depth= 42,389.29 cfs
Bank-Full Depth= 28.00', Capacity at Bank-Full= 42,389.29 cfs

Custom cross-section, Length= 7,500.0' Slope= 0.0010 '/' (104 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,006.00', Outlet Invert= 998.50'

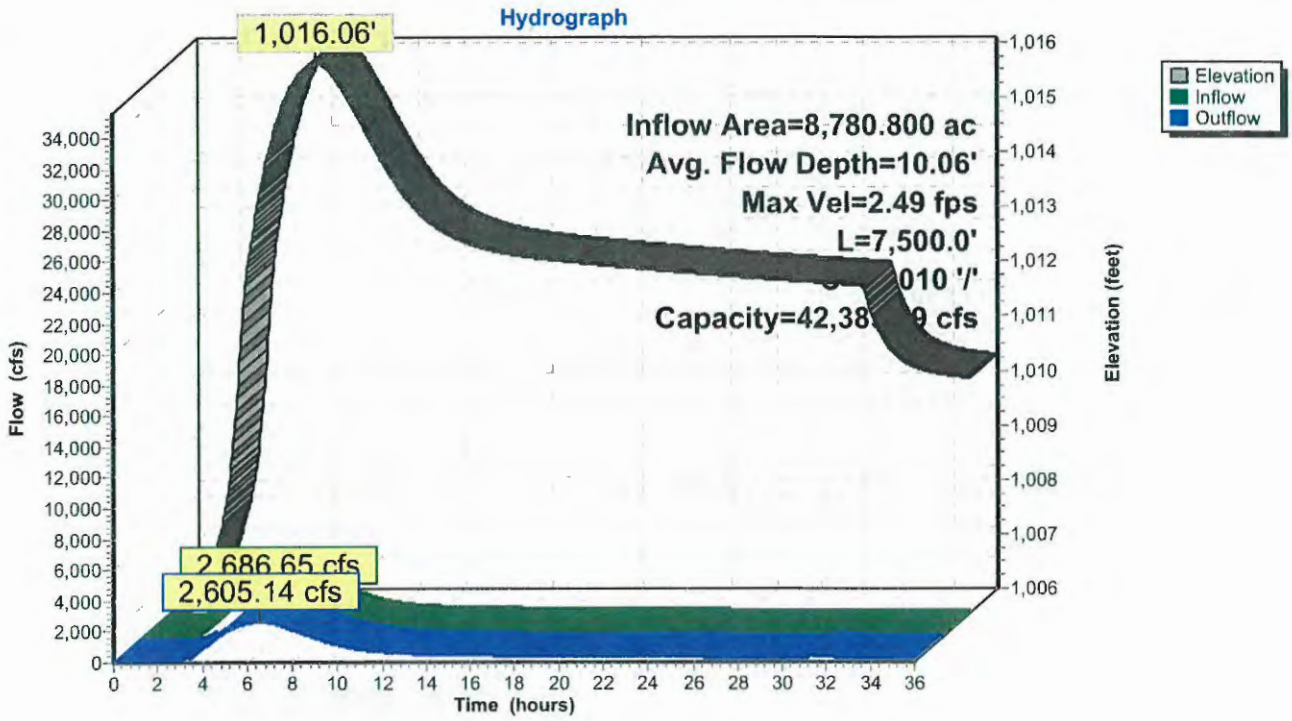


‡

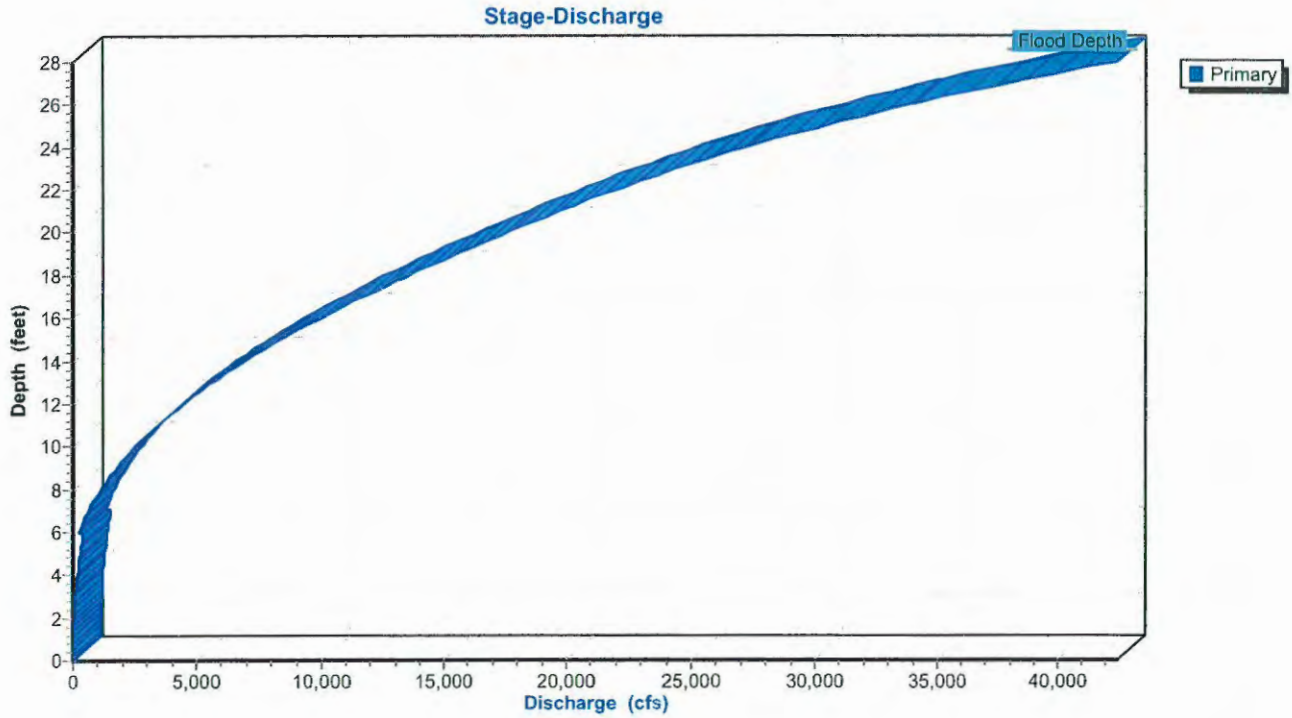
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,034.00	0.00		
200.00	1,032.00	2.00	0.060	
420.00	1,030.00	4.00	0.060	
550.00	1,012.00	22.00	0.050	
670.00	1,012.00	22.00	0.050	
693.00	1,006.00	28.00	0.050	
705.00	1,006.00	28.00	0.050	
790.00	1,026.00	8.00	0.060	
900.00	1,034.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	12.0	0	0.00
6.00	217.5	182.0	1,631,250	246.41
20.00	3,868.8	345.2	29,015,833	17,663.27
24.00	5,401.0	429.5	40,507,500	27,141.14
26.00	6,498.5	677.1	48,738,750	33,993.67
28.00	8,071.0	904.6	60,532,500	42,389.29

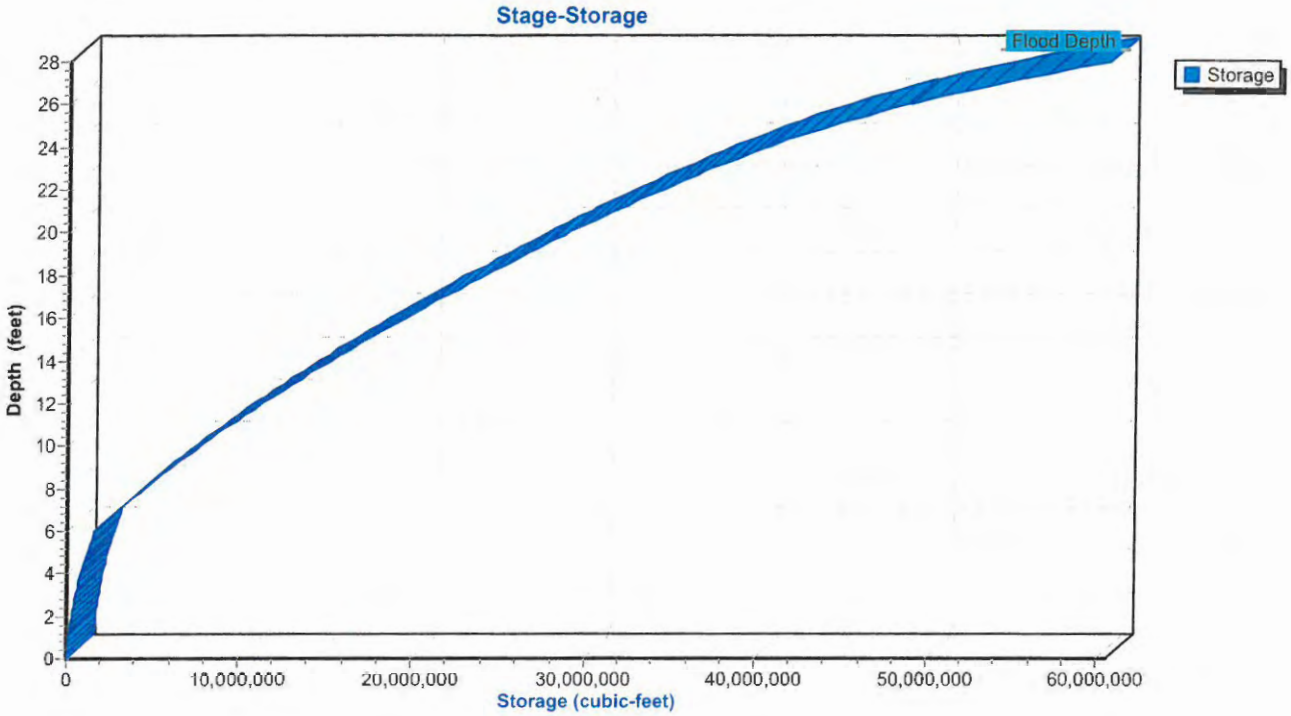
Reach 16R: Channel 16



Reach 16R: Channel 16



Reach 16R: Channel 16



Summary for Reach 18R: Sippo Creek Channel Downstream of Lincoln Way

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 2.52" for 6-HR 0.21 PMF event
Inflow = 2,680.30 cfs @ 7.22 hrs, Volume= 1,986.915 af
Outflow = 2,680.30 cfs @ 7.23 hrs, Volume= 1,986.796 af, Atten= 0%, Lag= 0.7 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.49 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 8.52 fps, Avg. Travel Time= 0.9 min

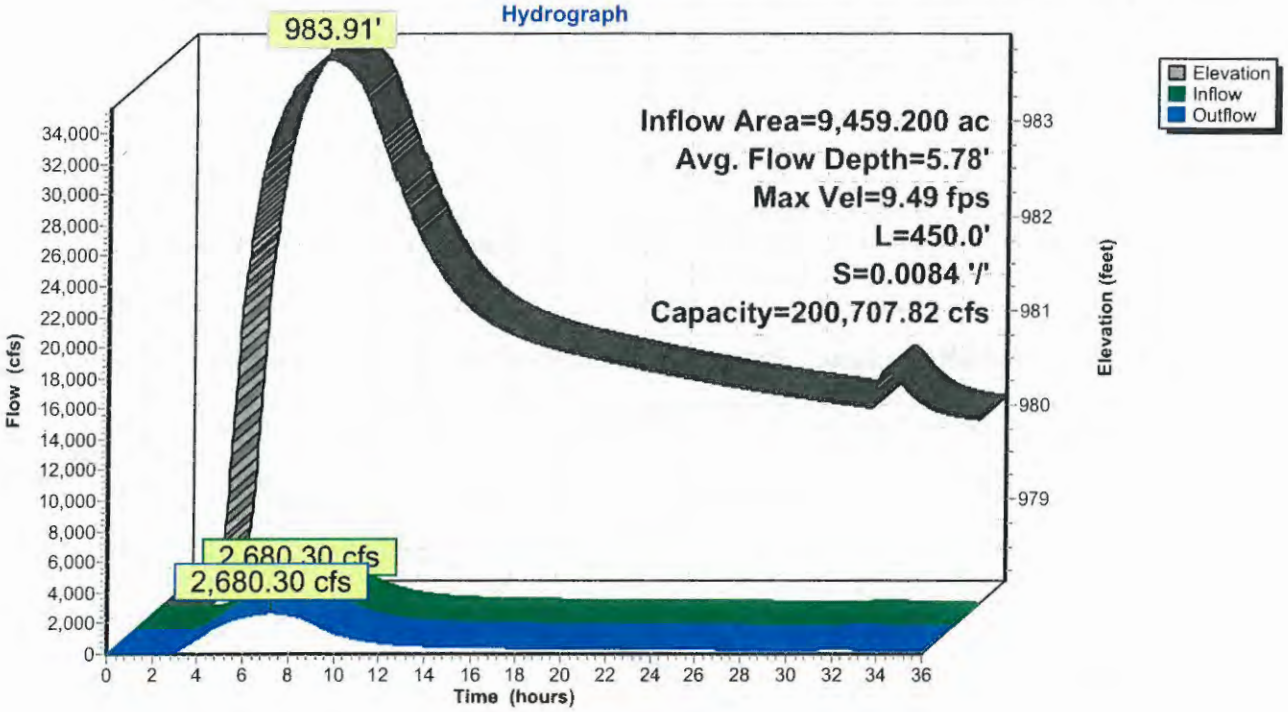
Peak Storage= 127,109 cf @ 7.23 hrs
Average Depth at Peak Storage= 5.78'
Defined Flood Depth= 15.00', Capacity at Flood Depth= 28,360.41 cfs
Bank-Full Depth= 40.50', Capacity at Bank-Full= 200,707.82 cfs

Custom cross-section, Length= 450.0' Slope= 0.0084 '/' (1006 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 978.13', Outlet Invert= 974.35'

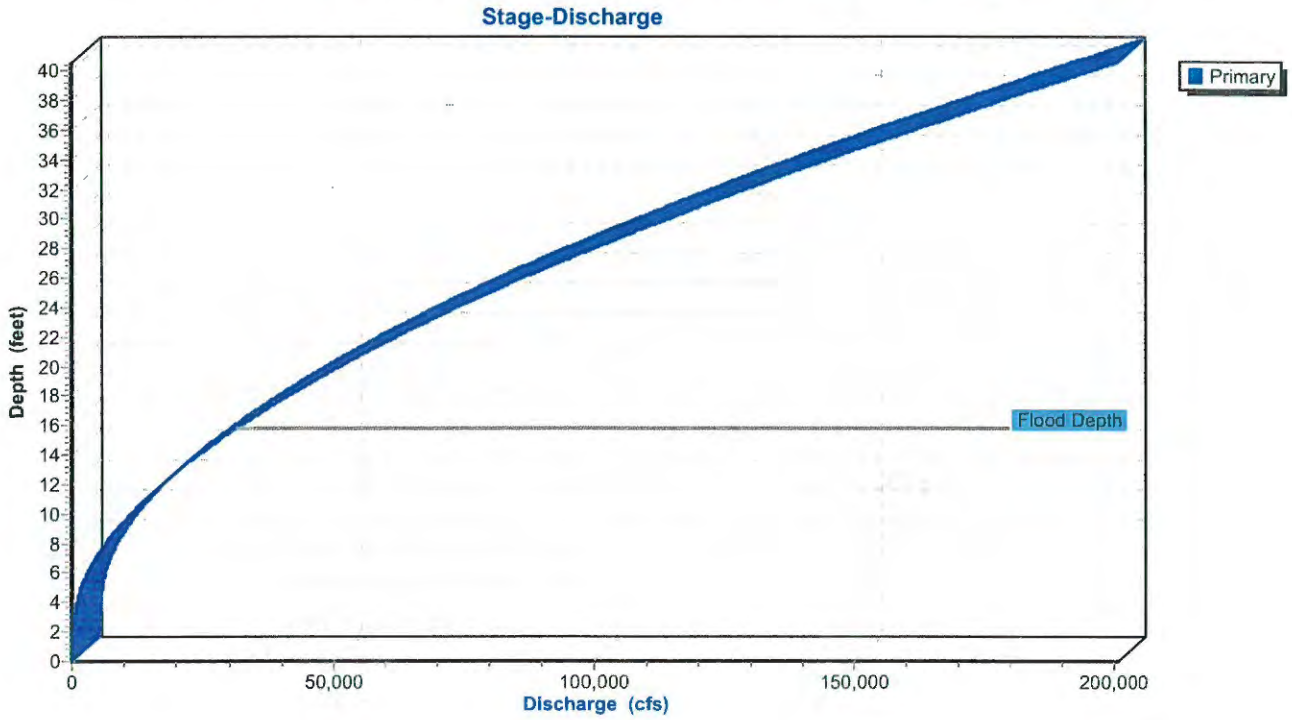
Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,012.00	0.00		
20.00	1,008.00	4.00	0.100	Heavy timber, flow below branches
51.00	980.00	32.00	0.100	Heavy timber, flow below branches
74.00	978.00	34.00	0.100	Heavy timber, flow below branches
121.00	976.00	36.00	0.100	Heavy timber, flow below branches
173.00	974.00	38.00	0.030	Short grass
175.00	972.00	40.00	0.030	Short grass
176.00	971.50	40.50	0.025	Stream, clean & straight
187.00	971.50	40.50	0.025	Stream, clean & straight
188.00	972.00	40.00	0.025	Stream, clean & straight
194.00	974.00	38.00	0.030	Short grass
206.00	976.00	36.00	0.100	Heavy timber, flow below branches
225.50	978.00	34.00	0.100	Heavy timber, flow below branches
229.50	980.00	32.00	0.100	Heavy timber, flow below branches
248.00	990.00	22.00	0.100	Heavy timber, flow below branches
265.00	1,000.00	12.00	0.100	Heavy timber, flow below branches
289.00	1,012.00	0.00	0.100	Heavy timber, flow below branches

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	11.0	0	0.00
0.50	6.0	13.2	2,700	19.29
2.50	40.0	22.4	18,000	347.53
4.50	146.0	86.6	65,701	1,300.01
6.50	382.5	153.2	172,125	3,703.14
8.50	712.5	180.8	320,625	7,536.06
18.50	2,645.4	216.7	1,190,411	44,005.23
28.50	4,866.4	251.4	2,189,893	103,800.74
36.50	6,855.0	281.2	3,084,750	166,501.22
40.50	7,955.0	310.6	3,579,750	200,707.82

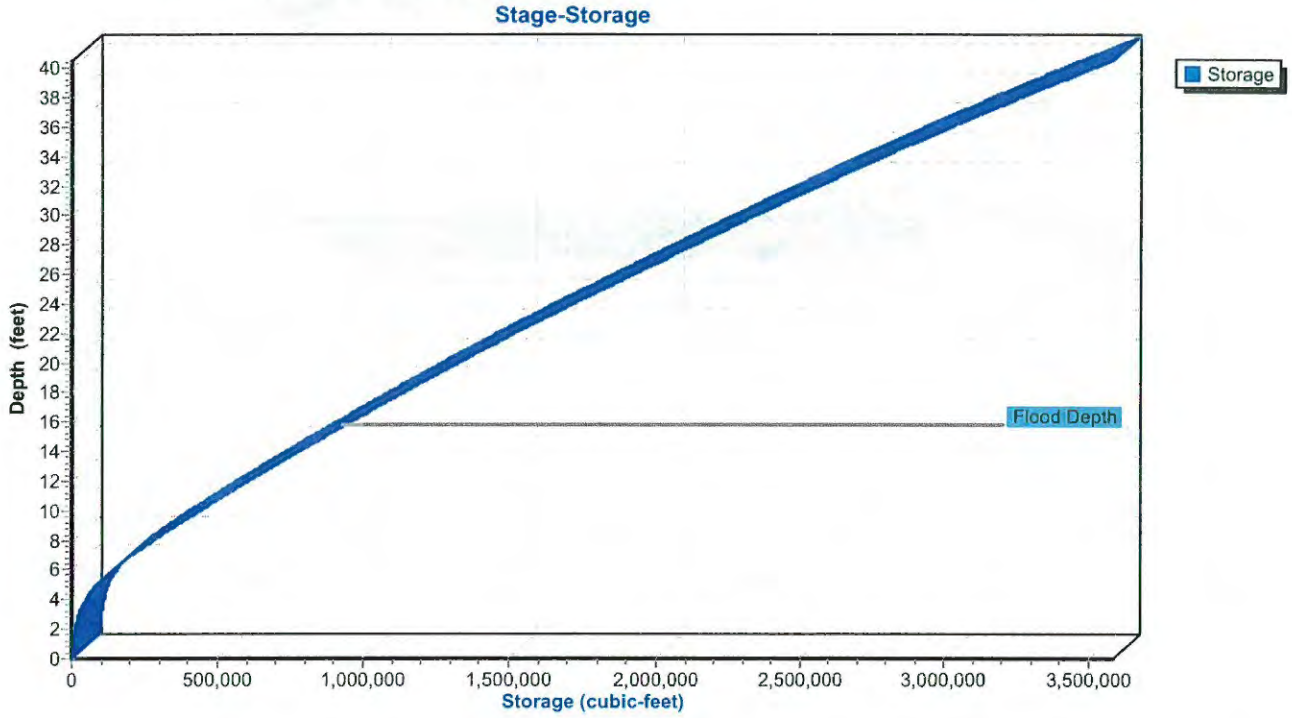
Reach 18R: Sippo Creek Channel Downstream of Lincoln Way



Reach 18R: Sippo Creek Channel Downstream of Lincoln Way



Reach 18R: Sippo Creek Channel Downstream of Lincoln Way

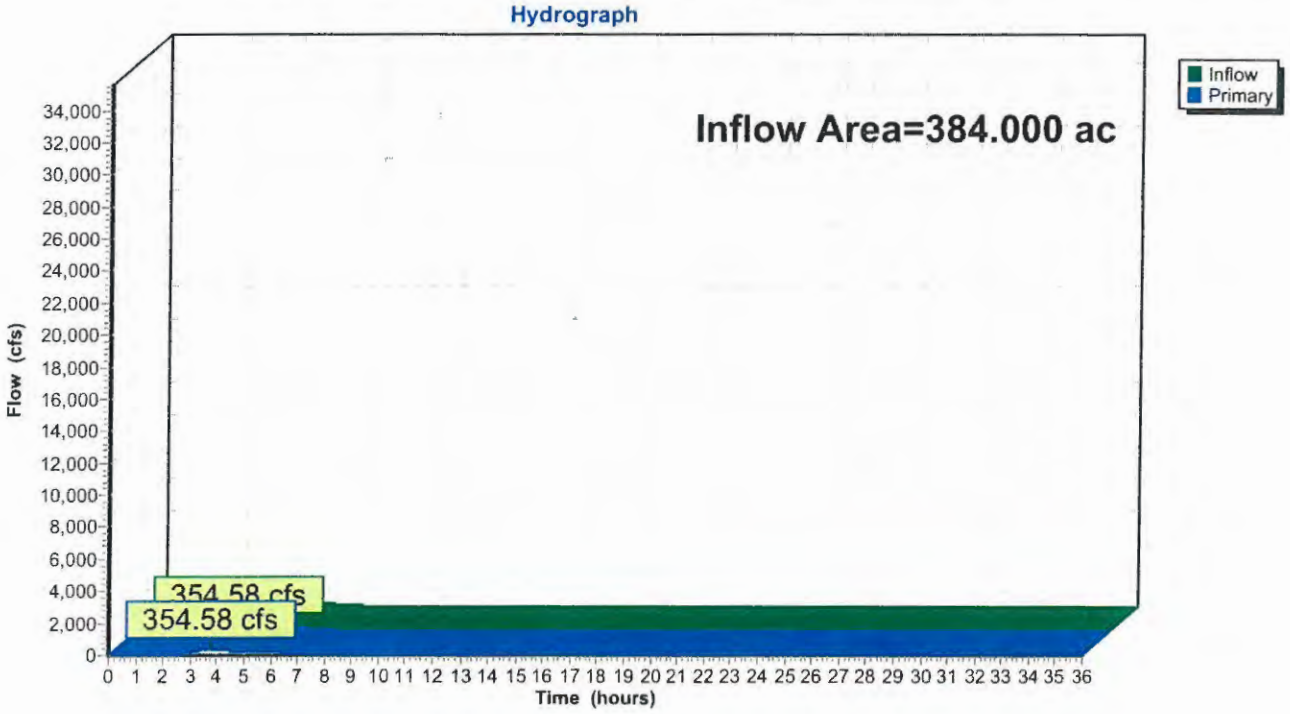


Summary for Pond 1C: CONF 1 Combined O'Springs and Eric

Inflow Area = 384.000 ac, 26.60% Impervious, Inflow Depth > 2.83" for 6-HR 0.21 PMF event
Inflow = 354.58 cfs @ 3.76 hrs, Volume= 90.553 af
Primary = 354.58 cfs @ 3.77 hrs, Volume= 90.553 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 1C: CONF 1 Combined O'Springs and Eric



Summary for Pond 1P: Sippo Creek Reservoir - Existing Conditions

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 2.54" for 6-HR 0.21 PMF event
Inflow = 2,906.45 cfs @ 6.38 hrs, Volume= 1,998.588 af
Outflow = 2,896.41 cfs @ 6.54 hrs, Volume= 1,987.921 af, Atten= 0%, Lag= 9.4 min
Primary = 2,085.96 cfs @ 6.54 hrs, Volume= 1,753.004 af
Secondary = 810.45 cfs @ 6.54 hrs, Volume= 234.917 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,001.64' Surf.Area= 7.050 ac Storage= 60.962 af
Peak Elev= 1,007.05' @ 6.54 hrs Surf.Area= 18.874 ac Storage= 124.055 af (63.093 af above start)
Flood Elev= 1,005.00' Surf.Area= 12.657 ac Storage= 91.431 af (30.469 af above start)

Plug-Flow detention time= 80.8 min calculated for 1,926.424 af (96% of inflow)
Center-of-Mass det. time= 15.0 min (739.6 - 724.6)

Volume	Invert	Avail.Storage	Storage Description
#1	985.00'	1,292.544 af	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
985.00	0.500	500.0	0.000	0.000	0.500
990.00	3.000	1,000.0	7.875	7.875	1.873
998.00	4.870	2,500.0	31.179	39.054	11.469
1,000.00	6.204	3,251.0	11.047	50.101	19.360
1,002.00	7.243	5,147.0	13.434	63.535	48.449
1,004.00	9.610	10,274.0	16.797	80.332	192.887
1,006.00	16.124	11,202.9	25.455	105.787	229.335
1,008.00	21.577	15,736.9	37.569	143.356	452.477
1,010.00	29.674	20,301.4	51.036	194.392	752.988
1,012.00	39.539	22,845.5	68.977	263.369	953.524
1,014.00	68.669	34,370.5	106.876	370.246	2,158.174
1,025.00	100.000	50,000.0	922.298	1,292.544	4,567.204

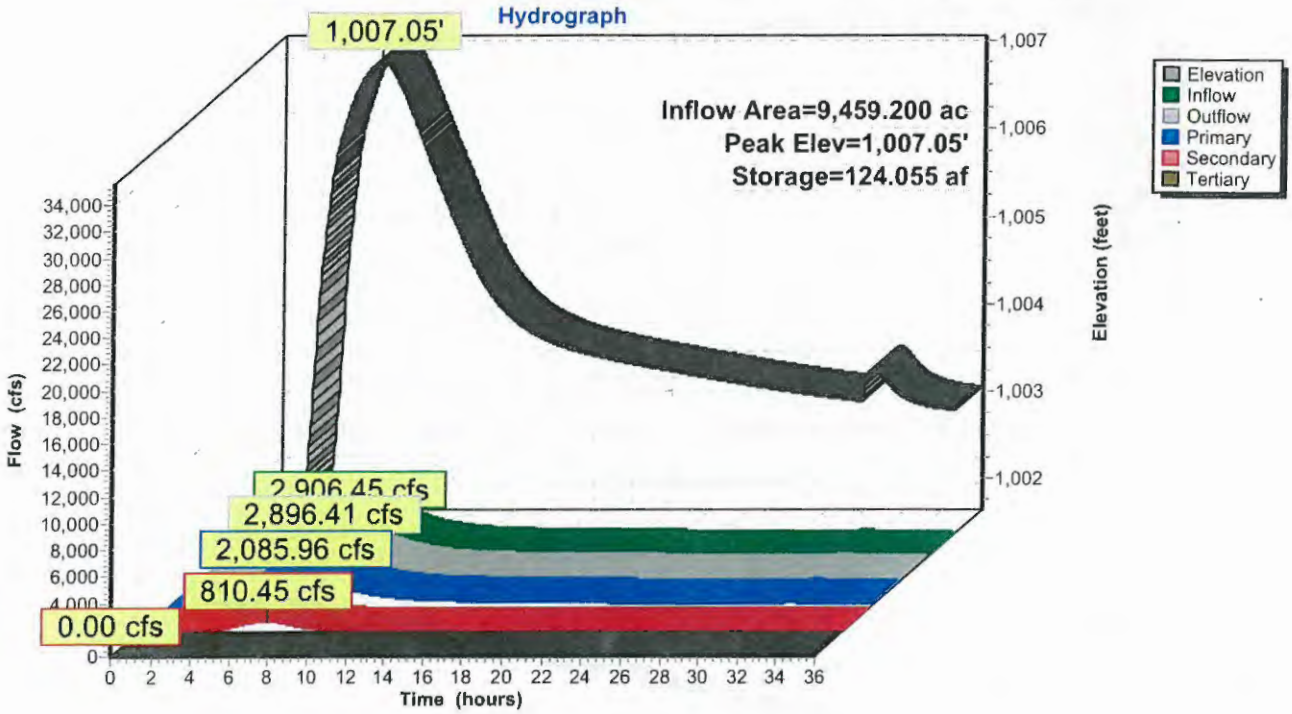
Device	Routing	Invert	Outlet Devices
#1	Primary	1,001.64'	**50.0' long x 2.9' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.45 2.58 2.66 2.66 2.65 2.64 2.65 2.69 2.69 2.73 2.83 2.95 3.01 3.12 3.32
#2	Secondary	1,005.00'	**Right Embankment Weir - Building side, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 1.60 20.00 Width (feet) 17.00 23.00 77.00 77.00
#3	Secondary	1,004.20'	**Left Embankment Weir - Playground side, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 1.80 3.80 5.80 15.80 Width (feet) 10.00 22.00 45.00 130.00 180.00 205.00
#4	Tertiary	1,008.00'	**Weir Flow around Bldg. X 0.50, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 2.00 4.00 6.00 8.00 10.00 12.00 Width (feet) 50.00 90.00 122.00 166.00 240.00 334.00 420.00

Primary OutFlow Max=2,085.95 cfs @ 6.54 hrs HW=1,007.05' TW=998.40' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 2,085.95 cfs @ 7.72 fps)

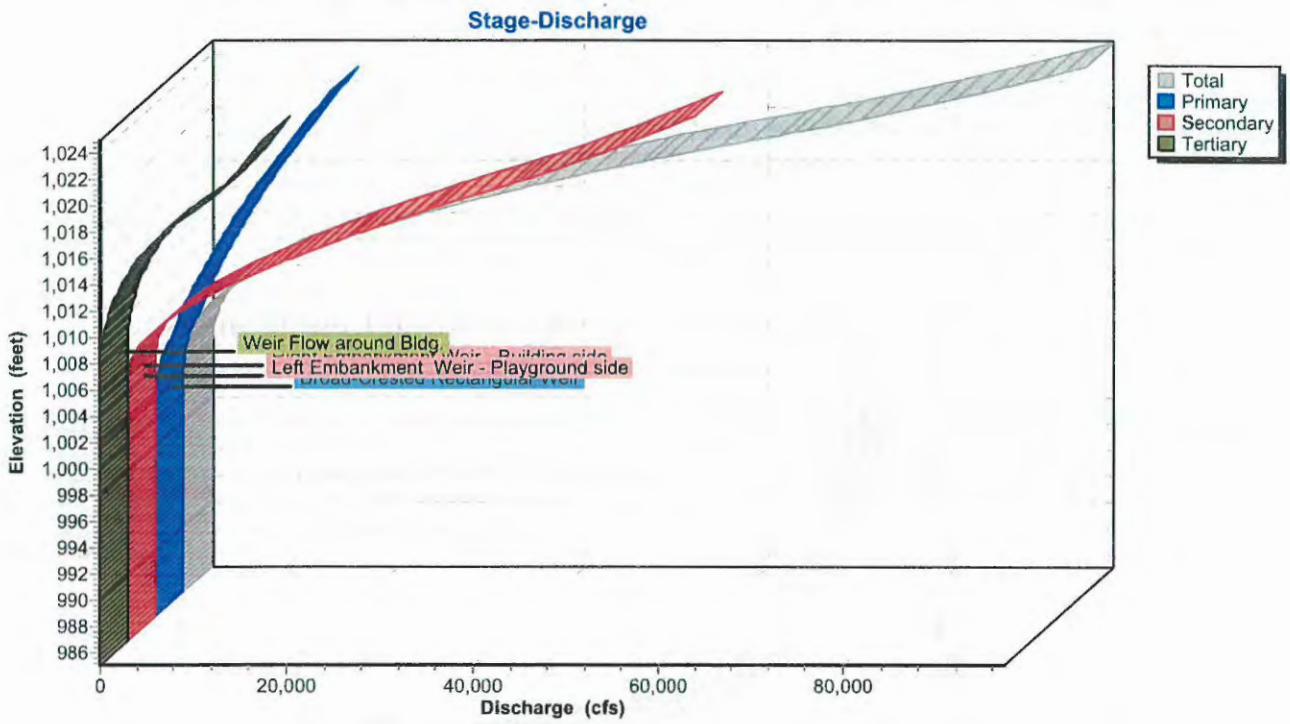
Secondary OutFlow Max=810.44 cfs @ 6.54 hrs HW=1,007.05' TW=998.40' (Dynamic Tailwater)
├─**2=Right Embankment Weir - Building side** (Weir Controls 317.10 cfs @ 3.76 fps)
└─**3=Left Embankment Weir - Playground side** (Weir Controls 493.34 cfs @ 4.36 fps)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,001.64' TW=978.00' (Dynamic Tailwater)
└─**4=Weir Flow around Bldg.** (Controls 0.00 cfs)

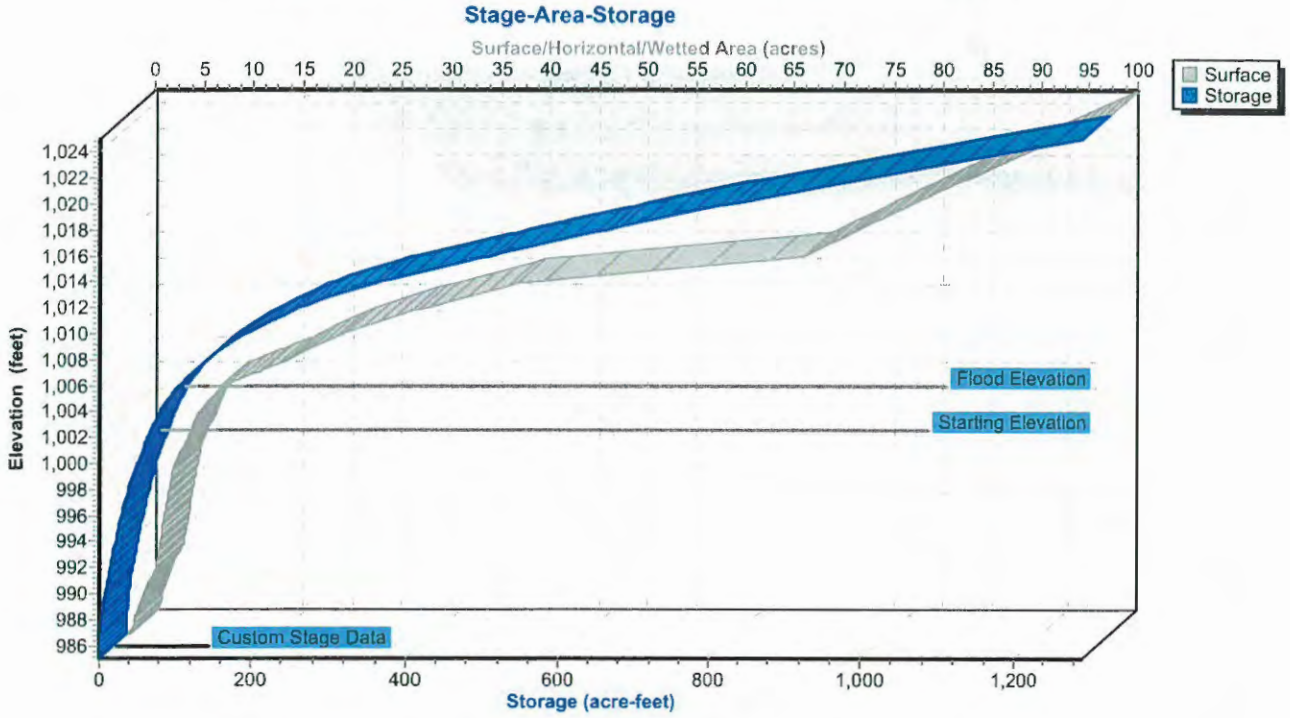
Pond 1P: Sippo Creek Reservoir - Existing Conditions



Pond 1P: Sippo Creek Reservoir - Existing Conditions



Pond 1P: Sippo Creek Reservoir - Existing Conditions

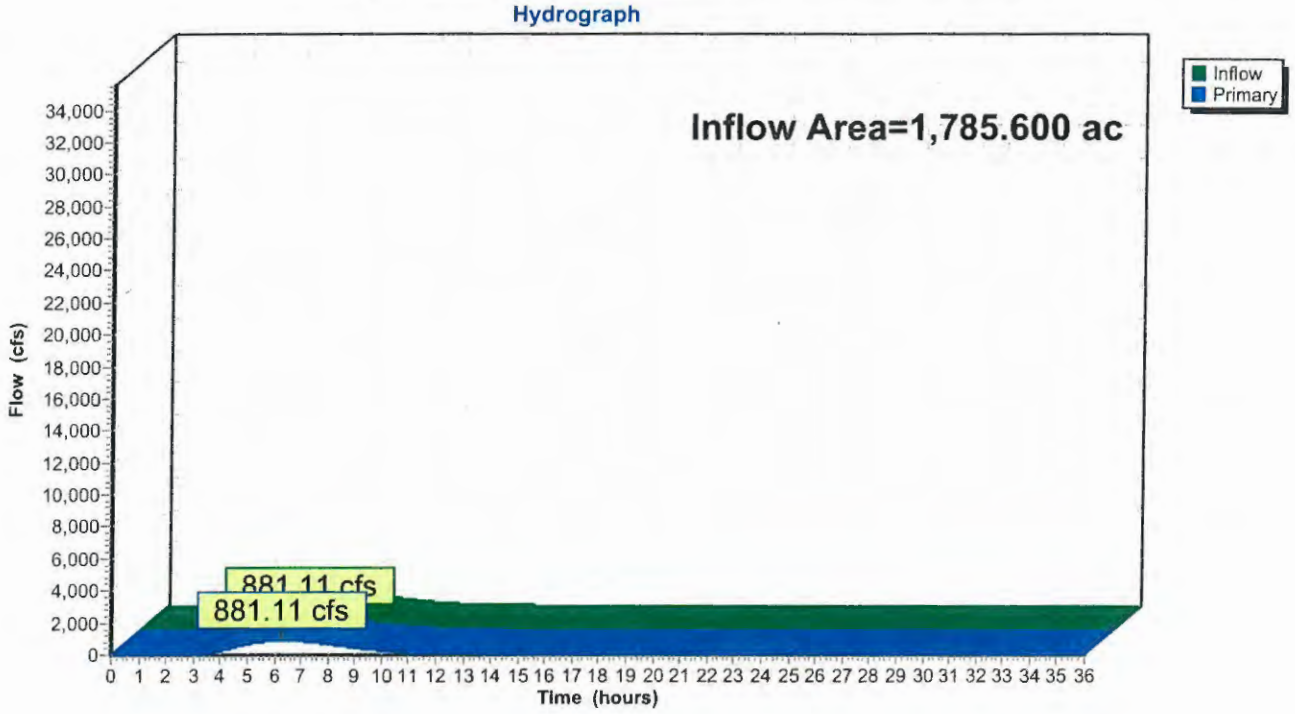


Summary for Pond 2C: CONF 2 Combined Cable and O'Springs

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 2.50" for 6-HR 0.21 PMF event
Inflow = 881.11 cfs @ 6.28 hrs, Volume= 372.072 af
Primary = 881.11 cfs @ 6.29 hrs, Volume= 372.072 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 2C: CONF 2 Combined Cable and O'Springs



Summary for Pond 3P: Lake Cable

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 2.50" for 6-HR 0.21 PMF event
Inflow = 881.11 cfs @ 6.29 hrs, Volume= 372.071 af
Outflow = 312.45 cfs @ 9.60 hrs, Volume= 597.614 af, Atten= 65%, Lag= 198.8 min
Primary = 312.45 cfs @ 9.60 hrs, Volume= 597.614 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,097.40' Surf.Area= 220.000 ac Storage= 1,914.000 af
Peak Elev= 1,097.94' @ 9.60 hrs Surf.Area= 239.429 ac Storage= 2,037.321 af (123.321 af above start)
Flood Elev= 1,099.50' Surf.Area= 296.000 ac Storage= 2,455.800 af (541.800 af above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 475.9 min (944.5 - 468.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,080.00'	4,144.025 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

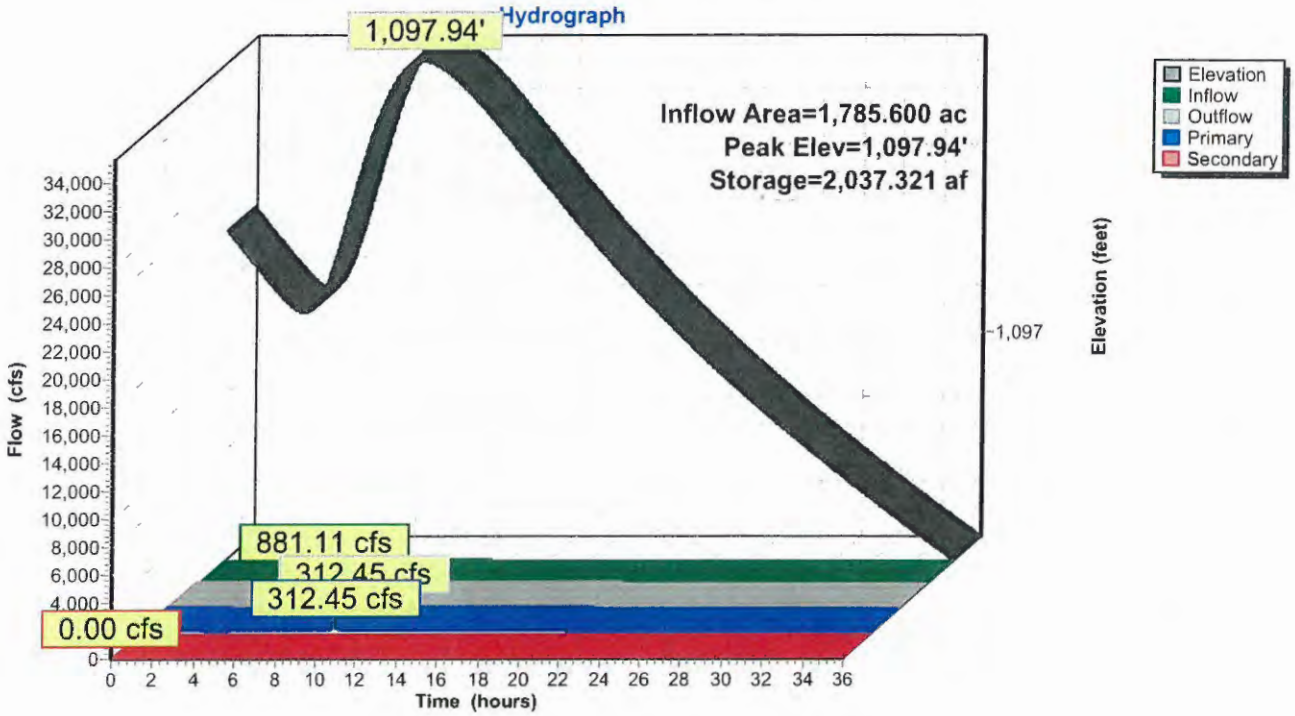
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,080.00	0.000	0.000	0.000
1,097.40	220.000	1,914.000	1,914.000
1,099.50	296.000	541.800	2,455.800
1,100.00	316.700	153.175	2,608.975
1,103.00	405.000	1,082.550	3,691.525
1,104.00	500.000	452.500	4,144.025

Device	Routing	Invert	Outlet Devices
#1	Primary	1,088.00'	**36.0" Round Culvert-RCP** L= 450.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 1,088.00' / 1,076.00' S= 0.0267 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished
#2	Primary	1,096.40'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 3.10 6.00 Width (feet) 30.00 30.00 30.00
#3	Secondary	1,099.50'	**Custom Weir/Orifice, Cv= 2.24 (C= 2.80)** Head (feet) 0.00 3.00 Width (feet) 1,000.00 1,000.00

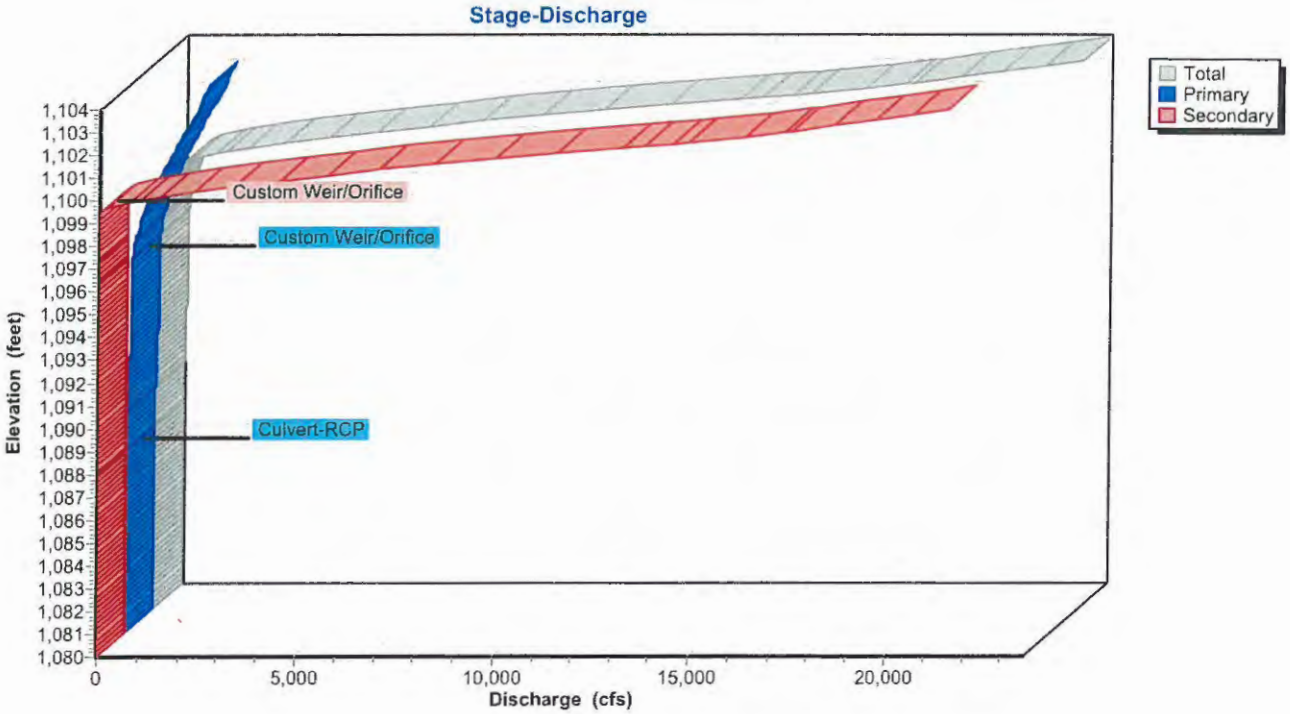
Primary OutFlow Max=312.45 cfs @ 9.60 hrs HW=1,097.94' TW=1,071.91' (Dynamic Tailwater)
↑—**1=Culvert-RCP** (Barrel Controls 125.26 cfs @ 17.72 fps)
└—**2=Custom Weir/Orifice** (Weir Controls 187.19 cfs @ 4.06 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,097.40' TW=1,069.00' (Dynamic Tailwater)
↑—**3=Custom Weir/Orifice** (Controls 0.00 cfs)

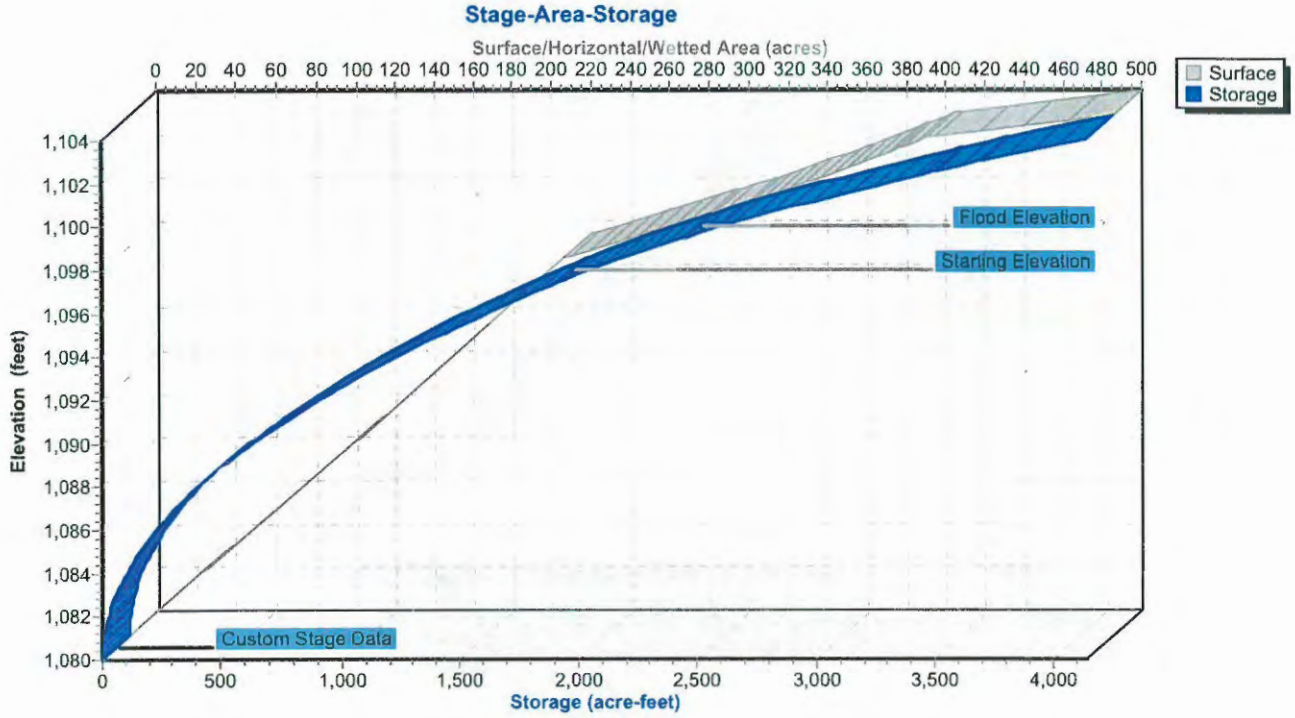
Pond 3P: Lake Cable



Pond 3P: Lake Cable



Pond 3P: Lake Cable

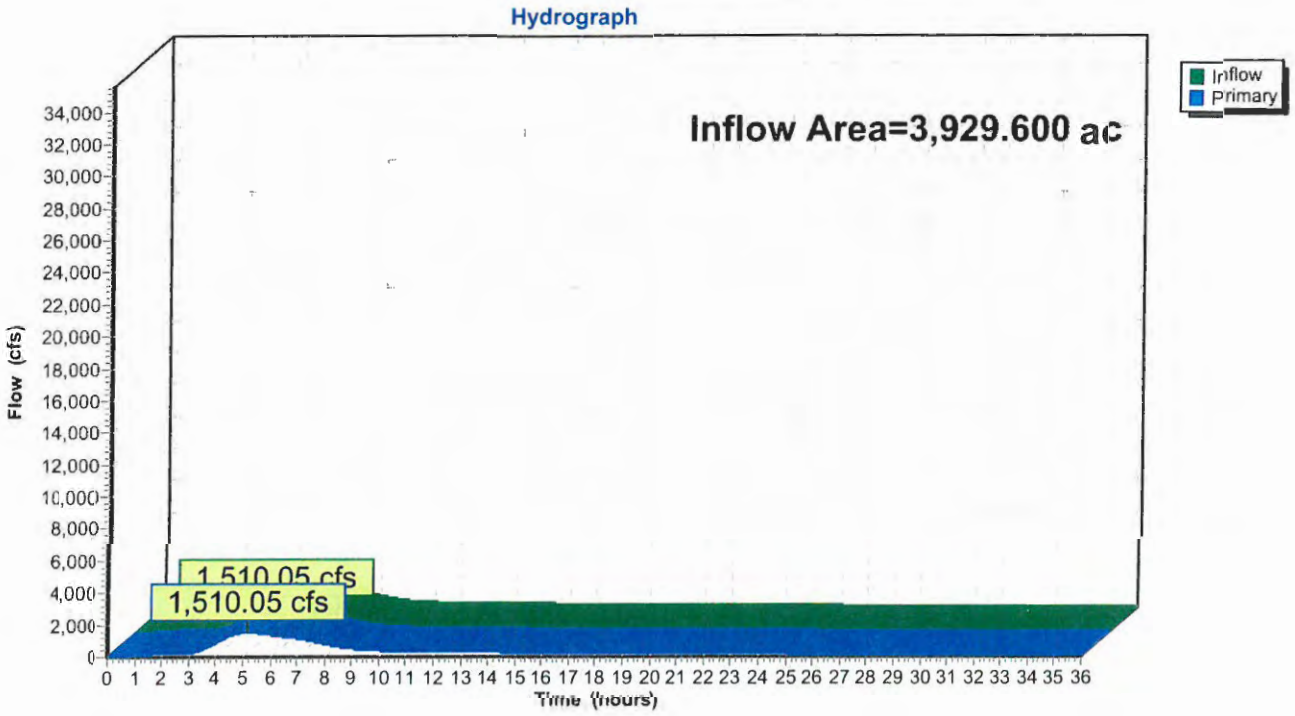


Summary for Pond 4C: Confluence 4

Inflow Area = 3,929.600 ac, 16.99% Impervious, Inflow Depth > 3.03" for 6-HR 0.21 PMF event
Inflow = 1,510.05 cfs @ 5.17 hrs, Volume= 991.866 af
Primary = 1,510.05 cfs @ 5.18 hrs, Volume= 991.866 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 4C: Confluence 4



Summary for Pond 4P: Lake O'Springs

Inflow Area = 384.000 ac, 26.60% Impervious, Inflow Depth > 2.83" for 6-HR 0.21 PMF event
Inflow = 354.58 cfs @ 3.77 hrs, Volume= 90.552 af
Outflow = 142.90 cfs @ 6.59 hrs, Volume= 90.084 af, Atten= 60%, Lag= 169.1 min
Primary = 142.90 cfs @ 6.59 hrs, Volume= 90.084 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,106.00' Surf.Area= 27.000 ac Storage= 24.300 af
Peak Elev= 1,107.69' @ 6.59 hrs Surf.Area= 28.879 ac Storage= 71.540 af (47.240 af above start)
Flood Elev= 1,108.70' Surf.Area= 30.000 ac Storage= 101.250 af (76.950 af above start)

Plug-Flow detention time= 455.9 min calculated for 65.784 af (73% of inflow)
Center-of-Mass det. time= 277.5 min (601.5 - 324.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,104.20'	268.550 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

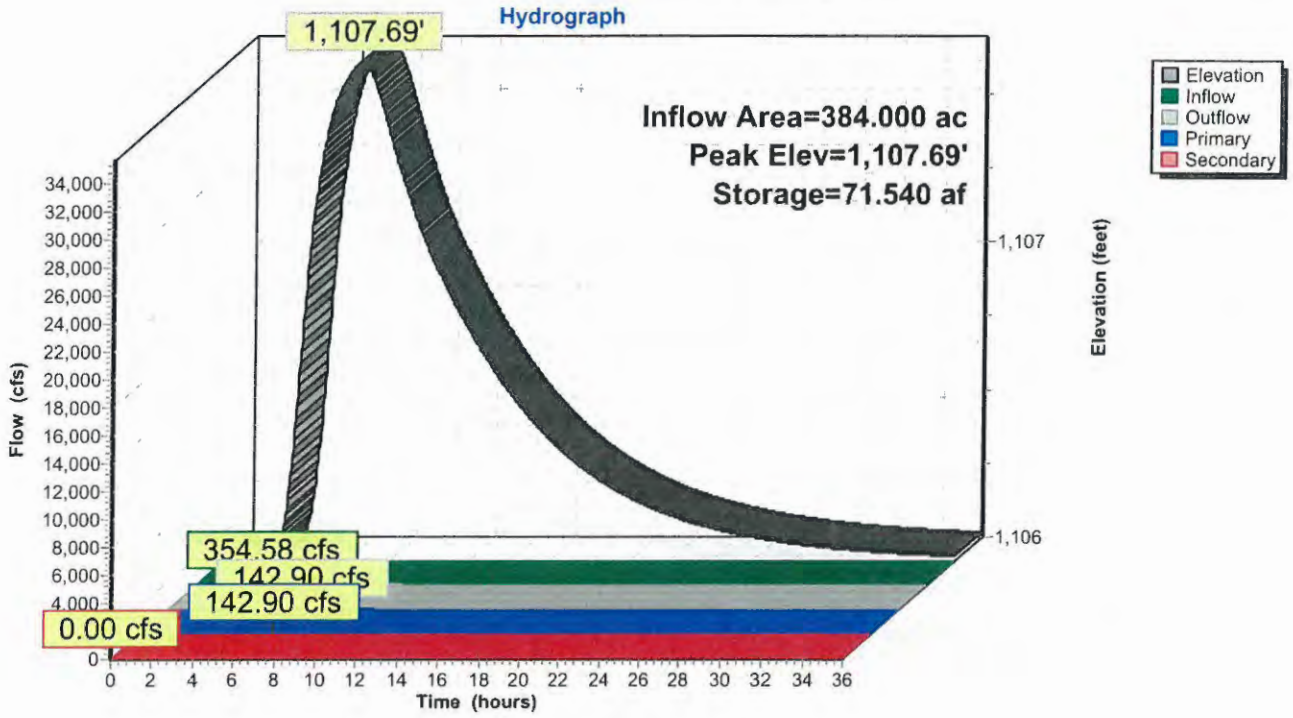
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,104.20	0.000	0.000	0.000
1,106.00	27.000	24.300	24.300
1,108.70	30.000	76.950	101.250
1,110.00	40.000	45.500	146.750
1,112.90	44.000	121.800	268.550

Device	Routing	Invert	Outlet Devices
#1	Primary	1,106.00'	**Lake Eric Special & User-Defined Outlet** Head (feet) 0.00 1.00 2.00 2.70 3.00 4.00 Disch. (cfs) 0.000 60.000 180.000 300.000 1,240.000 3,930.000
#2	Secondary	1,108.70'	**Custom Weir/Orifice, Cv= 2.24 (C= 2.80)** Head (feet) 0.00 1.30 Width (feet) 150.00 150.00

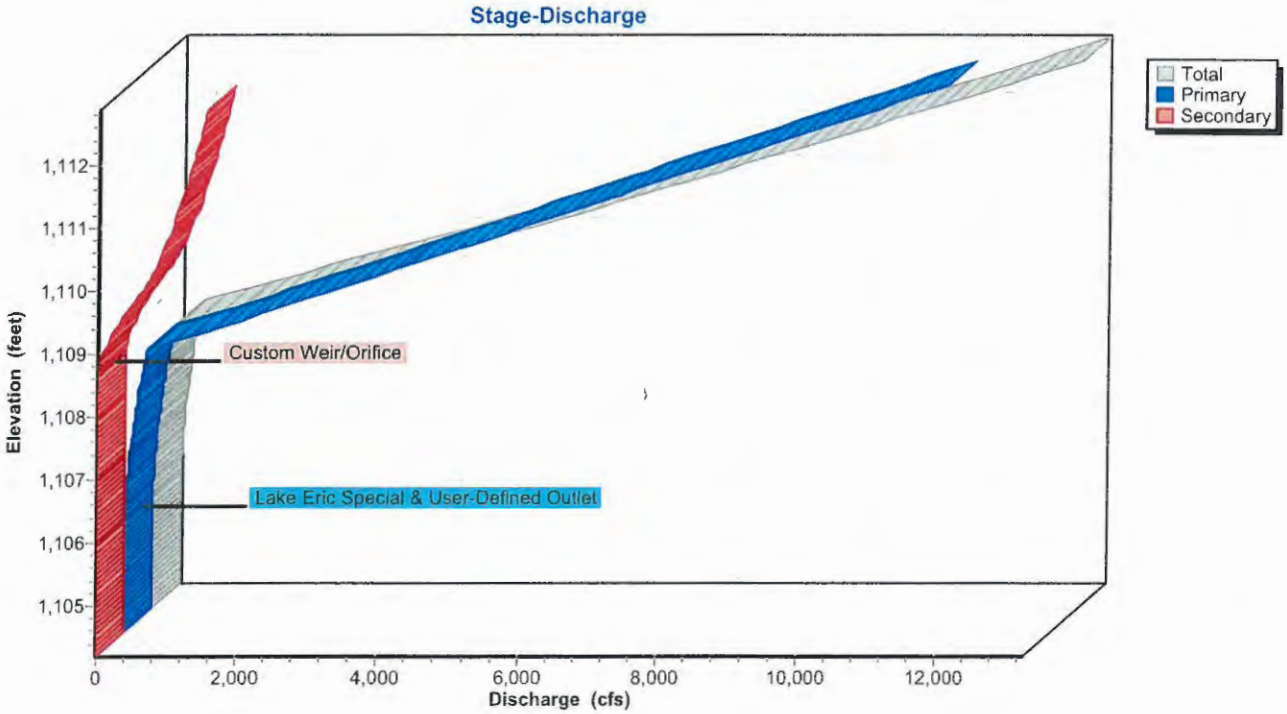
Primary OutFlow Max=142.90 cfs @ 6.59 hrs HW=1,107.69' TW=0.00' (Dynamic Tailwater)
↑—**1=Lake Eric Special & User-Defined Outlet**(Custom Controls 142.90 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,106.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Custom Weir/Orifice** (Controls 0.00 cfs)

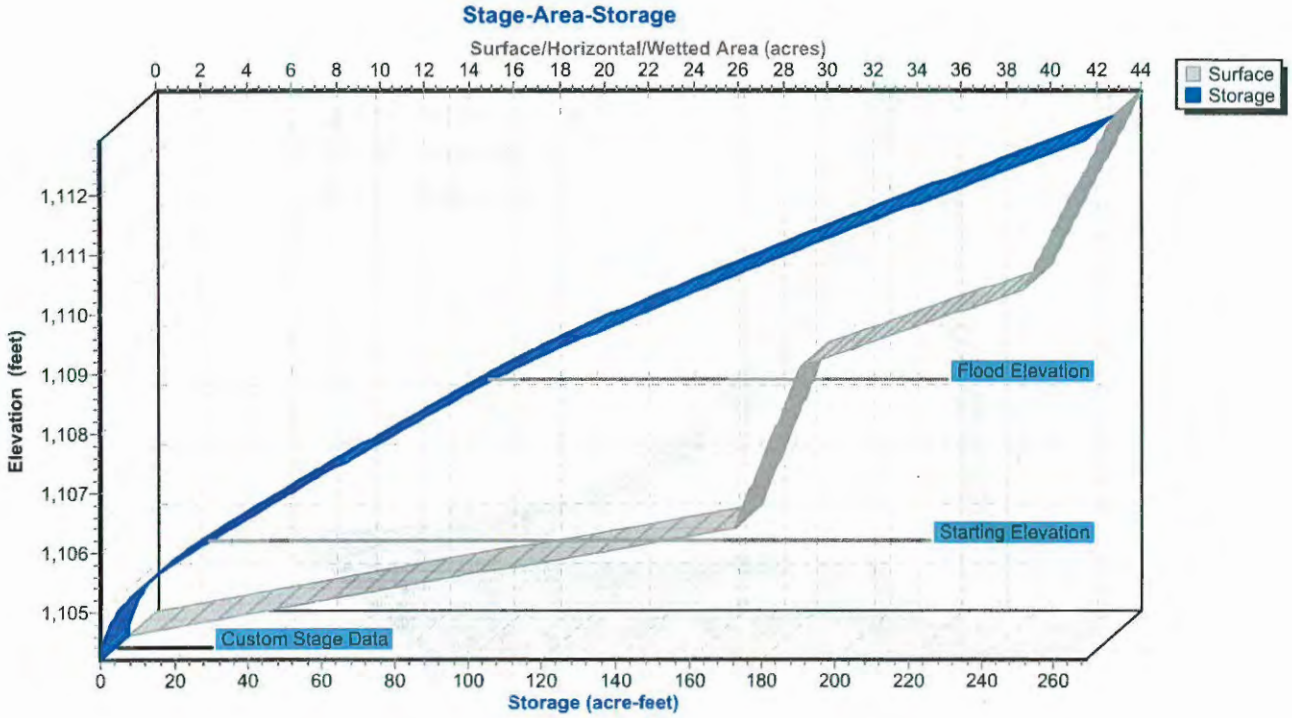
Pond 4P: Lake O'Springs



Pond 4P: Lake O'Springs



Pond 4P: Lake O'Springs

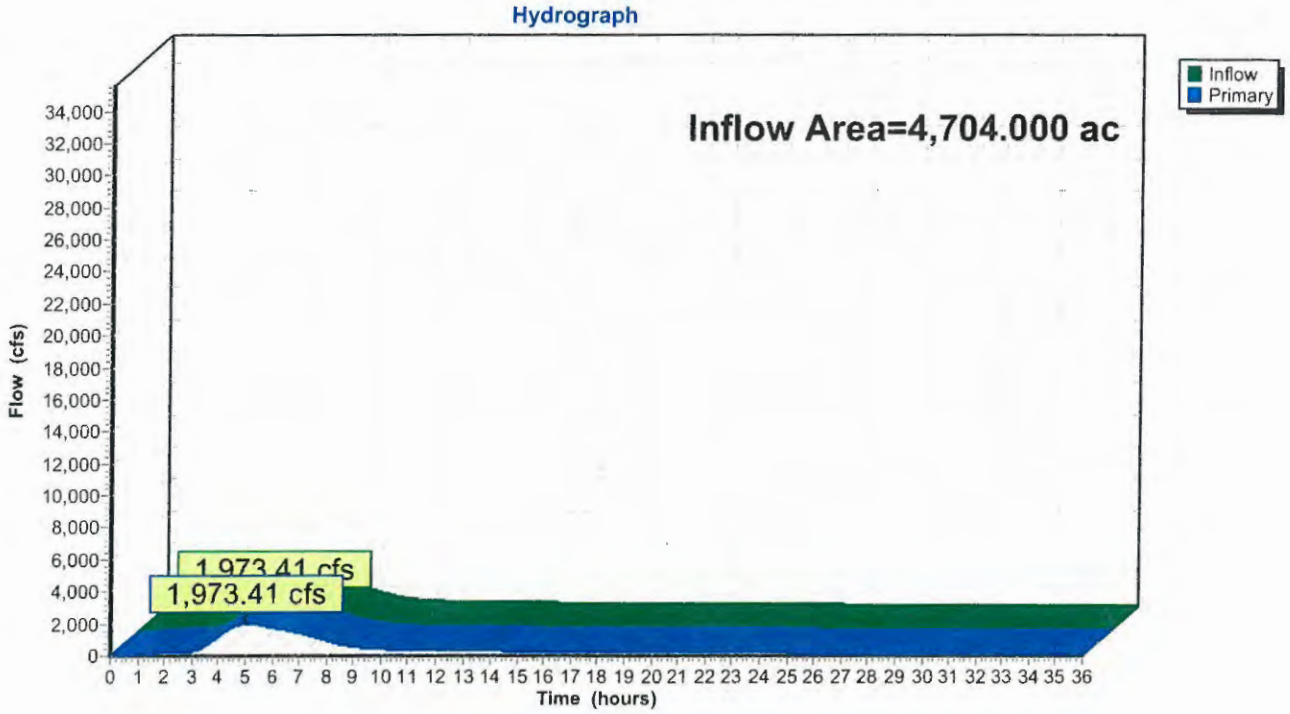


Summary for Pond 5C: Confluence 5

Inflow Area = 4,704.000 ac, 14.19% Impervious, Inflow Depth > 2.89" for 6-HR 0.21 PMF event
Inflow = 1,973.41 cfs @ 5.03 hrs, Volume= 1,131.114 af
Primary = 1,973.41 cfs @ 5.04 hrs, Volume= 1,131.114 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 5C: Confluence 5



Summary for Pond 5P: Lake Eric (Slagle)

Inflow Area = 115.200 ac, 0.00% Impervious, Inflow Depth = 2.77" for 6-HR 0.21 PMF event
Inflow = 145.29 cfs @ 3.37 hrs, Volume= 26.584 af
Outflow = 60.63 cfs @ 4.82 hrs, Volume= 26.476 af, Atten= 58%, Lag= 86.6 min
Primary = 60.63 cfs @ 4.82 hrs, Volume= 26.476 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,116.50' Surf.Area= 3.700 ac Storage= 13.690 af
Peak Elev= 1,119.71' @ 4.82 hrs Surf.Area= 4.157 ac Storage= 26.284 af (12.594 af above start)
Flood Elev= 1,120.00' Surf.Area= 4.200 ac Storage= 27.490 af (13.800 af above start)

Plug-Flow detention time= 422.3 min calculated for 12.783 af (48% of inflow)
Center-of-Mass det. time= 197.5 min (450.1 - 252.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,109.10'	88.990 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

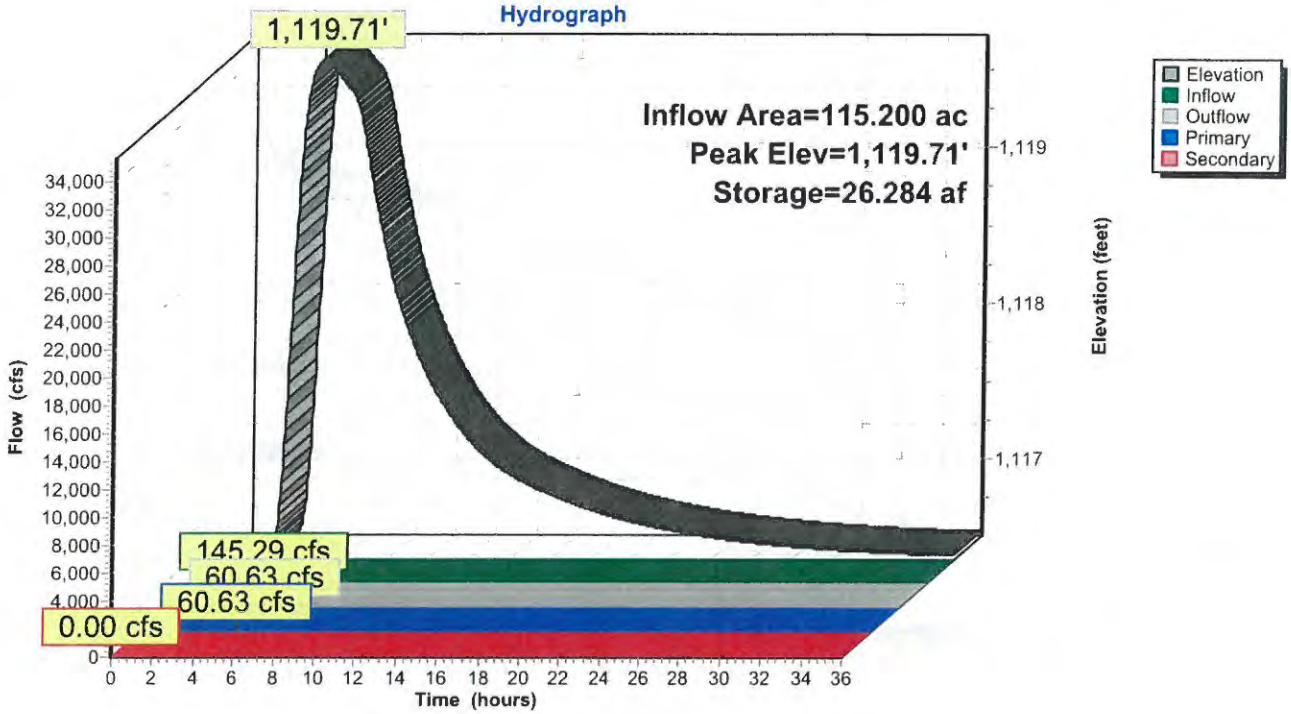
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,109.10	0.000	0.000	0.000
1,116.50	3.700	13.690	13.690
1,118.00	3.900	5.700	19.390
1,120.00	4.200	8.100	27.490
1,130.00	8.100	61.500	88.990

Device	Routing	Invert	Outlet Devices
#1	Primary	1,116.50'	**Special & User-Defined** Head (feet) 0.00 0.50 1.50 2.50 3.50 4.50 5.00 Disch. (cfs) 0.000 3.000 17.000 40.000 69.000 600.000 1,130.000
#2	Secondary	1,120.00'	**Custom Weir/Orifice, Cv= 2.24 (C= 2.80)** Head (feet) 0.00 10.00 Width (feet) 150.00 150.00

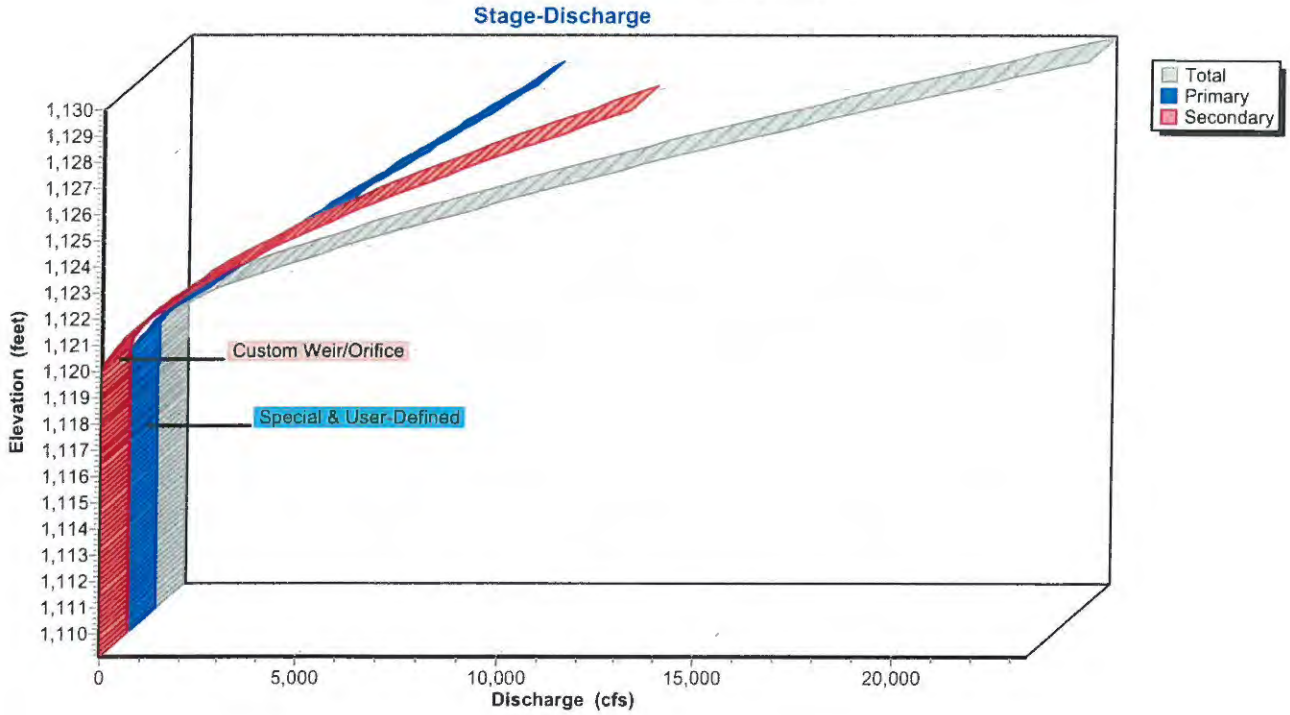
Primary OutFlow Max=60.63 cfs @ 4.82 hrs HW=1,119.71' TW=0.00' (Dynamic Tailwater)
↑—**1=Special & User-Defined** (Custom Controls 60.63 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,116.50' TW=0.00' (Dynamic Tailwater)
↑—**2=Custom Weir/Orifice** (Controls 0.00 cfs)

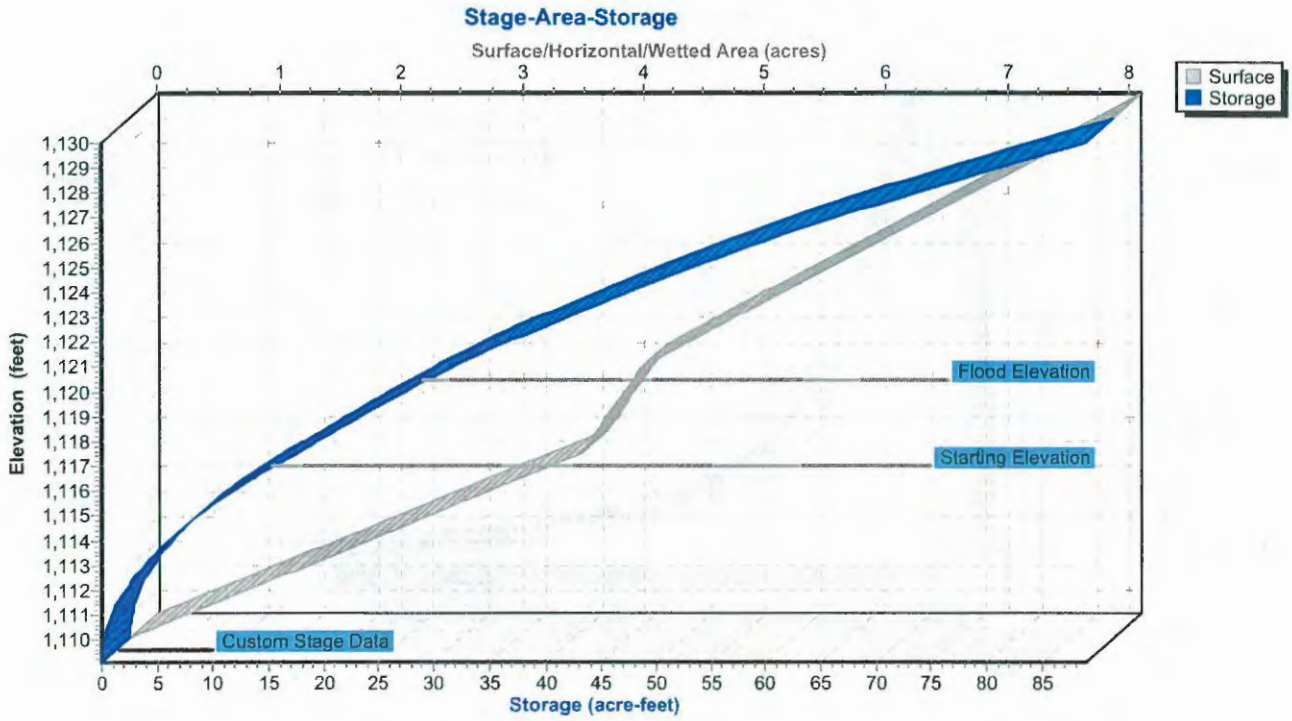
Pond 5P: Lake Eric (Slagle)



Pond 5P: Lake Eric (Slagle)



Pond 5P: Lake Eric (Slagle)

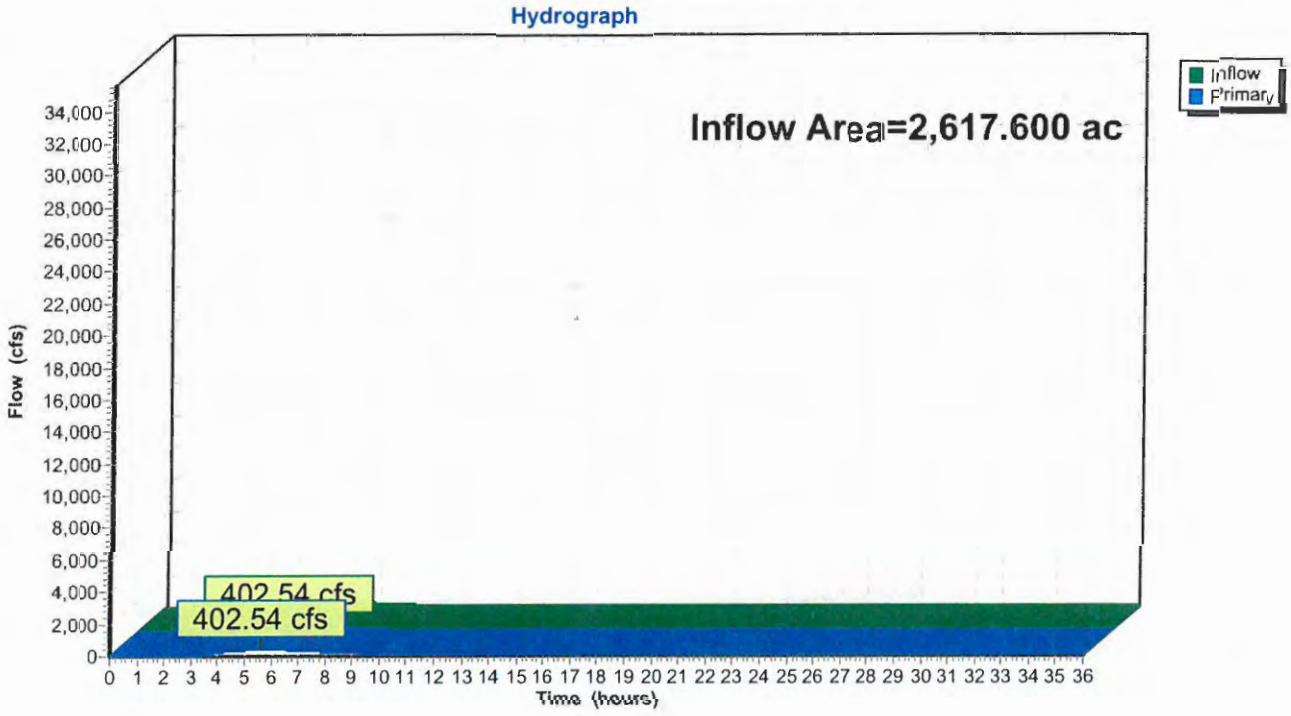


Summary for Pond 6C: Confluence 6

Inflow Area = 2,617.600 ac, 28.52% Impervious, Inflow Depth > 1.79" for 6-HR 0.21 PMF event
Inflow = 402.54 cfs @ 5.62 hrs, Volume= 390.231 af
Primary = 402.54 cfs @ 5.63 hrs, Volume= 390.231 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 6C: Confluence 6

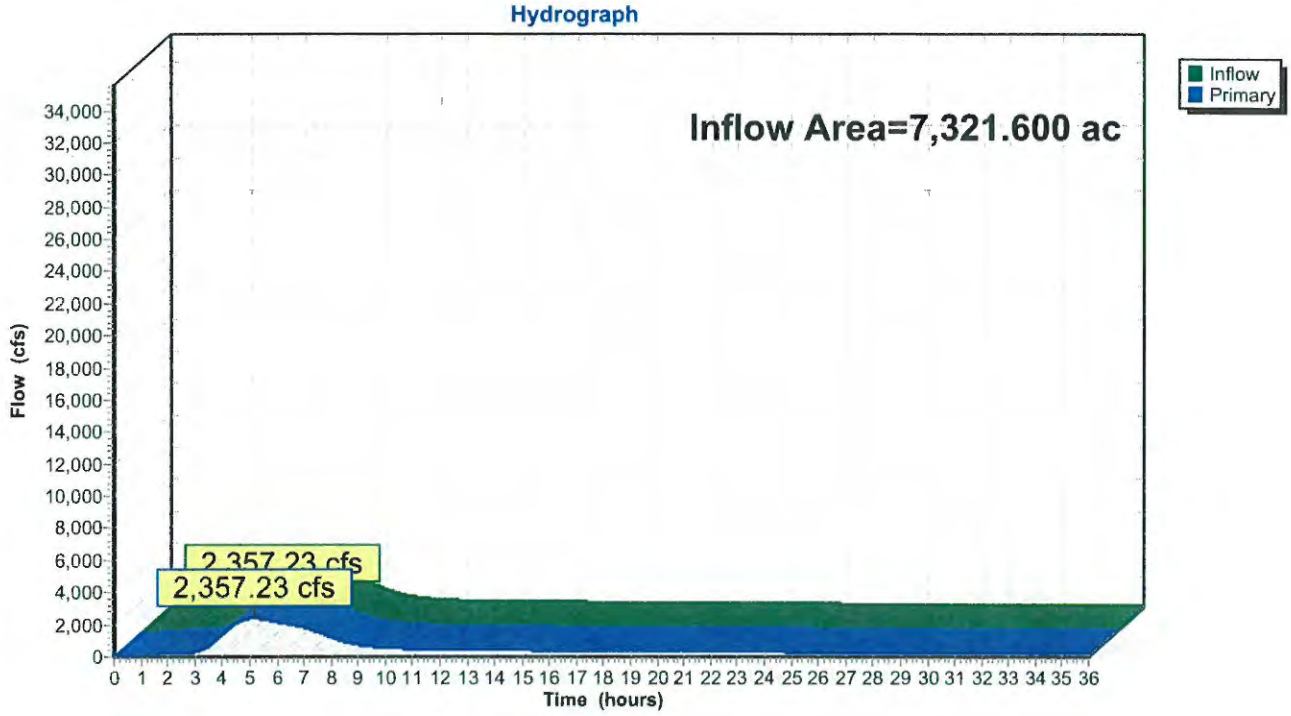


Summary for Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake

Inflow Area = 7,321.600 ac, 19.32% Impervious, Inflow Depth > 2.49" for 6-HR 0.21 PMF event
Inflow = 2,357.23 cfs @ 5.18 hrs, Volume= 1,521.171 af
Primary = 2,357.23 cfs @ 5.19 hrs, Volume= 1,521.171 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake

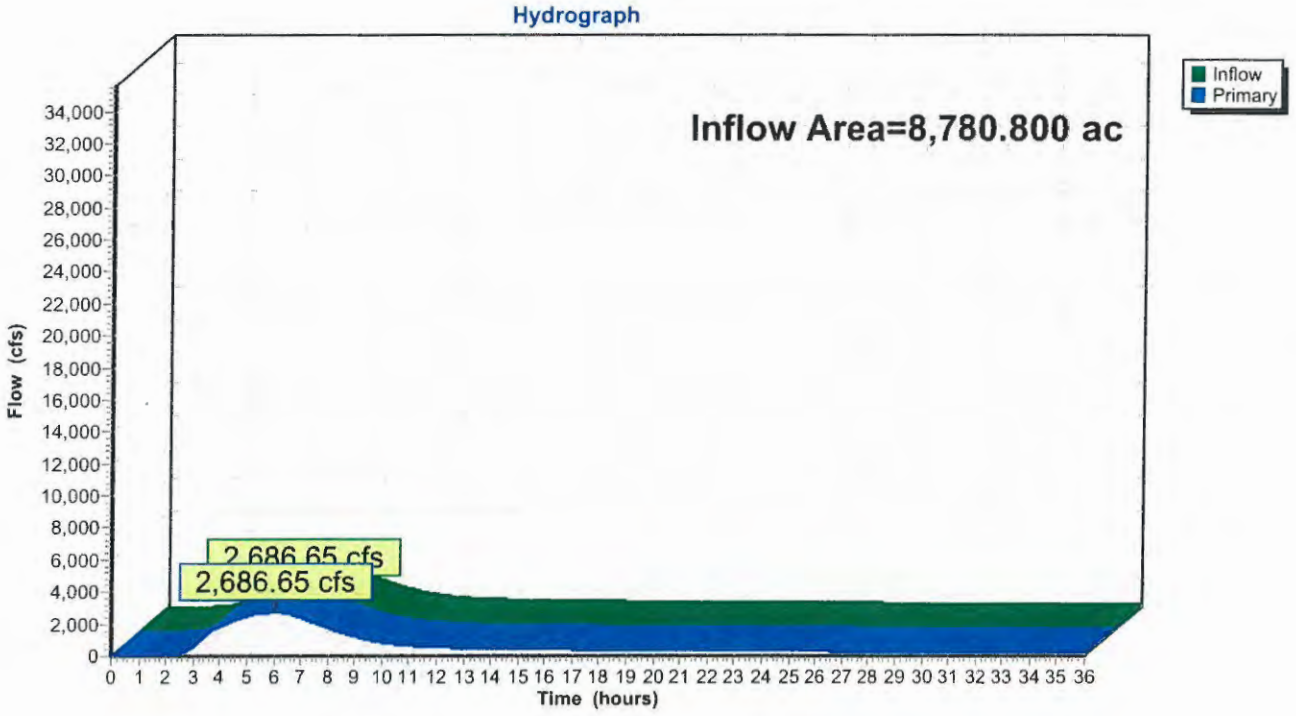


Summary for Pond 8C: Confluence 8

Inflow Area = 8,780.800 ac, 19.29% Impervious, Inflow Depth > 2.50" for 6-HR 0.21 PMF event
Inflow = 2,686.65 cfs @ 6.06 hrs, Volume= 1,832.308 af
Primary = 2,686.65 cfs @ 6.07 hrs, Volume= 1,832.308 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 8C: Confluence 8



Summary for Pond 8P: Storage Area Genoa Rd

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth > 2.29" for 6-HR 0.21 PMF event
Inflow = 1,166.04 cfs @ 6.29 hrs, Volume= 375.539 af
Outflow = 122.97 cfs @ 11.58 hrs, Volume= 273.638 af, Atten= 89%, Lag= 317.3 min
Primary = 122.97 cfs @ 11.58 hrs, Volume= 273.638 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 1,024.86' @ 11.58 hrs Surf.Area= 124.276 ac Storage= 291.935 af
Flood Elev= 1,028.00' Surf.Area= 213.745 ac Storage= 851.153 af

Plug-Flow detention time= 809.5 min calculated for 273.562 af (73% of inflow)
Center-of-Mass det. time= 736.5 min (1,211.7 - 475.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,018.00'	1,873.781 af	**Custom Stage Data (Irregular)**Listed below (Recalc)

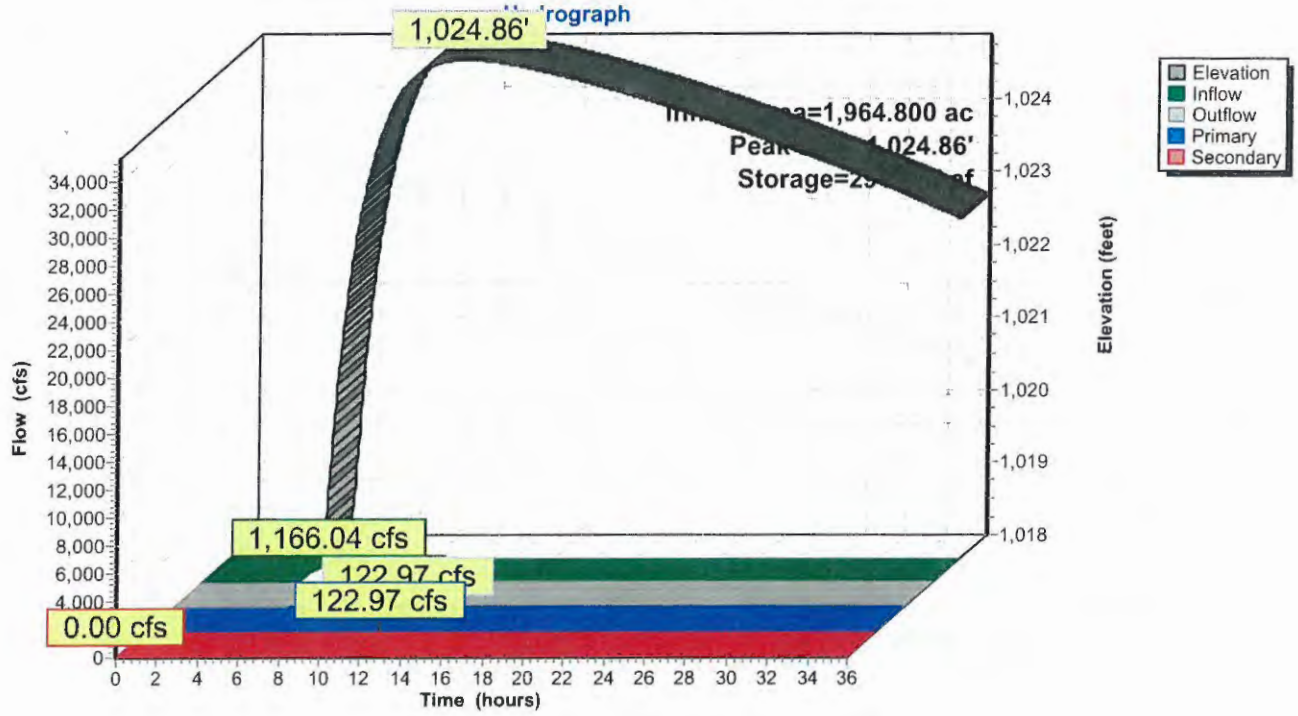
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
1,018.00	1.828	9,236.2	0.000	0.000	1.828
1,020.00	12.667	15,179.0	12.871	12.871	266.894
1,022.00	44.456	16,532.1	53.902	66.773	345.285
1,024.00	91.000	31,384.9	132.707	199.480	1,645.455
1,026.00	176.087	39,123.0	262.448	461.929	2,642.179
1,032.00	300.000	45,000.0	1,411.853	1,873.781	3,545.375

Device	Routing	Invert	Outlet Devices
#1	Primary	1,018.00'	**48.0" Round Culvert** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 1,018.00' / 1,017.00' S= 0.0167 '/' Cc= 0.900 n= 0.025 Corrugated metal
#2	Secondary	1,025.00'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 1.00 3.00 5.00 Width (feet) 125.00 192.00 308.00 415.00

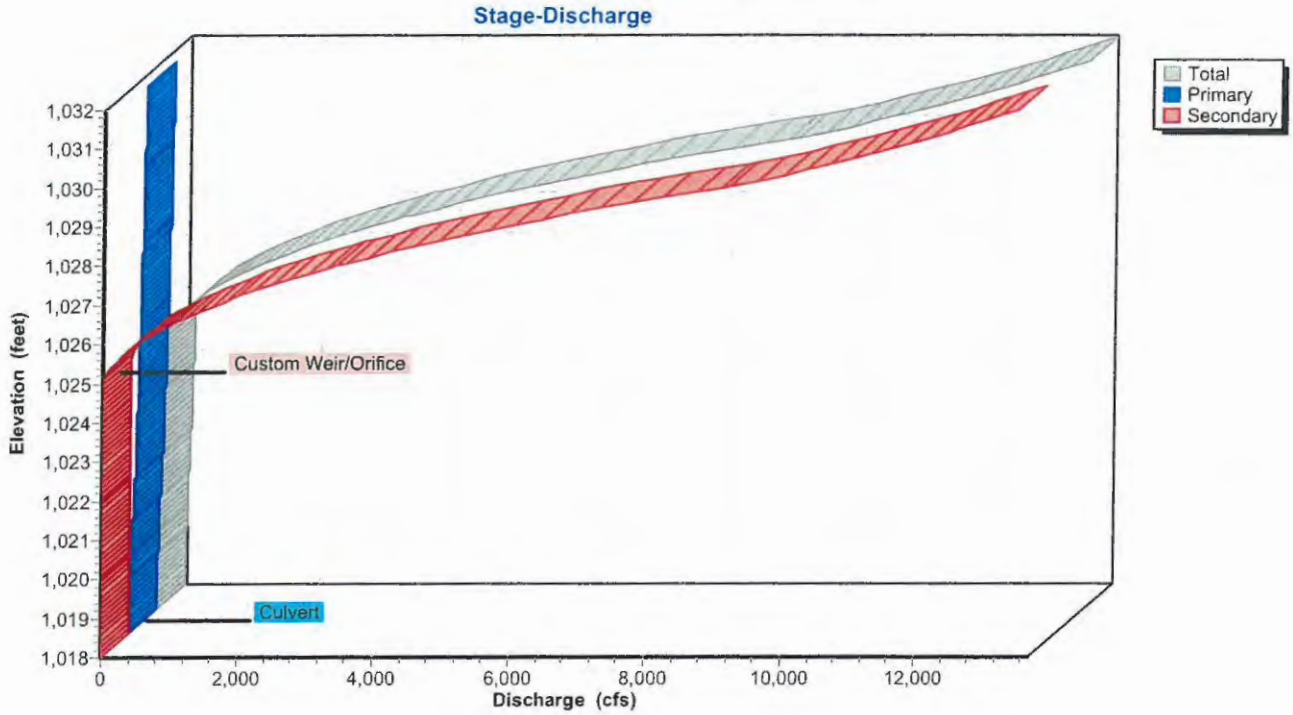
Primary OutFlow Max=122.97 cfs @ 11.58 hrs HW=1,024.86' TW=1,020.52' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 122.97 cfs @ 9.79 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,018.00' TW=1,017.50' (Dynamic Tailwater)
↑—**2=Custom Weir/Orifice** (Controls 0.00 cfs)

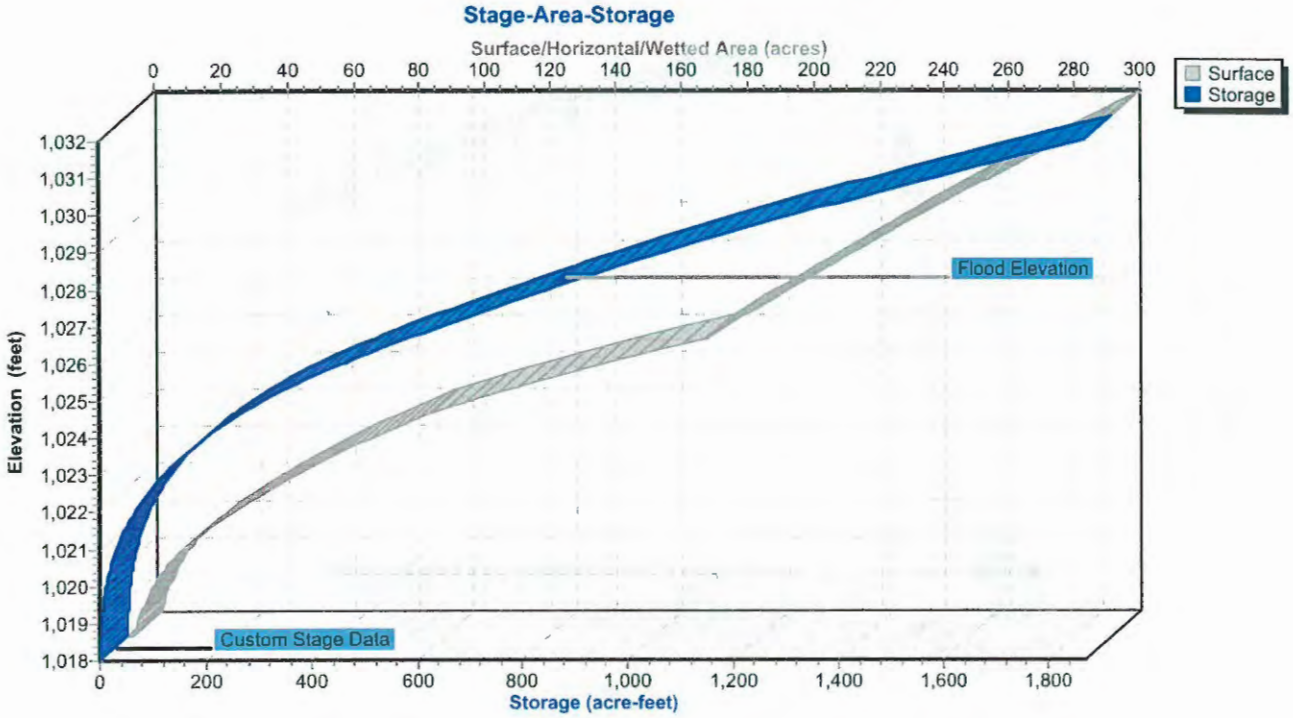
Pond 8P: Storage Area Genoa Rd



Pond 8P: Storage Area Genoa Rd



Pond 8P: Storage Area Genoa Rd



Summary for Pond 9P: Sippo Lake

Inflow Area = 1,964.800 ac, 38.00% Impervious, Inflow Depth = 2.86" for 6-HR 0.21 PMF event
Inflow = 1,519.45 cfs @ 5.03 hrs, Volume= 468.366 af
Outflow = 1,166.04 cfs @ 6.29 hrs, Volume= 375.540 af, Atten= 23%, Lag= 75.8 min
Primary = 1,166.04 cfs @ 6.29 hrs, Volume= 375.540 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Starting Elev= 1,027.00' Surf.Area= 88.000 ac Storage= 220.000 af
Peak Elev= 1,029.03' @ 6.29 hrs Surf.Area= 103.876 ac Storage= 414.624 af (194.624 af above start)
Flood Elev= 1,029.30' Surf.Area= 106.000 ac Storage= 443.100 af (223.100 af above start)

Plug-Flow detention time= 347.6 min calculated for 155.540 af (33% of inflow)
Center-of-Mass det. time= 119.8 min (475.2 - 355.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,022.00'	1,220.300 af	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
1,022.00	0.000	0.000	0.000
1,027.00	88.000	220.000	220.000
1,029.30	106.000	223.100	443.100
1,036.00	126.000	777.200	1,220.300

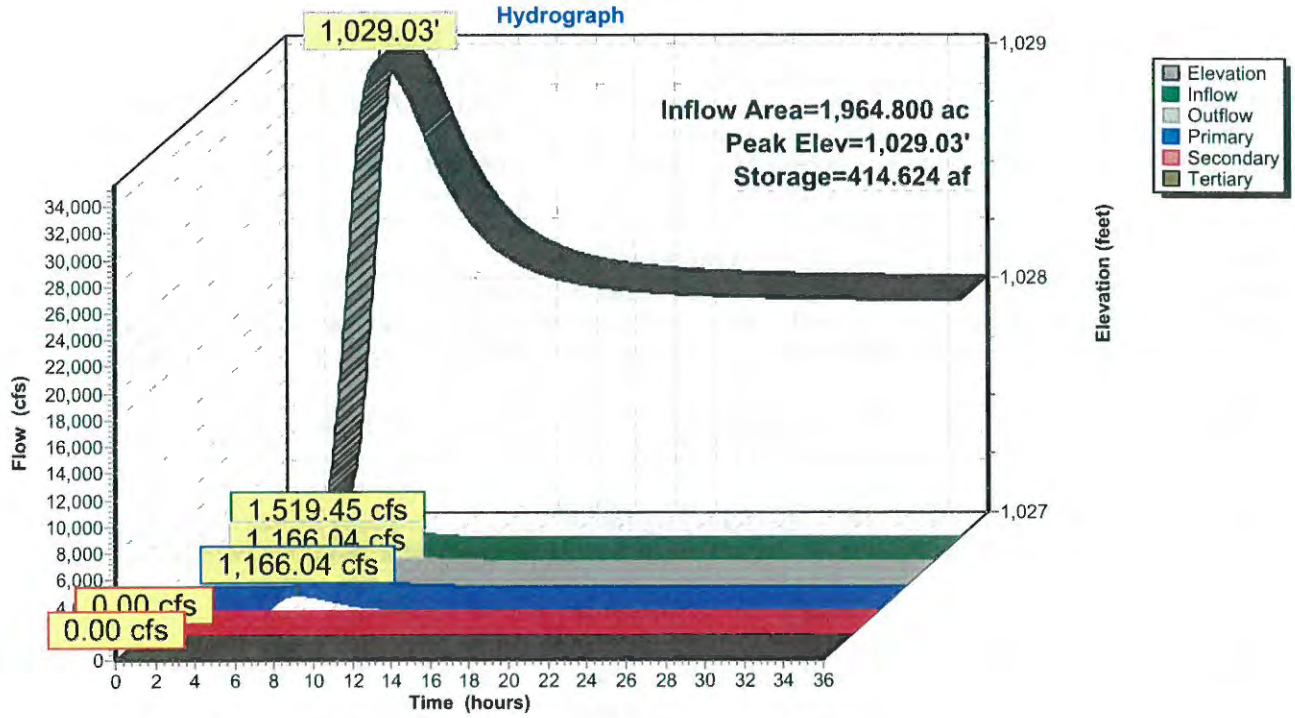
Device	Routing	Invert	Outlet Devices
#1	Primary	1,028.00'	**300.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	1,028.50'	**330.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#3	Secondary	1,029.30'	**30.0' long Sharp-Crested Rectangular Weir** 0 End Contraction(s)
#4	Tertiary	1,030.00'	**650.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1,166.04 cfs @ 6.29 hrs HW=1,029.03' TW=1,022.56' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 823.58 cfs @ 2.67 fps)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 342.46 cfs @ 1.96 fps)

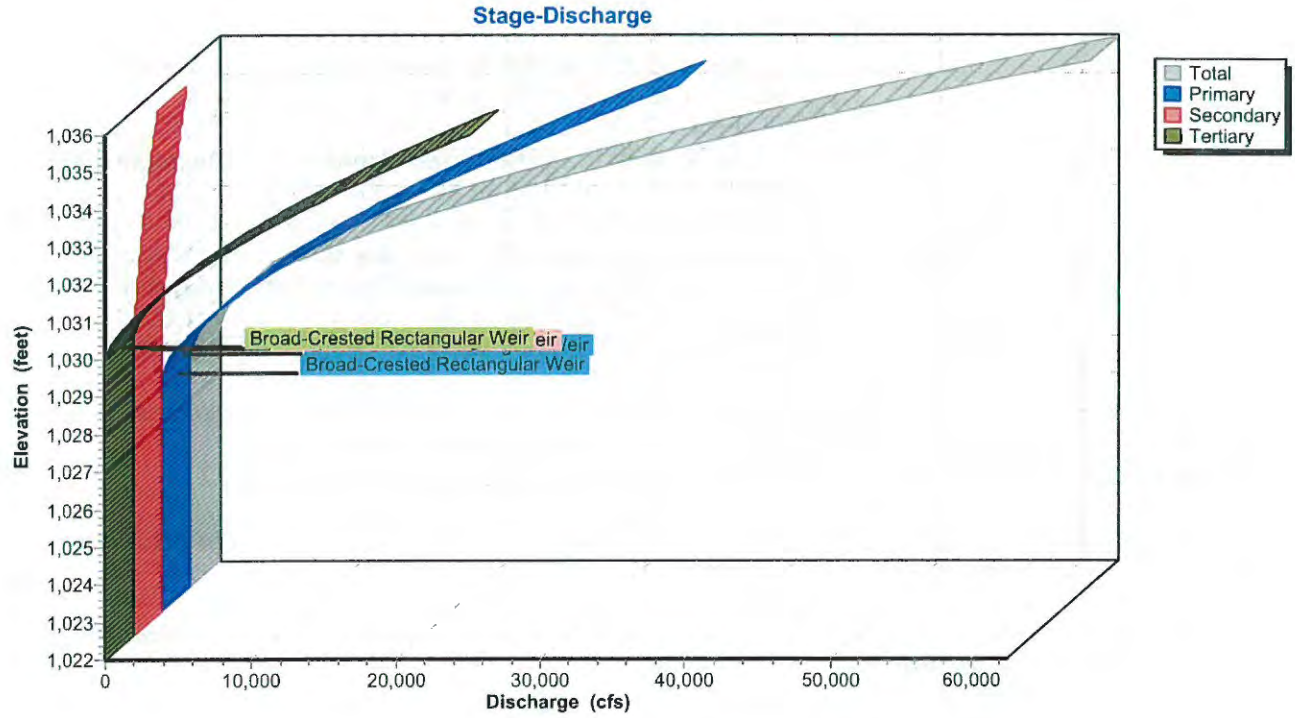
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,027.00' TW=1,018.00' (Dynamic Tailwater)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,027.00' TW=1,018.00' (Dynamic Tailwater)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

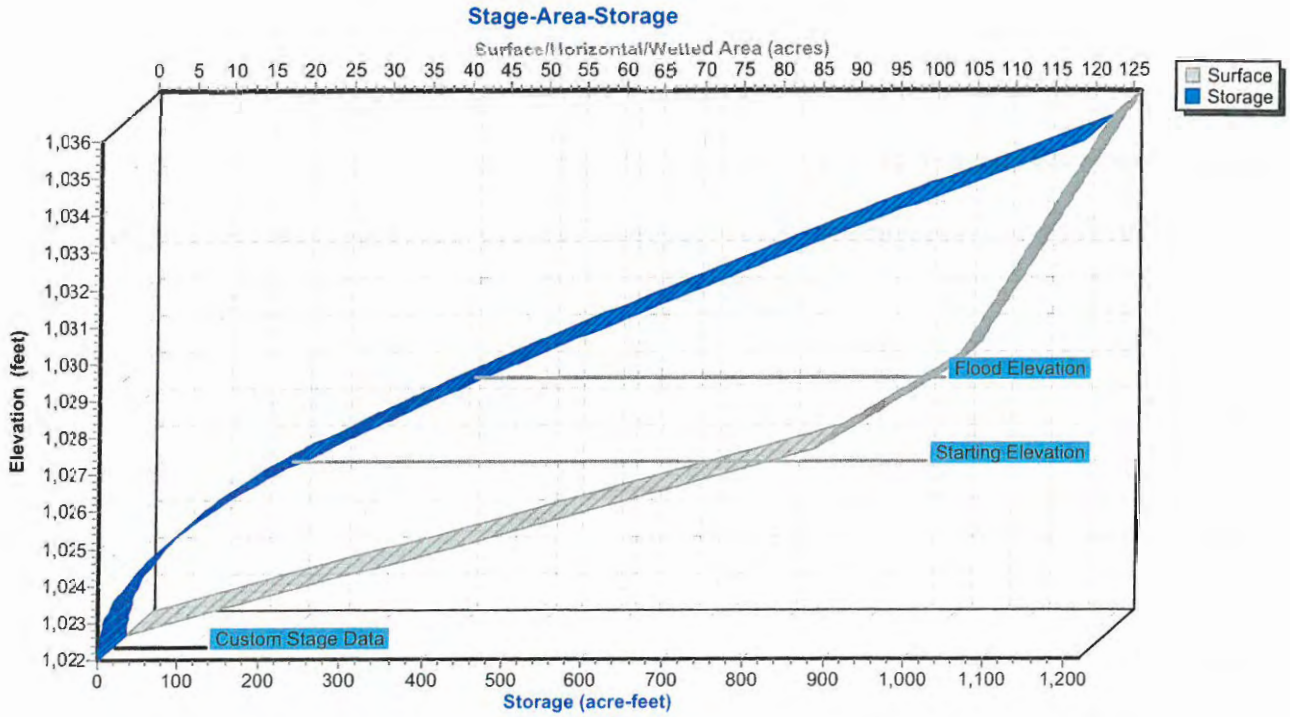
Pond 9P: Sippo Lake



Pond 9P: Sippo Lake



Pond 9P: Sippo Lake

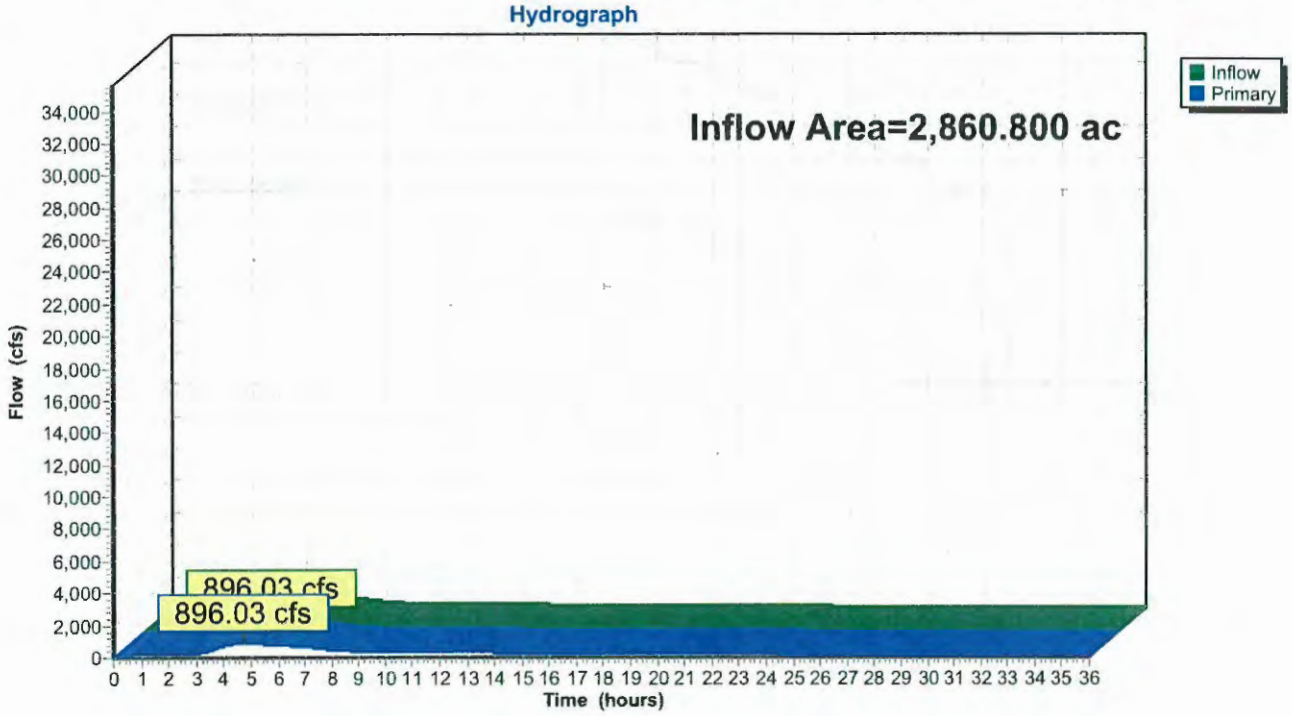


Summary for Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed

Inflow Area = 2,860.800 ac, 23.34% Impervious, Inflow Depth > 3.33" for 6-HR 0.21 PMF event
Inflow = 896.03 cfs @ 4.70 hrs, Volume= 793.180 af
Primary = 896.03 cfs @ 4.71 hrs, Volume= 793.180 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed



Summary for Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 2.52" for 6-HR 0.21 PMF event
Inflow = 2,896.41 cfs @ 6.54 hrs, Volume= 1,987.736 af
Outflow = 2,680.30 cfs @ 7.22 hrs, Volume= 1,987.099 af, Atten= 7%, Lag= 40.9 min
Primary = 2,680.30 cfs @ 7.22 hrs, Volume= 1,987.099 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 999.48' @ 7.22 hrs Surf.Area= 9.272 ac Storage= 101.598 af
Flood Elev= 1,008.00' Surf.Area= 13.465 ac Storage= 197.028 af

Plug-Flow detention time= 14.2 min calculated for 1,986.548 af (100% of inflow)
Center-of-Mass det. time= 13.8 min (753.2 - 739.5)

Volume	Invert	Avail.Storage	Storage Description
#1	978.00'	371.368 af	**Stage Storage in Sippo Park (Irregular)** Listed below (Recalc)

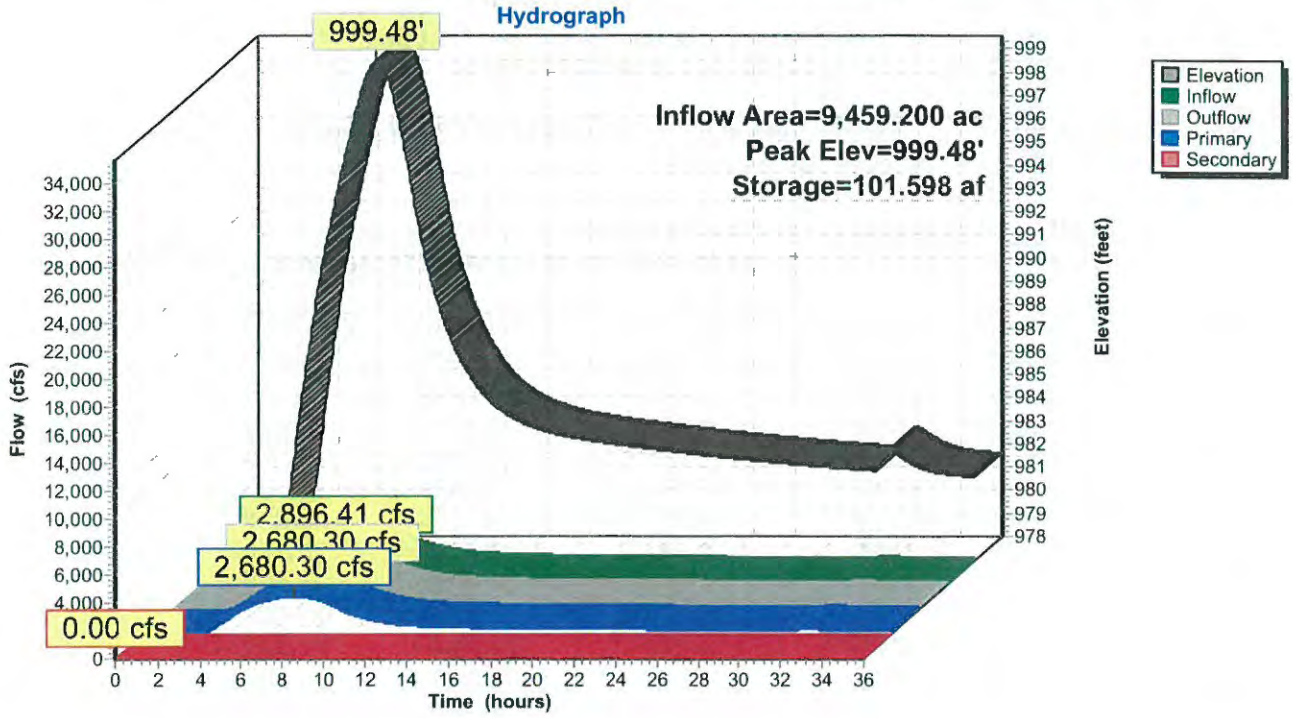
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
978.00	0.100	200.0	0.000	0.000	0.100
981.00	0.300	500.0	0.573	0.573	0.484
982.00	0.659	1,392.9	0.468	1.041	3.572
984.00	2.018	2,470.7	2.553	3.595	11.180
986.00	3.584	3,300.7	5.528	9.122	19.932
988.00	5.007	3,247.5	8.551	17.674	20.586
990.00	6.111	3,143.9	11.100	28.773	21.805
992.00	6.773	3,217.1	12.878	41.652	22.668
994.00	7.411	3,271.9	14.179	55.831	23.334
996.00	8.110	3,253.8	15.516	71.347	23.597
998.00	8.804	3,273.8	16.909	88.256	23.878
1,000.00	9.441	3,318.6	18.241	106.497	24.439
1,002.00	10.181	3,437.0	19.617	126.114	25.908
1,004.00	11.109	3,548.6	21.283	147.398	27.341
1,006.00	12.538	3,553.4	23.633	171.030	27.516
1,008.00	13.465	3,829.8	25.997	197.028	31.248
1,010.00	14.326	4,085.3	27.787	224.814	34.947
1,012.00	15.633	4,329.5	29.949	254.764	38.706
1,014.00	17.576	4,742.6	33.190	287.954	45.555
1,016.00	20.521	5,940.5	38.059	326.013	68.935
1,018.00	24.905	6,310.6	45.355	371.368	77.223

Device	Routing	Invert	Outlet Devices
#1	Primary	978.25'	**168.0" W x 98.0" H Box Box Culvert** L= 121.8' Box, 30-75° wingwalls, rounded crown, Ke= 0.200 Inlet / Outlet Invert= 978.25' / 978.13' S= 0.0010 '/' Cc= 0.900 n= 0.015 Brickwork
#2	Secondary	1,008.00'	**Linclon Way (172), Cv= 2.63 (C= 3.29)** Head (feet) 0.00 1.00 2.00 4.00 6.00 8.00 10.00 Width (feet) 233.00 373.00 475.00 630.00 790.00 940.00 1,090.00

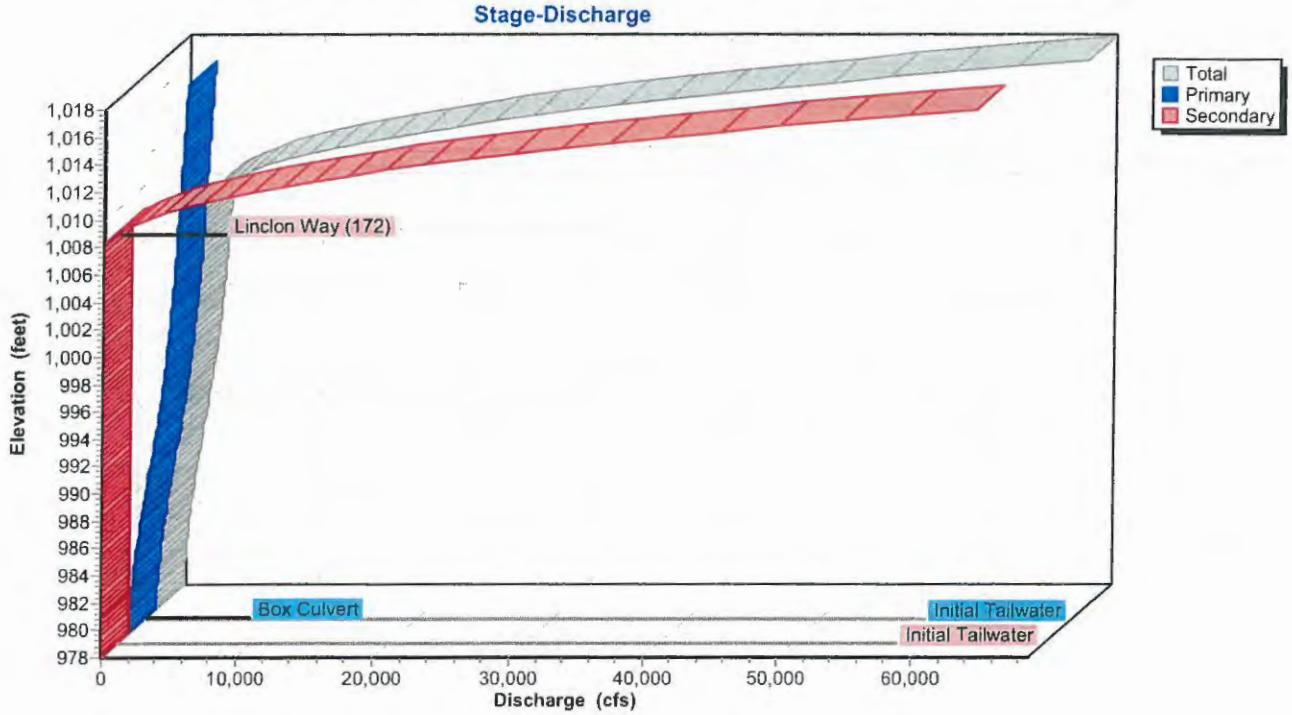
Primary OutFlow Max=2,680.29 cfs @ 7.22 hrs HW=999.48' TW=983.91' (Dynamic Tailwater)
└─**1=Box Culvert** (Inlet Controls 2,680.29 cfs @ 23.44 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=978.00' TW=978.13' (Dynamic Tailwater)
└─**2=Linclon Way (172)** (Controls 0.00 cfs)

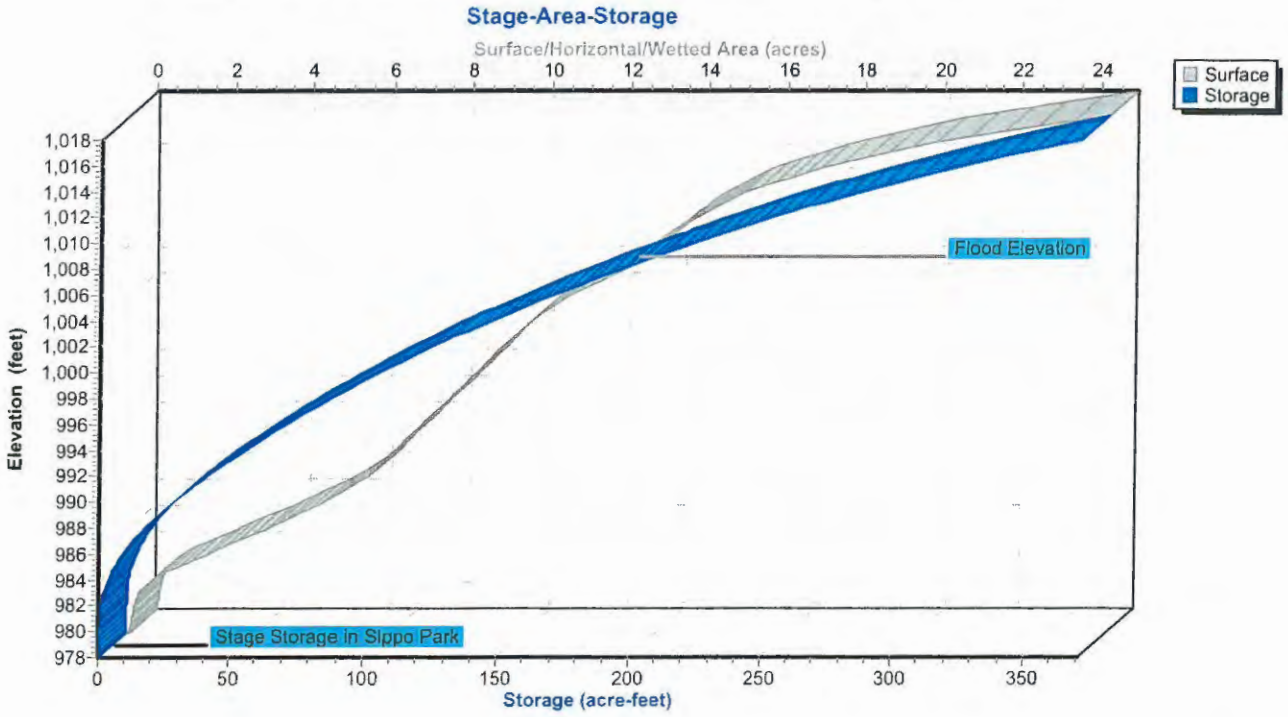
Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-



Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-



Pond 16P: Lincoln Way Box Culvert-Weir - Sippo Park Storage-

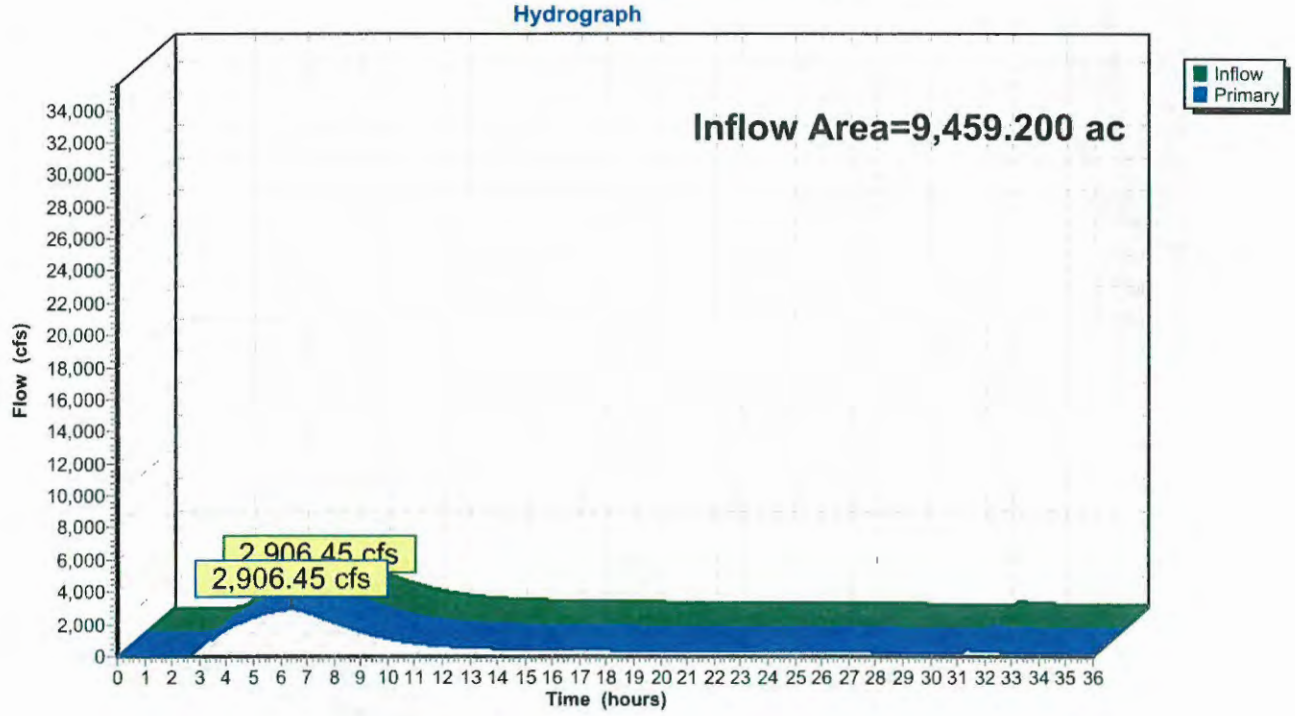


Summary for Pond 19C: Confluence 19

Inflow Area = 9,459.200 ac, 19.70% Impervious, Inflow Depth > 2.54" for 6-HR 0.21 PMF event
Inflow = 2,906.45 cfs @ 6.37 hrs, Volume= 1,998.771 af
Primary = 2,906.45 cfs @ 6.38 hrs, Volume= 1,998.771 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Pond 19C: Confluence 19



Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment HYD 1: Lake Eric Drainage Runoff Area=115.200 ac 0.00% Impervious Runoff Depth=2.98"
Tc=44.0 min CN=74 Runoff=157.03 cfs 28.647 af

Subcatchment HYD 2: Lake O'Springs Runoff Area=268.800 ac 38.00% Impervious Runoff Depth=3.08"
Tc=65.0 min CN=75 Runoff=339.23 cfs 68.960 af

Subcatchment HYD 3: Lake Cable Runoff Area=1,401.600 ac 25.00% Impervious Runoff Depth=2.62"
Tc=226.0 min CN=70 Runoff=802.13 cfs 305.558 af

Subcatchment HYD 4: Hyd 4 Watershed Runoff Area=1,075.200 ac 20.00% Impervious Runoff Depth=2.44"
Tc=128.0 min CN=68 Runoff=772.46 cfs 218.443 af

Subcatchment HYD11: HYD11 Watershed Runoff Area=774.400 ac 0.00% Impervious Runoff Depth=2.35"
Tc=129.0 min CN=67 Runoff=532.29 cfs 151.681 af

Subcatchment HYD12: HYD12 Watershed Runoff Area=723.200 ac 0.00% Impervious Runoff Depth=2.98"
Tc=110.0 min CN=74 Runoff=701.67 cfs 179.842 af

Subcatchment HYD13: HYD13 Watershed Runoff Area=736.000 ac 38.00% Impervious Runoff Depth=3.08"
Tc=72.0 min CN=75 Runoff=895.23 cfs 188.819 af

Subcatchment HYD14: HYD14 Watershed Runoff Area=678.400 ac 25.00% Impervious Runoff Depth=3.57"
Tc=78.0 min CN=80 Runoff=937.68 cfs 201.565 af

Subcatchment HYD6: HYD6 Watershed Runoff Area=1,068.800 ac 0.00% Impervious Runoff Depth=2.53"
Tc=155.0 min CN=69 Runoff=719.73 cfs 225.030 af

Subcatchment HYD8: Sippo Lake Runoff Area=1,964.800 ac 38.00% Impervious Runoff Depth=3.08"
Tc=156.0 min CN=75 Runoff=1,638.90 cfs 504.064 af

Subcatchment HYD9: HYD9 Watershed Runoff Area=652.800 ac 0.00% Impervious Runoff Depth=2.35"
Tc=151.0 min CN=67 Runoff=412.39 cfs 127.864 af

Reach 5R: Channel 5 Avg. Flow Depth=2.98' Max Vel=5.94 fps Inflow=329.82 cfs 619.659 af
L=8,800.0' S=0.0240 '/' Capacity=106,015.62 cfs Outflow=329.24 cfs 614.422 af

Reach 7R: Channel 7 Avg. Flow Depth=7.99' Max Vel=3.12 fps Inflow=961.99 cfs 832.666 af
L=5,900.0' S=0.0017 '/' Capacity=195,473.52 cfs Outflow=911.86 cfs 824.147 af

Reach 10Ra: Channel 10 (Reach Avg. Flow Depth=3.23' Max Vel=2.63 fps Inflow=139.93 cfs 287.571 af
L=900.0' S=0.0028 '/' Capacity=36,685.79 cfs Outflow=139.92 cfs 286.818 af

Reach 15R: Channel 15 Avg. Flow Depth=8.39' Max Vel=2.12 fps Inflow=2,560.49 cfs 1,614.903 af
L=8,800.0' S=0.0010 '/' Capacity=189,892.92 cfs Outflow=2,165.84 cfs 1,583.296 af

Reach 16R: Channel 16 Avg. Flow Depth=10.31' Max Vel=2.56 fps Inflow=2,901.22 cfs 1,951.590 af
L=7,500.0' S=0.0010 '/' Capacity=42,389.29 cfs Outflow=2,819.07 cfs 1,929.374 af

Reach 18R: Sippo Creek Avg. Flow Depth=5.92' Max Vel=9.53 fps Inflow=2,858.31 cfs 2,118.464 af
L=450.0' S=0.0084 '/' Capacity=200,707.82 cfs Outflow=2,858.31 cfs 2,118.344 af

Pond 1C: CONF 1 Combined O'Springs and Eric Inflow=384.80 cfs 97.498 af
Primary=384.80 cfs 97.498 af

Pond 1P: Sippo Creek Reservoir Peak Elev=1,007.21' Storage=127.145 af Inflow=3,142.96 cfs 2,130.560 af
180.31 cfs 1,837.758 af Secondary=952.82 cfs 281.783 af Tertiary=0.00 cfs 0.000 af Outflow=3,133.13 cfs 2,119.541 af

Pond 2C: CONF 2 Combined Cable and O'Springs Inflow=956.52 cfs 402.572 af
Primary=956.52 cfs 402.572 af

Pond 3P: Lake Cable Peak Elev=1,098.03' Storage=2,059.507 af Inflow=956.52 cfs 402.571 af
Primary=329.82 cfs 619.758 af Secondary=0.00 cfs 0.000 af Outflow=329.82 cfs 619.758 af

Pond 4C: Confluence 4 Inflow=1,631.27 cfs 1,049.077 af
Primary=1,631.27 cfs 1,049.077 af

Pond 4P: Lake O'Springs Peak Elev=1,107.80' Storage=74.635 af Inflow=384.80 cfs 97.498 af
Primary=155.73 cfs 97.015 af Secondary=0.00 cfs 0.000 af Outflow=155.73 cfs 97.015 af

Pond 5C: Confluence 5 Inflow=2,138.81 cfs 1,200.658 af
Primary=2,138.81 cfs 1,200.658 af

Pond 5P: Lake Eric (Slagle) Peak Elev=1,119.91' Storage=27.112 af Inflow=157.03 cfs 28.647 af
Primary=66.39 cfs 28.538 af Secondary=0.00 cfs 0.000 af Outflow=66.39 cfs 28.538 af

Pond 6C: Confluence 6 Inflow=442.90 cfs 414.603 af
Primary=442.90 cfs 414.603 af

Pond 7C: Confluence 7 - Combined North Watershed and Sippo Lake Inflow=2,560.49 cfs 1,615.082 af
Primary=2,560.49 cfs 1,615.082 af

Pond 8C: Confluence 8 Inflow=2,901.22 cfs 1,951.773 af
Primary=2,901.22 cfs 1,951.773 af

Pond 8P: Storage Area Genoa Rd Peak Elev=1,025.10' Storage=322.771 af Inflow=1,284.87 cfs 411.232 af
Primary=126.65 cfs 284.673 af Secondary=13.40 cfs 2.977 af Outflow=139.93 cfs 287.650 af

Pond 9P: Sippo Lake Peak Elev=1,029.08' Storage=420.172 af Inflow=1,638.90 cfs 504.064 af
mary=1,284.87 cfs 411.233 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=1,284.87 cfs 411.233 af

Pond 13P: Confluence 3 - Combined Watershed NW and North Watershed Inflow=961.99 cfs 832.766 af
Primary=961.99 cfs 832.766 af

Pond 16P: Lincoln Way Box Peak Elev=1,001.65' Storage=122.580 af Inflow=3,133.13 cfs 2,119.347 af
Primary=2,858.31 cfs 2,118.658 af Secondary=0.00 cfs 0.000 af Outflow=2,858.31 cfs 2,118.658 af

Pond 19C: Confluence 19 Inflow=3,142.96 cfs 2,130.749 af
Primary=3,142.96 cfs 2,130.749 af

Total Runoff Area = 9,459.200 ac Runoff Volume = 2,200.473 af Average Runoff Depth = 2.79"
80.30% Pervious = 7,595.712 ac 19.70% Impervious = 1,863.488 ac

Summary for Subcatchment HYD 1: Lake Eric Drainage Area

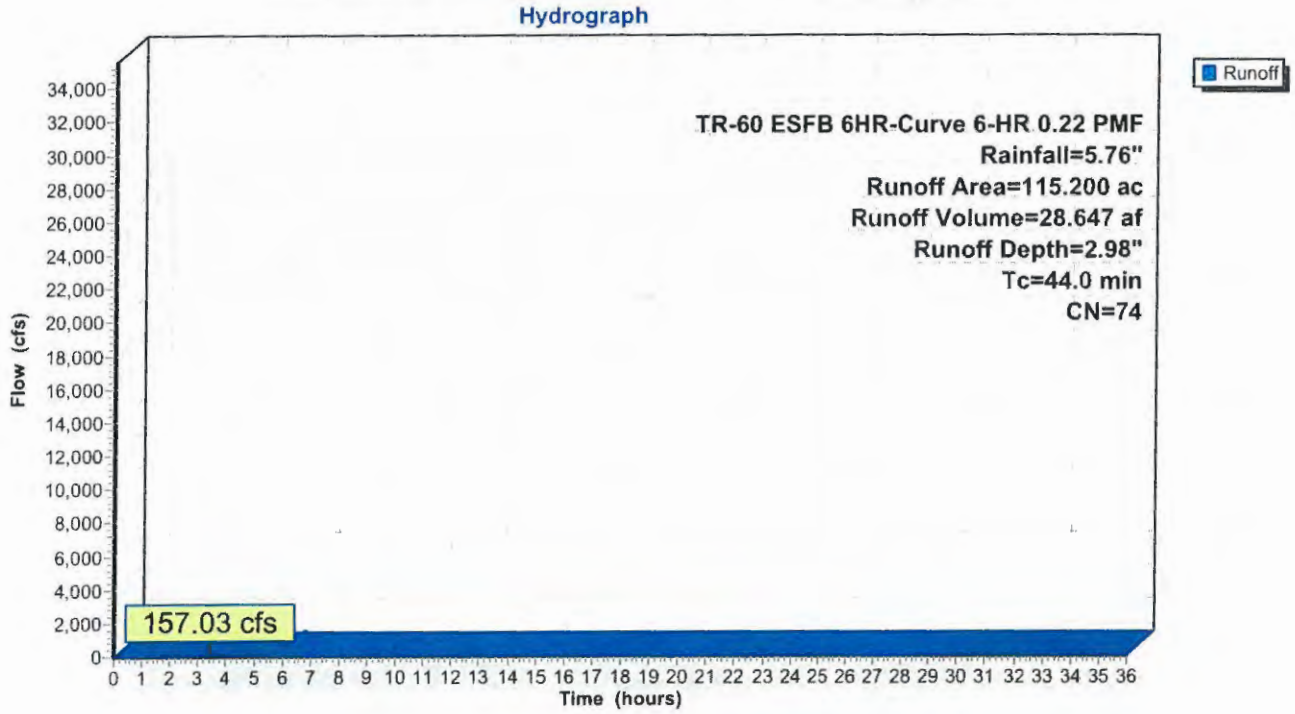
Runoff = 157.03 cfs @ 3.37 hrs, Volume= 28.647 af, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.22 PMF Rainfall=5.76"

Area (ac)	CN	Description
115.200	74	>75% Grass cover, Good, HSG C
115.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
44.0					**Direct Entry, HEC-1 Lag Time = 0.44 hr**

Subcatchment HYD 1: Lake Eric Drainage Area



Summary for Subcatchment HYD 2: Lake O'Springs Watershed

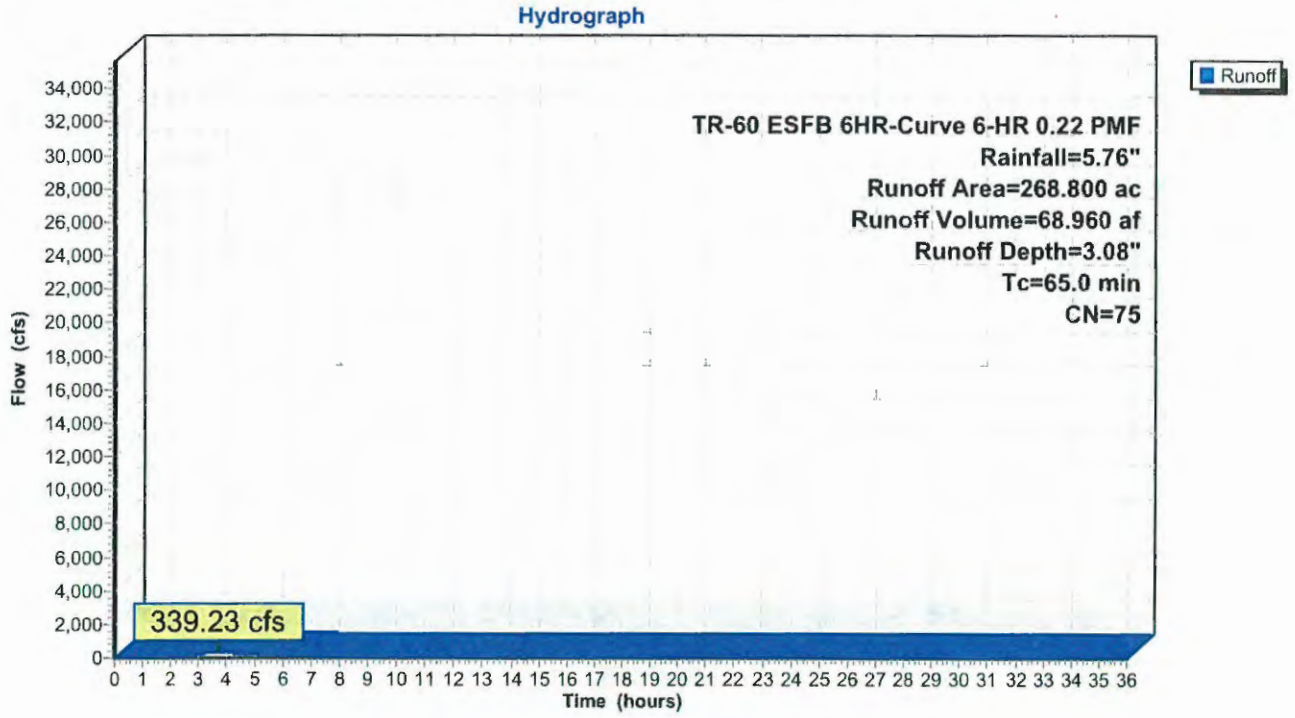
Runoff = 339.23 cfs @ 3.68 hrs, Volume= 68.960 af, Depth= 3.08"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.22 PMF Rainfall=5.76"

Area (ac)	CN	Description
268.800	75	1/4 acre lots, 38% imp, HSG B
166.656		62.00% Pervious Area
102.144		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.0					**Direct Entry, HEC-1 Lag Time = 0.65 hours**

Subcatchment HYD 2: Lake O'Springs Watershed



Summary for Subcatchment HYD 3: Lake Cable Watershed

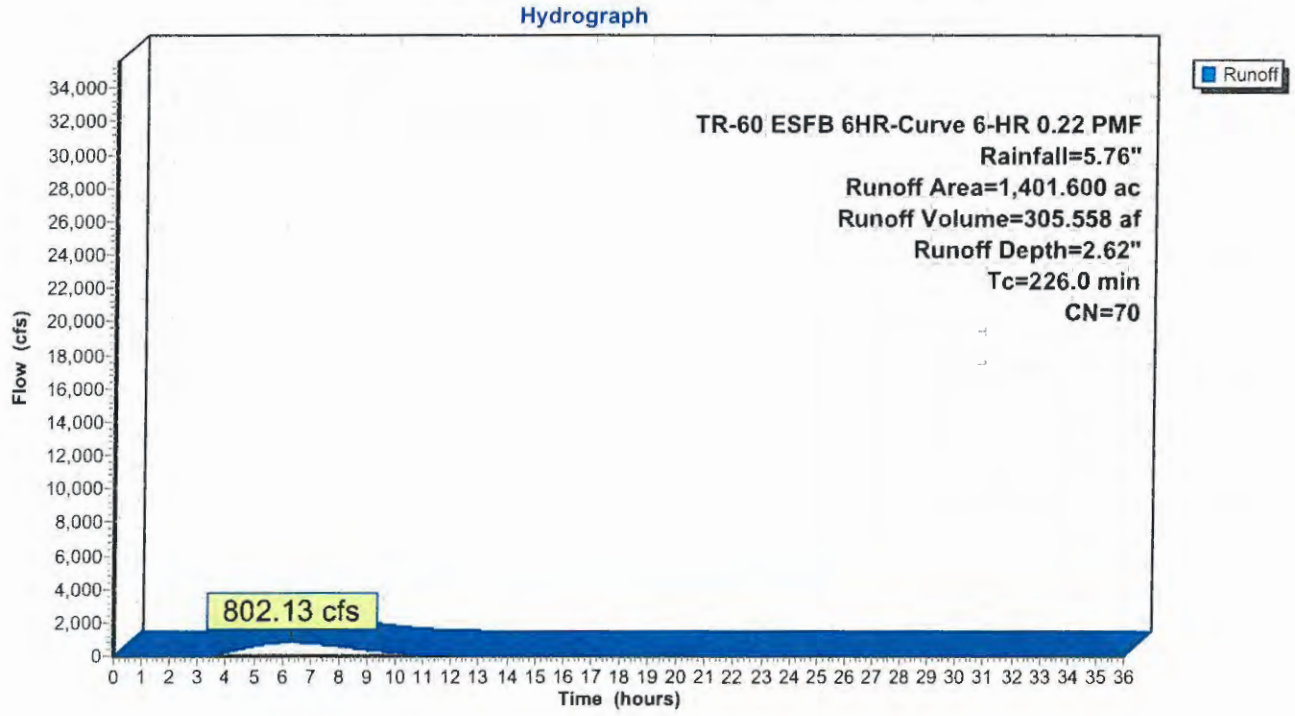
Runoff = 802.13 cfs @ 6.28 hrs, Volume= 305.558 af, Depth= 2.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.22 PMF Rainfall=5.76"

Area (ac)	CN	Description
1,401.600	70	1/2 acre lots, 25% imp, HSG B
1,051.200		75.00% Pervious Area
350.400		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
226.0					**Direct Entry, HEC-1 Lag time 2.26hr**

Subcatchment HYD 3: Lake Cable Watershed



Summary for Subcatchment HYD 4: Hyd 4 Watershed

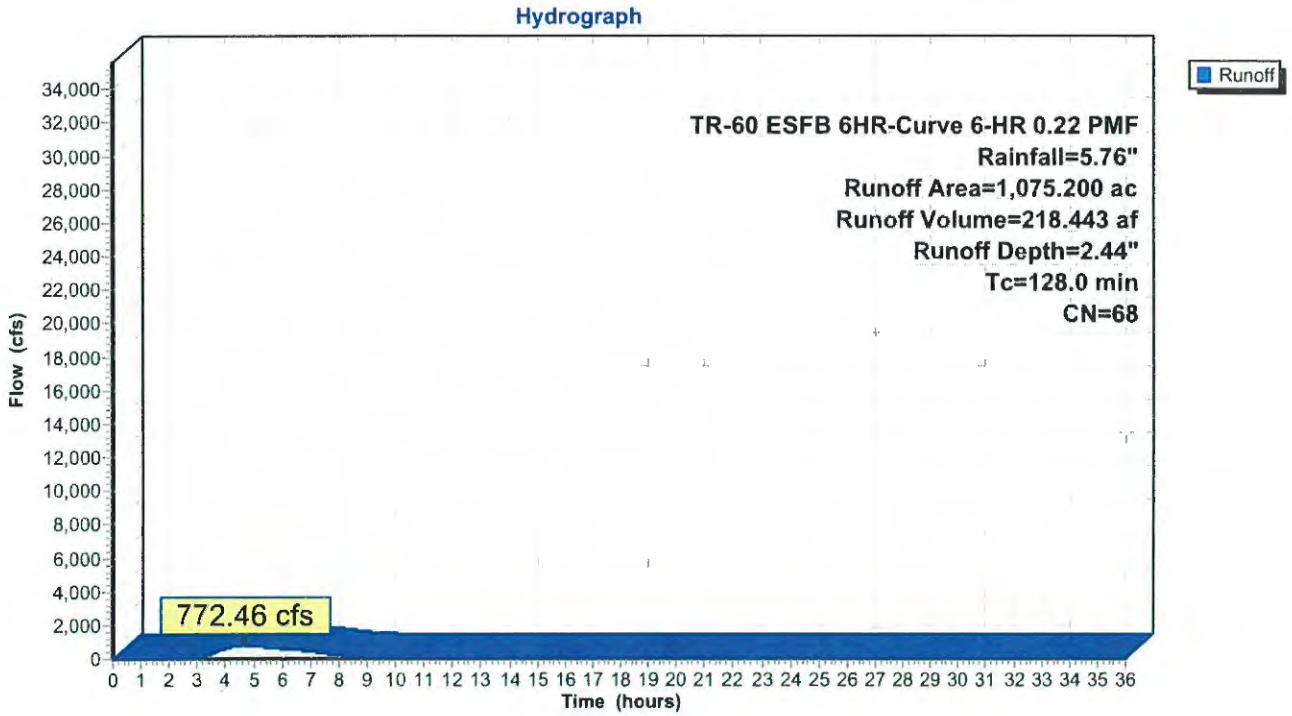
Runoff = 772.46 cfs @ 4.69 hrs, Volume= 218.443 af, Depth= 2.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.22 PMF Rainfall=5.76"

Area (ac)	CN	Description
1,075.200	68	1 acre lots, 20% imp, HSG B
860.160		80.00% Pervious Area
215.040		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
128.0					**Direct Entry, HEC-1 Lag Time = 1.28 hr**

Subcatchment HYD 4: Hyd 4 Watershed



Summary for Subcatchment HYD11: HYD11 Watershed

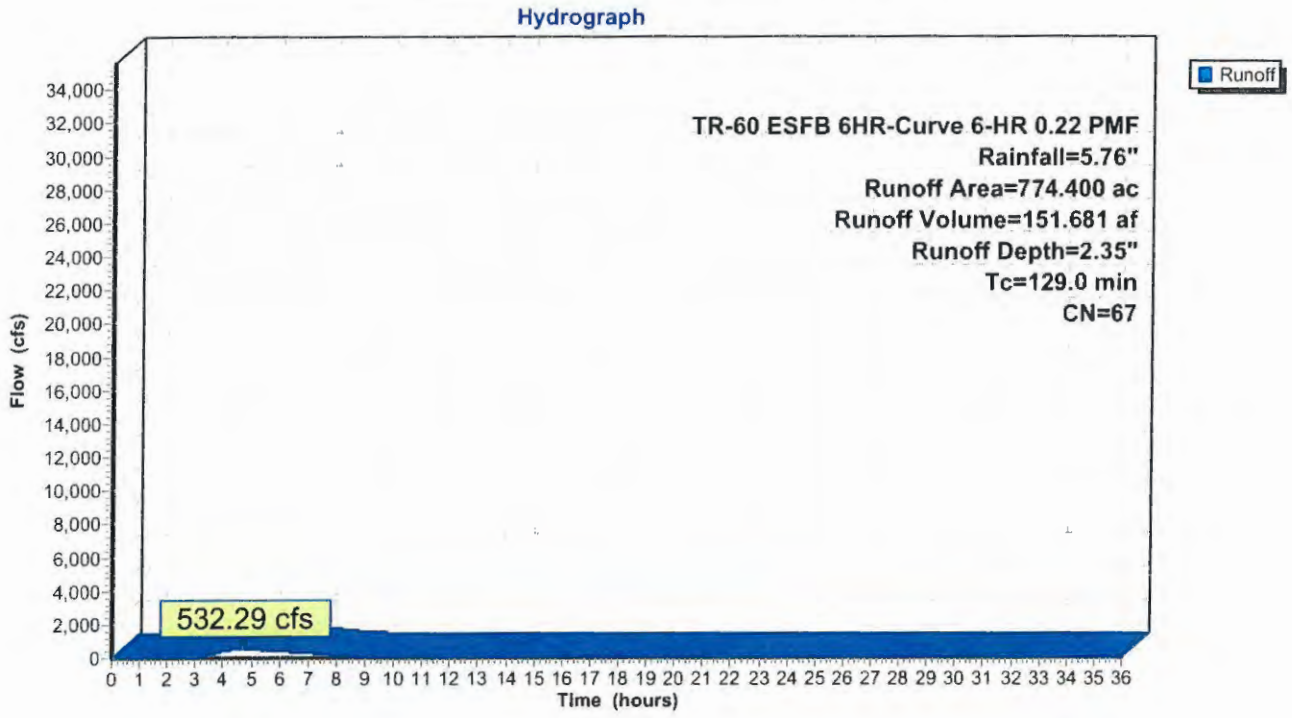
Runoff = 532.29 cfs @ 4.73 hrs, Volume= 151.681 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.22 PMF Rainfall=5.76"

	Area (ac)	CN	Description
*	774.400	67	
	774.400		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
129.0					**Direct Entry, HEC-1 Lag Time = 1.29 hr**

Subcatchment HYD11: HYD11 Watershed



Summary for Subcatchment HYD12: HYD12 Watershed

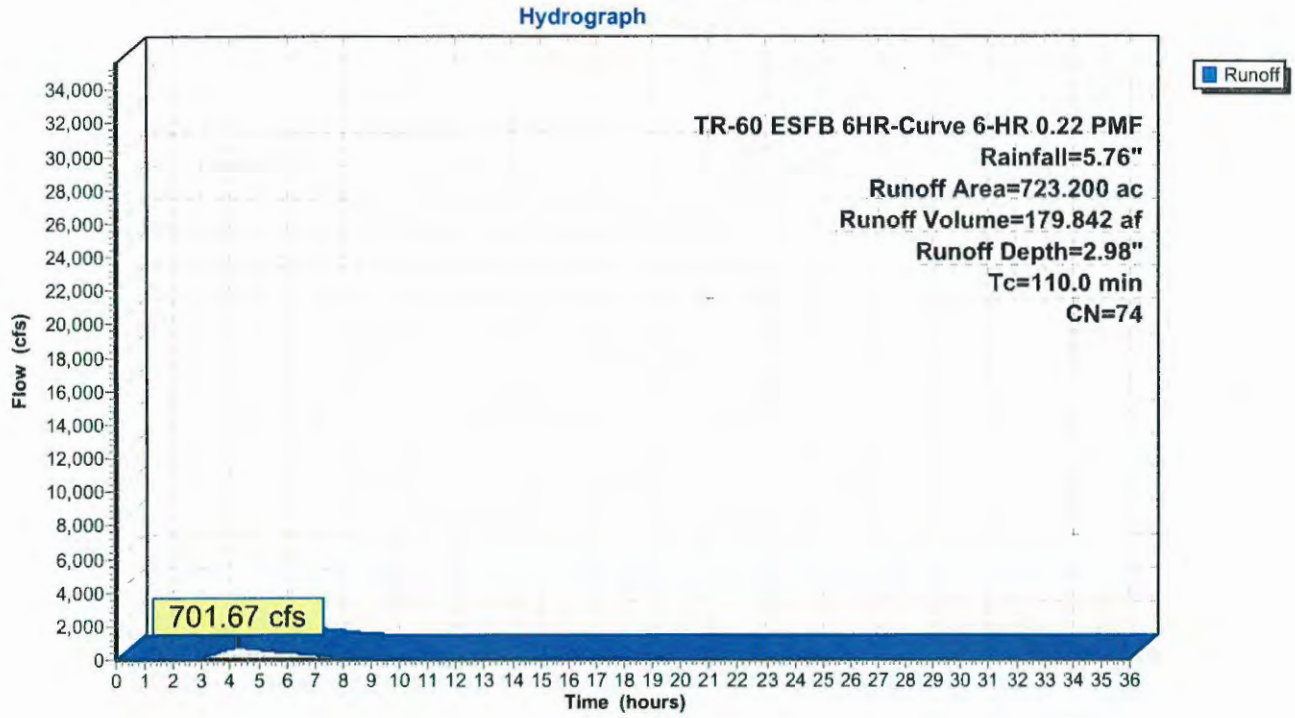
Runoff = 701.67 cfs @ 4.28 hrs, Volume= 179.842 af, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.22 PMF Rainfall=5.76"

Area (ac)	CN	Description
723.200	74	>75% Grass cover, Good, HSG C
723.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
110.0					**Direct Entry, HEC-1 Lag Time = 1.10 hr**

Subcatchment HYD12: HYD12 Watershed



Summary for Subcatchment HYD13: HYD13 Watershed

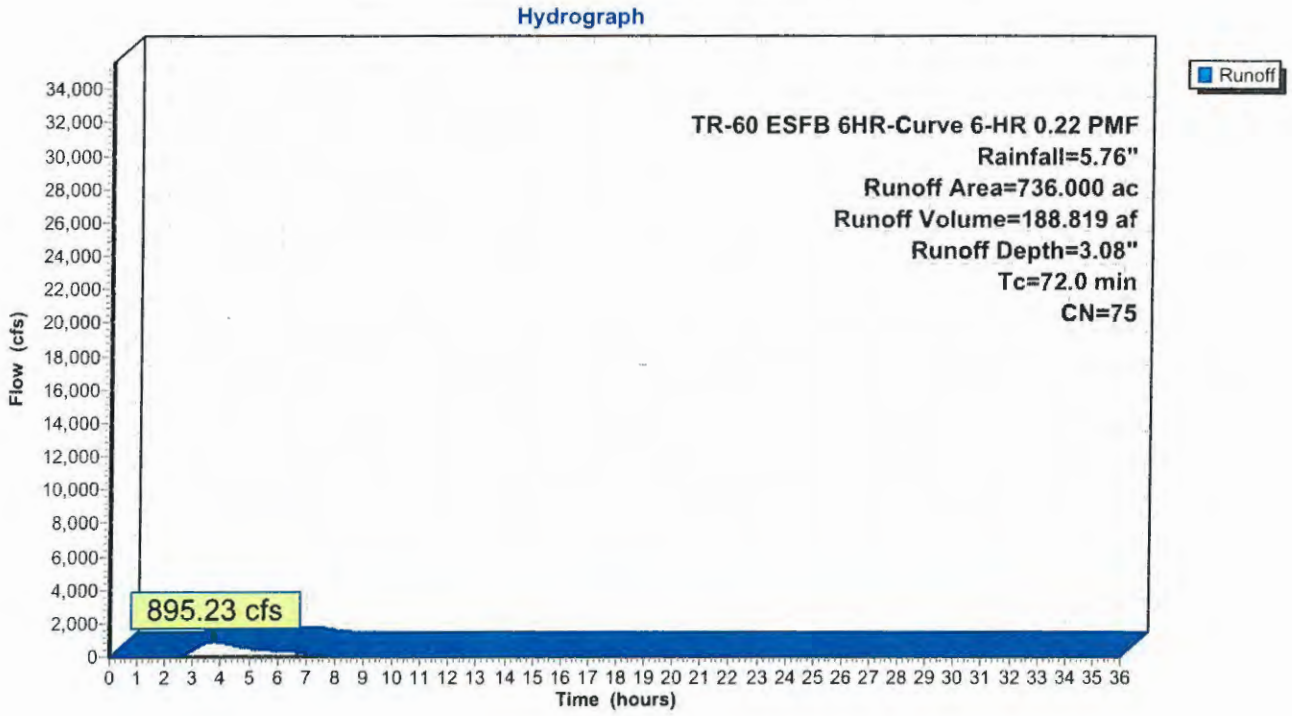
Runoff = 895.23 cfs @ 3.76 hrs, Volume= 188.819 af, Depth= 3.08"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.22 PMF Rainfall=5.76"

Area (ac)	CN	Description
736.000	75	1/4 acre lots, 38% imp, HSG B
456.320		62.00% Pervious Area
279.680		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
72.0					**Direct Entry, HEC-1 Lag Time = 0.72 hr**

Subcatchment HYD13: HYD13 Watershed



Summary for Subcatchment HYD14: HYD14 Watershed

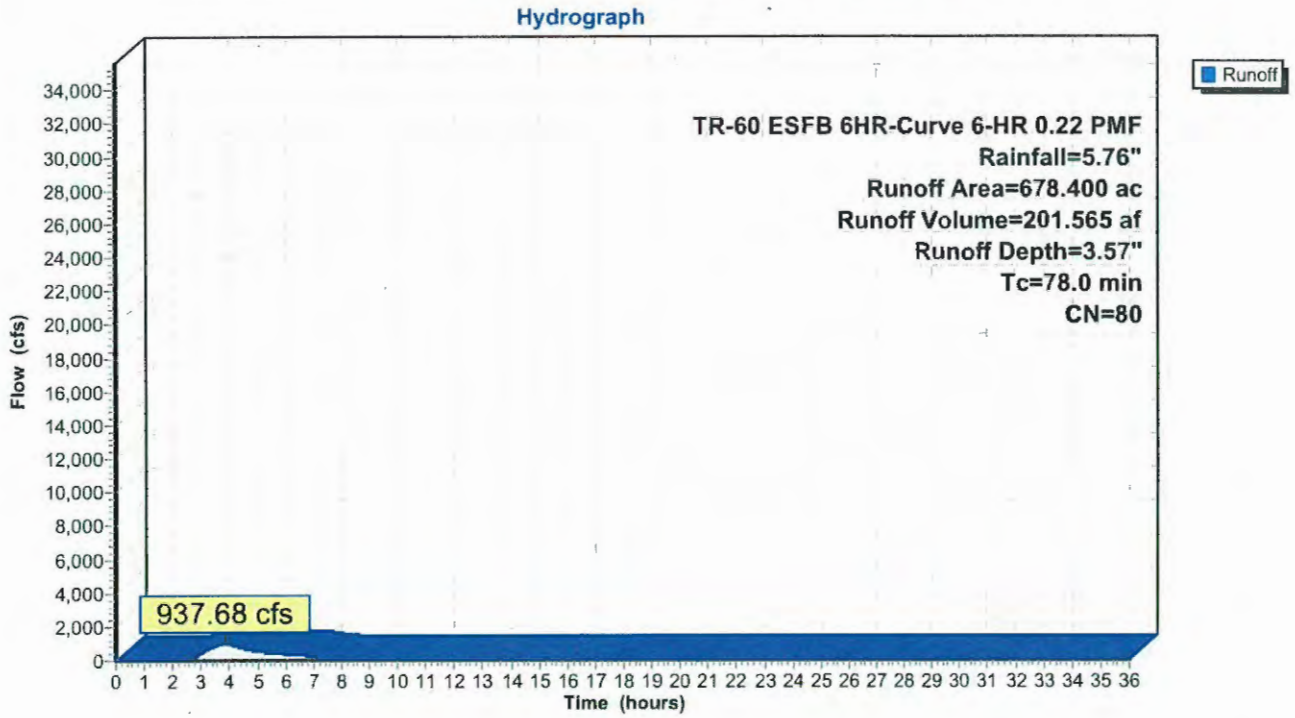
Runoff = 937.68 cfs @ 3.81 hrs, Volume= 201.565 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.22 PMF Rainfall=5.76"

Area (ac)	CN	Description
678.400	80	1/2 acre lots, 25% imp, HSG C
508.800		75.00% Pervious Area
169.600		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
78.0					**Direct Entry, HEC-1 Lag Time = 0.78 hr**

Subcatchment HYD14: HYD14 Watershed



Summary for Subcatchment HYD6: HYD6 Watershed

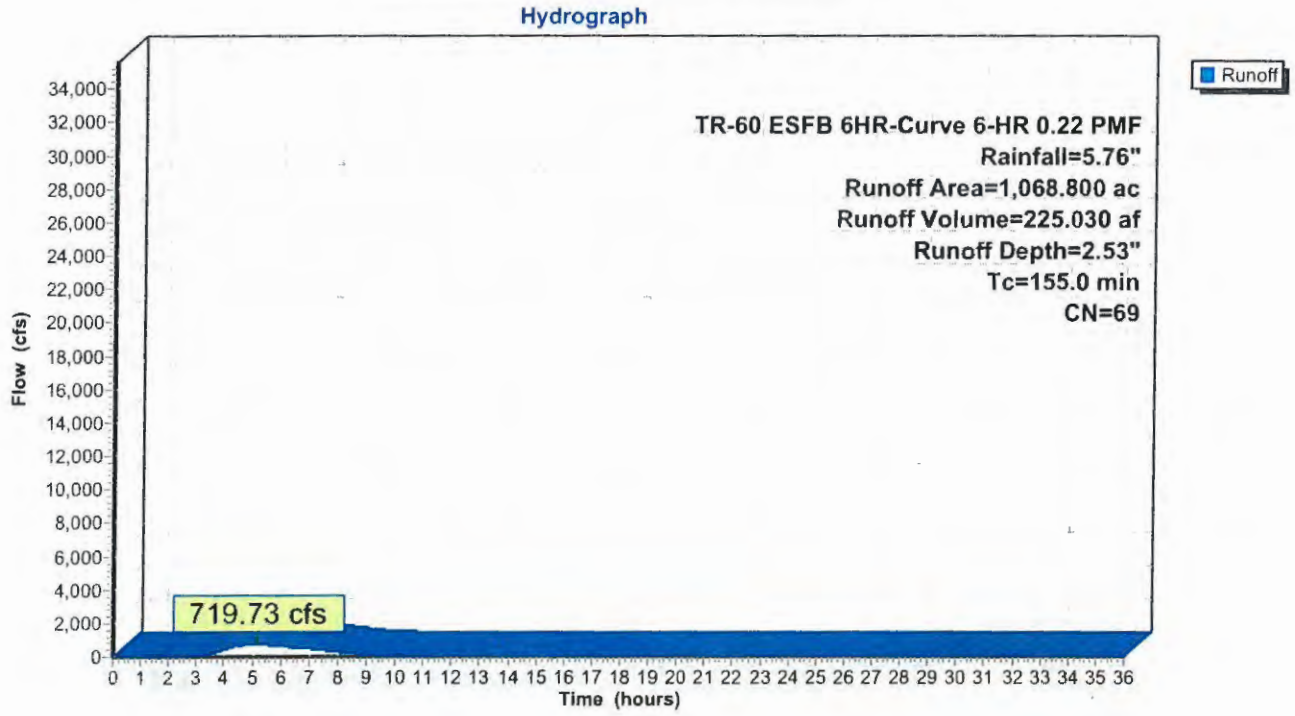
Runoff = 719.73 cfs @ 5.16 hrs, Volume= 225.030 af, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.22 PMF Rainfall=5.76"

Area (ac)	CN	Description
1,068.800	69	Pasture/grassland/range, Fair, HSG B
1,068.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
155.0					**Direct Entry, HEC-1 Lag Time = 1.55 hr**

Subcatchment HYD6: HYD6 Watershed



Summary for Subcatchment HYD8: Sippo Lake Watershed

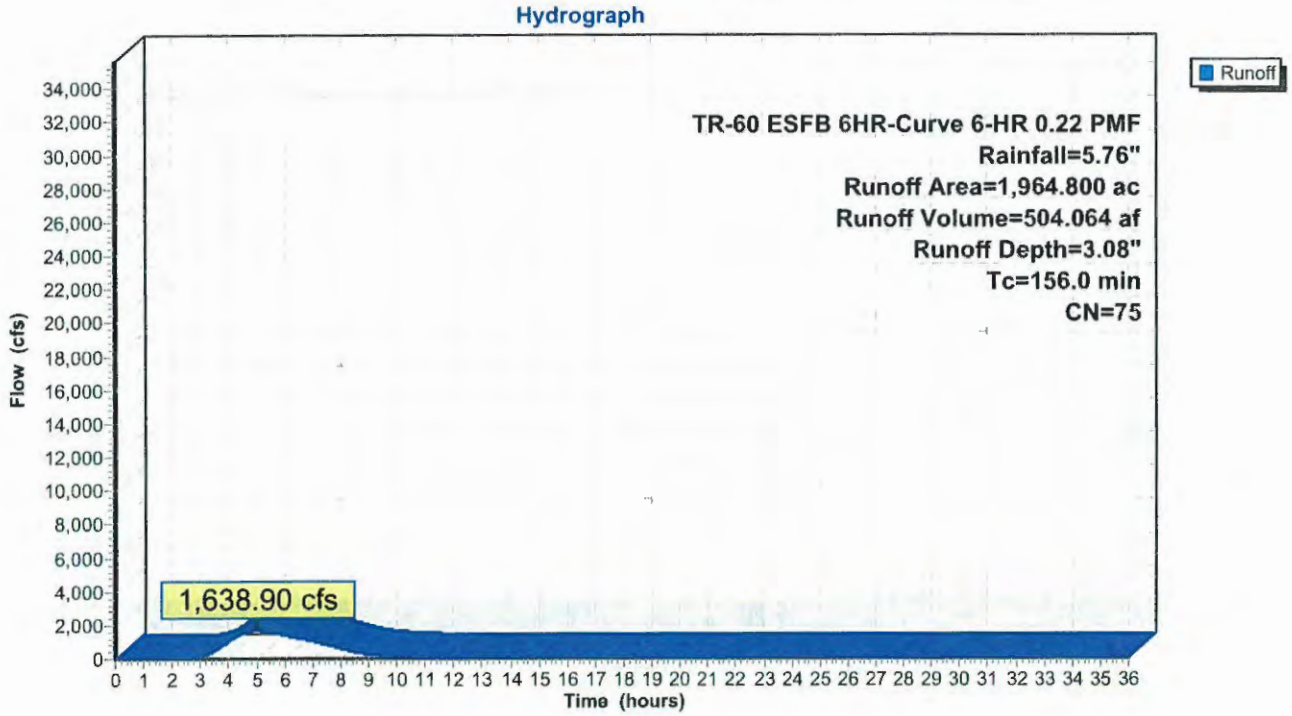
Runoff = 1,638.90 cfs @ 5.03 hrs, Volume= 504.064 af, Depth= 3.08"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.22 PMF Rainfall=5.76"

Area (ac)	CN	Description
1,964.800	75	1/4 acre lots, 38% imp, HSG B
1,218.176		62.00% Pervious Area
746.624		38.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
156.0					**Direct Entry, HEC-1 Lag Time = 1.56hr**

Subcatchment HYD8: Sippo Lake Watershed



Summary for Subcatchment HYD9: HYD9 Watershed

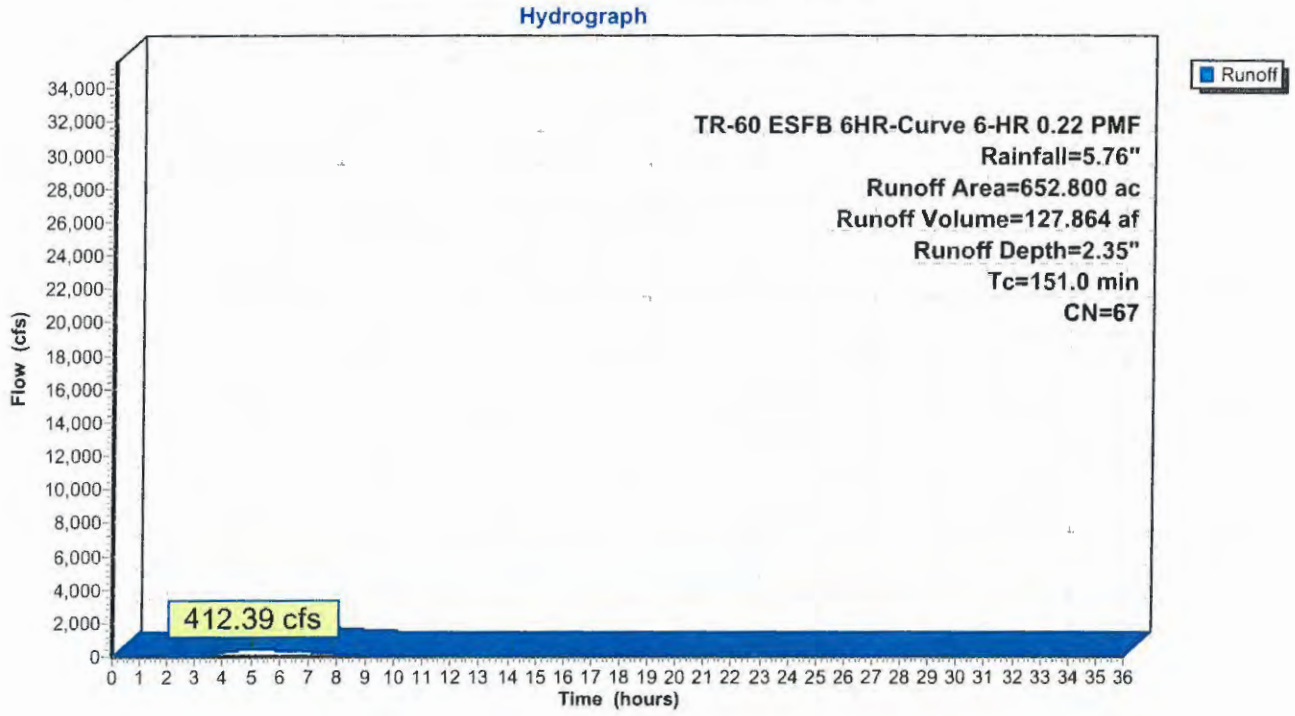
Runoff = 412.39 cfs @ 5.04 hrs, Volume= 127.864 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
TR-60 ESFB 6HR-Curve 6-HR 0.22 PMF Rainfall=5.76"

	Area (ac)	CN	Description
*	652.800	67	
	652.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
151.0					**Direct Entry, HEC-1 Lag Time = 1.51hr**

Subcatchment HYD9: HYD9 Watershed



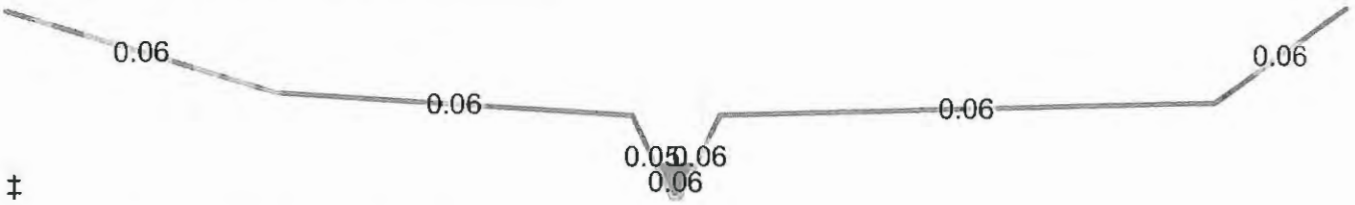
Summary for Reach 5R: Channel 5

Inflow Area = 1,785.600 ac, 25.34% Impervious, Inflow Depth > 4.16" for 6-HR 0.22 PMF event
Inflow = 329.82 cfs @ 9.64 hrs, Volume= 619.659 af
Outflow = 329.24 cfs @ 9.96 hrs, Volume= 614.422 af, Atten= 0%, Lag= 19.5 min

Routing by Sim-Route method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.94 fps, Min. Travel Time= 24.7 min
Avg. Velocity = 5.20 fps, Avg. Travel Time= 28.2 min

Peak Storage= 488,235 cf @ 9.96 hrs
Average Depth at Peak Storage= 2.98'
Defined Flood Depth= 16.00', Capacity at Flood Depth= 106,015.62 cfs
Bank-Full Depth= 16.00', Capacity at Bank-Full= 106,015.62 cfs

Custom cross-section, Length= 8,800.0' Slope= 0.0240 '/' (102 Elevation Intervals)
Flow calculated by Manning's Subdivision method
Inlet Invert= 1,069.00', Outlet Invert= 857.80'



‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)	n	Description
0.00	1,085.00	0.00		
200.00	1,078.00	7.00	0.060	
465.00	1,076.00	9.00	0.060	
494.00	1,069.00	16.00	0.050	
500.00	1,069.00	16.00	0.060	
530.00	1,076.00	9.00	0.060	
900.00	1,077.00	8.00	0.060	
1,000.00	1,085.00	0.00	0.060	

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	6.0	0	0.00
7.00	248.5	66.6	2,186,800	2,476.94
8.00	564.8	569.1	4,969,800	3,087.89
9.00	1,204.8	714.2	10,601,800	7,790.91
16.00	7,198.5	1,002.1	63,346,800	106,015.62