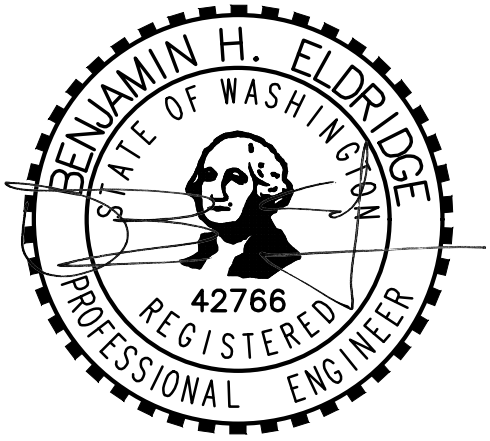
Received 8-26-2022
City of DuPont

BARGHAUSEN

PRELIMINARY STORMWATER SITE PLAN

Founder's Ridge

A PORTION OF SECTIONS 22, 56 AND 27, TOWNSHIP 19 NORTH, RANGE 1 EAST, W.M.
DuPont, Washington



Prepared for:
Northpoint Development
4825 N.W. 41st Street, Suite 500
Riverside, Missouri 64150

August 11, 2022
Job No. 21127

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH KENT, WA 98032 P) 425.251.6222 F) 425.251.8782
BRANCH OFFICES: CHEHALIS, WA KLAMATH FALLS, OR LONG BEACH, CA RICHLAND, WA ROSEVILLE, CA
barghausen.com

Preliminary Stormwater Site Plan

Barghausen Consulting Engineers, Inc.

Founders Ridge

Dupont, Washington

Our Job No. 21127

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APPENDIX F: Water Quality Calculations

APPENDIX G: Infiltration Memo

Tab 1.0

1.0 PROJECT OVERVIEW

The proposed Founder's Ridge development is located on a parent parcel (Tax Parcel No. 0119272005) totaling approximately 124 acres, located around Fort Lake and south of Sequalitchew Creek in the City of DuPont, Washington. The parcel consists of previously cleared and graded land that is currently covered in small brush and trees. The project site is found not to be in a flood zone. See Figure 3 for FEMA maps. The site is also found to not include any sensitive areas. See Figure 4 for a sensitive areas map.

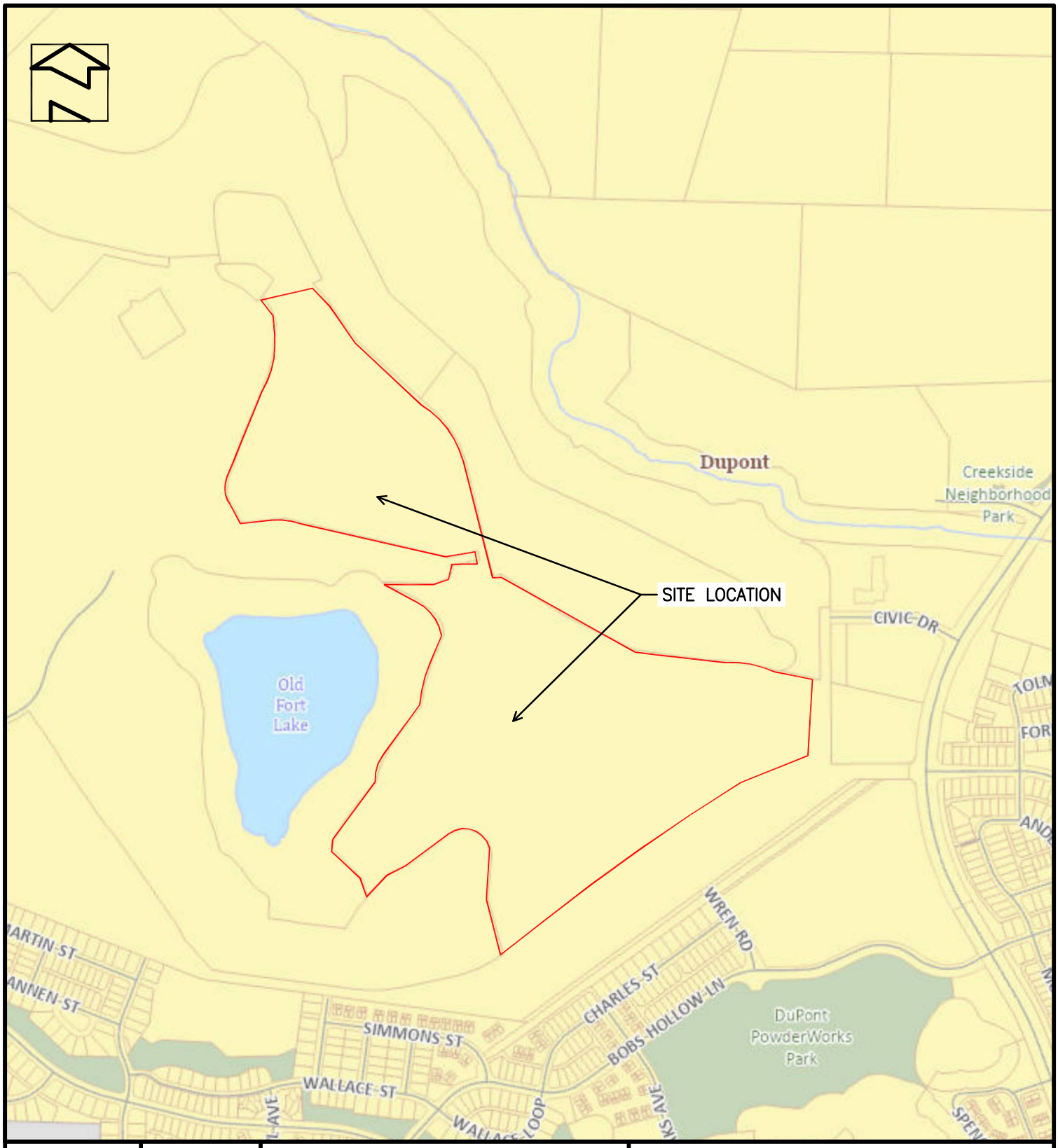
Please see Figure 1 for the Vicinity Map of the project site.

The proposal for this development is to construct industrial buildings with associated site and frontage improvements on the southeastern part of the parent parcel. The industrial improvements total approximately 83 acres of new and replaced impervious surfaces which include both asphalt and concrete paving.

The site is zoned as MUV Mixed use Village 1-8

The project site is subject to the 2012 Department of Ecology Stormwater Management Manual of Western Washington (SWMMWW) as amended in 2014. Per the SWMMWW, the project site is considered a new development as the parent parcel has less than 35% of existing impervious surfaces. Given this, the project site shall implement Minimum Requirements 1 to 9 to new hard surfaces and converted vegetation areas. See Figure 5 for Flow Chart of New-Development. Furthermore, as part of the stormwater design, infiltration is the proposed method of flow control for this project with basic water quality required for pretreatment prior to infiltration. See Section 5.0 for further discussion.

Figure 1:
Vicinity Map



Job Number 21127	Designed SG Drawn SG Checked BE Approved BE Date 03/16/2021	Scale: Horizontal N.T.S. Vertical N/A	For: FOUNDER'S RIDGE
Sheet 1 of 1		BARGHAUSEN CONSULTING ENGINEERS, INC. 18215 72ND AVENUE SOUTH KENT, WA 98032 425.251.6222 BARGHAUSEN.COM	Title: VICINITY MAP

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Figure 2:
Assessor Map



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Sheet 1 of 1		BARGHAUSEN CONSULTING ENGINEERS, INC. 18215 72ND AVENUE SOUTH KENT, WA 98032 425.251.6222 BARGHAUSEN.COM	Title: ASSESSOR'S MAP

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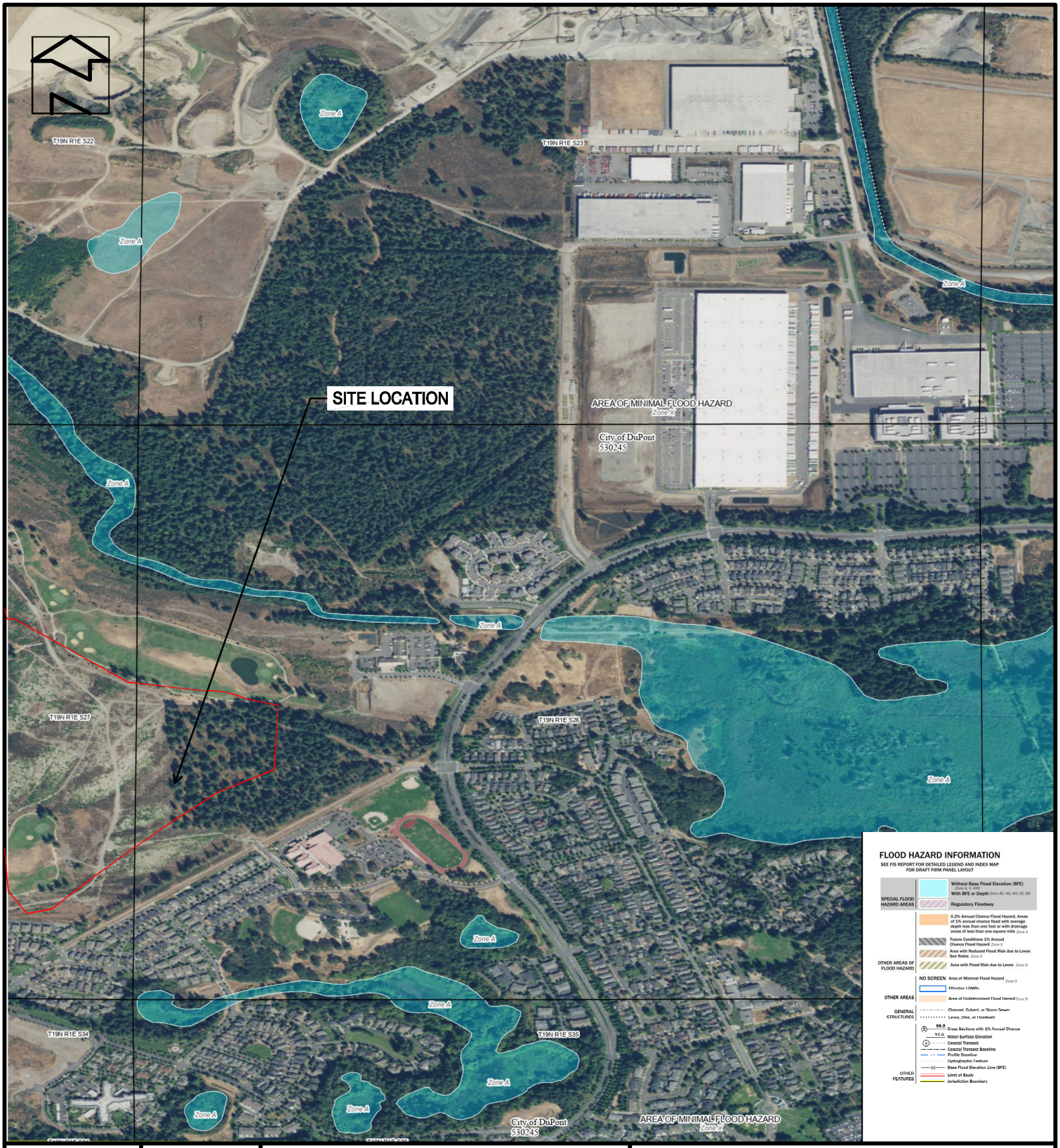
Figure 3:
FEMA Map



Job Number 21127	Designed SG Drawn SG Checked BE Approved BE Date 03/16/2021	Scale: Horizontal N.T.S. Vertical N/A	For: FOUNDER'S RIDGE
Sheet 1 of 1		BARGHAUSEN CONSULTING ENGINEERS, INC. 18215 72ND AVENUE SOUTH KENT, WA 98032 425.251.6222 BARGHAUSEN.COM	Title: FEMA 1

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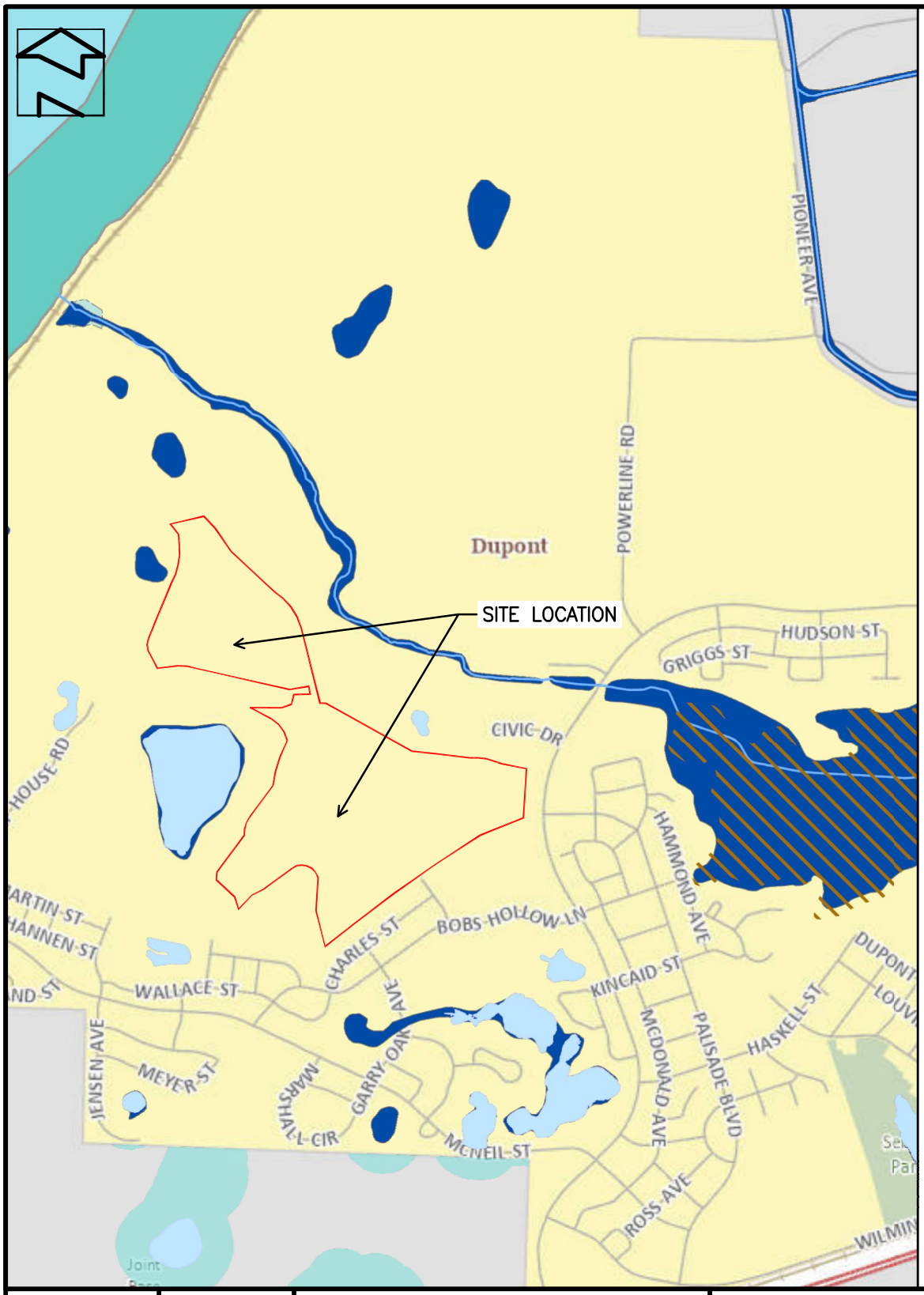


Job Number 21127	Designed SG Drawn SG Checked BE Approved BE Date 03/16/2021	Scale: Horizontal N.T.S. Vertical N/A	For: FOUNDER'S RIDGE
Sheet 1 of 1		BARGHAUSEN CONSULTING ENGINEERS, INC. 18215 72ND AVENUE SOUTH KENT, WA 98032 425.251.6222 BARGHAUSEN.COM	Title: FEMA 2

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Figure 4: Sensitive Areas Map



Legend

Hydro - Centerlines

- Hydro Centerline
- Pipe
- Hydric Soils
- Hydro Water Bodies

Regulated Floodplain 2017

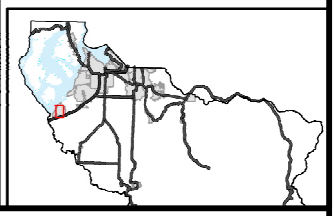
- 1% Annual Chance Flood
- X BEHIND LEVEE
- 0.2 PCT
- X (SHADED)
- Coastal High Hazard Areas
- See King County FIRM
- Potential Wetland Review

Wetlands

- Unconfirmed
- Yes
- No

Wetlands Delineation

- Delineated
- Verified
- Unverified
- Floodways



Job Number 21127	Designed SG Drawn SG Checked BE Approved BE Date 03/16/2021	Scale: Horizontal N.T.S. Vertical N/A	For: FOUNDER'S RIDGE
Sheet 1 of 1		BARGHAUSEN CONSULTING ENGINEERS, INC. 18215 72ND AVENUE SOUTH KENT, WA 98032 425.251.6222 BARGHAUSEN.COM	Title: SENSITIVE AREAS

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Figure 5: Minimum Requirements for Re-Development Flowchart

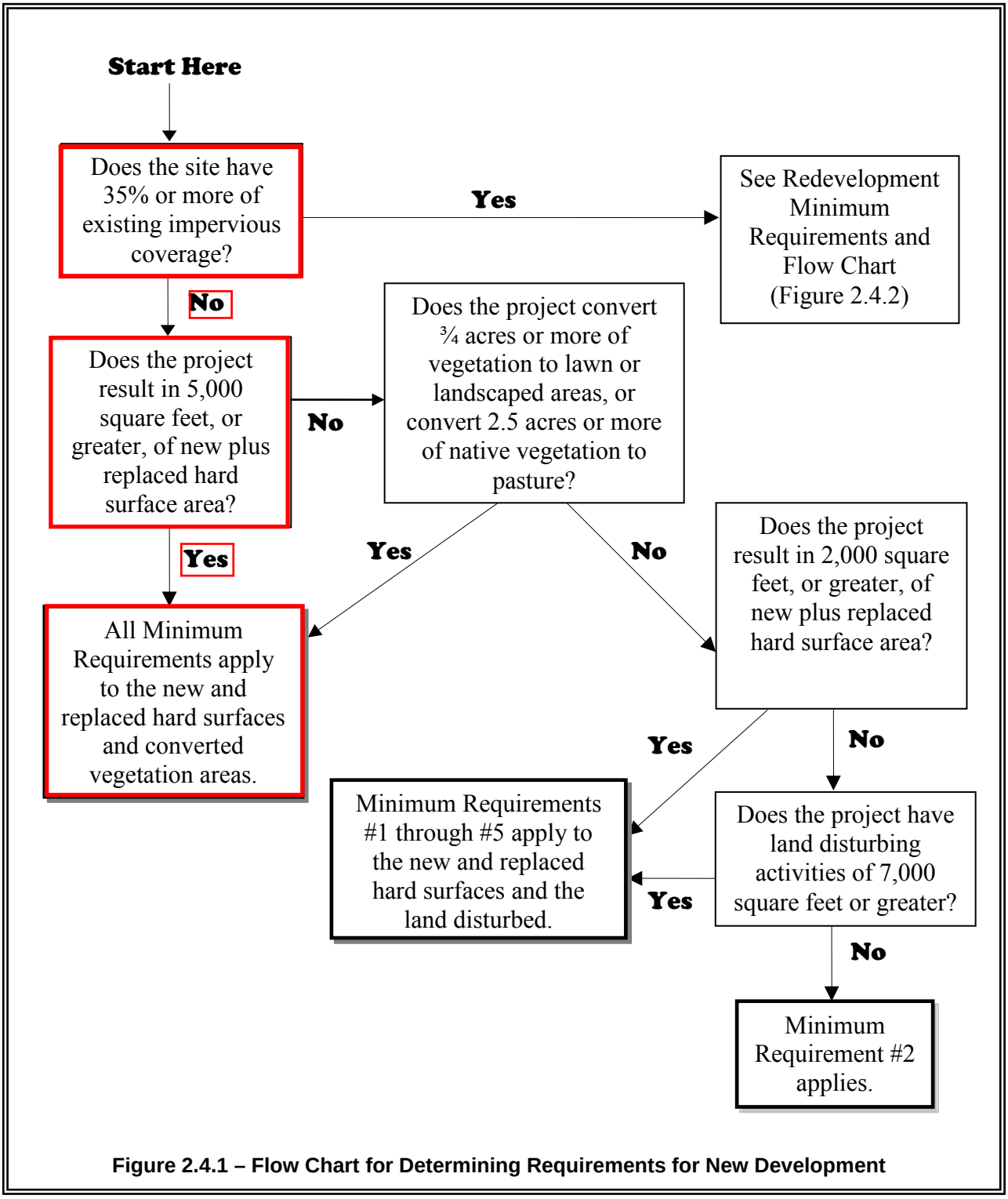


Figure 2.4.1 – Flow Chart for Determining Requirements for New Development

Tab 2.0

2.0 ANALYSIS OF THE MINIMUM REQUIREMENTS

Minimum Requirement No. 1 – Preparation of Stormwater Site Plan:

This document fulfills the requirements of a Stormwater Site Plan.

Minimum Requirement No. 2 – Construction Stormwater Pollution Prevention:

The Construction Stormwater Pollution Prevention Plan is included in Appendix C of this report.

Minimum Requirement No. 3 – Source Control Prevention:

Source control will be provided on site in the form of regular sweeping of the parking areas, as well as educating the owner about the proper use of fertilizers and pesticides on the landscaping areas. All applicable mandatory operational Source Control BMPs per Volume IV-2.1 such as Formation of a Pollution Prevention Team, Good Housekeeping, Preventive Maintenance, etc. shall be observed and implemented to this proposed project. Moreover, all known available and reasonable Source Control BMPs will be applied to this project in accordance with those applicable manufacturing project per Volume IV-2.1 of the 2012 SWMMWW as amended in 2014.

Minimum Requirement No. 4 – Preservation of Natural Drainage Systems and Outfalls:

This area consists of silty gravel and silty sand overlaying sand and gravel soils that infiltrate over the entire site. The infiltration rate utilized was 10 inches per hour as allowed by the geotechnical report for long-term infiltration.

Minimum Requirement No. 5 – On-Site Stormwater Management:

This project achieves the Low Impact Development Performance Standard due to full infiltration of runoff from all impervious areas on-site.

Minimum Requirement No. 6 – Runoff Treatment:

Per the 2012 SWMMWW as amended in 2014, the project site is required to comply to Basic Treatment standards. All areas requiring runoff treatment will have runoff from those areas routed to a basic water quality facility prior to infiltration. See Section 5.E for further discussion.

Minimum Requirement No. 7 – Flow Control:

Flow control for this development will be provided using infiltration ponds designed to infiltrate 100% of the runoff for historical storm events using the Western Washington Hydrology Model (WWHM) 2012. See Section 5.D for further discussion.

Minimum Requirement No. 8 – Wetland Protection:

There are no wetlands on this project site.

Minimum Requirement No. 9 – Operations and Maintenance:

An Operations and Maintenance Manual will be prepared and included in the final stormwater site plan prepared for this development.

Tab 3.0

3.0 EXISTING CONDITIONS SUMMARY

The existing project site consists of previously cleared and graded land that is currently covered in small brush with some trees. The topography of the site ranges from 200 to 230 feet in elevation with the highest being on the southwest portion of the site. See Figure 7 for an existing conditions map. The on-site soils are Spanaway gravelly sandy loam (Type “A”) as mapped in the USDA, Soil Conservation Service, and Soil survey of Pierce County area. See Figure 4 for the Soil Survey Map. The design infiltration rate of the site is 10 inches per hour. See Appendix D for Geotechnical Report. The site is bound on the north by the Sequalitchew Creek, on the west by the Puget Sound, on the east by an existing trail, and on the south by an existing residential building.

Figure 6:
Soil Survey Map



REFERENCE: USDA, Natural Resources Conservation Service

LEGEND:	HSG
41A = Spanaway gravelly sandy loam	A

Job Number 21127	Designed SG Drawn SG Checked BE Approved BE Date 03/16/2021	Scale: Horizontal N.T.S. Vertical N/A	For: FOUNDER'S RIDGE
Sheet 1 of 1		BARGHAUSEN CONSULTING ENGINEERS, INC. 18215 72ND AVENUE SOUTH KENT, WA 98032 425.251.6222 BARGHAUSEN.COM	Title: SOIL SURVEY MAP

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Figure 7: Existing Conditions Map

ALTA/NSPS LAND TITLE SURVEY

LEGEND

(NOTE: NOT ALL SYMBOLS MAY APPEAR ON THE MAP)

- SURVEY MONUMENT (AS NOTED)
- SECTION CORNER (AS NOTED)
- SET REBAR/CAP (AS NOTED)
- FOUND REBAR/CAP (AS NOTED)
- SET 2"x2" HUB/TACK LINE STAKE
- MAG/WASHER OR LEAD/TACK (AS NOTED)
- BENCHMARK
- LUMINAIRE (LUM.)
- YARD LIGHT
- ORNAMENTAL LIGHT
- TRAFFIC SIGNAL LIGHTS
- POWER METER
- POWER POLE
- JUNCTION BOX (AS NOTED)
- TELEPHONE MANHOLE
- CATCH BASIN (CB)
- STORM MANHOLE (SDMH)
- SANITARY SEWER MANHOLE (SSMH)
- CLEANOUT (AS NOTED)
- GAS METER
- GAS VALVE
- WATER VALVE (WV)
- FAUCET
- FIRE HYDRANT(FH) / CONNECTION(FDC)
- WATER MANHOLE
- WATER METER
- BLOW-OFF / AIRVAC
- MONITOR WELL
- SIGN
- IRRIGATION SPRINKLER
- DIRECTIONAL ARROW
- ADA SYMBOL

- CHAIN LINK FENCE
- WOOD FENCE
- HOGWIRE FENCE
- SILT FENCE
- METAL/IRON FENCE
- GUARD RAIL/CABLE FENCE
- WATER LINE
- GAS LINE
- STEAM LINE
- TELEPHONE LINE (OH) OR (UG)
- POWER LINE (OH) OR (UG)
- STORM LINE
- SEWER LINE
- ROCKERY
- KEYSTONE WALL
- DECIDUOUS TREE
- CONIFEROUS TREE
- TREE DRIPLINE
- CONCRETE
- GRAVEL/SAND (AS NOTED)
- ASPHALT
- BUILDING LINE

ABBREVIATIONS

- (R#) REFERENCE SURVEYS
- (OH) OVERHEAD
- (UG) UNDERGROUND
- (TYP) TYPICAL
- (C) CALCULATED
- (M) MEASURED

N

0 75' 150' 300'

SCALE: 1"=150'

LINE TABLE

LINE	DIST	BEARING
L1	14.05'	S85°00'47"W
L2	91.61'	N72°47'23"W
L3	91.46'	N88°10'01"W
L4	45.22'	S76°43'36"W
L5	113.83'	N32°09'46"W
L6	56.76'	N63°32'48"E
L7	61.01'	N87°03'49"E
L8	31.22'	S62°41'22"E
L9	112.06'	S51°34'13"E
L10	49.33'	S33°19'39"W
L11	65.84'	S34°39'09"W
L12	5.46'	S47°24'39"W
L13	133.40'	S15°43'09"W
L14	93.32'	S25°19'49"W
L15	100.08'	S00°43'27"E
L16	164.00'	S29°11'26"E
L17	245.21'	N84°26'24"E
L18	167.78'	N77°36'29"E
L19	49.96'	S13°16'24"E
L20	150.83'	S77°36'29"W
L21	72.75'	S15°14'23"W
L22	83.57'	S64°19'18"W
L23	303.65'	N88°16'43"W
L24	223.18'	S64°21'54"E
L25	119.97'	S49°41'56"E
L26	160.93'	S23°48'06"W
L27	139.32'	S17°09'55"W
L28	119.20'	S09°33'25"W
L29	111.59'	S40°23'29"W
L30	148.44'	S35°51'20"W
L31	124.16'	S29°29'59"W
L32	128.18'	S17°18'08"W
L33	120.33'	S42°08'22"W
L34	157.90'	S36°27'52"W
L35	104.49'	S30°12'01"W
L36	56.58'	S12°03'04"W
L37	229.60'	S45°28'03"E
L38	110.14'	S19°19'41"E
L39	167.25'	N41°25'32"E
L40	140.16'	N65°00'28"E
L41	63.99'	S35°06'13"E

Title: ALTA/NSPS LAND TITLE SURVEY
PTN OF SEC. 26 AND SEC. 27, TWP. 19 N., RGE 1 EAST, W. M.
CITY OF DUPONT PIERCE COUNTY
STATE OF WASHINGTON

FOUNDER'S RIDGE

For:

Scale: Horizontal 1"=150' Vertical

Designed — Drawn STM Checked DS Approved DS Date 10/27/20

Revision | No. | Date | By | Chkd. | Appr.

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222 barghausen.com

Job Number 21127 Sheet 3 of 4

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ALTA/NSPS LAND TITLE SURVEY

N

SCALE: 1"=150'

LINE	DIST	BEARING
L1	14.05'	S85°00'47"W
L2	91.61'	N72°47'23"W
L3	91.46'	N88°10'01"W
L4	45.22'	S76°43'36"W
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L20	150.83'	S77°36'29"W
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L36	56.58'	S12°03'04"W
L37	229.60'	S45°28'03"E
L38	110.14'	S19°19'41"E
L39	167.25'	N41°25'32"E
L40	140.16'	N65°00'28"E
L41	63.99'	S35°06'13"E

1" VERT PVC PIPE (VPP) (TYP.)
(GOLF COURSE OUT OF BOUNDS MARKER)

Δ=54°16'33"
R=146.00'
L=138.30'

N85°25'23"W(R)

CITY OF DUPONT
TPN.0119274007

LOT 6
ROS 2006-01-27-5001

"T" POST

SHEET 3
SHEET 4

MONITOR WELL

FLOOD ZONE X - UNSHADED

NO BUILDINGS

Δ=132°46'56"
R=146.00'
L=338.28'

N52°43'29"E
269.42'

DIRT TRAIL

N31°33'30"W

S35°30'30"W
220.14'

S15°08'45"E
127.52'

ASEMENT
609050738
3N 18)

Δ=23°12'56"
R=803.50'
L=325.57'

Δ=19°22'02"
R=803.50'
L=271.60'

GRAVEL TRAIL

S07°28'45"W
11.00'

N75°06'43"E 267.16'

S82°31'15"E 899.59'

STORM DRAINAGE
00208210701

STORMSAFE ATTENUATION TANK UNDER CONDO

9" STEEL VERT. PIPE
(POSSIBLE WELLHEAD)

LOT 8
ROS 2006-01-27-5001

N83°20'49"W
428.82'

N81°53'23"W
414.44'

N81°53'23"W
209.98'

N77°30'36"W
237.07'

GRAVEL TRAIL

FND 5/8" REBAR/CAP
ESM LS 29294 LS 29281
(OCTOBER 2020)

FND 5/8" REBAR/CAP
ILLEGIBLE YELLOW CAP
(OCTOBER 2020)

INGRESS, EGRESS AND UTILITIES ESMT
AFN:200712210492
(EXCEPTION 34)

NISQUALLY INDIAN TRIBE
TPN.0119271089

S00°23'40"E
405.53'

LOT A
CHAINLINK FENCE
CITY OF DUPONT
TPN.0119268004

N00°23'40"W 675.99'

(3) WATER VALVES

MISC. WATER BOX

CIVIC DRIVE

LOT B
SP.2007-08-15-5002

CENTER DRIVE

LOT C, ROS
200508245006
NISQUALLY INDIAN TRIBE
TPN.0119263014

"T" POST
GUY ANCHOR
POWER POLE
W/LUMINAIRE,
POWER METER, &
UG WIRE DROP

KEYPAD W/BOLLARDS
TEL. RISER
FLAG POLE
TEL. RISER
STEEL PLATE
GATE
TEL.
RISER

FND MONUMENT
2.5" BRASSY W/"X"
(OCTOBER 2020)

GUY ANCHOR
POWER POLE
W/LIG WIRE DROP
TEL. RISER
TEL.
POWER CABINET ON CNC PAD
W/GROUND BOX
SIGNAL POLE
TRANSFORMER
BOX (TYP.)

FND MONUMENT
2" DOMED BRASSY W/PUNCH
INTX CENTER DR & PALISADE BLVD
(OCTOBER 2020)

SSMH
TRANSFORMER ON CNC PAD
WATER BLOWOFF
GAS VALVE
SIGNAL POLE
WATER VALVE
POWER VAULT

FND MONUMENT
3" BRASSY W/PUNCH
INTX MCDONALD AVE & 41
(OCTOBER 2020)

S89°36'20"W
425.98'

S89°36'20"E
504.10'

NO BUILDINGS

FAUCET
GATE
SSMH

POWER EASEMENT
AFN 9004190543
(EXCEPTION 1)

SANITARY SEWER
EASEMENT
AFN 9909090470
(EXCEPTION 6)

CHAINLINK FENCE
ROW OF BOLLARDS
W/"CITY OF DUPONT
TRAIL" SIGN
KEYPAD &
4" METAL POST
SIGNAL POLE
POWER POLE W/TRANSFORMER
FAUCET
(2) GUY ANCHORS

POWER EASEMENT
AFN 9511200856
(EXCEPTION 4)

35' LANDSCAPING ESMT
AFN.9205210946
(EXCEPTION 2)
35' LANDSCAPING, PEDESTRIAN
& UTILITY ESMT
AFN.9601090362
(EXCEPTION 5)

POWER POLE (PP) (TYP.)
W/POWER POLE ARMS

SANITARY SEWER
EASEMENT
AFN 200504040337
& 200504040338
(EXCEPTION 11)

WATER METER
GAS STUB
STREET LIGHT
(3) POWER STUBS

HOGWIRE FENCE
W/BARBED WIRE

ROW OF BOLLARDS
IN CNC PADS

SSMH
POWER VAULT
TEL. RISER

ROW OF BOLLARDS
IN CNC PADS

BOLLARD
W/"CITY OF DUPONT TRAIL" SIGN

N54°01'20"E 297.91'

PLAT OF THE OAKS
AFN 200509185004

FND MONUMENT
3" BRASSY W/PUNCH
IN CNC
LS 29281
(OCTOBER 2020)

FND MONUMENT
3" BRASSY W/PUNCH
LS 29281
INTX CHARLES ST & BARRY OAKS AVE
(OCTOBER 2020)

LEGEND

(NOTE: NOT ALL SYMBOLS MAY APPEAR ON THE MAP)

- SURVEY MONUMENT (AS NOTED)
- SECTION CORNER (AS NOTED)
- SET REBAR/CAP (AS NOTED)
- FOUND REBAR/CAP (AS NOTED)
- SET 2"X2" HUB/TACK LINE STAKE
- MAG/WASHER OR LEAD/TACK (AS NOTED)
- BENCHMARK
- LUMINAIRE (LUM.)
- YARD LIGHT
- ORNAMENTAL LIGHT
- TRAFFIC SIGNAL LIGHTS
- POWER METER
- POWER POLE
- JUNCTION BOX (AS NOTED)
- TELEPHONE MANHOLE
- CATCH BASIN (CB)
- STORM MANHOLE (SDMH)
- SANITARY SEWER MANHOLE (SSMH)
- CLEANOUT (AS NOTED)
- GAS METER
- GAS VALVE
- WATER VALVE (WV)
- FAUCET
- FIRE HYDRANT(FH) / CONNECTION(FDC)
- WATER MANHOLE
- WATER METER
- BLOW-OFF / AIRVAC
- MONITOR WELL
- SIGN
- IRRIGATION SPRINKLER
- DIRECTIONAL ARROW
- ADA SYMBOL

- CHAIN LINK FENCE
- WOOD FENCE
- HOGWIRE FENCE
- SILT FENCE
- METAL/IRON FENCE
- GUARD RAIL/CABLE FENCE
- WATER LINE
- GAS LINE
- STEAM LINE
- TELEPHONE LINE (OH) OR (UG)
- POWER LINE (OH) OR (UG)
- STORM LINE
- SEWER LINE
- ROCKERY
- KEYSTONE WALL
- DECIDUOUS TREE
- CONIFEROUS TREE
- TREE DRIPLINE
- CONCRETE
- GRAVEL/SAND (AS NOTED)
- ASPHALT
- BUILDING LINE

ABBREVIATIONS

(R#)	REFERENCE SURVEYS
(OH)	OVERHEAD
(UG)	UNDERGROUND
(TYP)	TYPICAL
(C)	CALCULATED
(M)	MEASURED

No.	Date	By	Chkd.	Appr.	Revision

Title: ALTA/NSPS LAND TITLE SURVEY
PTN OF SEC. 26 AND SEC. 27,
TWP. 19 N., RGE 1 EAST, W. M.
CITY OF DUPONT PIERCE COUNTY
STATE OF WASHINGTON

FOUNDER'S RIDGE

For:

Scale: Horizontal 1"=150' Vertical

Designed — Drawn STM Checked DS Approved DS Date 10/27/20

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222 barghausen.com

Job Number 21127

Sheet 4 of 4

File: \\Apollo-WA\Projects\21000s\21127\survey\21127-ALT.dwg Date/Time: Aug 11, 2022 - 11:52am Scale: 1"=150' wsullivan Xrefs: 21127-defd.dwg, 21127-GIS01.dwg

Tab 4.0

4.0 OFF-SITE ANALYSIS REPORT

The project site is surrounded by well-developed residential buildings to the south and southeast, a Sequalitchew Creek to the north, and a Puget Sound to the west.

There are no offsite upstream stormwater runoff contributions and since infiltration is proposed as the flow control method for the entire project site, and there are very minimal, if any, off-site areas contributing to this site, no further off-site analysis has been prepared for this development.

The site runoff from Founder's Ridge project will be contained on site in infiltration ponds.

Tab 5.0

5.0 PERMANENT STORMWATER CONTROL PLAN

A. **Existing Site Hydrology**: The existing project site consists of land that has been previously cleared and graded and is now covered in small deciduous trees and brush. The on-site soil type is considered Spanaway type soil. This creates a pre-developed condition of no runoff from the site, even in peak storm events. All runoff infiltrates into the ground or evaporates. This will be matched in the developed condition through the use of infiltration ponds.

B. **Developed Site Hydrology**: In developed conditions, all runoff from the on-site improvements will be routed through water treatment systems prior to infiltration on-site. An infiltration rate of 10 inches per hour was utilized based on the geotechnical recommendations. See Appendix D for Geotechnical Report.

C. **Performance Standards and Goals**: The infiltration facilities were sized using the Western Washington Hydrology Model (WWHM), utilizing an infiltration rate of 10 inches per hour and providing 100% infiltration for up to the 100-year storm event for historic rainfall data. Basic water treatment is provided.

D. **Flow Control System:** Flow control will be provided by several infiltration ponds on site. The system has been designed based off the geotechnical engineer's preliminary infiltration rate of 10 inches per hour. Based on the topography, the private property is divided into 4 private basins with corresponding ponds. See table 1 below for private pond sizes. This site will also have separate public ponds for the public road being developed on site. There are a total of 6 public ponds to ensure the road will have adequate drainage. The infiltration ponds are designed to accommodate run-off from the total new and replaced hard surfaces areas. PGIS NPGIS

Table 1: Private Development basins & associated ponds

Basin Name	Total Contribution Area (AC)	PGIS Area (AC)	NPGIS Area (AC)	Pervious Area (AC)	Discharge to	Pond Size	
						Bottom Area (sf)	Riser Height (ft)
Basin 1	8.56	3.15	2.82	2.59	Pond 2	5,145	6
Basin 2	12.74	4.15	4.59	4.00	Pond 5	5,305	6
Basin 3	15.56	6.72	4.59	4.25	Pond 4	7,040	6
Basin 4	15.07	5.98	4.59	4.50	Pond 1	7,060	6

Table 2: Public Development basins & associated ponds

Basin Name	Total Contribution Area (AC)	PGIS Area (AC)	Pervious Area (AC)	Discharge to	Pond Size	
					Bottom Area (sf)	Riser Height (ft)
P-1	1.26	1.02	0.25	P-1	576	6
P-2	2.00	1.61	0.39	P-2	720	6
P-3	1.69	1.34	0.34	P-3	585	6
P-4	0.78	0.62	0.16	P-4	360	6
P-5	4.33	3.45	0.88	P-5	1,800	6
P-6	0.95	0.43	0.52	P-6	360	6

E. **Water Quality System**: Per Chapter V-2 of the 2012 SWMMWW as amended in 2014, Oil Control is not required for this proposal as it does not fall within the definition of a high-use site, given that the general use of the improvements is for industrial use/vehicular parking lot. However, Basic Treatment is deemed appropriate for this project, as the site

will use infiltration strictly for flow control but does not discharge to any phosphorus sensitive lake that is within 1/4 mile of the site, nor does it discharge to a fresh water designated for aquatic life use/has an existing aquatic life use that is within 1/4 mile of the site. See Figure 8 for the Treatment Facility Selection Flow Chart.

The installation of appropriate Storm Filter upstream of the infiltration ponds will be proposed to provide Basic Water Quality treatment for the site. The water quality units will be sized to accommodate run-off from the total area of land disturbed and will use the off-line water quality flowrate as tabulated in the WWHM Report found in Appendix F.

F. **Conveyance System Analysis and Design**: The internal conveyance system for this project will be designed for a 25-year storm event using the Rational Method. See Figure 9 for the Developed Basin Map. Conveyance Calculations will be provided in Appendix B with the final design package.

Figure 8:
Water Quality
Flowchart

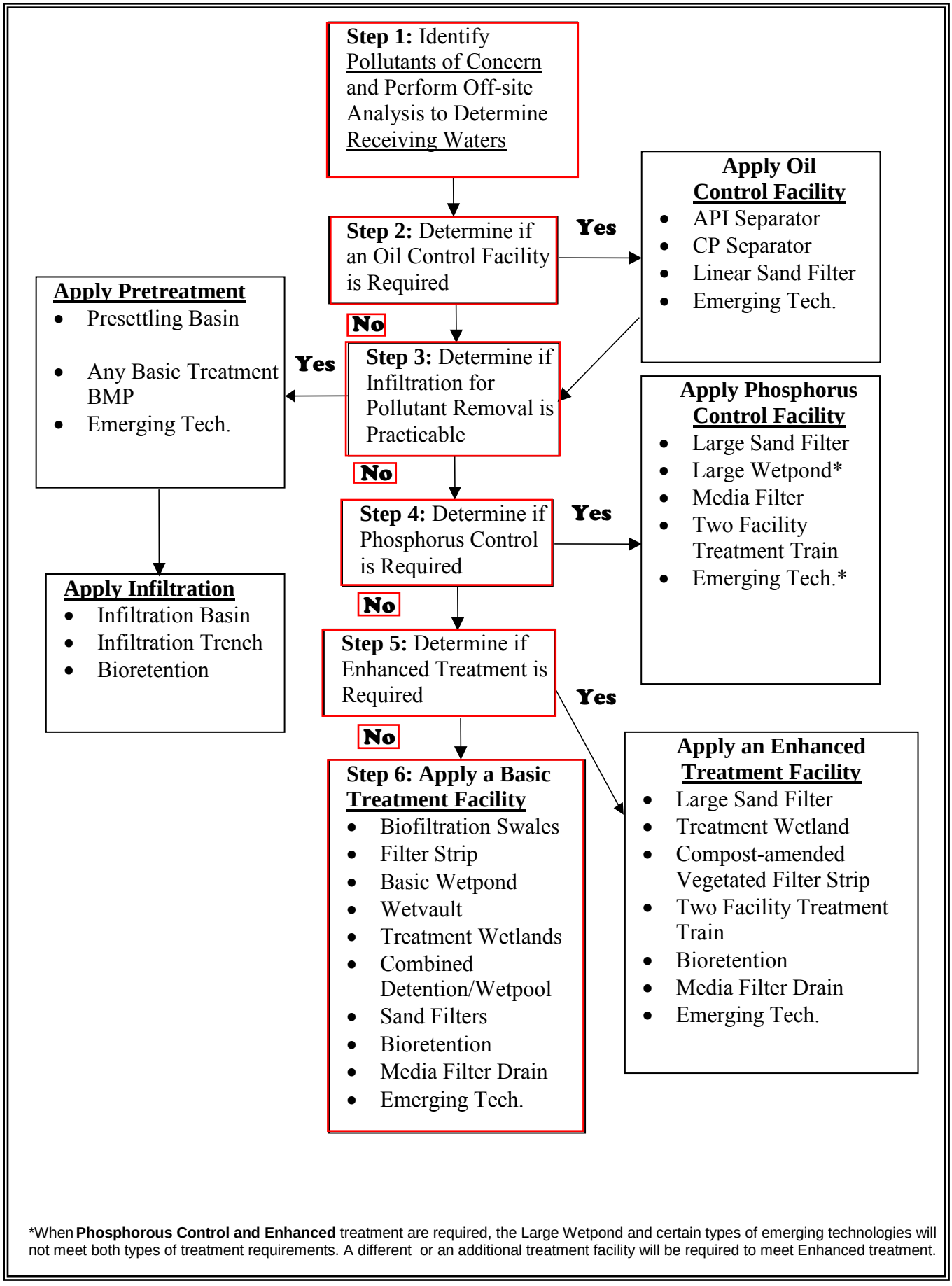
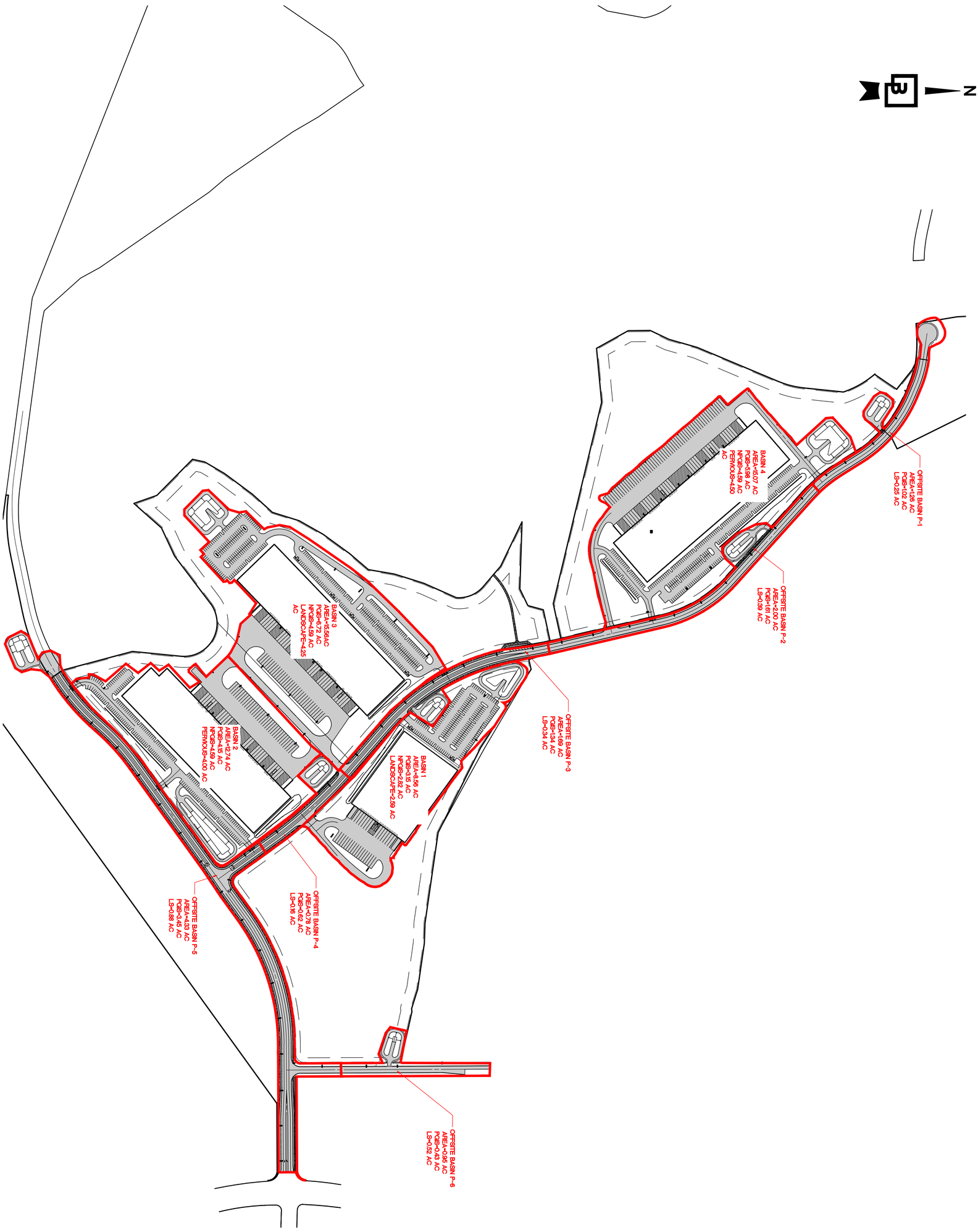


Figure 2.1.1 – Treatment Facility Selection Flow Chart

Figure 9:
Post Developed
Basin Map



No.	Date	By	Ckd.	Appr.	Revision

Job Number: 21127

Sheet: 1 of 1

Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222 barghausen.com

Designed SAR
Drawn SAR
Checked BE
Approved BE
Date 8/10/22

Scale:
Horizontal 1"=200'
Vertical –

For:
ALBATROSS ESTATES LLC
17837 1ST AVE S NORMANDY PARK
98148-1728

Title:
DRAINAGE BASINS EXHIBIT

FOR
FIRST PARK NORTHWEST LANDING

P:\21000s\21127\exhibit\21127 Drainage Basins.dwg 8/10/2022 4:06 PM SREED

Tab 6.0

6.0 CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN

The site has been previously cleared and graded. The erosion control measures proposed under this plan include a sediment trap, v-ditches with rock check dams, silt fence, inlet protection and construction entrances. For further detail please see Appendix C.

Tab 7.0

7.0 SPECIAL REPORTS AND STUDIES

Special reports for this project include:

- Infiltration Memo prepared by Terra Associates dated Oct 10, 2020

  See Appendix G

Tab 8.0

8.0 OTHER PERMITS

Other permits for this project include:

- Site Development Permit
- Building Permit
- Sanitary Sewer Connection Permit
- Right-of-Way Use Permit
- Construction Stormwater General Permit (NPDES)

Tab 9.0

9.0 OPERATION AND MAINTENANCE MANUAL

Applicable Operations and Maintenance Manual are to be provided with future submittals in this Section.

Tab 10.0

10.0 BOND QUANTITIES WORKSHEET

Performance bonding or other appropriate financial instruments shall be provided as determined necessary by the City of Dupont.

APPENDIX A: WWHM Pond Size Calculations

Private Ponds

WWHM2012

PROJECT REPORT

Private Ponds

General Model Information

Project Name:	21127-Pond Sizes
Site Name:	First Parking NW Landing
Site Address:	First Parking NW Landing
City:	Dupont, WA
Report Date:	8/10/2022
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year
Low Flow Threshold for POC2:	50 Percent of the 2 Year
High Flow Threshold for POC2:	50 Year
Low Flow Threshold for POC3:	50 Percent of the 2 Year
High Flow Threshold for POC3:	50 Year
Low Flow Threshold for POC4:	50 Percent of the 2 Year
High Flow Threshold for POC4:	50 Year

Landuse Basin Data

Predeveloped Land Use

Pond 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	15.07
Pervious Total	15.07
Impervious Land Use	acre
Impervious Total	0
Basin Total	15.07

Element Flows To:

Surface	Interflow	Groundwater

Pond 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Forest, Flat	8.56
Pervious Total	8.56

Impervious Land Use	acre
Impervious Total	0
Basin Total	8.56

Element Flows To:

Surface	Interflow	Groundwater

Pond 4

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	12.74
Pervious Total	12.74
Impervious Land Use	acre
Impervious Total	0
Basin Total	12.74

Element Flows To:

Surface	Interflow	Groundwater

Pond 5

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	15.56
Pervious Total	15.56
Impervious Land Use	acre
Impervious Total	0
Basin Total	15.56

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Pond 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Lawn, Flat	4.5
Pervious Total	4.5

Impervious Land Use	acre
ROADS FLAT	5.98
ROOF TOPS FLAT	4.59
Impervious Total	10.57
Basin Total	15.07

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Pond 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Lawn, Flat	2.59
Pervious Total	2.59

Impervious Land Use	acre
ROADS FLAT	3.15
ROOF TOPS FLAT	2.82
Impervious Total	5.97
Basin Total	8.56

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 2	Trapezoidal Pond 2	

Pond 4

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Lawn, Flat	4
Pervious Total	4

Impervious Land Use	acre
ROADS FLAT	4.15
ROOF TOPS FLAT	4.59
Impervious Total	8.74
Basin Total	12.74

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 4	Trapezoidal Pond 4	

Pond 5

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Lawn, Flat	4.25
Pervious Total	4.25

Impervious Land Use	acre
ROADS FLAT	6.72
ROOF TOPS FLAT	4.59
Impervious Total	11.31
Basin Total	15.56

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 5	Trapezoidal Pond 5	

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length:	84.00 ft.	
Bottom Width:	84.00 ft.	
Depth:	7 ft.	
Volume at riser head:	1.4701 acre-feet.	
Infiltration On		
Infiltration rate:	10	
Infiltration safety factor:	1	
Wetted surface area On		
Total Volume Infiltrated (ac-ft.):		5019.238
Total Volume Through Riser (ac-ft.):		0
Total Volume Through Facility (ac-ft.):		5019.238
Percent Infiltrated:		100
Total Precip Applied to Facility:		0
Total Evap From Facility:		0
Side slope 1:	3 To 1	
Side slope 2:	3 To 1	
Side slope 3:	3 To 1	
Side slope 4:	3 To 1	
Discharge Structure		
Riser Height:	6 ft.	
Riser Diameter:	18 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.162	0.000	0.000	0.000
0.0778	0.163	0.012	0.000	1.651
0.1556	0.165	0.025	0.000	1.669
0.2333	0.167	0.038	0.000	1.688
0.3111	0.169	0.051	0.000	1.706
0.3889	0.171	0.064	0.000	1.725
0.4667	0.173	0.078	0.000	1.744
0.5444	0.174	0.091	0.000	1.762
0.6222	0.176	0.105	0.000	1.781
0.7000	0.178	0.119	0.000	1.800
0.7778	0.180	0.133	0.000	1.819
0.8556	0.182	0.147	0.000	1.839
0.9333	0.184	0.161	0.000	1.858
1.0111	0.186	0.175	0.000	1.877
1.0889	0.188	0.190	0.000	1.897
1.1667	0.190	0.205	0.000	1.916
1.2444	0.192	0.220	0.000	1.936
1.3222	0.194	0.235	0.000	1.956
1.4000	0.196	0.250	0.000	1.976
1.4778	0.198	0.265	0.000	1.996
1.5556	0.200	0.281	0.000	2.016
1.6333	0.202	0.296	0.000	2.036
1.7111	0.204	0.312	0.000	2.057
1.7889	0.206	0.328	0.000	2.077
1.8667	0.208	0.344	0.000	2.097
1.9444	0.210	0.360	0.000	2.118

2.0222	0.212	0.377	0.000	2.139
2.1000	0.214	0.393	0.000	2.160
2.1778	0.216	0.410	0.000	2.181
2.2556	0.218	0.427	0.000	2.202
2.3333	0.220	0.444	0.000	2.223
2.4111	0.222	0.461	0.000	2.244
2.4889	0.224	0.479	0.000	2.265
2.5667	0.226	0.496	0.000	2.287
2.6444	0.229	0.514	0.000	2.308
2.7222	0.231	0.532	0.000	2.330
2.8000	0.233	0.550	0.000	2.352
2.8778	0.235	0.568	0.000	2.373
2.9556	0.237	0.586	0.000	2.395
3.0333	0.239	0.605	0.000	2.417
3.1111	0.242	0.624	0.000	2.439
3.1889	0.244	0.643	0.000	2.462
3.2667	0.246	0.662	0.000	2.484
3.3444	0.248	0.681	0.000	2.506
3.4222	0.250	0.700	0.000	2.529
3.5000	0.253	0.720	0.000	2.552
3.5778	0.255	0.740	0.000	2.574
3.6556	0.257	0.760	0.000	2.597
3.7333	0.259	0.780	0.000	2.620
3.8111	0.262	0.800	0.000	2.643
3.8889	0.264	0.821	0.000	2.666
3.9667	0.266	0.841	0.000	2.690
4.0444	0.269	0.862	0.000	2.713
4.1222	0.271	0.883	0.000	2.736
4.2000	0.273	0.904	0.000	2.760
4.2778	0.276	0.926	0.000	2.784
4.3556	0.278	0.947	0.000	2.807
4.4333	0.280	0.969	0.000	2.831
4.5111	0.283	0.991	0.000	2.855
4.5889	0.285	1.013	0.000	2.879
4.6667	0.288	1.035	0.000	2.903
4.7444	0.290	1.058	0.000	2.928
4.8222	0.292	1.081	0.000	2.952
4.9000	0.295	1.103	0.000	2.976
4.9778	0.297	1.127	0.000	3.001
5.0556	0.300	1.150	0.000	3.026
5.1333	0.302	1.173	0.000	3.050
5.2111	0.305	1.197	0.000	3.075
5.2889	0.307	1.221	0.000	3.100
5.3667	0.310	1.245	0.000	3.125
5.4444	0.312	1.269	0.000	3.150
5.5222	0.315	1.293	0.000	3.176
5.6000	0.317	1.318	0.000	3.201
5.6778	0.320	1.343	0.000	3.226
5.7556	0.322	1.368	0.000	3.252
5.8333	0.325	1.393	0.000	3.278
5.9111	0.327	1.418	0.000	3.303
5.9889	0.330	1.444	0.000	3.329
6.0667	0.332	1.470	0.273	3.355
6.1444	0.335	1.496	0.869	3.381
6.2222	0.338	1.522	1.636	3.407
6.3000	0.340	1.548	2.501	3.434
6.3778	0.343	1.575	3.386	3.460
6.4556	0.345	1.602	4.216	3.486

6.5333	0.348	1.629	4.924	3.513
6.6111	0.351	1.656	5.468	3.540
6.6889	0.353	1.683	5.848	3.566
6.7667	0.356	1.711	6.205	3.593
6.8444	0.359	1.739	6.512	3.620
6.9222	0.361	1.767	6.805	3.647
7.0000	0.364	1.795	7.086	3.675
7.0778	0.367	1.823	7.357	3.702

Trapezoidal Pond 2

Bottom Length:	72.00 ft.	
Bottom Width:	72.00 ft.	
Depth:	7 ft.	
Volume at riser head:	1.1485 acre-feet.	
Infiltration On		
Infiltration rate:	10	
Infiltration safety factor:	1	
Wetted surface area On		
Total Volume Infiltrated (ac-ft.):		2842.832
Total Volume Through Riser (ac-ft.):		0
Total Volume Through Facility (ac-ft.):		2842.832
Percent Infiltrated:		100
Total Precip Applied to Facility:		0
Total Evap From Facility:		0
Side slope 1:	3 To 1	
Side slope 2:	3 To 1	
Side slope 3:	3 To 1	
Side slope 4:	3 To 1	
Discharge Structure		
Riser Height:	6 ft.	
Riser Diameter:	18 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.119	0.000	0.000	0.000
0.0778	0.120	0.009	0.000	1.215
0.1556	0.122	0.018	0.000	1.231
0.2333	0.123	0.028	0.000	1.247
0.3111	0.125	0.038	0.000	1.263
0.3889	0.126	0.047	0.000	1.279
0.4667	0.128	0.057	0.000	1.295
0.5444	0.130	0.067	0.000	1.311
0.6222	0.131	0.078	0.000	1.327
0.7000	0.133	0.088	0.000	1.344
0.7778	0.134	0.098	0.000	1.360
0.8556	0.136	0.109	0.000	1.377
0.9333	0.138	0.119	0.000	1.393
1.0111	0.139	0.130	0.000	1.410
1.0889	0.141	0.141	0.000	1.427
1.1667	0.143	0.152	0.000	1.444
1.2444	0.145	0.164	0.000	1.461
1.3222	0.146	0.175	0.000	1.479
1.4000	0.148	0.186	0.000	1.496
1.4778	0.150	0.198	0.000	1.513
1.5556	0.151	0.210	0.000	1.531
1.6333	0.153	0.222	0.000	1.548
1.7111	0.155	0.234	0.000	1.566
1.7889	0.157	0.246	0.000	1.584
1.8667	0.158	0.258	0.000	1.602
1.9444	0.160	0.270	0.000	1.620
2.0222	0.162	0.283	0.000	1.638
2.1000	0.164	0.296	0.000	1.656

2.1778	0.166	0.309	0.000	1.675
2.2556	0.168	0.322	0.000	1.693
2.3333	0.169	0.335	0.000	1.712
2.4111	0.171	0.348	0.000	1.730
2.4889	0.173	0.361	0.000	1.749
2.5667	0.175	0.375	0.000	1.768
2.6444	0.177	0.389	0.000	1.787
2.7222	0.179	0.403	0.000	1.806
2.8000	0.181	0.417	0.000	1.825
2.8778	0.182	0.431	0.000	1.844
2.9556	0.184	0.445	0.000	1.863
3.0333	0.186	0.459	0.000	1.883
3.1111	0.188	0.474	0.000	1.902
3.1889	0.190	0.489	0.000	1.922
3.2667	0.192	0.504	0.000	1.942
3.3444	0.194	0.519	0.000	1.962
3.4222	0.196	0.534	0.000	1.982
3.5000	0.198	0.549	0.000	2.002
3.5778	0.200	0.565	0.000	2.022
3.6556	0.202	0.581	0.000	2.042
3.7333	0.204	0.596	0.000	2.062
3.8111	0.206	0.612	0.000	2.083
3.8889	0.208	0.629	0.000	2.103
3.9667	0.210	0.645	0.000	2.124
4.0444	0.212	0.661	0.000	2.145
4.1222	0.214	0.678	0.000	2.166
4.2000	0.216	0.695	0.000	2.187
4.2778	0.219	0.712	0.000	2.208
4.3556	0.221	0.729	0.000	2.229
4.4333	0.223	0.746	0.000	2.250
4.5111	0.225	0.764	0.000	2.271
4.5889	0.227	0.781	0.000	2.293
4.6667	0.229	0.799	0.000	2.314
4.7444	0.231	0.817	0.000	2.336
4.8222	0.233	0.835	0.000	2.358
4.9000	0.236	0.853	0.000	2.380
4.9778	0.238	0.872	0.000	2.402
5.0556	0.240	0.890	0.000	2.424
5.1333	0.242	0.909	0.000	2.446
5.2111	0.244	0.928	0.000	2.468
5.2889	0.247	0.947	0.000	2.490
5.3667	0.249	0.966	0.000	2.513
5.4444	0.251	0.986	0.000	2.535
5.5222	0.253	1.006	0.000	2.558
5.6000	0.256	1.025	0.000	2.581
5.6778	0.258	1.045	0.000	2.604
5.7556	0.260	1.066	0.000	2.627
5.8333	0.262	1.086	0.000	2.650
5.9111	0.265	1.106	0.000	2.673
5.9889	0.267	1.127	0.000	2.696
6.0667	0.269	1.148	0.273	2.720
6.1444	0.272	1.169	0.869	2.743
6.2222	0.274	1.190	1.636	2.767
6.3000	0.276	1.212	2.501	2.790
6.3778	0.279	1.233	3.386	2.814
6.4556	0.281	1.255	4.216	2.838
6.5333	0.283	1.277	4.924	2.862
6.6111	0.286	1.299	5.468	2.886

6.6889	0.288	1.322	5.848	2.910
6.7667	0.291	1.344	6.205	2.934
6.8444	0.293	1.367	6.512	2.959
6.9222	0.295	1.390	6.805	2.983
7.0000	0.298	1.413	7.086	3.008
7.0778	0.300	1.436	7.357	3.033

Trapezoidal Pond 4

Bottom Length:	84.00 ft.	
Bottom Width:	84.00 ft.	
Depth:	7 ft.	
Volume at riser head:	1.4701 acre-feet.	
Infiltration On		
Infiltration rate:	10	
Infiltration safety factor:	1	
Wetted surface area On		
Total Volume Infiltrated (ac-ft.):		4197.447
Total Volume Through Riser (ac-ft.):		0
Total Volume Through Facility (ac-ft.):		4197.447
Percent Infiltrated:		100
Total Precip Applied to Facility:		0
Total Evap From Facility:		0
Side slope 1:	3 To 1	
Side slope 2:	3 To 1	
Side slope 3:	3 To 1	
Side slope 4:	3 To 1	
Discharge Structure		
Riser Height:	6 ft.	
Riser Diameter:	18 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.162	0.000	0.000	0.000
0.0778	0.163	0.012	0.000	1.651
0.1556	0.165	0.025	0.000	1.669
0.2333	0.167	0.038	0.000	1.688
0.3111	0.169	0.051	0.000	1.706
0.3889	0.171	0.064	0.000	1.725
0.4667	0.173	0.078	0.000	1.744
0.5444	0.174	0.091	0.000	1.762
0.6222	0.176	0.105	0.000	1.781
0.7000	0.178	0.119	0.000	1.800
0.7778	0.180	0.133	0.000	1.819
0.8556	0.182	0.147	0.000	1.839
0.9333	0.184	0.161	0.000	1.858
1.0111	0.186	0.175	0.000	1.877
1.0889	0.188	0.190	0.000	1.897
1.1667	0.190	0.205	0.000	1.916
1.2444	0.192	0.220	0.000	1.936
1.3222	0.194	0.235	0.000	1.956
1.4000	0.196	0.250	0.000	1.976
1.4778	0.198	0.265	0.000	1.996
1.5556	0.200	0.281	0.000	2.016
1.6333	0.202	0.296	0.000	2.036
1.7111	0.204	0.312	0.000	2.057
1.7889	0.206	0.328	0.000	2.077
1.8667	0.208	0.344	0.000	2.097
1.9444	0.210	0.360	0.000	2.118
2.0222	0.212	0.377	0.000	2.139
2.1000	0.214	0.393	0.000	2.160

2.1778	0.216	0.410	0.000	2.181
2.2556	0.218	0.427	0.000	2.202
2.3333	0.220	0.444	0.000	2.223
2.4111	0.222	0.461	0.000	2.244
2.4889	0.224	0.479	0.000	2.265
2.5667	0.226	0.496	0.000	2.287
2.6444	0.229	0.514	0.000	2.308
2.7222	0.231	0.532	0.000	2.330
2.8000	0.233	0.550	0.000	2.352
2.8778	0.235	0.568	0.000	2.373
2.9556	0.237	0.586	0.000	2.395
3.0333	0.239	0.605	0.000	2.417
3.1111	0.242	0.624	0.000	2.439
3.1889	0.244	0.643	0.000	2.462
3.2667	0.246	0.662	0.000	2.484
3.3444	0.248	0.681	0.000	2.506
3.4222	0.250	0.700	0.000	2.529
3.5000	0.253	0.720	0.000	2.552
3.5778	0.255	0.740	0.000	2.574
3.6556	0.257	0.760	0.000	2.597
3.7333	0.259	0.780	0.000	2.620
3.8111	0.262	0.800	0.000	2.643
3.8889	0.264	0.821	0.000	2.666
3.9667	0.266	0.841	0.000	2.690
4.0444	0.269	0.862	0.000	2.713
4.1222	0.271	0.883	0.000	2.736
4.2000	0.273	0.904	0.000	2.760
4.2778	0.276	0.926	0.000	2.784
4.3556	0.278	0.947	0.000	2.807
4.4333	0.280	0.969	0.000	2.831
4.5111	0.283	0.991	0.000	2.855
4.5889	0.285	1.013	0.000	2.879
4.6667	0.288	1.035	0.000	2.903
4.7444	0.290	1.058	0.000	2.928
4.8222	0.292	1.081	0.000	2.952
4.9000	0.295	1.103	0.000	2.976
4.9778	0.297	1.127	0.000	3.001
5.0556	0.300	1.150	0.000	3.026
5.1333	0.302	1.173	0.000	3.050
5.2111	0.305	1.197	0.000	3.075
5.2889	0.307	1.221	0.000	3.100
5.3667	0.310	1.245	0.000	3.125
5.4444	0.312	1.269	0.000	3.150
5.5222	0.315	1.293	0.000	3.176
5.6000	0.317	1.318	0.000	3.201
5.6778	0.320	1.343	0.000	3.226
5.7556	0.322	1.368	0.000	3.252
5.8333	0.325	1.393	0.000	3.278
5.9111	0.327	1.418	0.000	3.303
5.9889	0.330	1.444	0.000	3.329
6.0667	0.332	1.470	0.273	3.355
6.1444	0.335	1.496	0.869	3.381
6.2222	0.338	1.522	1.636	3.407
6.3000	0.340	1.548	2.501	3.434
6.3778	0.343	1.575	3.386	3.460
6.4556	0.345	1.602	4.216	3.486
6.5333	0.348	1.629	4.924	3.513
6.6111	0.351	1.656	5.468	3.540

6.6889	0.353	1.683	5.848	3.566
6.7667	0.356	1.711	6.205	3.593
6.8444	0.359	1.739	6.512	3.620
6.9222	0.361	1.767	6.805	3.647
7.0000	0.364	1.795	7.086	3.675
7.0778	0.367	1.823	7.357	3.702

Trapezoidal Pond 5

Bottom Length:	73.00 ft.	
Bottom Width:	73.00 ft.	
Depth:	7 ft.	
Volume at riser head:	1.1738 acre-feet.	
Infiltration On		
Infiltration rate:	10	
Infiltration safety factor:	1	
Wetted surface area On		
Total Volume Infiltrated (ac-ft.):		5274.414
Total Volume Through Riser (ac-ft.):		0.041
Total Volume Through Facility (ac-ft.):		5274.455
Percent Infiltrated:		100
Total Precip Applied to Facility:		0
Total Evap From Facility:		0
Side slope 1:	3 To 1	
Side slope 2:	3 To 1	
Side slope 3:	3 To 1	
Side slope 4:	3 To 1	
Discharge Structure		
Riser Height:	6 ft.	
Riser Diameter:	18 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Pond Hydraulic Table

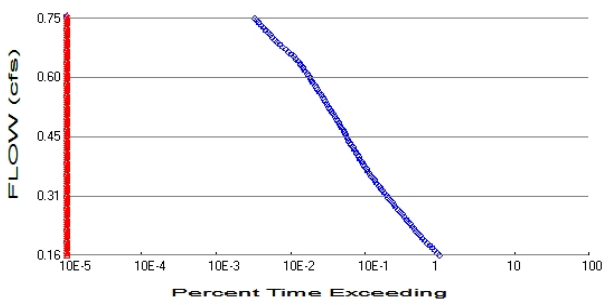
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.122	0.000	0.000	0.000
0.0778	0.123	0.009	0.000	1.249
0.1556	0.125	0.019	0.000	1.265
0.2333	0.127	0.029	0.000	1.281
0.3111	0.128	0.039	0.000	1.297
0.3889	0.130	0.049	0.000	1.313
0.4667	0.131	0.059	0.000	1.330
0.5444	0.133	0.069	0.000	1.346
0.6222	0.135	0.080	0.000	1.363
0.7000	0.136	0.090	0.000	1.379
0.7778	0.138	0.101	0.000	1.396
0.8556	0.140	0.112	0.000	1.413
0.9333	0.141	0.123	0.000	1.430
1.0111	0.143	0.134	0.000	1.447
1.0889	0.145	0.145	0.000	1.464
1.1667	0.146	0.156	0.000	1.481
1.2444	0.148	0.168	0.000	1.498
1.3222	0.150	0.180	0.000	1.516
1.4000	0.152	0.191	0.000	1.533
1.4778	0.153	0.203	0.000	1.551
1.5556	0.155	0.215	0.000	1.569
1.6333	0.157	0.227	0.000	1.587
1.7111	0.159	0.240	0.000	1.604
1.7889	0.161	0.252	0.000	1.623
1.8667	0.162	0.265	0.000	1.641
1.9444	0.164	0.277	0.000	1.659
2.0222	0.166	0.290	0.000	1.677
2.1000	0.168	0.303	0.000	1.696

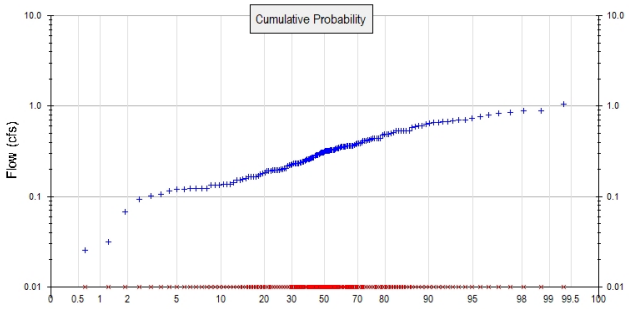
2.1778	0.170	0.317	0.000	1.714
2.2556	0.171	0.330	0.000	1.733
2.3333	0.173	0.343	0.000	1.752
2.4111	0.175	0.357	0.000	1.770
2.4889	0.177	0.371	0.000	1.789
2.5667	0.179	0.384	0.000	1.808
2.6444	0.181	0.398	0.000	1.828
2.7222	0.183	0.413	0.000	1.847
2.8000	0.185	0.427	0.000	1.866
2.8778	0.187	0.441	0.000	1.886
2.9556	0.189	0.456	0.000	1.905
3.0333	0.190	0.471	0.000	1.925
3.1111	0.192	0.486	0.000	1.945
3.1889	0.194	0.501	0.000	1.964
3.2667	0.196	0.516	0.000	1.984
3.3444	0.198	0.531	0.000	2.005
3.4222	0.200	0.547	0.000	2.025
3.5000	0.202	0.563	0.000	2.045
3.5778	0.204	0.579	0.000	2.065
3.6556	0.206	0.595	0.000	2.086
3.7333	0.208	0.611	0.000	2.106
3.8111	0.211	0.627	0.000	2.127
3.8889	0.213	0.644	0.000	2.148
3.9667	0.215	0.660	0.000	2.169
4.0444	0.217	0.677	0.000	2.190
4.1222	0.219	0.694	0.000	2.211
4.2000	0.221	0.711	0.000	2.232
4.2778	0.223	0.728	0.000	2.253
4.3556	0.225	0.746	0.000	2.274
4.4333	0.227	0.764	0.000	2.296
4.5111	0.229	0.781	0.000	2.317
4.5889	0.232	0.799	0.000	2.339
4.6667	0.234	0.817	0.000	2.361
4.7444	0.236	0.836	0.000	2.383
4.8222	0.238	0.854	0.000	2.405
4.9000	0.240	0.873	0.000	2.427
4.9778	0.242	0.892	0.000	2.449
5.0556	0.245	0.911	0.000	2.471
5.1333	0.247	0.930	0.000	2.494
5.2111	0.249	0.949	0.000	2.516
5.2889	0.251	0.969	0.000	2.539
5.3667	0.254	0.988	0.000	2.561
5.4444	0.256	1.008	0.000	2.584
5.5222	0.258	1.028	0.000	2.607
5.6000	0.260	1.048	0.000	2.630
5.6778	0.263	1.069	0.000	2.653
5.7556	0.265	1.089	0.000	2.676
5.8333	0.267	1.110	0.000	2.700
5.9111	0.270	1.131	0.000	2.723
5.9889	0.272	1.152	0.000	2.746
6.0667	0.274	1.173	0.273	2.770
6.1444	0.277	1.195	0.869	2.794
6.2222	0.279	1.216	1.636	2.817
6.3000	0.281	1.238	2.501	2.841
6.3778	0.284	1.260	3.386	2.865
6.4556	0.286	1.282	4.216	2.889
6.5333	0.289	1.305	4.924	2.914
6.6111	0.291	1.327	5.468	2.938

6.6889	0.293	1.350	5.848	2.962
6.7667	0.296	1.373	6.205	2.987
6.8444	0.298	1.396	6.512	3.011
6.9222	0.301	1.420	6.805	3.036
7.0000	0.303	1.443	7.086	3.061
7.0778	0.306	1.467	7.357	3.086

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 15.07
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 4.5
Total Impervious Area: 10.57

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.317567
5 year	0.494041
10 year	0.58993
25 year	0.687527
50 year	0.745537
100 year	0.793238

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.233	0.000
1903	0.194	0.000
1904	0.317	0.000
1905	0.152	0.000
1906	0.068	0.000
1907	0.487	0.000
1908	0.361	0.000
1909	0.357	0.000
1910	0.492	0.000
1911	0.320	0.000

1912	1.057	0.000
1913	0.507	0.000
1914	0.124	0.000
1915	0.204	0.000
1916	0.317	0.000
1917	0.106	0.000
1918	0.339	0.000
1919	0.251	0.000
1920	0.323	0.000
1921	0.361	0.000
1922	0.362	0.000
1923	0.291	0.000
1924	0.133	0.000
1925	0.165	0.000
1926	0.308	0.000
1927	0.199	0.000
1928	0.246	0.000
1929	0.504	0.000
1930	0.324	0.000
1931	0.300	0.000
1932	0.235	0.000
1933	0.226	0.000
1934	0.665	0.000
1935	0.309	0.000
1936	0.268	0.000
1937	0.428	0.000
1938	0.261	0.000
1939	0.016	0.000
1940	0.289	0.000
1941	0.138	0.000
1942	0.436	0.000
1943	0.224	0.000
1944	0.411	0.000
1945	0.363	0.000
1946	0.196	0.000
1947	0.124	0.000
1948	0.683	0.000
1949	0.585	0.000
1950	0.166	0.000
1951	0.204	0.000
1952	0.891	0.000
1953	0.804	0.000
1954	0.290	0.000
1955	0.237	0.000
1956	0.116	0.000
1957	0.412	0.000
1958	0.860	0.000
1959	0.531	0.000
1960	0.141	0.000
1961	0.534	0.000
1962	0.287	0.000
1963	0.137	0.000
1964	0.151	0.000
1965	0.598	0.000
1966	0.168	0.000
1967	0.257	0.000
1968	0.262	0.000
1969	0.262	0.000

1970	0.410	0.000
1971	0.645	0.000
1972	0.418	0.000
1973	0.533	0.000
1974	0.288	0.000
1975	0.677	0.000
1976	0.358	0.000
1977	0.121	0.000
1978	0.603	0.000
1979	0.165	0.000
1980	0.341	0.000
1981	0.327	0.000
1982	0.134	0.000
1983	0.534	0.000
1984	0.218	0.000
1985	0.354	0.000
1986	0.318	0.000
1987	0.606	0.000
1988	0.384	0.000
1989	0.346	0.000
1990	0.391	0.000
1991	0.306	0.000
1992	0.438	0.000
1993	0.425	0.000
1994	0.637	0.000
1995	0.122	0.000
1996	0.698	0.000
1997	0.268	0.000
1998	0.318	0.000
1999	0.026	0.000
2000	0.242	0.000
2001	0.124	0.000
2002	0.443	0.000
2003	0.385	0.000
2004	0.355	0.000
2005	0.653	0.000
2006	0.197	0.000
2007	0.198	0.000
2008	0.337	0.000
2009	0.231	0.000
2010	0.197	0.000
2011	0.159	0.000
2012	0.231	0.000
2013	0.180	0.000
2014	0.134	0.000
2015	0.257	0.000
2016	0.102	0.000
2017	0.489	0.000
2018	0.890	0.000
2019	0.830	0.000
2020	0.271	0.000
2021	0.441	0.000
2022	0.182	0.000
2023	0.371	0.000
2024	0.697	0.000
2025	0.327	0.000
2026	0.534	0.000
2027	0.192	0.000

2028	0.166	0.000
2029	0.362	0.000
2030	0.672	0.000
2031	0.222	0.000
2032	0.121	0.000
2033	0.194	0.000
2034	0.191	0.000
2035	0.758	0.000
2036	0.393	0.000
2037	0.094	0.000
2038	0.314	0.000
2039	0.031	0.000
2040	0.174	0.000
2041	0.235	0.000
2042	0.737	0.000
2043	0.356	0.000
2044	0.480	0.000
2045	0.327	0.000
2046	0.383	0.000
2047	0.282	0.000
2048	0.365	0.000
2049	0.326	0.000
2050	0.234	0.000
2051	0.340	0.000
2052	0.196	0.000
2053	0.350	0.000
2054	0.445	0.000
2055	0.138	0.000
2056	0.155	0.000
2057	0.240	0.000
2058	0.304	0.000
2059	0.537	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	1.0571	0.0000
2	0.8908	0.0000
3	0.8899	0.0000
4	0.8596	0.0000
5	0.8300	0.0000
6	0.8035	0.0000
7	0.7576	0.0000
8	0.7370	0.0000
9	0.6979	0.0000
10	0.6969	0.0000
11	0.6832	0.0000
12	0.6768	0.0000
13	0.6715	0.0000
14	0.6649	0.0000
15	0.6529	0.0000
16	0.6449	0.0000
17	0.6368	0.0000
18	0.6062	0.0000
19	0.6026	0.0000
20	0.5980	0.0000
21	0.5853	0.0000
22	0.5373	0.0000

23	0.5344	0.0000
24	0.5343	0.0000
25	0.5342	0.0000
26	0.5329	0.0000
27	0.5314	0.0000
28	0.5065	0.0000
29	0.5044	0.0000
30	0.4922	0.0000
31	0.4894	0.0000
32	0.4874	0.0000
33	0.4802	0.0000
34	0.4448	0.0000
35	0.4427	0.0000
36	0.4407	0.0000
37	0.4380	0.0000
38	0.4358	0.0000
39	0.4284	0.0000
40	0.4246	0.0000
41	0.4181	0.0000
42	0.4115	0.0000
43	0.4107	0.0000
44	0.4096	0.0000
45	0.3934	0.0000
46	0.3911	0.0000
47	0.3855	0.0000
48	0.3844	0.0000
49	0.3830	0.0000
50	0.3706	0.0000
51	0.3649	0.0000
52	0.3630	0.0000
53	0.3623	0.0000
54	0.3620	0.0000
55	0.3612	0.0000
56	0.3610	0.0000
57	0.3584	0.0000
58	0.3570	0.0000
59	0.3559	0.0000
60	0.3546	0.0000
61	0.3543	0.0000
62	0.3499	0.0000
63	0.3456	0.0000
64	0.3412	0.0000
65	0.3401	0.0000
66	0.3393	0.0000
67	0.3373	0.0000
68	0.3272	0.0000
69	0.3270	0.0000
70	0.3267	0.0000
71	0.3262	0.0000
72	0.3241	0.0000
73	0.3230	0.0000
74	0.3205	0.0000
75	0.3185	0.0000
76	0.3178	0.0000
77	0.3170	0.0000
78	0.3168	0.0000
79	0.3137	0.0000
80	0.3087	0.0000

81	0.3076	0.0000
82	0.3062	0.0000
83	0.3042	0.0000
84	0.2998	0.0000
85	0.2912	0.0000
86	0.2900	0.0000
87	0.2893	0.0000
88	0.2885	0.0000
89	0.2869	0.0000
90	0.2820	0.0000
91	0.2708	0.0000
92	0.2683	0.0000
93	0.2677	0.0000
94	0.2621	0.0000
95	0.2616	0.0000
96	0.2611	0.0000
97	0.2573	0.0000
98	0.2568	0.0000
99	0.2508	0.0000
100	0.2461	0.0000
101	0.2423	0.0000
102	0.2403	0.0000
103	0.2370	0.0000
104	0.2351	0.0000
105	0.2347	0.0000
106	0.2342	0.0000
107	0.2329	0.0000
108	0.2315	0.0000
109	0.2309	0.0000
110	0.2264	0.0000
111	0.2242	0.0000
112	0.2219	0.0000
113	0.2177	0.0000
114	0.2041	0.0000
115	0.2041	0.0000
116	0.1995	0.0000
117	0.1980	0.0000
118	0.1974	0.0000
119	0.1970	0.0000
120	0.1963	0.0000
121	0.1956	0.0000
122	0.1943	0.0000
123	0.1937	0.0000
124	0.1920	0.0000
125	0.1911	0.0000
126	0.1824	0.0000
127	0.1803	0.0000
128	0.1744	0.0000
129	0.1677	0.0000
130	0.1663	0.0000
131	0.1659	0.0000
132	0.1653	0.0000
133	0.1651	0.0000
134	0.1592	0.0000
135	0.1546	0.0000
136	0.1525	0.0000
137	0.1513	0.0000
138	0.1414	0.0000

139	0.1378	0.0000
140	0.1378	0.0000
141	0.1375	0.0000
142	0.1343	0.0000
143	0.1335	0.0000
144	0.1331	0.0000
145	0.1240	0.0000
146	0.1240	0.0000
147	0.1238	0.0000
148	0.1222	0.0000
149	0.1208	0.0000
150	0.1207	0.0000
151	0.1162	0.0000
152	0.1057	0.0000
153	0.1024	0.0000
154	0.0940	0.0000
155	0.0682	0.0000
156	0.0315	0.0000
157	0.0256	0.0000
158	0.0163	0.0000

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1588	54852	0	0	Pass
0.1647	50631	0	0	Pass
0.1706	46924	0	0	Pass
0.1766	43595	0	0	Pass
0.1825	40503	0	0	Pass
0.1884	37634	0	0	Pass
0.1943	35046	0	0	Pass
0.2003	32675	0	0	Pass
0.2062	30393	0	0	Pass
0.2121	28299	0	0	Pass
0.2181	26432	0	0	Pass
0.2240	25041	0	0	Pass
0.2299	23518	0	0	Pass
0.2358	22116	0	0	Pass
0.2418	20786	0	0	Pass
0.2477	19551	0	0	Pass
0.2536	18393	0	0	Pass
0.2595	17307	0	0	Pass
0.2655	16238	0	0	Pass
0.2714	15191	0	0	Pass
0.2773	14310	0	0	Pass
0.2832	13468	0	0	Pass
0.2892	12681	0	0	Pass
0.2951	11944	0	0	Pass
0.3010	11241	0	0	Pass
0.3070	10676	0	0	Pass
0.3129	10050	0	0	Pass
0.3188	9446	0	0	Pass
0.3247	8920	0	0	Pass
0.3307	8382	0	0	Pass
0.3366	7900	0	0	Pass
0.3425	7490	0	0	Pass
0.3484	7064	0	0	Pass
0.3544	6631	0	0	Pass
0.3603	6282	0	0	Pass
0.3662	5989	0	0	Pass
0.3721	5712	0	0	Pass
0.3781	5439	0	0	Pass
0.3840	5197	0	0	Pass
0.3899	4982	0	0	Pass
0.3959	4725	0	0	Pass
0.4018	4533	0	0	Pass
0.4077	4354	0	0	Pass
0.4136	4172	0	0	Pass
0.4196	3970	0	0	Pass
0.4255	3778	0	0	Pass
0.4314	3587	0	0	Pass
0.4373	3422	0	0	Pass
0.4433	3269	0	0	Pass
0.4492	3135	0	0	Pass
0.4551	3028	0	0	Pass
0.4611	2927	0	0	Pass
0.4670	2829	0	0	Pass

0.4729	2698	0	0	Pass
0.4788	2568	0	0	Pass
0.4848	2468	0	0	Pass
0.4907	2367	0	0	Pass
0.4966	2266	0	0	Pass
0.5025	2150	0	0	Pass
0.5085	2044	0	0	Pass
0.5144	1954	0	0	Pass
0.5203	1862	0	0	Pass
0.5262	1779	0	0	Pass
0.5322	1692	0	0	Pass
0.5381	1619	0	0	Pass
0.5440	1561	0	0	Pass
0.5500	1497	0	0	Pass
0.5559	1419	0	0	Pass
0.5618	1351	0	0	Pass
0.5677	1276	0	0	Pass
0.5737	1222	0	0	Pass
0.5796	1169	0	0	Pass
0.5855	1108	0	0	Pass
0.5914	1060	0	0	Pass
0.5974	1008	0	0	Pass
0.6033	965	0	0	Pass
0.6092	920	0	0	Pass
0.6151	873	0	0	Pass
0.6211	815	0	0	Pass
0.6270	772	0	0	Pass
0.6329	742	0	0	Pass
0.6389	697	0	0	Pass
0.6448	647	0	0	Pass
0.6507	605	0	0	Pass
0.6566	559	0	0	Pass
0.6626	519	0	0	Pass
0.6685	478	0	0	Pass
0.6744	436	0	0	Pass
0.6803	395	0	0	Pass
0.6863	363	0	0	Pass
0.6922	340	0	0	Pass
0.6981	310	0	0	Pass
0.7040	295	0	0	Pass
0.7100	279	0	0	Pass
0.7159	254	0	0	Pass
0.7218	240	0	0	Pass
0.7278	224	0	0	Pass
0.7337	207	0	0	Pass
0.7396	195	0	0	Pass
0.7455	181	0	0	Pass

Water Quality

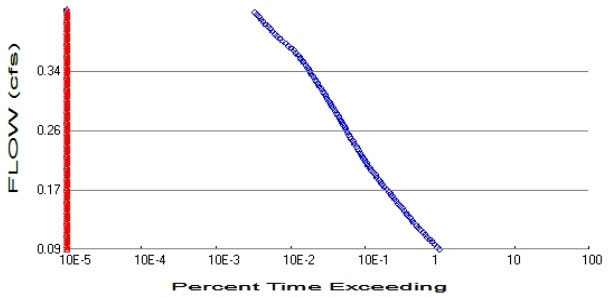
Water Quality BMP Flow and Volume for POC #1

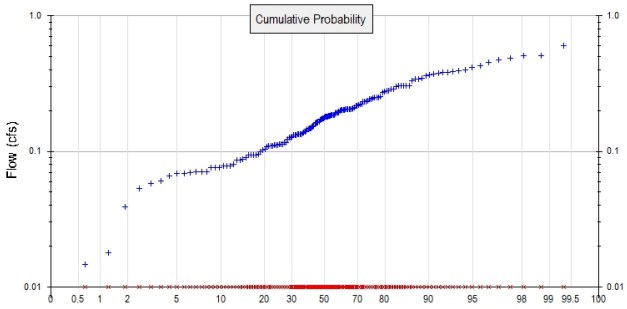
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	4567.51			☐	100.00			
Total Volume Infiltrated		4567.51	0.00	0.00		100.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

POC 2





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #2
Total Pervious Area: 8.56
Total Impervious Area: 0

Mitigated Landuse Totals for POC #2
Total Pervious Area: 2.59
Total Impervious Area: 5.97

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #2

Return Period	**Flow(cfs)**
2 year	0.180383
5 year	0.280623
10 year	0.33509
25 year	0.390527
50 year	0.423477
100 year	0.450572

Flow Frequency Return Periods for Mitigated. POC #2

Return Period	**Flow(cfs)**
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #2

Year	**Predeveloped**	**Mitigated**
1902	0.132	0.000
1903	0.110	0.000
1904	0.180	0.000
1905	0.087	0.000
1906	0.039	0.000
1907	0.277	0.000
1908	0.205	0.000
1909	0.203	0.000
1910	0.280	0.000
1911	0.182	0.000
1912	0.600	0.000

1913	0.288	0.000
1914	0.070	0.000
1915	0.116	0.000
1916	0.180	0.000
1917	0.060	0.000
1918	0.193	0.000
1919	0.142	0.000
1920	0.183	0.000
1921	0.205	0.000
1922	0.206	0.000
1923	0.165	0.000
1924	0.076	0.000
1925	0.094	0.000
1926	0.175	0.000
1927	0.113	0.000
1928	0.140	0.000
1929	0.287	0.000
1930	0.184	0.000
1931	0.170	0.000
1932	0.133	0.000
1933	0.129	0.000
1934	0.378	0.000
1935	0.175	0.000
1936	0.152	0.000
1937	0.243	0.000
1938	0.148	0.000
1939	0.009	0.000
1940	0.164	0.000
1941	0.078	0.000
1942	0.248	0.000
1943	0.127	0.000
1944	0.233	0.000
1945	0.206	0.000
1946	0.112	0.000
1947	0.070	0.000
1948	0.388	0.000
1949	0.332	0.000
1950	0.094	0.000
1951	0.116	0.000
1952	0.506	0.000
1953	0.456	0.000
1954	0.165	0.000
1955	0.135	0.000
1956	0.066	0.000
1957	0.234	0.000
1958	0.488	0.000
1959	0.302	0.000
1960	0.080	0.000
1961	0.303	0.000
1962	0.163	0.000
1963	0.078	0.000
1964	0.086	0.000
1965	0.340	0.000
1966	0.095	0.000
1967	0.146	0.000
1968	0.149	0.000
1969	0.149	0.000
1970	0.233	0.000

1971	0.366	0.000
1972	0.238	0.000
1973	0.303	0.000
1974	0.164	0.000
1975	0.384	0.000
1976	0.204	0.000
1977	0.069	0.000
1978	0.342	0.000
1979	0.094	0.000
1980	0.194	0.000
1981	0.186	0.000
1982	0.076	0.000
1983	0.304	0.000
1984	0.124	0.000
1985	0.201	0.000
1986	0.181	0.000
1987	0.344	0.000
1988	0.218	0.000
1989	0.196	0.000
1990	0.222	0.000
1991	0.174	0.000
1992	0.249	0.000
1993	0.241	0.000
1994	0.362	0.000
1995	0.069	0.000
1996	0.396	0.000
1997	0.152	0.000
1998	0.181	0.000
1999	0.015	0.000
2000	0.138	0.000
2001	0.070	0.000
2002	0.251	0.000
2003	0.219	0.000
2004	0.201	0.000
2005	0.371	0.000
2006	0.112	0.000
2007	0.112	0.000
2008	0.192	0.000
2009	0.131	0.000
2010	0.112	0.000
2011	0.090	0.000
2012	0.131	0.000
2013	0.102	0.000
2014	0.076	0.000
2015	0.146	0.000
2016	0.058	0.000
2017	0.278	0.000
2018	0.505	0.000
2019	0.471	0.000
2020	0.154	0.000
2021	0.250	0.000
2022	0.104	0.000
2023	0.211	0.000
2024	0.396	0.000
2025	0.186	0.000
2026	0.303	0.000
2027	0.109	0.000
2028	0.094	0.000

2029	0.206	0.000
2030	0.381	0.000
2031	0.126	0.000
2032	0.069	0.000
2033	0.110	0.000
2034	0.109	0.000
2035	0.430	0.000
2036	0.223	0.000
2037	0.053	0.000
2038	0.178	0.000
2039	0.018	0.000
2040	0.099	0.000
2041	0.134	0.000
2042	0.419	0.000
2043	0.202	0.000
2044	0.273	0.000
2045	0.186	0.000
2046	0.218	0.000
2047	0.160	0.000
2048	0.207	0.000
2049	0.185	0.000
2050	0.133	0.000
2051	0.193	0.000
2052	0.111	0.000
2053	0.199	0.000
2054	0.253	0.000
2055	0.078	0.000
2056	0.088	0.000
2057	0.136	0.000
2058	0.173	0.000
2059	0.305	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #2

Rank	Predeveloped	Mitigated
1	0.6004	0.0000
2	0.5060	0.0000
3	0.5055	0.0000
4	0.4883	0.0000
5	0.4715	0.0000
6	0.4564	0.0000
7	0.4303	0.0000
8	0.4186	0.0000
9	0.3964	0.0000
10	0.3959	0.0000
11	0.3880	0.0000
12	0.3844	0.0000
13	0.3814	0.0000
14	0.3777	0.0000
15	0.3708	0.0000
16	0.3663	0.0000
17	0.3617	0.0000
18	0.3443	0.0000
19	0.3423	0.0000
20	0.3397	0.0000
21	0.3325	0.0000
22	0.3052	0.0000
23	0.3036	0.0000

24	0.3035	0.0000
25	0.3034	0.0000
26	0.3027	0.0000
27	0.3019	0.0000
28	0.2877	0.0000
29	0.2865	0.0000
30	0.2796	0.0000
31	0.2780	0.0000
32	0.2768	0.0000
33	0.2728	0.0000
34	0.2526	0.0000
35	0.2515	0.0000
36	0.2503	0.0000
37	0.2488	0.0000
38	0.2475	0.0000
39	0.2433	0.0000
40	0.2412	0.0000
41	0.2375	0.0000
42	0.2338	0.0000
43	0.2333	0.0000
44	0.2327	0.0000
45	0.2235	0.0000
46	0.2222	0.0000
47	0.2190	0.0000
48	0.2183	0.0000
49	0.2176	0.0000
50	0.2105	0.0000
51	0.2073	0.0000
52	0.2062	0.0000
53	0.2058	0.0000
54	0.2056	0.0000
55	0.2052	0.0000
56	0.2050	0.0000
57	0.2036	0.0000
58	0.2028	0.0000
59	0.2022	0.0000
60	0.2014	0.0000
61	0.2013	0.0000
62	0.1988	0.0000
63	0.1963	0.0000
64	0.1938	0.0000
65	0.1932	0.0000
66	0.1927	0.0000
67	0.1916	0.0000
68	0.1859	0.0000
69	0.1857	0.0000
70	0.1856	0.0000
71	0.1853	0.0000
72	0.1841	0.0000
73	0.1834	0.0000
74	0.1820	0.0000
75	0.1809	0.0000
76	0.1805	0.0000
77	0.1801	0.0000
78	0.1800	0.0000
79	0.1782	0.0000
80	0.1754	0.0000
81	0.1747	0.0000

82	0.1739	0.0000
83	0.1728	0.0000
84	0.1703	0.0000
85	0.1654	0.0000
86	0.1647	0.0000
87	0.1643	0.0000
88	0.1639	0.0000
89	0.1630	0.0000
90	0.1602	0.0000
91	0.1538	0.0000
92	0.1524	0.0000
93	0.1521	0.0000
94	0.1489	0.0000
95	0.1486	0.0000
96	0.1483	0.0000
97	0.1461	0.0000
98	0.1459	0.0000
99	0.1425	0.0000
100	0.1398	0.0000
101	0.1376	0.0000
102	0.1365	0.0000
103	0.1346	0.0000
104	0.1335	0.0000
105	0.1333	0.0000
106	0.1330	0.0000
107	0.1323	0.0000
108	0.1315	0.0000
109	0.1312	0.0000
110	0.1286	0.0000
111	0.1273	0.0000
112	0.1260	0.0000
113	0.1237	0.0000
114	0.1159	0.0000
115	0.1159	0.0000
116	0.1133	0.0000
117	0.1125	0.0000
118	0.1122	0.0000
119	0.1119	0.0000
120	0.1115	0.0000
121	0.1111	0.0000
122	0.1104	0.0000
123	0.1100	0.0000
124	0.1090	0.0000
125	0.1086	0.0000
126	0.1036	0.0000
127	0.1024	0.0000
128	0.0990	0.0000
129	0.0952	0.0000
130	0.0945	0.0000
131	0.0942	0.0000
132	0.0939	0.0000
133	0.0938	0.0000
134	0.0904	0.0000
135	0.0878	0.0000
136	0.0866	0.0000
137	0.0859	0.0000
138	0.0803	0.0000
139	0.0783	0.0000

140	0.0783	0.0000
141	0.0781	0.0000
142	0.0763	0.0000
143	0.0758	0.0000
144	0.0756	0.0000
145	0.0704	0.0000
146	0.0704	0.0000
147	0.0703	0.0000
148	0.0694	0.0000
149	0.0686	0.0000
150	0.0685	0.0000
151	0.0660	0.0000
152	0.0601	0.0000
153	0.0582	0.0000
154	0.0534	0.0000
155	0.0387	0.0000
156	0.0179	0.0000
157	0.0146	0.0000
158	0.0093	0.0000

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0902	54520	0	0	Pass
0.0936	50819	0	0	Pass
0.0969	47506	0	0	Pass
0.1003	43573	0	0	Pass
0.1037	40808	0	0	Pass
0.1070	37462	0	0	Pass
0.1104	35190	0	0	Pass
0.1138	33080	0	0	Pass
0.1171	30398	0	0	Pass
0.1205	28542	0	0	Pass
0.1239	26858	0	0	Pass
0.1272	24886	0	0	Pass
0.1306	23551	0	0	Pass
0.1340	22315	0	0	Pass
0.1373	20748	0	0	Pass
0.1407	19662	0	0	Pass
0.1441	18299	0	0	Pass
0.1474	17346	0	0	Pass
0.1508	16399	0	0	Pass
0.1542	15174	0	0	Pass
0.1575	14393	0	0	Pass
0.1609	13651	0	0	Pass
0.1643	12726	0	0	Pass
0.1676	12055	0	0	Pass
0.1710	11451	0	0	Pass
0.1744	10631	0	0	Pass
0.1777	10088	0	0	Pass
0.1811	9385	0	0	Pass
0.1845	8931	0	0	Pass
0.1878	8449	0	0	Pass
0.1912	7884	0	0	Pass
0.1946	7518	0	0	Pass
0.1979	7147	0	0	Pass
0.2013	6643	0	0	Pass
0.2047	6327	0	0	Pass
0.2080	5978	0	0	Pass
0.2114	5740	0	0	Pass
0.2148	5495	0	0	Pass
0.2181	5204	0	0	Pass
0.2215	4980	0	0	Pass
0.2249	4752	0	0	Pass
0.2282	4522	0	0	Pass
0.2316	4359	0	0	Pass
0.2350	4197	0	0	Pass
0.2383	3970	0	0	Pass
0.2417	3805	0	0	Pass
0.2451	3582	0	0	Pass
0.2484	3432	0	0	Pass
0.2518	3293	0	0	Pass
0.2552	3137	0	0	Pass
0.2585	3046	0	0	Pass
0.2619	2951	0	0	Pass
0.2653	2817	0	0	Pass

0.2686	2702	0	0	Pass
0.2720	2589	0	0	Pass
0.2754	2464	0	0	Pass
0.2787	2375	0	0	Pass
0.2821	2257	0	0	Pass
0.2854	2155	0	0	Pass
0.2888	2059	0	0	Pass
0.2922	1953	0	0	Pass
0.2955	1874	0	0	Pass
0.2989	1797	0	0	Pass
0.3023	1699	0	0	Pass
0.3056	1631	0	0	Pass
0.3090	1561	0	0	Pass
0.3124	1490	0	0	Pass
0.3157	1425	0	0	Pass
0.3191	1340	0	0	Pass
0.3225	1277	0	0	Pass
0.3258	1230	0	0	Pass
0.3292	1166	0	0	Pass
0.3326	1112	0	0	Pass
0.3359	1071	0	0	Pass
0.3393	1010	0	0	Pass
0.3427	972	0	0	Pass
0.3460	919	0	0	Pass
0.3494	878	0	0	Pass
0.3528	820	0	0	Pass
0.3561	776	0	0	Pass
0.3595	742	0	0	Pass
0.3629	701	0	0	Pass
0.3662	641	0	0	Pass
0.3696	608	0	0	Pass
0.3730	563	0	0	Pass
0.3763	519	0	0	Pass
0.3797	485	0	0	Pass
0.3831	434	0	0	Pass
0.3864	396	0	0	Pass
0.3898	367	0	0	Pass
0.3932	341	0	0	Pass
0.3965	315	0	0	Pass
0.3999	298	0	0	Pass
0.4033	274	0	0	Pass
0.4066	254	0	0	Pass
0.4100	237	0	0	Pass
0.4134	224	0	0	Pass
0.4167	208	0	0	Pass
0.4201	195	0	0	Pass
0.4235	181	0	0	Pass

Water Quality

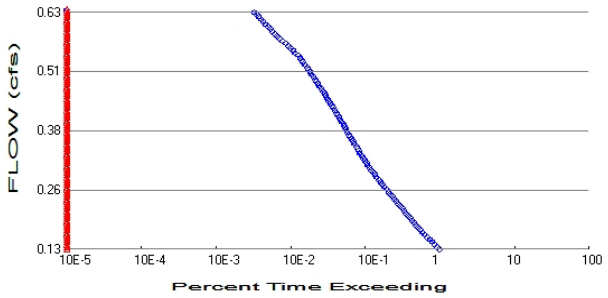
Water Quality BMP Flow and Volume for POC #2

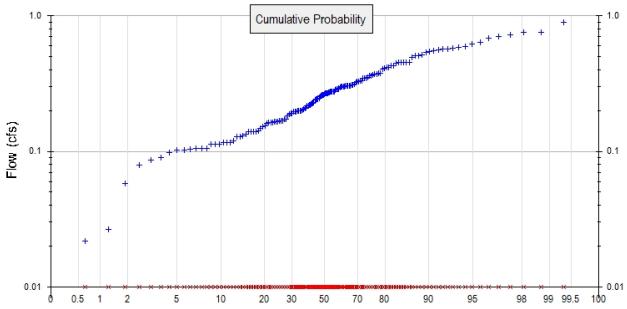
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 2 POC	☐	2586.98			☐	100.00			
Total Volume Infiltrated		2586.98	0.00	0.00		100.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

POC 3





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #3
Total Pervious Area: 12.74
Total Impervious Area: 0

Mitigated Landuse Totals for POC #3
Total Pervious Area: 4
Total Impervious Area: 8.74

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #3

Return Period	**Flow(cfs)**
2 year	0.268467
5 year	0.417656
10 year	0.49872
25 year	0.581228
50 year	0.630268
100 year	0.670594

Flow Frequency Return Periods for Mitigated. POC #3

Return Period	**Flow(cfs)**
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #3

Year	**Predeveloped**	**Mitigated**
1902	0.197	0.000
1903	0.164	0.000
1904	0.268	0.000
1905	0.129	0.000
1906	0.058	0.000
1907	0.412	0.000
1908	0.305	0.000
1909	0.302	0.000
1910	0.416	0.000
1911	0.271	0.000
1912	0.894	0.000

1913	0.428	0.000
1914	0.105	0.000
1915	0.173	0.000
1916	0.268	0.000
1917	0.089	0.000
1918	0.287	0.000
1919	0.212	0.000
1920	0.273	0.000
1921	0.305	0.000
1922	0.306	0.000
1923	0.246	0.000
1924	0.112	0.000
1925	0.140	0.000
1926	0.260	0.000
1927	0.169	0.000
1928	0.208	0.000
1929	0.426	0.000
1930	0.274	0.000
1931	0.253	0.000
1932	0.198	0.000
1933	0.191	0.000
1934	0.562	0.000
1935	0.261	0.000
1936	0.227	0.000
1937	0.362	0.000
1938	0.221	0.000
1939	0.014	0.000
1940	0.245	0.000
1941	0.116	0.000
1942	0.368	0.000
1943	0.190	0.000
1944	0.347	0.000
1945	0.307	0.000
1946	0.166	0.000
1947	0.105	0.000
1948	0.578	0.000
1949	0.495	0.000
1950	0.140	0.000
1951	0.173	0.000
1952	0.753	0.000
1953	0.679	0.000
1954	0.245	0.000
1955	0.200	0.000
1956	0.098	0.000
1957	0.348	0.000
1958	0.727	0.000
1959	0.449	0.000
1960	0.120	0.000
1961	0.452	0.000
1962	0.243	0.000
1963	0.116	0.000
1964	0.128	0.000
1965	0.506	0.000
1966	0.142	0.000
1967	0.217	0.000
1968	0.222	0.000
1969	0.221	0.000
1970	0.346	0.000

1971	0.545	0.000
1972	0.353	0.000
1973	0.451	0.000
1974	0.244	0.000
1975	0.572	0.000
1976	0.303	0.000
1977	0.102	0.000
1978	0.509	0.000
1979	0.140	0.000
1980	0.288	0.000
1981	0.276	0.000
1982	0.113	0.000
1983	0.452	0.000
1984	0.184	0.000
1985	0.300	0.000
1986	0.269	0.000
1987	0.512	0.000
1988	0.325	0.000
1989	0.292	0.000
1990	0.331	0.000
1991	0.259	0.000
1992	0.370	0.000
1993	0.359	0.000
1994	0.538	0.000
1995	0.103	0.000
1996	0.590	0.000
1997	0.226	0.000
1998	0.269	0.000
1999	0.022	0.000
2000	0.205	0.000
2001	0.105	0.000
2002	0.374	0.000
2003	0.326	0.000
2004	0.300	0.000
2005	0.552	0.000
2006	0.167	0.000
2007	0.167	0.000
2008	0.285	0.000
2009	0.196	0.000
2010	0.167	0.000
2011	0.135	0.000
2012	0.195	0.000
2013	0.152	0.000
2014	0.114	0.000
2015	0.218	0.000
2016	0.087	0.000
2017	0.414	0.000
2018	0.752	0.000
2019	0.702	0.000
2020	0.229	0.000
2021	0.373	0.000
2022	0.154	0.000
2023	0.313	0.000
2024	0.589	0.000
2025	0.277	0.000
2026	0.452	0.000
2027	0.162	0.000
2028	0.141	0.000

2029	0.306	0.000
2030	0.568	0.000
2031	0.188	0.000
2032	0.102	0.000
2033	0.164	0.000
2034	0.162	0.000
2035	0.640	0.000
2036	0.333	0.000
2037	0.079	0.000
2038	0.265	0.000
2039	0.027	0.000
2040	0.147	0.000
2041	0.199	0.000
2042	0.623	0.000
2043	0.301	0.000
2044	0.406	0.000
2045	0.276	0.000
2046	0.324	0.000
2047	0.238	0.000
2048	0.309	0.000
2049	0.276	0.000
2050	0.198	0.000
2051	0.287	0.000
2052	0.165	0.000
2053	0.296	0.000
2054	0.376	0.000
2055	0.117	0.000
2056	0.131	0.000
2057	0.203	0.000
2058	0.257	0.000
2059	0.454	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #3

Rank	Predeveloped	Mitigated
1	0.8936	0.0000
2	0.7531	0.0000
3	0.7523	0.0000
4	0.7267	0.0000
5	0.7017	0.0000
6	0.6793	0.0000
7	0.6404	0.0000
8	0.6230	0.0000
9	0.5900	0.0000
10	0.5892	0.0000
11	0.5775	0.0000
12	0.5722	0.0000
13	0.5677	0.0000
14	0.5621	0.0000
15	0.5519	0.0000
16	0.5452	0.0000
17	0.5384	0.0000
18	0.5125	0.0000
19	0.5095	0.0000
20	0.5055	0.0000
21	0.4948	0.0000
22	0.4542	0.0000
23	0.4518	0.0000

24	0.4517	0.0000
25	0.4516	0.0000
26	0.4505	0.0000
27	0.4493	0.0000
28	0.4282	0.0000
29	0.4264	0.0000
30	0.4161	0.0000
31	0.4137	0.0000
32	0.4120	0.0000
33	0.4060	0.0000
34	0.3760	0.0000
35	0.3743	0.0000
36	0.3726	0.0000
37	0.3703	0.0000
38	0.3684	0.0000
39	0.3621	0.0000
40	0.3590	0.0000
41	0.3535	0.0000
42	0.3479	0.0000
43	0.3472	0.0000
44	0.3463	0.0000
45	0.3326	0.0000
46	0.3307	0.0000
47	0.3259	0.0000
48	0.3250	0.0000
49	0.3238	0.0000
50	0.3133	0.0000
51	0.3085	0.0000
52	0.3069	0.0000
53	0.3063	0.0000
54	0.3061	0.0000
55	0.3054	0.0000
56	0.3052	0.0000
57	0.3030	0.0000
58	0.3018	0.0000
59	0.3009	0.0000
60	0.2997	0.0000
61	0.2995	0.0000
62	0.2958	0.0000
63	0.2922	0.0000
64	0.2885	0.0000
65	0.2875	0.0000
66	0.2868	0.0000
67	0.2851	0.0000
68	0.2766	0.0000
69	0.2764	0.0000
70	0.2762	0.0000
71	0.2758	0.0000
72	0.2740	0.0000
73	0.2730	0.0000
74	0.2709	0.0000
75	0.2693	0.0000
76	0.2687	0.0000
77	0.2680	0.0000
78	0.2679	0.0000
79	0.2652	0.0000
80	0.2610	0.0000
81	0.2600	0.0000

82	0.2589	0.0000
83	0.2572	0.0000
84	0.2535	0.0000
85	0.2462	0.0000
86	0.2451	0.0000
87	0.2446	0.0000
88	0.2439	0.0000
89	0.2425	0.0000
90	0.2384	0.0000
91	0.2289	0.0000
92	0.2268	0.0000
93	0.2263	0.0000
94	0.2216	0.0000
95	0.2211	0.0000
96	0.2207	0.0000
97	0.2175	0.0000
98	0.2171	0.0000
99	0.2121	0.0000
100	0.2081	0.0000
101	0.2048	0.0000
102	0.2031	0.0000
103	0.2004	0.0000
104	0.1988	0.0000
105	0.1985	0.0000
106	0.1980	0.0000
107	0.1969	0.0000
108	0.1957	0.0000
109	0.1952	0.0000
110	0.1914	0.0000
111	0.1895	0.0000
112	0.1876	0.0000
113	0.1841	0.0000
114	0.1725	0.0000
115	0.1725	0.0000
116	0.1686	0.0000
117	0.1674	0.0000
118	0.1669	0.0000
119	0.1666	0.0000
120	0.1660	0.0000
121	0.1653	0.0000
122	0.1642	0.0000
123	0.1638	0.0000
124	0.1623	0.0000
125	0.1616	0.0000
126	0.1542	0.0000
127	0.1524	0.0000
128	0.1474	0.0000
129	0.1417	0.0000
130	0.1406	0.0000
131	0.1402	0.0000
132	0.1397	0.0000
133	0.1396	0.0000
134	0.1345	0.0000
135	0.1307	0.0000
136	0.1289	0.0000
137	0.1279	0.0000
138	0.1195	0.0000
139	0.1165	0.0000

140	0.1165	0.0000
141	0.1162	0.0000
142	0.1135	0.0000
143	0.1129	0.0000
144	0.1125	0.0000
145	0.1048	0.0000
146	0.1048	0.0000
147	0.1046	0.0000
148	0.1033	0.0000
149	0.1021	0.0000
150	0.1020	0.0000
151	0.0982	0.0000
152	0.0894	0.0000
153	0.0866	0.0000
154	0.0795	0.0000
155	0.0577	0.0000
156	0.0266	0.0000
157	0.0217	0.0000
158	0.0138	0.0000

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1342	54475	0	0	Pass
0.1392	50354	0	0	Pass
0.1443	46736	0	0	Pass
0.1493	43456	0	0	Pass
0.1543	40404	0	0	Pass
0.1593	37595	0	0	Pass
0.1643	35046	0	0	Pass
0.1693	32714	0	0	Pass
0.1743	30470	0	0	Pass
0.1793	28387	0	0	Pass
0.1843	26531	0	0	Pass
0.1893	24892	0	0	Pass
0.1944	23401	0	0	Pass
0.1994	22022	0	0	Pass
0.2044	20725	0	0	Pass
0.2094	19518	0	0	Pass
0.2144	18365	0	0	Pass
0.2194	17302	0	0	Pass
0.2244	16243	0	0	Pass
0.2294	15219	0	0	Pass
0.2344	14349	0	0	Pass
0.2395	13507	0	0	Pass
0.2445	12737	0	0	Pass
0.2495	12000	0	0	Pass
0.2545	11307	0	0	Pass
0.2595	10631	0	0	Pass
0.2645	10022	0	0	Pass
0.2695	9424	0	0	Pass
0.2745	8908	0	0	Pass
0.2795	8382	0	0	Pass
0.2845	7911	0	0	Pass
0.2896	7501	0	0	Pass
0.2946	7080	0	0	Pass
0.2996	6654	0	0	Pass
0.3046	6299	0	0	Pass
0.3096	6017	0	0	Pass
0.3146	5740	0	0	Pass
0.3196	5469	0	0	Pass
0.3246	5218	0	0	Pass
0.3296	4978	0	0	Pass
0.3347	4724	0	0	Pass
0.3397	4533	0	0	Pass
0.3447	4356	0	0	Pass
0.3497	4179	0	0	Pass
0.3547	3977	0	0	Pass
0.3597	3789	0	0	Pass
0.3647	3602	0	0	Pass
0.3697	3433	0	0	Pass
0.3747	3285	0	0	Pass
0.3797	3148	0	0	Pass
0.3848	3044	0	0	Pass
0.3898	2942	0	0	Pass
0.3948	2826	0	0	Pass

0.3998	2699	0	0	Pass
0.4048	2570	0	0	Pass
0.4098	2470	0	0	Pass
0.4148	2372	0	0	Pass
0.4198	2272	0	0	Pass
0.4248	2159	0	0	Pass
0.4299	2052	0	0	Pass
0.4349	1965	0	0	Pass
0.4399	1875	0	0	Pass
0.4449	1790	0	0	Pass
0.4499	1707	0	0	Pass
0.4549	1630	0	0	Pass
0.4599	1571	0	0	Pass
0.4649	1498	0	0	Pass
0.4699	1421	0	0	Pass
0.4749	1354	0	0	Pass
0.4800	1282	0	0	Pass
0.4850	1227	0	0	Pass
0.4900	1172	0	0	Pass
0.4950	1113	0	0	Pass
0.5000	1069	0	0	Pass
0.5050	1005	0	0	Pass
0.5100	963	0	0	Pass
0.5150	919	0	0	Pass
0.5200	872	0	0	Pass
0.5250	814	0	0	Pass
0.5301	774	0	0	Pass
0.5351	738	0	0	Pass
0.5401	694	0	0	Pass
0.5451	637	0	0	Pass
0.5501	601	0	0	Pass
0.5551	555	0	0	Pass
0.5601	517	0	0	Pass
0.5651	478	0	0	Pass
0.5701	434	0	0	Pass
0.5752	394	0	0	Pass
0.5802	363	0	0	Pass
0.5852	340	0	0	Pass
0.5902	310	0	0	Pass
0.5952	297	0	0	Pass
0.6002	273	0	0	Pass
0.6052	253	0	0	Pass
0.6102	237	0	0	Pass
0.6152	224	0	0	Pass
0.6202	206	0	0	Pass
0.6253	195	0	0	Pass
0.6303	180	0	0	Pass

Water Quality

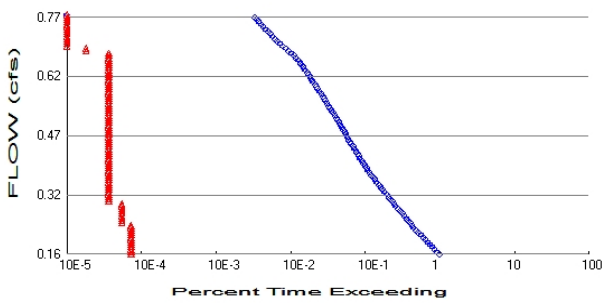
Water Quality BMP Flow and Volume for POC #3

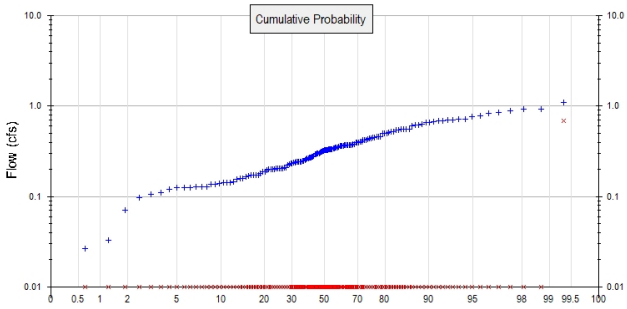
On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 4 POC	☐	3819.68			☐	100.00			
Total Volume Infiltrated		3819.68	0.00	0.00		100.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

POC 4





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #4
Total Pervious Area: 15.56
Total Impervious Area: 0

Mitigated Landuse Totals for POC #4
Total Pervious Area: 4.25
Total Impervious Area: 11.31

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #4

Return Period	**Flow(cfs)**
2 year	0.327893
5 year	0.510105
10 year	0.609111
25 year	0.709882
50 year	0.769778
100 year	0.81903

Flow Frequency Return Periods for Mitigated. POC #4

Return Period	**Flow(cfs)**
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #4

Year	**Predeveloped**	**Mitigated**
1902	0.240	0.000
1903	0.200	0.000
1904	0.327	0.000
1905	0.157	0.000
1906	0.070	0.000
1907	0.503	0.000
1908	0.373	0.000
1909	0.369	0.000
1910	0.508	0.000
1911	0.331	0.000
1912	1.091	0.000

1913	0.523	0.000
1914	0.128	0.000
1915	0.211	0.000
1916	0.327	0.000
1917	0.109	0.000
1918	0.350	0.000
1919	0.259	0.000
1920	0.333	0.000
1921	0.373	0.000
1922	0.374	0.000
1923	0.301	0.000
1924	0.137	0.000
1925	0.170	0.000
1926	0.318	0.000
1927	0.206	0.000
1928	0.254	0.000
1929	0.521	0.000
1930	0.335	0.000
1931	0.310	0.000
1932	0.242	0.000
1933	0.234	0.000
1934	0.687	0.000
1935	0.319	0.000
1936	0.277	0.000
1937	0.442	0.000
1938	0.270	0.000
1939	0.017	0.000
1940	0.299	0.000
1941	0.142	0.000
1942	0.450	0.000
1943	0.231	0.000
1944	0.424	0.000
1945	0.375	0.000
1946	0.203	0.000
1947	0.128	0.000
1948	0.705	0.000
1949	0.604	0.000
1950	0.171	0.000
1951	0.211	0.000
1952	0.920	0.696
1953	0.830	0.000
1954	0.299	0.000
1955	0.245	0.000
1956	0.120	0.000
1957	0.425	0.000
1958	0.888	0.000
1959	0.549	0.000
1960	0.146	0.000
1961	0.552	0.000
1962	0.296	0.000
1963	0.142	0.000
1964	0.156	0.000
1965	0.617	0.000
1966	0.173	0.000
1967	0.265	0.000
1968	0.271	0.000
1969	0.270	0.000
1970	0.423	0.000

1971	0.666	0.000
1972	0.432	0.000
1973	0.550	0.000
1974	0.298	0.000
1975	0.699	0.000
1976	0.370	0.000
1977	0.125	0.000
1978	0.622	0.000
1979	0.171	0.000
1980	0.352	0.000
1981	0.337	0.000
1982	0.138	0.000
1983	0.552	0.000
1984	0.225	0.000
1985	0.366	0.000
1986	0.328	0.000
1987	0.626	0.000
1988	0.397	0.000
1989	0.357	0.000
1990	0.404	0.000
1991	0.316	0.000
1992	0.452	0.000
1993	0.438	0.000
1994	0.658	0.000
1995	0.126	0.000
1996	0.721	0.000
1997	0.276	0.000
1998	0.329	0.000
1999	0.026	0.000
2000	0.250	0.000
2001	0.128	0.000
2002	0.457	0.000
2003	0.398	0.000
2004	0.366	0.000
2005	0.674	0.000
2006	0.204	0.000
2007	0.204	0.000
2008	0.348	0.000
2009	0.239	0.000
2010	0.203	0.000
2011	0.164	0.000
2012	0.238	0.000
2013	0.186	0.000
2014	0.139	0.000
2015	0.266	0.000
2016	0.106	0.000
2017	0.505	0.000
2018	0.919	0.000
2019	0.857	0.000
2020	0.280	0.000
2021	0.455	0.000
2022	0.188	0.000
2023	0.383	0.000
2024	0.720	0.000
2025	0.338	0.000
2026	0.552	0.000
2027	0.198	0.000
2028	0.172	0.000

2029	0.374	0.000
2030	0.693	0.000
2031	0.229	0.000
2032	0.125	0.000
2033	0.201	0.000
2034	0.197	0.000
2035	0.782	0.000
2036	0.406	0.000
2037	0.097	0.000
2038	0.324	0.000
2039	0.033	0.000
2040	0.180	0.000
2041	0.243	0.000
2042	0.761	0.000
2043	0.367	0.000
2044	0.496	0.000
2045	0.338	0.000
2046	0.395	0.000
2047	0.291	0.000
2048	0.377	0.000
2049	0.337	0.000
2050	0.242	0.000
2051	0.351	0.000
2052	0.202	0.000
2053	0.361	0.000
2054	0.459	0.000
2055	0.142	0.000
2056	0.160	0.000
2057	0.248	0.000
2058	0.314	0.000
2059	0.555	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #4

Rank	Predeveloped	Mitigated
1	1.0915	0.6956
2	0.9198	0.0000
3	0.9188	0.0000
4	0.8876	0.0000
5	0.8570	0.0000
6	0.8297	0.0000
7	0.7822	0.0000
8	0.7609	0.0000
9	0.7206	0.0000
10	0.7196	0.0000
11	0.7054	0.0000
12	0.6988	0.0000
13	0.6934	0.0000
14	0.6865	0.0000
15	0.6741	0.0000
16	0.6658	0.0000
17	0.6575	0.0000
18	0.6259	0.0000
19	0.6222	0.0000
20	0.6174	0.0000
21	0.6044	0.0000
22	0.5548	0.0000
23	0.5518	0.0000

24	0.5517	0.0000
25	0.5516	0.0000
26	0.5502	0.0000
27	0.5487	0.0000
28	0.5230	0.0000
29	0.5208	0.0000
30	0.5082	0.0000
31	0.5053	0.0000
32	0.5032	0.0000
33	0.4958	0.0000
34	0.4592	0.0000
35	0.4571	0.0000
36	0.4550	0.0000
37	0.4522	0.0000
38	0.4499	0.0000
39	0.4423	0.0000
40	0.4384	0.0000
41	0.4317	0.0000
42	0.4249	0.0000
43	0.4240	0.0000
44	0.4229	0.0000
45	0.4062	0.0000
46	0.4039	0.0000
47	0.3980	0.0000
48	0.3969	0.0000
49	0.3955	0.0000
50	0.3827	0.0000
51	0.3768	0.0000
52	0.3748	0.0000
53	0.3741	0.0000
54	0.3738	0.0000
55	0.3730	0.0000
56	0.3727	0.0000
57	0.3700	0.0000
58	0.3686	0.0000
59	0.3675	0.0000
60	0.3661	0.0000
61	0.3658	0.0000
62	0.3613	0.0000
63	0.3568	0.0000
64	0.3523	0.0000
65	0.3511	0.0000
66	0.3503	0.0000
67	0.3482	0.0000
68	0.3378	0.0000
69	0.3376	0.0000
70	0.3374	0.0000
71	0.3369	0.0000
72	0.3347	0.0000
73	0.3335	0.0000
74	0.3309	0.0000
75	0.3289	0.0000
76	0.3281	0.0000
77	0.3273	0.0000
78	0.3271	0.0000
79	0.3239	0.0000
80	0.3187	0.0000
81	0.3176	0.0000

82	0.3162	0.0000
83	0.3141	0.0000
84	0.3096	0.0000
85	0.3007	0.0000
86	0.2994	0.0000
87	0.2987	0.0000
88	0.2979	0.0000
89	0.2962	0.0000
90	0.2912	0.0000
91	0.2796	0.0000
92	0.2770	0.0000
93	0.2764	0.0000
94	0.2706	0.0000
95	0.2701	0.0000
96	0.2695	0.0000
97	0.2657	0.0000
98	0.2652	0.0000
99	0.2590	0.0000
100	0.2542	0.0000
101	0.2502	0.0000
102	0.2481	0.0000
103	0.2447	0.0000
104	0.2428	0.0000
105	0.2424	0.0000
106	0.2418	0.0000
107	0.2405	0.0000
108	0.2390	0.0000
109	0.2384	0.0000
110	0.2338	0.0000
111	0.2315	0.0000
112	0.2291	0.0000
113	0.2248	0.0000
114	0.2107	0.0000
115	0.2107	0.0000
116	0.2060	0.0000
117	0.2045	0.0000
118	0.2039	0.0000
119	0.2034	0.0000
120	0.2027	0.0000
121	0.2019	0.0000
122	0.2006	0.0000
123	0.2000	0.0000
124	0.1982	0.0000
125	0.1974	0.0000
126	0.1884	0.0000
127	0.1861	0.0000
128	0.1800	0.0000
129	0.1731	0.0000
130	0.1718	0.0000
131	0.1713	0.0000
132	0.1707	0.0000
133	0.1705	0.0000
134	0.1643	0.0000
135	0.1596	0.0000
136	0.1574	0.0000
137	0.1562	0.0000
138	0.1460	0.0000
139	0.1423	0.0000

140	0.1423	0.0000
141	0.1420	0.0000
142	0.1387	0.0000
143	0.1379	0.0000
144	0.1374	0.0000
145	0.1280	0.0000
146	0.1280	0.0000
147	0.1278	0.0000
148	0.1262	0.0000
149	0.1247	0.0000
150	0.1246	0.0000
151	0.1200	0.0000
152	0.1092	0.0000
153	0.1057	0.0000
154	0.0971	0.0000
155	0.0704	0.0000
156	0.0325	0.0000
157	0.0265	0.0000
158	0.0169	0.0000

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1639	54957	4	0	Pass
0.1701	50199	4	0	Pass
0.1762	46669	4	0	Pass
0.1823	43456	4	0	Pass
0.1884	40476	4	0	Pass
0.1945	37689	4	0	Pass
0.2007	35168	4	0	Pass
0.2068	32864	4	0	Pass
0.2129	30637	4	0	Pass
0.2190	28265	4	0	Pass
0.2251	26454	4	0	Pass
0.2313	24842	4	0	Pass
0.2374	23379	4	0	Pass
0.2435	22027	3	0	Pass
0.2496	20753	3	0	Pass
0.2557	19556	3	0	Pass
0.2619	18437	3	0	Pass
0.2680	17385	3	0	Pass
0.2741	16166	3	0	Pass
0.2802	15163	3	0	Pass
0.2863	14310	3	0	Pass
0.2925	13496	3	0	Pass
0.2986	12737	2	0	Pass
0.3047	12011	2	0	Pass
0.3108	11329	2	0	Pass
0.3169	10670	2	0	Pass
0.3231	9972	2	0	Pass
0.3292	9390	2	0	Pass
0.3353	8875	2	0	Pass
0.3414	8360	2	0	Pass
0.3475	7895	2	0	Pass
0.3537	7501	2	0	Pass
0.3598	7080	2	0	Pass
0.3659	6665	2	0	Pass
0.3720	6271	2	0	Pass
0.3781	5978	2	0	Pass
0.3842	5712	2	0	Pass
0.3904	5453	2	0	Pass
0.3965	5215	2	0	Pass
0.4026	4968	2	0	Pass
0.4087	4720	2	0	Pass
0.4148	4533	2	0	Pass
0.4210	4358	2	0	Pass
0.4271	4159	2	0	Pass
0.4332	3959	2	0	Pass
0.4393	3773	2	0	Pass
0.4454	3587	2	0	Pass
0.4516	3428	2	0	Pass
0.4577	3277	2	0	Pass
0.4638	3144	2	0	Pass
0.4699	3044	2	0	Pass
0.4760	2926	2	0	Pass
0.4822	2815	2	0	Pass

0.4883	2685	2	0	Pass
0.4944	2560	2	0	Pass
0.5005	2461	2	0	Pass
0.5066	2367	2	0	Pass
0.5128	2268	2	0	Pass
0.5189	2156	2	0	Pass
0.5250	2051	2	0	Pass
0.5311	1952	2	0	Pass
0.5372	1862	2	0	Pass
0.5434	1786	2	0	Pass
0.5495	1698	2	0	Pass
0.5556	1624	2	0	Pass
0.5617	1568	2	0	Pass
0.5678	1494	2	0	Pass
0.5740	1419	2	0	Pass
0.5801	1339	2	0	Pass
0.5862	1273	2	0	Pass
0.5923	1219	2	0	Pass
0.5984	1167	2	0	Pass
0.6046	1108	2	0	Pass
0.6107	1064	2	0	Pass
0.6168	1012	2	0	Pass
0.6229	968	2	0	Pass
0.6290	919	2	0	Pass
0.6351	873	2	0	Pass
0.6413	815	2	0	Pass
0.6474	777	2	0	Pass
0.6535	738	2	0	Pass
0.6596	695	2	0	Pass
0.6657	646	2	0	Pass
0.6719	605	2	0	Pass
0.6780	561	2	0	Pass
0.6841	517	1	0	Pass
0.6902	478	1	0	Pass
0.6963	434	0	0	Pass
0.7025	395	0	0	Pass
0.7086	364	0	0	Pass
0.7147	342	0	0	Pass
0.7208	314	0	0	Pass
0.7269	297	0	0	Pass
0.7331	273	0	0	Pass
0.7392	252	0	0	Pass
0.7453	237	0	0	Pass
0.7514	224	0	0	Pass
0.7575	207	0	0	Pass
0.7637	195	0	0	Pass
0.7698	181	0	0	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #4

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 5 POC	☐	4799.75			☐	100.00			
Total Volume Infiltrated		4799.75	0.00	0.00		100.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

POC 5

POC #5 was not reported because POC must exist in both scenarios and both scenarios must have been run.

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

No PERLND changes have been made.

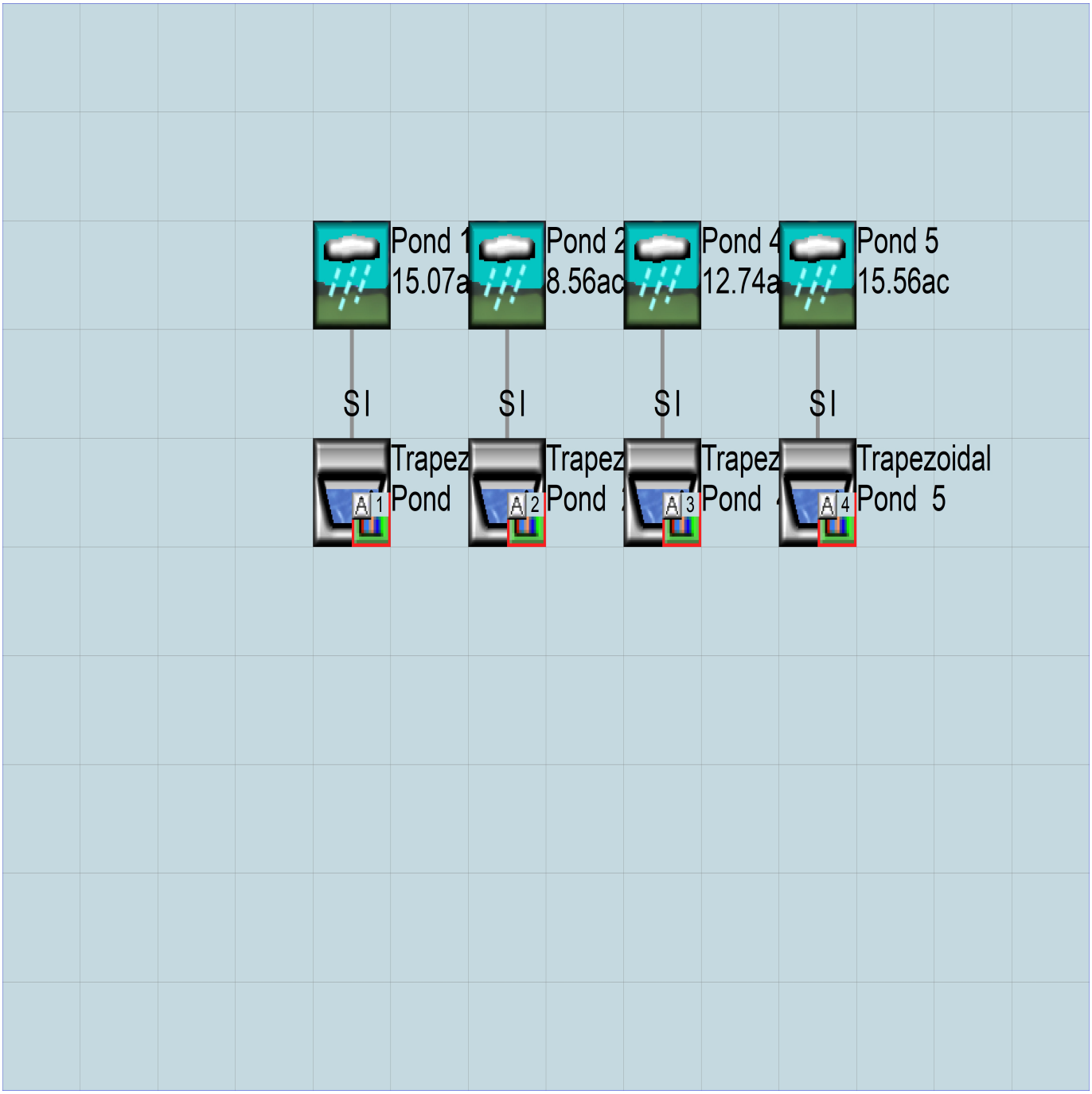
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   21127-Pond Sizes.wdm
MESSU       25   Pre21127-Pond Sizes.MES
            27   Pre21127-Pond Sizes.L61
            28   Pre21127-Pond Sizes.L62
            30   POC21127-Pond Sizes1.dat
            31   POC21127-Pond Sizes2.dat
            32   POC21127-Pond Sizes3.dat
            33   POC21127-Pond Sizes4.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      10
      COPY       501
      COPY       502
      COPY       503
      COPY       504
      DISPLY       1
      DISPLY       2
      DISPLY       3
      DISPLY       4
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Pond 1                     MAX                    1    2   30    9
    2        Pond 2                     MAX                    1    2   31    9
    3        Pond 4                     MAX                    1    2   32    9
    4        Pond 5                     MAX                    1    2   33    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  502         1    1
  503         1    1
  504         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
```

```
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10          0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1
```

```
  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Pond 1***
PERLND  10                       15.07     COPY   501     12
PERLND  10                       15.07     COPY   501     13
Pond 2***
PERLND  10                        8.56     COPY   502     12
PERLND  10                        8.56     COPY   502     13
Pond 4***
PERLND  10                       12.74     COPY   503     12
PERLND  10                       12.74     COPY   503     13
Pond 5***
PERLND  10                       15.56     COPY   504     12
PERLND  10                       15.56     COPY   504     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1
COPY   502 OUTPUT MEAN   1 1   48.4        DISPLY   2     INPUT  TIMSER 1
COPY   503 OUTPUT MEAN   1 1   48.4        DISPLY   3     INPUT  TIMSER 1
COPY   504 OUTPUT MEAN   1 1   48.4        DISPLY   4     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
```

```
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
             FG FG FG FG  possible  exit  *** possible  exit      possible  exit
              *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
COPY   502 OUTPUT MEAN   1 1     48.4      WDM    502 FLOW     ENGL      REPL
COPY   503 OUTPUT MEAN   1 1     48.4      WDM    503 FLOW     ENGL      REPL
COPY   504 OUTPUT MEAN   1 1     48.4      WDM    504 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   21127-Pond Sizes.wdm
MESSU       25   Mit21127-Pond Sizes.MES
            27   Mit21127-Pond Sizes.L61
            28   Mit21127-Pond Sizes.L62
            30   POC21127-Pond Sizes1.dat
            31   POC21127-Pond Sizes2.dat
            32   POC21127-Pond Sizes3.dat
            33   POC21127-Pond Sizes4.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      16
      IMPLND       1
      IMPLND       4
      RCHRES       1
      RCHRES       2
      RCHRES       3
      RCHRES       4
      COPY         1
      COPY       501
      COPY         2
      COPY       502
      COPY         3
      COPY       503
      COPY         4
      COPY       504
      DISPLY       1
      DISPLY       2
      DISPLY       3
      DISPLY       4
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Trapezoidal Pond  1         MAX                    1    2   30    9
    2        Trapezoidal Pond  2         MAX                    1    2   31    9
    3        Trapezoidal Pond  4         MAX                    1    2   32    9
    4        Trapezoidal Pond  5         MAX                    1    2   33    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
    2         1    1
  502         1    1
    3         1    1
  503         1    1
    4         1    1
  504         1    1
  END TIMESERIES
END COPY
GENER
```

```
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   16     C, Lawn, Flat           1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   16         0    0    1    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   16         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   16         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   16             0       4.5      0.03       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   16              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   16            0.1      0.25      0.25         6       0.5      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
              ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   16             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                       User  t-series Engl Metr ***
                                        in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***
```

```
  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    4         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    4         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Pond 1***
PERLND  16                       4.5     RCHRES   1      2
PERLND  16                       4.5     RCHRES   1      3
IMPLND   1                      5.98     RCHRES   1      5
IMPLND   4                      4.59     RCHRES   1      5
Pond 2***
PERLND  16                      2.59     RCHRES   2      2
PERLND  16                      2.59     RCHRES   2      3
IMPLND   1                      3.15     RCHRES   2      5
IMPLND   4                      2.82     RCHRES   2      5
Pond 4***
PERLND  16                         4     RCHRES   3      2
PERLND  16                         4     RCHRES   3      3
IMPLND   1                      4.15     RCHRES   3      5
IMPLND   4                      4.59     RCHRES   3      5
Pond 5***
PERLND  16                      4.25     RCHRES   4      2
PERLND  16                      4.25     RCHRES   4      3
IMPLND   1                      6.72     RCHRES   4      5
IMPLND   4                      4.59     RCHRES   4      5

******Routing******
PERLND  16                       4.5     COPY     1     12
```

```
IMPLND   1                        5.98     COPY     1     15
IMPLND   4                        4.59     COPY     1     15
PERLND  16                         4.5     COPY     1     13
PERLND  16                        2.59     COPY     2     12
IMPLND   1                        3.15     COPY     2     15
IMPLND   4                        2.82     COPY     2     15
PERLND  16                        2.59     COPY     2     13
PERLND  16                           4     COPY     3     12
IMPLND   1                        4.15     COPY     3     15
IMPLND   4                        4.59     COPY     3     15
PERLND  16                           4     COPY     3     13
PERLND  16                        4.25     COPY     4     12
IMPLND   1                        6.72     COPY     4     15
IMPLND   4                        4.59     COPY     4     15
PERLND  16                        4.25     COPY     4     13
RCHRES   1                           1     COPY   501     17
RCHRES   2                           1     COPY   502     17
RCHRES   3                           1     COPY   503     17
RCHRES   4                           1     COPY   504     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1
COPY   502 OUTPUT MEAN   1 1   48.4        DISPLY   2     INPUT  TIMSER 1
COPY   503 OUTPUT MEAN   1 1   48.4        DISPLY   3     INPUT  TIMSER 1
COPY   504 OUTPUT MEAN   1 1   48.4        DISPLY   4     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG             ***
                                       in  out                              ***
    1     Trapezoidal Pond-013    2    1    1    1   28    0    1
    2     Trapezoidal Pond-014    2    1    1    1   28    0    1
    3     Trapezoidal Pond-015    2    1    1    1   28    0    1
    4     Trapezoidal Pond-016    2    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
    3         1    0    0    0    0    0    0    0    0    0
    4         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
    3         4    0    0    0    0    0    0    0    0    0    1    9
    4         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
          FG FG FG FG  possible  exit  *** possible  exit      possible  exit
           *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
```

```
    1        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
    2        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
    3        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
    4        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50        ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1              1      0.02       0.0       0.0       0.5       0.0
    2              2      0.01       0.0       0.0       0.5       0.0
    3              3      0.02       0.0       0.0       0.5       0.0
    4              4      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2            0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    3            0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    4            0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)     (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.161983  0.000000  0.000000  0.000000
  0.077778  0.163788  0.012669  0.000000  1.651532
  0.155556  0.165603  0.025479  0.000000  1.669831
  0.233333  0.167428  0.038430  0.000000  1.688231
  0.311111  0.169263  0.051523  0.000000  1.706733
  0.388889  0.171108  0.064760  0.000000  1.725334
  0.466667  0.172962  0.078140  0.000000  1.744037
  0.544444  0.174827  0.091666  0.000000  1.762841
  0.622222  0.176702  0.105336  0.000000  1.781745
  0.700000  0.178587  0.119153  0.000000  1.800750
  0.777778  0.180482  0.133117  0.000000  1.819856
  0.855556  0.182386  0.147228  0.000000  1.839063
  0.933333  0.184301  0.161488  0.000000  1.858370
  1.011111  0.186226  0.175898  0.000000  1.877779
  1.088889  0.188161  0.190457  0.000000  1.897288
  1.166667  0.190106  0.205168  0.000000  1.916898
  1.244444  0.192060  0.220030  0.000000  1.936609
  1.322222  0.194025  0.235044  0.000000  1.956421
  1.400000  0.196000  0.250212  0.000000  1.976333
  1.477778  0.197985  0.265533  0.000000  1.996347
  1.555556  0.199980  0.281010  0.000000  2.016461
  1.633333  0.201984  0.296642  0.000000  2.036676
  1.711111  0.203999  0.312430  0.000000  2.056992
  1.788889  0.206024  0.328375  0.000000  2.077408
  1.866667  0.208059  0.344478  0.000000  2.097926
  1.944444  0.210104  0.360740  0.000000  2.118544
  2.022222  0.212158  0.377162  0.000000  2.139263
  2.100000  0.214223  0.393743  0.000000  2.160083
  2.177778  0.216298  0.410486  0.000000  2.181004
  2.255556  0.218383  0.427390  0.000000  2.202026
  2.333333  0.220478  0.444457  0.000000  2.223148
  2.411111  0.222582  0.461687  0.000000  2.244371
  2.488889  0.224697  0.479081  0.000000  2.265695
  2.566667  0.226822  0.496640  0.000000  2.287120
  2.644444  0.228957  0.514365  0.000000  2.308646
  2.722222  0.231101  0.532256  0.000000  2.330273
  2.800000  0.233256  0.550314  0.000000  2.352000
```

```
2.877778  0.235421  0.568541  0.000000  2.373828
2.955556  0.237596  0.586936  0.000000  2.395757
3.033333  0.239781  0.605500  0.000000  2.417787
3.111111  0.241975  0.624235  0.000000  2.439918
3.188889  0.244180  0.643141  0.000000  2.462149
3.266667  0.246395  0.662219  0.000000  2.484481
3.344444  0.248620  0.681470  0.000000  2.506915
3.422222  0.250854  0.700894  0.000000  2.529449
3.500000  0.253099  0.720492  0.000000  2.552083
3.577778  0.255354  0.740265  0.000000  2.574819
3.655556  0.257619  0.760214  0.000000  2.597655
3.733333  0.259893  0.780339  0.000000  2.620593
3.811111  0.262178  0.800642  0.000000  2.643631
3.888889  0.264473  0.821123  0.000000  2.666770
3.966667  0.266778  0.841783  0.000000  2.690009
4.044444  0.269093  0.862622  0.000000  2.713350
4.122222  0.271417  0.883642  0.000000  2.736791
4.200000  0.273752  0.904843  0.000000  2.760333
4.277778  0.276097  0.926226  0.000000  2.783976
4.355556  0.278452  0.947792  0.000000  2.807720
4.433333  0.280816  0.969541  0.000000  2.831565
4.511111  0.283191  0.991475  0.000000  2.855510
4.588889  0.285576  1.013594  0.000000  2.879557
4.666667  0.287971  1.035898  0.000000  2.903704
4.744444  0.290375  1.058389  0.000000  2.927952
4.822222  0.292790  1.081068  0.000000  2.952300
4.900000  0.295215  1.103935  0.000000  2.976750
4.977778  0.297650  1.126991  0.000000  3.001300
5.055556  0.300094  1.150236  0.000000  3.025952
5.133333  0.302549  1.173673  0.000000  3.050704
5.211111  0.305014  1.197300  0.000000  3.075557
5.288889  0.307489  1.221120  0.000000  3.100510
5.366667  0.309973  1.245132  0.000000  3.125565
5.444444  0.312468  1.269338  0.000000  3.150720
5.522222  0.314973  1.293738  0.000000  3.175976
5.600000  0.317488  1.318334  0.000000  3.201333
5.677778  0.320012  1.343126  0.000000  3.226791
5.755556  0.322547  1.368114  0.000000  3.252350
5.833333  0.325092  1.393300  0.000000  3.278009
5.911111  0.327647  1.418684  0.000000  3.303770
5.988889  0.330211  1.444268  0.000000  3.329631
6.066667  0.332786  1.470051  0.273695  3.355593
6.144444  0.335371  1.496035  0.868991  3.381655
6.222222  0.337966  1.522220  1.636945  3.407819
6.300000  0.340570  1.548608  2.501261  3.434083
6.377778  0.343185  1.575198  3.386283  3.460449
6.455556  0.345810  1.601992  4.216091  3.486915
6.533333  0.348444  1.628991  4.924197  3.513481
6.611111  0.351089  1.656195  5.468342  3.540149
6.688889  0.353744  1.683605  5.848795  3.566918
6.766667  0.356409  1.711223  6.205051  3.593787
6.844444  0.359083  1.739047  6.512198  3.620757
6.922222  0.361768  1.767080  6.805497  3.647828
7.000000  0.364463  1.795323  7.086668  3.675000
END FTABLE  1
FTABLE      2
 91    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
0.000000  0.119008  0.000000  0.000000  0.000000
0.077778  0.120556  0.009316  0.000000  1.215606
0.155556  0.122114  0.018754  0.000000  1.231313
0.233333  0.123681  0.028312  0.000000  1.247120
0.311111  0.125259  0.037993  0.000000  1.263029
0.388889  0.126847  0.047797  0.000000  1.279038
0.466667  0.128444  0.057725  0.000000  1.295148
0.544444  0.130052  0.067778  0.000000  1.311359
0.622222  0.131670  0.077956  0.000000  1.327671
0.700000  0.133298  0.088260  0.000000  1.344083
0.777778  0.134935  0.098692  0.000000  1.360597
```

0.855556	0.136583	0.109251	0.000000	1.377211
0.933333	0.138241	0.119938	0.000000	1.393926
1.011111	0.139908	0.130755	0.000000	1.410742
1.088889	0.141586	0.141702	0.000000	1.427658
1.166667	0.143274	0.152780	0.000000	1.444676
1.244444	0.144971	0.163990	0.000000	1.461794
1.322222	0.146679	0.175332	0.000000	1.479013
1.400000	0.148397	0.186807	0.000000	1.496333
1.477778	0.150124	0.198416	0.000000	1.513754
1.555556	0.151862	0.210160	0.000000	1.531276
1.633333	0.153610	0.222039	0.000000	1.548898
1.711111	0.155367	0.234055	0.000000	1.566621
1.788889	0.157135	0.246208	0.000000	1.584445
1.866667	0.158913	0.258499	0.000000	1.602370
1.944444	0.160700	0.270928	0.000000	1.620396
2.022222	0.162498	0.283497	0.000000	1.638523
2.100000	0.164306	0.296206	0.000000	1.656750
2.177778	0.166123	0.309056	0.000000	1.675078
2.255556	0.167951	0.322048	0.000000	1.693507
2.333333	0.169789	0.335182	0.000000	1.712037
2.411111	0.171636	0.348460	0.000000	1.730668
2.488889	0.173494	0.361881	0.000000	1.749399
2.566667	0.175362	0.375448	0.000000	1.768231
2.644444	0.177239	0.389160	0.000000	1.787165
2.722222	0.179127	0.403019	0.000000	1.806199
2.800000	0.181025	0.417025	0.000000	1.825333
2.877778	0.182932	0.431179	0.000000	1.844569
2.955556	0.184850	0.445481	0.000000	1.863905
3.033333	0.186778	0.459934	0.000000	1.883343
3.111111	0.188715	0.474536	0.000000	1.902881
3.188889	0.190663	0.489290	0.000000	1.922520
3.266667	0.192621	0.504195	0.000000	1.942259
3.344444	0.194588	0.519253	0.000000	1.962100
3.422222	0.196566	0.534465	0.000000	1.982041
3.500000	0.198554	0.549831	0.000000	2.002083
3.577778	0.200551	0.565351	0.000000	2.022226
3.655556	0.202559	0.581028	0.000000	2.042470
3.733333	0.204577	0.596861	0.000000	2.062815
3.811111	0.206604	0.612851	0.000000	2.083260
3.888889	0.208642	0.629000	0.000000	2.103807
3.966667	0.210690	0.645307	0.000000	2.124454
4.044444	0.212747	0.661774	0.000000	2.145202
4.122222	0.214815	0.678402	0.000000	2.166050
4.200000	0.216893	0.695190	0.000000	2.187000
4.277778	0.218980	0.712141	0.000000	2.208050
4.355556	0.221078	0.729254	0.000000	2.229202
4.433333	0.223185	0.746531	0.000000	2.250454
4.511111	0.225303	0.763972	0.000000	2.271807
4.588889	0.227431	0.781579	0.000000	2.293260
4.666667	0.229568	0.799351	0.000000	2.314815
4.744444	0.231716	0.817290	0.000000	2.336470
4.822222	0.233874	0.835396	0.000000	2.358226
4.900000	0.236041	0.853670	0.000000	2.380083
4.977778	0.238219	0.872114	0.000000	2.402041
5.055556	0.240407	0.890727	0.000000	2.424100
5.133333	0.242604	0.909511	0.000000	2.446259
5.211111	0.244812	0.928466	0.000000	2.468520
5.288889	0.247029	0.947593	0.000000	2.490881
5.366667	0.249257	0.966893	0.000000	2.513343
5.444444	0.251495	0.986367	0.000000	2.535905
5.522222	0.253742	1.006015	0.000000	2.558569
5.600000	0.256000	1.025838	0.000000	2.581333
5.677778	0.258268	1.045838	0.000000	2.604199
5.755556	0.260545	1.066014	0.000000	2.627165
5.833333	0.262833	1.086367	0.000000	2.650231
5.911111	0.265130	1.106899	0.000000	2.673399
5.988889	0.267438	1.127610	0.000000	2.696668
6.066667	0.269756	1.148501	0.273695	2.720037
6.144444	0.272083	1.169573	0.868991	2.743507
6.222222	0.274421	1.190825	1.636945	2.767078

```
6.300000  0.276769  1.212261  2.501261  2.790750
6.377778  0.279126  1.233879  3.386283  2.814523
6.455556  0.281494  1.255681  4.216091  2.838396
6.533333  0.283871  1.277667  4.924197  2.862370
6.611111  0.286259  1.299839  5.468342  2.886445
6.688889  0.288657  1.322197  5.848795  2.910621
6.766667  0.291064  1.344741  6.205051  2.934898
6.844444  0.293482  1.367474  6.512198  2.959276
6.922222  0.295909  1.390394  6.805497  2.983754
7.000000  0.298347  1.413504  7.086668  3.008333
END FTABLE  2
FTABLE      3
 91    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
0.000000  0.161983  0.000000  0.000000  0.000000
0.077778  0.163788  0.012669  0.000000  1.651532
0.155556  0.165603  0.025479  0.000000  1.669831
0.233333  0.167428  0.038430  0.000000  1.688231
0.311111  0.169263  0.051523  0.000000  1.706733
0.388889  0.171108  0.064760  0.000000  1.725334
0.466667  0.172962  0.078140  0.000000  1.744037
0.544444  0.174827  0.091666  0.000000  1.762841
0.622222  0.176702  0.105336  0.000000  1.781745
0.700000  0.178587  0.119153  0.000000  1.800750
0.777778  0.180482  0.133117  0.000000  1.819856
0.855556  0.182386  0.147228  0.000000  1.839063
0.933333  0.184301  0.161488  0.000000  1.858370
1.011111  0.186226  0.175898  0.000000  1.877779
1.088889  0.188161  0.190457  0.000000  1.897288
1.166667  0.190106  0.205168  0.000000  1.916898
1.244444  0.192060  0.220030  0.000000  1.936609
1.322222  0.194025  0.235044  0.000000  1.956421
1.400000  0.196000  0.250212  0.000000  1.976333
1.477778  0.197985  0.265533  0.000000  1.996347
1.555556  0.199980  0.281010  0.000000  2.016461
1.633333  0.201984  0.296642  0.000000  2.036676
1.711111  0.203999  0.312430  0.000000  2.056992
1.788889  0.206024  0.328375  0.000000  2.077408
1.866667  0.208059  0.344478  0.000000  2.097926
1.944444  0.210104  0.360740  0.000000  2.118544
2.022222  0.212158  0.377162  0.000000  2.139263
2.100000  0.214223  0.393743  0.000000  2.160083
2.177778  0.216298  0.410486  0.000000  2.181004
2.255556  0.218383  0.427390  0.000000  2.202026
2.333333  0.220478  0.444457  0.000000  2.223148
2.411111  0.222582  0.461687  0.000000  2.244371
2.488889  0.224697  0.479081  0.000000  2.265695
2.566667  0.226822  0.496640  0.000000  2.287120
2.644444  0.228957  0.514365  0.000000  2.308646
2.722222  0.231101  0.532256  0.000000  2.330273
2.800000  0.233256  0.550314  0.000000  2.352000
2.877778  0.235421  0.568541  0.000000  2.373828
2.955556  0.237596  0.586936  0.000000  2.395757
3.033333  0.239781  0.605500  0.000000  2.417787
3.111111  0.241975  0.624235  0.000000  2.439918
3.188889  0.244180  0.643141  0.000000  2.462149
3.266667  0.246395  0.662219  0.000000  2.484481
3.344444  0.248620  0.681470  0.000000  2.506915
3.422222  0.250854  0.700894  0.000000  2.529449
3.500000  0.253099  0.720492  0.000000  2.552083
3.577778  0.255354  0.740265  0.000000  2.574819
3.655556  0.257619  0.760214  0.000000  2.597655
3.733333  0.259893  0.780339  0.000000  2.620593
3.811111  0.262178  0.800642  0.000000  2.643631
3.888889  0.264473  0.821123  0.000000  2.666770
3.966667  0.266778  0.841783  0.000000  2.690009
4.044444  0.269093  0.862622  0.000000  2.713350
4.122222  0.271417  0.883642  0.000000  2.736791
4.200000  0.273752  0.904843  0.000000  2.760333
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4.277778  0.276097  0.926226  0.000000  2.783976
4.355556  0.278452  0.947792  0.000000  2.807720
4.433333  0.280816  0.969541  0.000000  2.831565
4.511111  0.283191  0.991475  0.000000  2.855510
4.588889  0.285576  1.013594  0.000000  2.879557
4.666667  0.287971  1.035898  0.000000  2.903704
4.744444  0.290375  1.058389  0.000000  2.927952
4.822222  0.292790  1.081068  0.000000  2.952300
4.900000  0.295215  1.103935  0.000000  2.976750
4.977778  0.297650  1.126991  0.000000  3.001300
5.055556  0.300094  1.150236  0.000000  3.025952
5.133333  0.302549  1.173673  0.000000  3.050704
5.211111  0.305014  1.197300  0.000000  3.075557
5.288889  0.307489  1.221120  0.000000  3.100510
5.366667  0.309973  1.245132  0.000000  3.125565
5.444444  0.312468  1.269338  0.000000  3.150720
5.522222  0.314973  1.293738  0.000000  3.175976
5.600000  0.317488  1.318334  0.000000  3.201333
5.677778  0.320012  1.343126  0.000000  3.226791
5.755556  0.322547  1.368114  0.000000  3.252350
5.833333  0.325092  1.393300  0.000000  3.278009
5.911111  0.327647  1.418684  0.000000  3.303770
5.988889  0.330211  1.444268  0.000000  3.329631
6.066667  0.332786  1.470051  0.273695  3.355593
6.144444  0.335371  1.496035  0.868991  3.381655
6.222222  0.337966  1.522220  1.636945  3.407819
6.300000  0.340570  1.548608  2.501261  3.434083
6.377778  0.343185  1.575198  3.386283  3.460449
6.455556  0.345810  1.601992  4.216091  3.486915
6.533333  0.348444  1.628991  4.924197  3.513481
6.611111  0.351089  1.656195  5.468342  3.540149
6.688889  0.353744  1.683605  5.848795  3.566918
6.766667  0.356409  1.711223  6.205051  3.593787
6.844444  0.359083  1.739047  6.512198  3.620757
6.922222  0.361768  1.767080  6.805497  3.647828
7.000000  0.364463  1.795323  7.086668  3.675000
END FTABLE  3
FTABLE      4
 91    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
0.000000  0.122337  0.000000  0.000000  0.000000
0.077778  0.123906  0.009576  0.000000  1.249387
0.155556  0.125485  0.019275  0.000000  1.265310
0.233333  0.127074  0.029096  0.000000  1.281333
0.311111  0.128674  0.039042  0.000000  1.297458
0.388889  0.130283  0.049113  0.000000  1.313683
0.466667  0.131902  0.059309  0.000000  1.330009
0.544444  0.133531  0.069631  0.000000  1.346436
0.622222  0.135170  0.080081  0.000000  1.362964
0.700000  0.136819  0.090658  0.000000  1.379593
0.777778  0.138478  0.101364  0.000000  1.396322
0.855556  0.140147  0.112199  0.000000  1.413152
0.933333  0.141826  0.123165  0.000000  1.430083
1.011111  0.143516  0.134262  0.000000  1.447115
1.088889  0.145215  0.145490  0.000000  1.464248
1.166667  0.146924  0.156851  0.000000  1.481481
1.244444  0.148643  0.168345  0.000000  1.498816
1.322222  0.150372  0.179974  0.000000  1.516251
1.400000  0.152111  0.191737  0.000000  1.533787
1.477778  0.153860  0.203636  0.000000  1.551424
1.555556  0.155619  0.215671  0.000000  1.569162
1.633333  0.157388  0.227844  0.000000  1.587000
1.711111  0.159168  0.240154  0.000000  1.604939
1.788889  0.160957  0.252603  0.000000  1.622979
1.866667  0.162756  0.265192  0.000000  1.641120
1.944444  0.164565  0.277921  0.000000  1.659362
2.022222  0.166384  0.290792  0.000000  1.677705
2.100000  0.168213  0.303804  0.000000  1.696148
2.177778  0.170052  0.316958  0.000000  1.714692
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  2.255556  0.171901  0.330257  0.000000  1.733337
  2.333333  0.173760  0.343699  0.000000  1.752083
  2.411111  0.175629  0.357286  0.000000  1.770930
  2.488889  0.177509  0.371020  0.000000  1.789878
  2.566667  0.179398  0.384899  0.000000  1.808926
  2.644444  0.181297  0.398926  0.000000  1.828075
  2.722222  0.183206  0.413101  0.000000  1.847325
  2.800000  0.185125  0.427425  0.000000  1.866676
  2.877778  0.187054  0.441899  0.000000  1.886128
  2.955556  0.188993  0.456523  0.000000  1.905680
  3.033333  0.190942  0.471298  0.000000  1.925333
  3.111111  0.192901  0.486225  0.000000  1.945087
  3.188889  0.194870  0.501305  0.000000  1.964942
  3.266667  0.196849  0.516539  0.000000  1.984898
  3.344444  0.198838  0.531927  0.000000  2.004955
  3.422222  0.200838  0.547470  0.000000  2.025112
  3.500000  0.202847  0.563169  0.000000  2.045370
  3.577778  0.204866  0.579024  0.000000  2.065729
  3.655556  0.206895  0.595037  0.000000  2.086189
  3.733333  0.208934  0.611208  0.000000  2.106750
  3.811111  0.210983  0.627538  0.000000  2.127412
  3.888889  0.213042  0.644028  0.000000  2.148174
  3.966667  0.215111  0.660679  0.000000  2.169037
  4.044444  0.217190  0.677490  0.000000  2.190001
  4.122222  0.219279  0.694464  0.000000  2.211066
  4.200000  0.221378  0.711601  0.000000  2.232231
  4.277778  0.223487  0.728901  0.000000  2.253498
  4.355556  0.225606  0.746366  0.000000  2.274865
  4.433333  0.227736  0.763996  0.000000  2.296333
  4.511111  0.229875  0.781792  0.000000  2.317902
  4.588889  0.232024  0.799754  0.000000  2.339572
  4.666667  0.234183  0.817885  0.000000  2.361343
  4.744444  0.236352  0.836183  0.000000  2.383214
  4.822222  0.238531  0.854651  0.000000  2.405186
  4.900000  0.240720  0.873288  0.000000  2.427259
  4.977778  0.242919  0.892097  0.000000  2.449433
  5.055556  0.245128  0.911076  0.000000  2.471708
  5.133333  0.247347  0.930228  0.000000  2.494083
  5.211111  0.249576  0.949553  0.000000  2.516560
  5.288889  0.251815  0.969051  0.000000  2.539137
  5.366667  0.254064  0.988725  0.000000  2.561815
  5.444444  0.256323  1.008573  0.000000  2.584594
  5.522222  0.258592  1.028597  0.000000  2.607473
  5.600000  0.260871  1.048799  0.000000  2.630454
  5.677778  0.263160  1.069178  0.000000  2.653535
  5.755556  0.265460  1.089735  0.000000  2.676717
  5.833333  0.267769  1.110472  0.000000  2.700000
  5.911111  0.270088  1.131389  0.000000  2.723384
  5.988889  0.272417  1.152486  0.000000  2.746868
  6.066667  0.274756  1.173765  0.273695  2.770454
  6.144444  0.277105  1.195226  0.868991  2.794140
  6.222222  0.279464  1.216870  1.636945  2.817927
  6.300000  0.281833  1.238699  2.501261  2.841815
  6.377778  0.284212  1.260711  3.386283  2.865803
  6.455556  0.286601  1.282910  4.216091  2.889893
  6.533333  0.289000  1.305294  4.924197  2.914083
  6.611111  0.291409  1.327866  5.468342  2.938374
  6.688889  0.293828  1.350625  5.848795  2.962766
  6.766667  0.296257  1.373573  6.205051  2.987259
  6.844444  0.298696  1.396710  6.512198  3.011853
  6.922222  0.301145  1.420037  6.805497  3.036547
  7.000000  0.303604  1.443555  7.086668  3.061343
  END FTABLE  4
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
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WDM      1 EVAP     ENGL    1             PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1             IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   1 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL       REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1001 FLOW     ENGL       REPL
RCHRES   1 HYDR   O      2 1        1      WDM   1002 FLOW     ENGL       REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1003 STAG     ENGL       REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL       REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL       REPL
RCHRES   2 HYDR   RO     1 1        1      WDM   1004 FLOW     ENGL       REPL
RCHRES   2 HYDR   O      1 1        1      WDM   1005 FLOW     ENGL       REPL
RCHRES   2 HYDR   O      2 1        1      WDM   1006 FLOW     ENGL       REPL
RCHRES   2 HYDR   STAGE  1 1        1      WDM   1007 STAG     ENGL       REPL
COPY     2 OUTPUT MEAN   1 1     48.4      WDM    702 FLOW     ENGL       REPL
COPY   502 OUTPUT MEAN   1 1     48.4      WDM    802 FLOW     ENGL       REPL
RCHRES   3 HYDR   RO     1 1        1      WDM   1008 FLOW     ENGL       REPL
RCHRES   3 HYDR   O      1 1        1      WDM   1009 FLOW     ENGL       REPL
RCHRES   3 HYDR   O      2 1        1      WDM   1010 FLOW     ENGL       REPL
RCHRES   3 HYDR   STAGE  1 1        1      WDM   1011 STAG     ENGL       REPL
COPY     3 OUTPUT MEAN   1 1     48.4      WDM    703 FLOW     ENGL       REPL
COPY   503 OUTPUT MEAN   1 1     48.4      WDM    803 FLOW     ENGL       REPL
RCHRES   4 HYDR   RO     1 1        1      WDM   1012 FLOW     ENGL       REPL
RCHRES   4 HYDR   O      1 1        1      WDM   1013 FLOW     ENGL       REPL
RCHRES   4 HYDR   O      2 1        1      WDM   1014 FLOW     ENGL       REPL
RCHRES   4 HYDR   STAGE  1 1        1      WDM   1015 STAG     ENGL       REPL
COPY     4 OUTPUT MEAN   1 1     48.4      WDM    704 FLOW     ENGL       REPL
COPY   504 OUTPUT MEAN   1 1     48.4      WDM    804 FLOW     ENGL       REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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Public Ponds

WWHM2012

PROJECT REPORT

Pond P-1

General Model Information

Project Name:	Basin P-1
Site Name:	
Site Address:	
City:	
Report Date:	8/10/2022
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	1.304
Pervious Total	1.304
Impervious Land Use	acre
Impervious Total	0
Basin Total	1.304

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	0.245
Pervious Total	0.245

Impervious Land Use	acre
ROADS FLAT	0.735
SIDEWALKS FLAT	0.283
POND	0.041
Impervious Total	1.059
Basin Total	1.304

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length:	19.54 ft.	
Bottom Width:	19.54 ft.	
Depth:	7 ft.	
Volume at riser head:	0.2137 acre-feet.	
Infiltration On		
Infiltration rate:	10	
Infiltration safety factor:	1	
Total Volume Infiltrated (ac-ft.):		426.277
Total Volume Through Riser (ac-ft.):		0
Total Volume Through Facility (ac-ft.):		426.277
Percent Infiltrated:		100
Total Precip Applied to Facility:		0
Total Evap From Facility:		0
Side slope 1:	3 To 1	
Side slope 2:	3 To 1	
Side slope 3:	3 To 1	
Side slope 4:	3 To 1	
Discharge Structure		
Riser Height:	6 ft.	
Riser Diameter:	12 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Pond Hydraulic Table

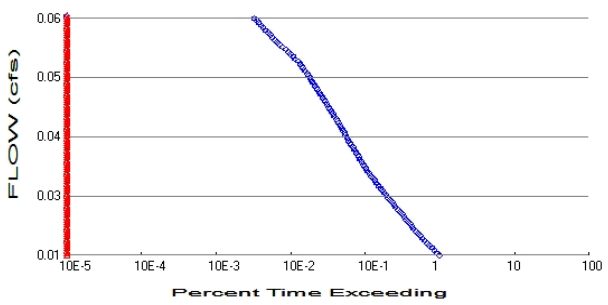
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.008	0.000	0.000	0.000
0.0778	0.009	0.000	0.000	0.088
0.1556	0.009	0.001	0.000	0.088
0.2333	0.010	0.002	0.000	0.088
0.3111	0.010	0.003	0.000	0.088
0.3889	0.011	0.003	0.000	0.088
0.4667	0.011	0.004	0.000	0.088
0.5444	0.011	0.005	0.000	0.088
0.6222	0.012	0.006	0.000	0.088
0.7000	0.012	0.007	0.000	0.088
0.7778	0.013	0.008	0.000	0.088
0.8556	0.014	0.009	0.000	0.088
0.9333	0.014	0.010	0.000	0.088
1.0111	0.015	0.011	0.000	0.088
1.0889	0.015	0.013	0.000	0.088
1.1667	0.016	0.014	0.000	0.088
1.2444	0.016	0.015	0.000	0.088
1.3222	0.017	0.016	0.000	0.088
1.4000	0.017	0.018	0.000	0.088
1.4778	0.018	0.019	0.000	0.088
1.5556	0.019	0.021	0.000	0.088
1.6333	0.019	0.022	0.000	0.088
1.7111	0.020	0.024	0.000	0.088
1.7889	0.021	0.025	0.000	0.088
1.8667	0.021	0.027	0.000	0.088
1.9444	0.022	0.029	0.000	0.088
2.0222	0.023	0.031	0.000	0.088

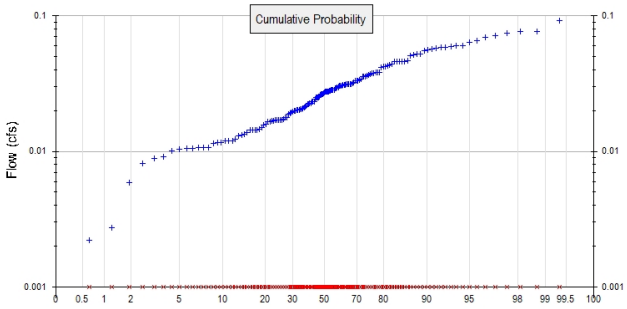
2.1000	0.023	0.032	0.000	0.088
2.1778	0.024	0.034	0.000	0.088
2.2556	0.025	0.036	0.000	0.088
2.3333	0.025	0.038	0.000	0.088
2.4111	0.026	0.040	0.000	0.088
2.4889	0.027	0.042	0.000	0.088
2.5667	0.028	0.044	0.000	0.088
2.6444	0.028	0.047	0.000	0.088
2.7222	0.029	0.049	0.000	0.088
2.8000	0.030	0.051	0.000	0.088
2.8778	0.031	0.054	0.000	0.088
2.9556	0.031	0.056	0.000	0.088
3.0333	0.032	0.059	0.000	0.088
3.1111	0.033	0.061	0.000	0.088
3.1889	0.034	0.064	0.000	0.088
3.2667	0.035	0.066	0.000	0.088
3.3444	0.036	0.069	0.000	0.088
3.4222	0.036	0.072	0.000	0.088
3.5000	0.037	0.075	0.000	0.088
3.5778	0.038	0.078	0.000	0.088
3.6556	0.039	0.081	0.000	0.088
3.7333	0.040	0.084	0.000	0.088
3.8111	0.041	0.087	0.000	0.088
3.8889	0.042	0.091	0.000	0.088
3.9667	0.043	0.094	0.000	0.088
4.0444	0.044	0.097	0.000	0.088
4.1222	0.045	0.101	0.000	0.088
4.2000	0.045	0.104	0.000	0.088
4.2778	0.046	0.108	0.000	0.088
4.3556	0.047	0.112	0.000	0.088
4.4333	0.048	0.115	0.000	0.088
4.5111	0.049	0.119	0.000	0.088
4.5889	0.050	0.123	0.000	0.088
4.6667	0.051	0.127	0.000	0.088
4.7444	0.052	0.131	0.000	0.088
4.8222	0.053	0.135	0.000	0.088
4.9000	0.055	0.140	0.000	0.088
4.9778	0.056	0.144	0.000	0.088
5.0556	0.057	0.148	0.000	0.088
5.1333	0.058	0.153	0.000	0.088
5.2111	0.059	0.157	0.000	0.088
5.2889	0.060	0.162	0.000	0.088
5.3667	0.061	0.167	0.000	0.088
5.4444	0.062	0.171	0.000	0.088
5.5222	0.063	0.176	0.000	0.088
5.6000	0.064	0.181	0.000	0.088
5.6778	0.066	0.186	0.000	0.088
5.7556	0.067	0.192	0.000	0.088
5.8333	0.068	0.197	0.000	0.088
5.9111	0.069	0.202	0.000	0.088
5.9889	0.070	0.208	0.000	0.088
6.0667	0.071	0.213	0.182	0.088
6.1444	0.073	0.219	0.572	0.088
6.2222	0.074	0.225	1.046	0.088
6.3000	0.075	0.230	1.509	0.088
6.3778	0.076	0.236	1.879	0.088
6.4556	0.077	0.242	2.114	0.088
6.5333	0.079	0.248	2.300	0.088

6.6111	0.080	0.255	2.462	0.088
6.6889	0.081	0.261	2.614	0.088
6.7667	0.083	0.267	2.757	0.088
6.8444	0.084	0.274	2.894	0.088
6.9222	0.085	0.281	3.024	0.088
7.0000	0.086	0.287	3.149	0.088
7.0778	0.088	0.294	3.269	0.088

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 1.304
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.245
Total Impervious Area: 1.059

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.027479
5 year	0.042749
10 year	0.051046
25 year	0.059491
50 year	0.064511
100 year	0.068638

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.020	0.000
1903	0.017	0.000
1904	0.027	0.000
1905	0.013	0.000
1906	0.006	0.000
1907	0.042	0.000
1908	0.031	0.000
1909	0.031	0.000
1910	0.043	0.000
1911	0.028	0.000

1912	0.091	0.000
1913	0.044	0.000
1914	0.011	0.000
1915	0.018	0.000
1916	0.027	0.000
1917	0.009	0.000
1918	0.029	0.000
1919	0.022	0.000
1920	0.028	0.000
1921	0.031	0.000
1922	0.031	0.000
1923	0.025	0.000
1924	0.012	0.000
1925	0.014	0.000
1926	0.027	0.000
1927	0.017	0.000
1928	0.021	0.000
1929	0.044	0.000
1930	0.028	0.000
1931	0.026	0.000
1932	0.020	0.000
1933	0.020	0.000
1934	0.058	0.000
1935	0.027	0.000
1936	0.023	0.000
1937	0.037	0.000
1938	0.023	0.000
1939	0.001	0.000
1940	0.025	0.000
1941	0.012	0.000
1942	0.038	0.000
1943	0.019	0.000
1944	0.036	0.000
1945	0.031	0.000
1946	0.017	0.000
1947	0.011	0.000
1948	0.059	0.000
1949	0.051	0.000
1950	0.014	0.000
1951	0.018	0.000
1952	0.077	0.000
1953	0.070	0.000
1954	0.025	0.000
1955	0.021	0.000
1956	0.010	0.000
1957	0.036	0.000
1958	0.074	0.000
1959	0.046	0.000
1960	0.012	0.000
1961	0.046	0.000
1962	0.025	0.000
1963	0.012	0.000
1964	0.013	0.000
1965	0.052	0.000
1966	0.015	0.000
1967	0.022	0.000
1968	0.023	0.000
1969	0.023	0.000

1970	0.035	0.000
1971	0.056	0.000
1972	0.036	0.000
1973	0.046	0.000
1974	0.025	0.000
1975	0.059	0.000
1976	0.031	0.000
1977	0.010	0.000
1978	0.052	0.000
1979	0.014	0.000
1980	0.030	0.000
1981	0.028	0.000
1982	0.012	0.000
1983	0.046	0.000
1984	0.019	0.000
1985	0.031	0.000
1986	0.027	0.000
1987	0.052	0.000
1988	0.033	0.000
1989	0.030	0.000
1990	0.034	0.000
1991	0.026	0.000
1992	0.038	0.000
1993	0.037	0.000
1994	0.055	0.000
1995	0.011	0.000
1996	0.060	0.000
1997	0.023	0.000
1998	0.028	0.000
1999	0.002	0.000
2000	0.021	0.000
2001	0.011	0.000
2002	0.038	0.000
2003	0.033	0.000
2004	0.031	0.000
2005	0.056	0.000
2006	0.017	0.000
2007	0.017	0.000
2008	0.029	0.000
2009	0.020	0.000
2010	0.017	0.000
2011	0.014	0.000
2012	0.020	0.000
2013	0.016	0.000
2014	0.012	0.000
2015	0.022	0.000
2016	0.009	0.000
2017	0.042	0.000
2018	0.077	0.000
2019	0.072	0.000
2020	0.023	0.000
2021	0.038	0.000
2022	0.016	0.000
2023	0.032	0.000
2024	0.060	0.000
2025	0.028	0.000
2026	0.046	0.000
2027	0.017	0.000

2028	0.014	0.000
2029	0.031	0.000
2030	0.058	0.000
2031	0.019	0.000
2032	0.010	0.000
2033	0.017	0.000
2034	0.017	0.000
2035	0.066	0.000
2036	0.034	0.000
2037	0.008	0.000
2038	0.027	0.000
2039	0.003	0.000
2040	0.015	0.000
2041	0.020	0.000
2042	0.064	0.000
2043	0.031	0.000
2044	0.042	0.000
2045	0.028	0.000
2046	0.033	0.000
2047	0.024	0.000
2048	0.032	0.000
2049	0.028	0.000
2050	0.020	0.000
2051	0.029	0.000
2052	0.017	0.000
2053	0.030	0.000
2054	0.038	0.000
2055	0.012	0.000
2056	0.013	0.000
2057	0.021	0.000
2058	0.026	0.000
2059	0.046	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.0915	0.0000
2	0.0771	0.0000
3	0.0770	0.0000
4	0.0744	0.0000
5	0.0718	0.0000
6	0.0695	0.0000
7	0.0656	0.0000
8	0.0638	0.0000
9	0.0604	0.0000
10	0.0603	0.0000
11	0.0591	0.0000
12	0.0586	0.0000
13	0.0581	0.0000
14	0.0575	0.0000
15	0.0565	0.0000
16	0.0558	0.0000
17	0.0551	0.0000
18	0.0525	0.0000
19	0.0521	0.0000
20	0.0517	0.0000
21	0.0506	0.0000
22	0.0465	0.0000

23	0.0462	0.0000
24	0.0462	0.0000
25	0.0462	0.0000
26	0.0461	0.0000
27	0.0460	0.0000
28	0.0438	0.0000
29	0.0436	0.0000
30	0.0426	0.0000
31	0.0423	0.0000
32	0.0422	0.0000
33	0.0416	0.0000
34	0.0385	0.0000
35	0.0383	0.0000
36	0.0381	0.0000
37	0.0379	0.0000
38	0.0377	0.0000
39	0.0371	0.0000
40	0.0367	0.0000
41	0.0362	0.0000
42	0.0356	0.0000
43	0.0355	0.0000
44	0.0354	0.0000
45	0.0340	0.0000
46	0.0338	0.0000
47	0.0334	0.0000
48	0.0333	0.0000
49	0.0331	0.0000
50	0.0321	0.0000
51	0.0316	0.0000
52	0.0314	0.0000
53	0.0313	0.0000
54	0.0313	0.0000
55	0.0313	0.0000
56	0.0312	0.0000
57	0.0310	0.0000
58	0.0309	0.0000
59	0.0308	0.0000
60	0.0307	0.0000
61	0.0307	0.0000
62	0.0303	0.0000
63	0.0299	0.0000
64	0.0295	0.0000
65	0.0294	0.0000
66	0.0294	0.0000
67	0.0292	0.0000
68	0.0283	0.0000
69	0.0283	0.0000
70	0.0283	0.0000
71	0.0282	0.0000
72	0.0280	0.0000
73	0.0279	0.0000
74	0.0277	0.0000
75	0.0276	0.0000
76	0.0275	0.0000
77	0.0274	0.0000
78	0.0274	0.0000
79	0.0271	0.0000
80	0.0267	0.0000

81	0.0266	0.0000
82	0.0265	0.0000
83	0.0263	0.0000
84	0.0259	0.0000
85	0.0252	0.0000
86	0.0251	0.0000
87	0.0250	0.0000
88	0.0250	0.0000
89	0.0248	0.0000
90	0.0244	0.0000
91	0.0234	0.0000
92	0.0232	0.0000
93	0.0232	0.0000
94	0.0227	0.0000
95	0.0226	0.0000
96	0.0226	0.0000
97	0.0223	0.0000
98	0.0222	0.0000
99	0.0217	0.0000
100	0.0213	0.0000
101	0.0210	0.0000
102	0.0208	0.0000
103	0.0205	0.0000
104	0.0203	0.0000
105	0.0203	0.0000
106	0.0203	0.0000
107	0.0202	0.0000
108	0.0200	0.0000
109	0.0200	0.0000
110	0.0196	0.0000
111	0.0194	0.0000
112	0.0192	0.0000
113	0.0188	0.0000
114	0.0177	0.0000
115	0.0177	0.0000
116	0.0173	0.0000
117	0.0171	0.0000
118	0.0171	0.0000
119	0.0170	0.0000
120	0.0170	0.0000
121	0.0169	0.0000
122	0.0168	0.0000
123	0.0168	0.0000
124	0.0166	0.0000
125	0.0165	0.0000
126	0.0158	0.0000
127	0.0156	0.0000
128	0.0151	0.0000
129	0.0145	0.0000
130	0.0144	0.0000
131	0.0144	0.0000
132	0.0143	0.0000
133	0.0143	0.0000
134	0.0138	0.0000
135	0.0134	0.0000
136	0.0132	0.0000
137	0.0131	0.0000
138	0.0122	0.0000

139	0.0119	0.0000
140	0.0119	0.0000
141	0.0119	0.0000
142	0.0116	0.0000
143	0.0116	0.0000
144	0.0115	0.0000
145	0.0107	0.0000
146	0.0107	0.0000
147	0.0107	0.0000
148	0.0106	0.0000
149	0.0105	0.0000
150	0.0104	0.0000
151	0.0101	0.0000
152	0.0092	0.0000
153	0.0089	0.0000
154	0.0081	0.0000
155	0.0059	0.0000
156	0.0027	0.0000
157	0.0022	0.0000
158	0.0014	0.0000

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0137	54370	0	0	Pass
0.0143	50171	0	0	Pass
0.0148	46603	0	0	Pass
0.0153	43362	0	0	Pass
0.0158	40260	0	0	Pass
0.0163	37462	0	0	Pass
0.0168	34941	0	0	Pass
0.0173	32603	0	0	Pass
0.0178	30321	0	0	Pass
0.0184	28276	0	0	Pass
0.0189	26443	0	0	Pass
0.0194	24786	0	0	Pass
0.0199	23296	0	0	Pass
0.0204	21939	0	0	Pass
0.0209	20653	0	0	Pass
0.0214	19418	0	0	Pass
0.0219	18288	0	0	Pass
0.0225	17230	0	0	Pass
0.0230	16149	0	0	Pass
0.0235	15147	0	0	Pass
0.0240	14282	0	0	Pass
0.0245	13462	0	0	Pass
0.0250	12665	0	0	Pass
0.0255	11944	0	0	Pass
0.0260	11246	0	0	Pass
0.0266	10559	0	0	Pass
0.0271	9972	0	0	Pass
0.0276	9379	0	0	Pass
0.0281	8853	0	0	Pass
0.0286	8332	0	0	Pass
0.0291	7861	0	0	Pass
0.0296	7462	0	0	Pass
0.0302	7025	0	0	Pass
0.0307	6615	0	0	Pass
0.0312	6277	0	0	Pass
0.0317	5978	0	0	Pass
0.0322	5701	0	0	Pass
0.0327	5437	0	0	Pass
0.0332	5198	0	0	Pass
0.0337	4940	0	0	Pass
0.0343	4703	0	0	Pass
0.0348	4513	0	0	Pass
0.0353	4339	0	0	Pass
0.0358	4154	0	0	Pass
0.0363	3958	0	0	Pass
0.0368	3770	0	0	Pass
0.0373	3576	0	0	Pass
0.0378	3412	0	0	Pass
0.0384	3265	0	0	Pass
0.0389	3135	0	0	Pass
0.0394	3026	0	0	Pass
0.0399	2927	0	0	Pass
0.0404	2814	0	0	Pass

0.0409	2681	0	0	Pass
0.0414	2555	0	0	Pass
0.0419	2451	0	0	Pass
0.0425	2361	0	0	Pass
0.0430	2256	0	0	Pass
0.0435	2140	0	0	Pass
0.0440	2039	0	0	Pass
0.0445	1952	0	0	Pass
0.0450	1860	0	0	Pass
0.0455	1778	0	0	Pass
0.0460	1691	0	0	Pass
0.0466	1619	0	0	Pass
0.0471	1561	0	0	Pass
0.0476	1482	0	0	Pass
0.0481	1407	0	0	Pass
0.0486	1338	0	0	Pass
0.0491	1270	0	0	Pass
0.0496	1218	0	0	Pass
0.0502	1162	0	0	Pass
0.0507	1103	0	0	Pass
0.0512	1055	0	0	Pass
0.0517	1006	0	0	Pass
0.0522	963	0	0	Pass
0.0527	919	0	0	Pass
0.0532	872	0	0	Pass
0.0537	814	0	0	Pass
0.0543	773	0	0	Pass
0.0548	738	0	0	Pass
0.0553	695	0	0	Pass
0.0558	636	0	0	Pass
0.0563	601	0	0	Pass
0.0568	553	0	0	Pass
0.0573	517	0	0	Pass
0.0578	478	0	0	Pass
0.0584	434	0	0	Pass
0.0589	394	0	0	Pass
0.0594	363	0	0	Pass
0.0599	339	0	0	Pass
0.0604	310	0	0	Pass
0.0609	295	0	0	Pass
0.0614	273	0	0	Pass
0.0619	252	0	0	Pass
0.0625	237	0	0	Pass
0.0630	223	0	0	Pass
0.0635	206	0	0	Pass
0.0640	194	0	0	Pass
0.0645	179	0	0	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	387.91			☐	100.00			
Total Volume Infiltrated		387.91	0.00	0.00		100.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

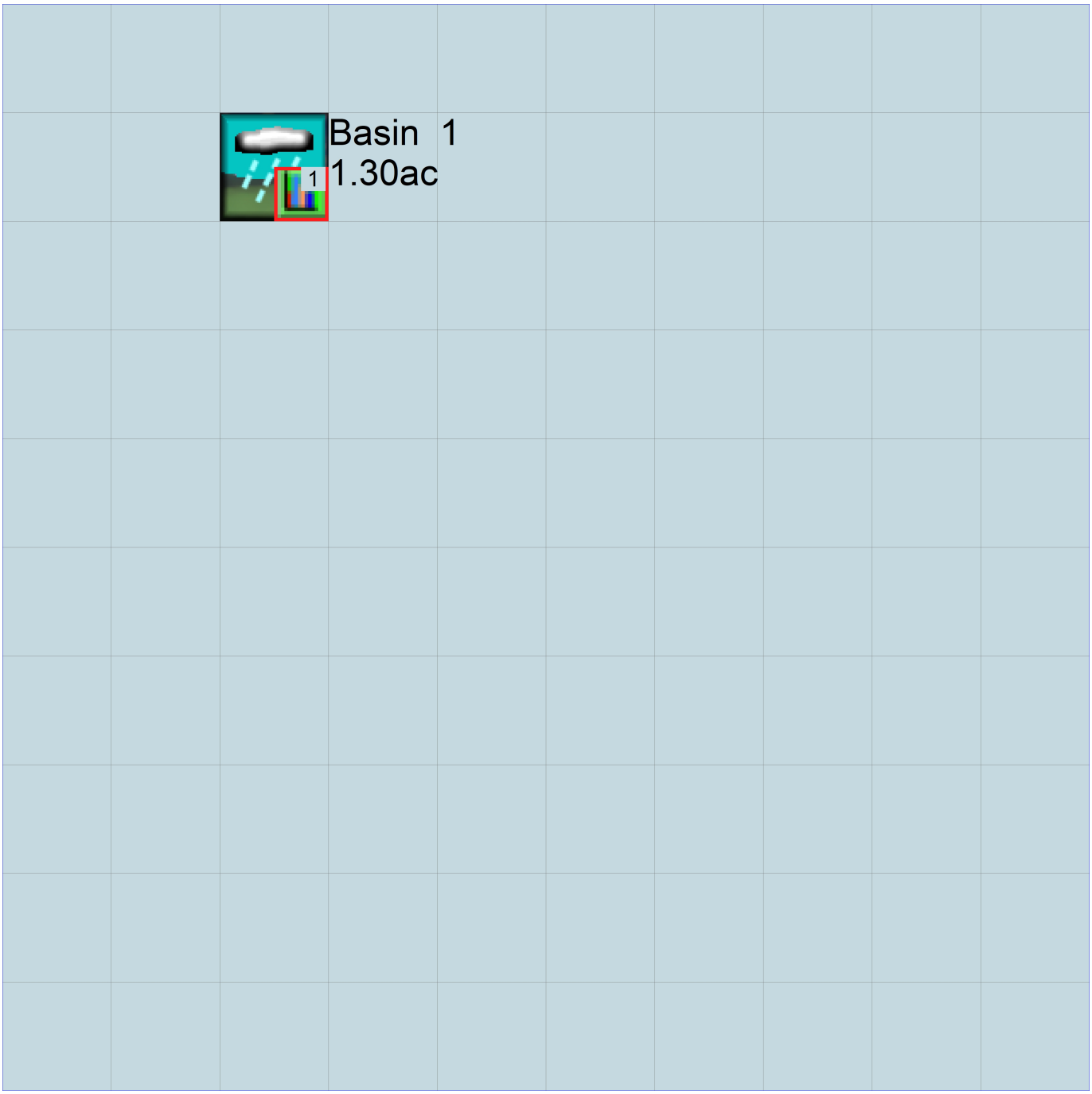
PERLND Changes

No PERLND changes have been made.

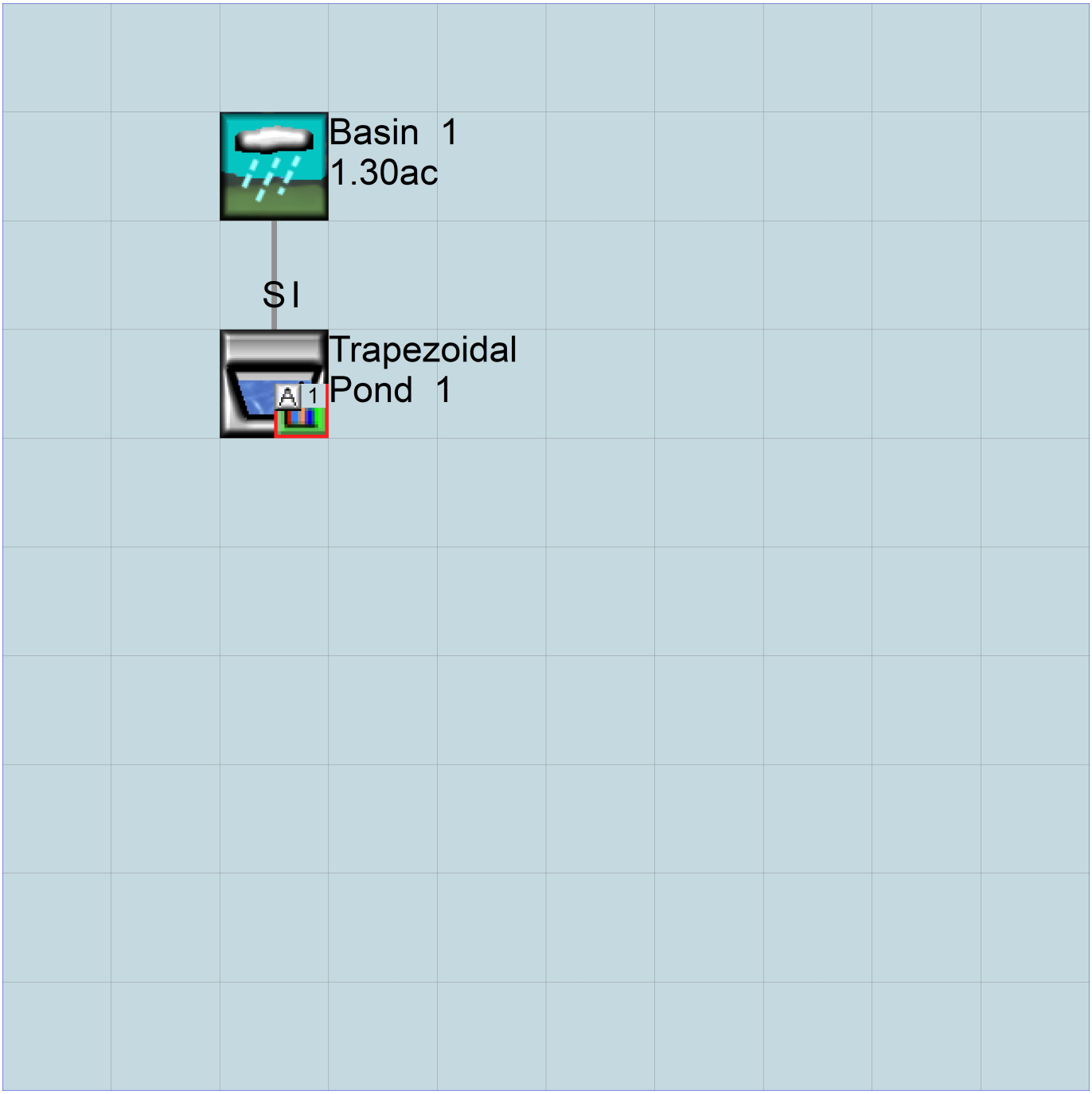
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin P-1.wdm
MESSU       25   PreBasin P-1.MES
            27   PreBasin P-1.L61
            28   PreBasin P-1.L62
            30   POCBasin P-11.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                     1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                       1.304     COPY   501     12
PERLND  10                       1.304     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><--->
```

```
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin P-1.wdm
MESSU       25   MitBasin P-1.MES
            27   MitBasin P-1.L61
            28   MitBasin P-1.L62
            30   POCBasin P-11.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       7
      IMPLND       1
      IMPLND       8
      IMPLND      14
      RCHRES       1
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Trapezoidal Pond  1         MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
    7     A/B, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    7         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
```

```
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
    7         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    7         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    7              0         5       0.8       400      0.05       0.3     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    7              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                 ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    7          0.1       0.5      0.25         0       0.7      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
    7              0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                   in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
   14      POND                   1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    8         0    0    1    0    0    0
   14         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
   14         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    8         0    0    0    0    0
   14         0    0    0    0    0
```

```
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
   14            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    8              0         0
   14              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    8              0         0
   14              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND   7                      0.245     RCHRES   1      2
PERLND   7                      0.245     RCHRES   1      3
IMPLND   1                      0.735     RCHRES   1      5
IMPLND   8                      0.283     RCHRES   1      5
IMPLND  14                      0.041     RCHRES   1      5

******Routing******
PERLND   7                      0.245     COPY     1     12
IMPLND   1                      0.735     COPY     1     15
IMPLND   8                      0.283     COPY     1     15
IMPLND  14                      0.041     COPY     1     15
PERLND   7                      0.245     COPY     1     13
RCHRES   1                          1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG             ***
                                        in  out                             ***
    1     Trapezoidal Pond-006    2    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
```

```
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                    ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
    1        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1              1      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                       ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.008761  0.000000  0.000000  0.000000
  0.077778  0.009185  0.000698  0.000000  0.088344
  0.155556  0.009619  0.001429  0.000000  0.088344
  0.233333  0.010062  0.002195  0.000000  0.088344
  0.311111  0.010516  0.002995  0.000000  0.088344
  0.388889  0.010979  0.003831  0.000000  0.088344
  0.466667  0.011453  0.004703  0.000000  0.088344
  0.544444  0.011936  0.005613  0.000000  0.088344
  0.622222  0.012430  0.006560  0.000000  0.088344
  0.700000  0.012934  0.007547  0.000000  0.088344
  0.777778  0.013447  0.008572  0.000000  0.088344
  0.855556  0.013971  0.009639  0.000000  0.088344
  0.933333  0.014504  0.010746  0.000000  0.088344
  1.011111  0.015048  0.011895  0.000000  0.088344
  1.088889  0.015601  0.013087  0.000000  0.088344
  1.166667  0.016165  0.014323  0.000000  0.088344
  1.244444  0.016739  0.015602  0.000000  0.088344
  1.322222  0.017322  0.016927  0.000000  0.088344
  1.400000  0.017916  0.018297  0.000000  0.088344
  1.477778  0.018519  0.019714  0.000000  0.088344
  1.555556  0.019133  0.021178  0.000000  0.088344
  1.633333  0.019756  0.022691  0.000000  0.088344
  1.711111  0.020390  0.024252  0.000000  0.088344
  1.788889  0.021033  0.025863  0.000000  0.088344
  1.866667  0.021687  0.027524  0.000000  0.088344
  1.944444  0.022351  0.029237  0.000000  0.088344
  2.022222  0.023024  0.031001  0.000000  0.088344
  2.100000  0.023708  0.032819  0.000000  0.088344
  2.177778  0.024401  0.034690  0.000000  0.088344
  2.255556  0.025105  0.036615  0.000000  0.088344
  2.333333  0.025818  0.038595  0.000000  0.088344
  2.411111  0.026542  0.040631  0.000000  0.088344
```

```
  2.488889  0.027275  0.042724  0.000000  0.088344
  2.566667  0.028019  0.044875  0.000000  0.088344
  2.644444  0.028773  0.047083  0.000000  0.088344
  2.722222  0.029536  0.049351  0.000000  0.088344
  2.800000  0.030310  0.051678  0.000000  0.088344
  2.877778  0.031093  0.054066  0.000000  0.088344
  2.955556  0.031887  0.056515  0.000000  0.088344
  3.033333  0.032690  0.059026  0.000000  0.088344
  3.111111  0.033504  0.061601  0.000000  0.088344
  3.188889  0.034327  0.064239  0.000000  0.088344
  3.266667  0.035161  0.066941  0.000000  0.088344
  3.344444  0.036004  0.069708  0.000000  0.088344
  3.422222  0.036858  0.072542  0.000000  0.088344
  3.500000  0.037721  0.075442  0.000000  0.088344
  3.577778  0.038595  0.078410  0.000000  0.088344
  3.655556  0.039479  0.081446  0.000000  0.088344
  3.733333  0.040372  0.084552  0.000000  0.088344
  3.811111  0.041276  0.087727  0.000000  0.088344
  3.888889  0.042189  0.090973  0.000000  0.088344
  3.966667  0.043113  0.094290  0.000000  0.088344
  4.044444  0.044046  0.097679  0.000000  0.088344
  4.122222  0.044990  0.101142  0.000000  0.088344
  4.200000  0.045943  0.104678  0.000000  0.088344
  4.277778  0.046907  0.108289  0.000000  0.088344
  4.355556  0.047880  0.111975  0.000000  0.088344
  4.433333  0.048864  0.115737  0.000000  0.088344
  4.511111  0.049857  0.119577  0.000000  0.088344
  4.588889  0.050861  0.123493  0.000000  0.088344
  4.666667  0.051874  0.127489  0.000000  0.088344
  4.744444  0.052898  0.131563  0.000000  0.088344
  4.822222  0.053931  0.135718  0.000000  0.088344
  4.900000  0.054975  0.139953  0.000000  0.088344
  4.977778  0.056028  0.144270  0.000000  0.088344
  5.055556  0.057092  0.148669  0.000000  0.088344
  5.133333  0.058165  0.153151  0.000000  0.088344
  5.211111  0.059249  0.157717  0.000000  0.088344
  5.288889  0.060342  0.162368  0.000000  0.088344
  5.366667  0.061446  0.167104  0.000000  0.088344
  5.444444  0.062560  0.171927  0.000000  0.088344
  5.522222  0.063683  0.176836  0.000000  0.088344
  5.600000  0.064817  0.181833  0.000000  0.088344
  5.677778  0.065960  0.186919  0.000000  0.088344
  5.755556  0.067114  0.192094  0.000000  0.088344
  5.833333  0.068277  0.197359  0.000000  0.088344
  5.911111  0.069451  0.202715  0.000000  0.088344
  5.988889  0.070634  0.208163  0.000000  0.088344
  6.066667  0.071828  0.213703  0.182234  0.088344
  6.144444  0.073031  0.219337  0.572643  0.088344
  6.222222  0.074245  0.225064  1.046030  0.088344
  6.300000  0.075468  0.230886  1.509672  0.088344
  6.377778  0.076702  0.236804  1.879270  0.088344
  6.455556  0.077945  0.242818  2.114227  0.088344
  6.533333  0.079199  0.248929  2.300165  0.088344
  6.611111  0.080462  0.255138  2.462179  0.088344
  6.688889  0.081736  0.261446  2.614172  0.088344
  6.766667  0.083019  0.267853  2.757800  0.088344
  6.844444  0.084313  0.274360  2.894310  0.088344
  6.922222  0.085616  0.280969  3.024665  0.088344
  7.000000  0.086929  0.287679  3.149630  0.088344
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1             PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1             IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1             PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1             IMPLND   1 999 EXTNL  PETINP
```

```
END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   1 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1001 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      2 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1003 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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Local (360)943-0304

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WWHM2012

PROJECT REPORT

Pond P-2

General Model Information

Project Name:	Basin P-2
Site Name:	
Site Address:	
City:	
Report Date:	8/10/2022
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	2.068
Pervious Total	2.068
Impervious Land Use	acre
Impervious Total	0
Basin Total	2.068

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	0.389
Pervious Total	0.389

Impervious Land Use	acre
ROADS FLAT	1.165
SIDEWALKS FLAT	0.448
POND	0.066
Impervious Total	1.679
Basin Total	2.068

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length:	26.56 ft.	
Bottom Width:	26.56 ft.	
Depth:	7 ft.	
Volume at riser head:	0.2944 acre-feet.	
Infiltration On		
Infiltration rate:	10	
Infiltration safety factor:	1	
Total Volume Infiltrated (ac-ft.):		675.955
Total Volume Through Riser (ac-ft.):		0.001
Total Volume Through Facility (ac-ft.):		675.955
Percent Infiltrated:		100
Total Precip Applied to Facility:		0
Total Evap From Facility:		0
Side slope 1:	3 To 1	
Side slope 2:	3 To 1	
Side slope 3:	3 To 1	
Side slope 4:	3 To 1	
Discharge Structure		
Riser Height:	6 ft.	
Riser Diameter:	12 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Pond Hydraulic Table

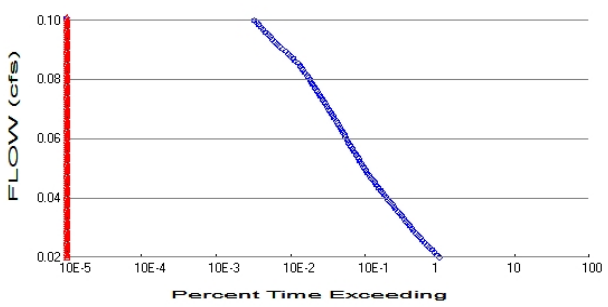
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.016	0.000	0.000	0.000
0.0778	0.016	0.001	0.000	0.163
0.1556	0.017	0.002	0.000	0.163
0.2333	0.017	0.004	0.000	0.163
0.3111	0.018	0.005	0.000	0.163
0.3889	0.019	0.006	0.000	0.163
0.4667	0.019	0.008	0.000	0.163
0.5444	0.020	0.009	0.000	0.163
0.6222	0.021	0.011	0.000	0.163
0.7000	0.021	0.013	0.000	0.163
0.7778	0.022	0.014	0.000	0.163
0.8556	0.023	0.016	0.000	0.163
0.9333	0.023	0.018	0.000	0.163
1.0111	0.024	0.020	0.000	0.163
1.0889	0.025	0.022	0.000	0.163
1.1667	0.025	0.024	0.000	0.163
1.2444	0.026	0.026	0.000	0.163
1.3222	0.027	0.028	0.000	0.163
1.4000	0.028	0.030	0.000	0.163
1.4778	0.028	0.032	0.000	0.163
1.5556	0.029	0.035	0.000	0.163
1.6333	0.030	0.037	0.000	0.163
1.7111	0.031	0.039	0.000	0.163
1.7889	0.031	0.042	0.000	0.163
1.8667	0.032	0.044	0.000	0.163
1.9444	0.033	0.047	0.000	0.163
2.0222	0.034	0.050	0.000	0.163

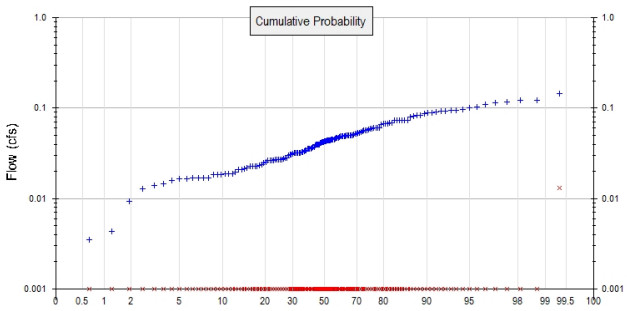
2.1000	0.035	0.052	0.000	0.163
2.1778	0.036	0.055	0.000	0.163
2.2556	0.036	0.058	0.000	0.163
2.3333	0.037	0.061	0.000	0.163
2.4111	0.038	0.064	0.000	0.163
2.4889	0.039	0.067	0.000	0.163
2.5667	0.040	0.070	0.000	0.163
2.6444	0.041	0.073	0.000	0.163
2.7222	0.042	0.076	0.000	0.163
2.8000	0.043	0.080	0.000	0.163
2.8778	0.044	0.083	0.000	0.163
2.9556	0.045	0.086	0.000	0.163
3.0333	0.046	0.090	0.000	0.163
3.1111	0.047	0.094	0.000	0.163
3.1889	0.047	0.097	0.000	0.163
3.2667	0.048	0.101	0.000	0.163
3.3444	0.049	0.105	0.000	0.163
3.4222	0.050	0.109	0.000	0.163
3.5000	0.051	0.113	0.000	0.163
3.5778	0.053	0.117	0.000	0.163
3.6556	0.054	0.121	0.000	0.163
3.7333	0.055	0.125	0.000	0.163
3.8111	0.056	0.130	0.000	0.163
3.8889	0.057	0.134	0.000	0.163
3.9667	0.058	0.139	0.000	0.163
4.0444	0.059	0.143	0.000	0.163
4.1222	0.060	0.148	0.000	0.163
4.2000	0.061	0.153	0.000	0.163
4.2778	0.062	0.157	0.000	0.163
4.3556	0.063	0.162	0.000	0.163
4.4333	0.064	0.167	0.000	0.163
4.5111	0.066	0.172	0.000	0.163
4.5889	0.067	0.178	0.000	0.163
4.6667	0.068	0.183	0.000	0.163
4.7444	0.069	0.188	0.000	0.163
4.8222	0.070	0.194	0.000	0.163
4.9000	0.071	0.199	0.000	0.163
4.9778	0.073	0.205	0.000	0.163
5.0556	0.074	0.211	0.000	0.163
5.1333	0.075	0.216	0.000	0.163
5.2111	0.076	0.222	0.000	0.163
5.2889	0.078	0.228	0.000	0.163
5.3667	0.079	0.234	0.000	0.163
5.4444	0.080	0.241	0.000	0.163
5.5222	0.081	0.247	0.000	0.163
5.6000	0.083	0.253	0.000	0.163
5.6778	0.084	0.260	0.000	0.163
5.7556	0.085	0.266	0.000	0.163
5.8333	0.087	0.273	0.000	0.163
5.9111	0.088	0.280	0.000	0.163
5.9889	0.089	0.287	0.000	0.163
6.0667	0.091	0.294	0.182	0.163
6.1444	0.092	0.301	0.572	0.163
6.2222	0.093	0.308	1.046	0.163
6.3000	0.095	0.316	1.509	0.163
6.3778	0.096	0.323	1.879	0.163
6.4556	0.097	0.331	2.114	0.163
6.5333	0.099	0.338	2.300	0.163

6.6111	0.100	0.346	2.462	0.163
6.6889	0.102	0.354	2.614	0.163
6.7667	0.103	0.362	2.757	0.163
6.8444	0.105	0.370	2.894	0.163
6.9222	0.106	0.378	3.024	0.163
7.0000	0.107	0.387	3.149	0.163
7.0778	0.109	0.395	3.269	0.163

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 2.068
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.389
Total Impervious Area: 1.679

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.043579
5 year	0.067795
10 year	0.080954
25 year	0.094347
50 year	0.102307
100 year	0.108853

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.032	0.000
1903	0.027	0.000
1904	0.043	0.000
1905	0.021	0.000
1906	0.009	0.000
1907	0.067	0.000
1908	0.050	0.000
1909	0.049	0.000
1910	0.068	0.000
1911	0.044	0.000

1912	0.145	0.000
1913	0.070	0.000
1914	0.017	0.000
1915	0.028	0.000
1916	0.044	0.000
1917	0.015	0.000
1918	0.047	0.000
1919	0.034	0.000
1920	0.044	0.000
1921	0.050	0.000
1922	0.050	0.000
1923	0.040	0.000
1924	0.018	0.000
1925	0.023	0.000
1926	0.042	0.000
1927	0.027	0.000
1928	0.034	0.000
1929	0.069	0.000
1930	0.044	0.000
1931	0.041	0.000
1932	0.032	0.000
1933	0.031	0.000
1934	0.091	0.000
1935	0.042	0.000
1936	0.037	0.000
1937	0.059	0.000
1938	0.036	0.000
1939	0.002	0.000
1940	0.040	0.000
1941	0.019	0.000
1942	0.060	0.000
1943	0.031	0.000
1944	0.056	0.000
1945	0.050	0.000
1946	0.027	0.000
1947	0.017	0.000
1948	0.094	0.000
1949	0.080	0.000
1950	0.023	0.000
1951	0.028	0.000
1952	0.122	0.000
1953	0.110	0.000
1954	0.040	0.000
1955	0.033	0.000
1956	0.016	0.000
1957	0.056	0.000
1958	0.118	0.000
1959	0.073	0.000
1960	0.019	0.000
1961	0.073	0.000
1962	0.039	0.000
1963	0.019	0.000
1964	0.021	0.000
1965	0.082	0.000
1966	0.023	0.000
1967	0.035	0.000
1968	0.036	0.000
1969	0.036	0.000

1970	0.056	0.000
1971	0.088	0.000
1972	0.057	0.000
1973	0.073	0.000
1974	0.040	0.000
1975	0.093	0.000
1976	0.049	0.000
1977	0.017	0.000
1978	0.083	0.000
1979	0.023	0.000
1980	0.047	0.000
1981	0.045	0.000
1982	0.018	0.000
1983	0.073	0.000
1984	0.030	0.000
1985	0.049	0.000
1986	0.044	0.000
1987	0.083	0.000
1988	0.053	0.000
1989	0.047	0.000
1990	0.054	0.000
1991	0.042	0.000
1992	0.060	0.000
1993	0.058	0.000
1994	0.087	0.000
1995	0.017	0.000
1996	0.096	0.000
1997	0.037	0.000
1998	0.044	0.000
1999	0.004	0.000
2000	0.033	0.000
2001	0.017	0.000
2002	0.061	0.000
2003	0.053	0.000
2004	0.049	0.000
2005	0.090	0.000
2006	0.027	0.000
2007	0.027	0.000
2008	0.046	0.000
2009	0.032	0.000
2010	0.027	0.000
2011	0.022	0.000
2012	0.032	0.000
2013	0.025	0.000
2014	0.018	0.000
2015	0.035	0.000
2016	0.014	0.000
2017	0.067	0.000
2018	0.122	0.000
2019	0.114	0.013
2020	0.037	0.000
2021	0.060	0.000
2022	0.025	0.000
2023	0.051	0.000
2024	0.096	0.000
2025	0.045	0.000
2026	0.073	0.000
2027	0.026	0.000

2028	0.023	0.000
2029	0.050	0.000
2030	0.092	0.000
2031	0.030	0.000
2032	0.017	0.000
2033	0.027	0.000
2034	0.026	0.000
2035	0.104	0.000
2036	0.054	0.000
2037	0.013	0.000
2038	0.043	0.000
2039	0.004	0.000
2040	0.024	0.000
2041	0.032	0.000
2042	0.101	0.000
2043	0.049	0.000
2044	0.066	0.000
2045	0.045	0.000
2046	0.053	0.000
2047	0.039	0.000
2048	0.050	0.000
2049	0.045	0.000
2050	0.032	0.000
2051	0.047	0.000
2052	0.027	0.000
2053	0.048	0.000
2054	0.061	0.000
2055	0.019	0.000
2056	0.021	0.000
2057	0.033	0.000
2058	0.042	0.000
2059	0.074	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.1451	0.0131
2	0.1222	0.0000
3	0.1221	0.0000
4	0.1180	0.0000
5	0.1139	0.0000
6	0.1103	0.0000
7	0.1040	0.0000
8	0.1011	0.0000
9	0.0958	0.0000
10	0.0956	0.0000
11	0.0937	0.0000
12	0.0929	0.0000
13	0.0922	0.0000
14	0.0912	0.0000
15	0.0896	0.0000
16	0.0885	0.0000
17	0.0874	0.0000
18	0.0832	0.0000
19	0.0827	0.0000
20	0.0821	0.0000
21	0.0803	0.0000
22	0.0737	0.0000

23	0.0733	0.0000
24	0.0733	0.0000
25	0.0733	0.0000
26	0.0731	0.0000
27	0.0729	0.0000
28	0.0695	0.0000
29	0.0692	0.0000
30	0.0675	0.0000
31	0.0672	0.0000
32	0.0669	0.0000
33	0.0659	0.0000
34	0.0610	0.0000
35	0.0608	0.0000
36	0.0605	0.0000
37	0.0601	0.0000
38	0.0598	0.0000
39	0.0588	0.0000
40	0.0583	0.0000
41	0.0574	0.0000
42	0.0565	0.0000
43	0.0564	0.0000
44	0.0562	0.0000
45	0.0540	0.0000
46	0.0537	0.0000
47	0.0529	0.0000
48	0.0527	0.0000
49	0.0526	0.0000
50	0.0509	0.0000
51	0.0501	0.0000
52	0.0498	0.0000
53	0.0497	0.0000
54	0.0497	0.0000
55	0.0496	0.0000
56	0.0495	0.0000
57	0.0492	0.0000
58	0.0490	0.0000
59	0.0488	0.0000
60	0.0487	0.0000
61	0.0486	0.0000
62	0.0480	0.0000
63	0.0474	0.0000
64	0.0468	0.0000
65	0.0467	0.0000
66	0.0466	0.0000
67	0.0463	0.0000
68	0.0449	0.0000
69	0.0449	0.0000
70	0.0448	0.0000
71	0.0448	0.0000
72	0.0445	0.0000
73	0.0443	0.0000
74	0.0440	0.0000
75	0.0437	0.0000
76	0.0436	0.0000
77	0.0435	0.0000
78	0.0435	0.0000
79	0.0431	0.0000
80	0.0424	0.0000

81	0.0422	0.0000
82	0.0420	0.0000
83	0.0417	0.0000
84	0.0411	0.0000
85	0.0400	0.0000
86	0.0398	0.0000
87	0.0397	0.0000
88	0.0396	0.0000
89	0.0394	0.0000
90	0.0387	0.0000
91	0.0372	0.0000
92	0.0368	0.0000
93	0.0367	0.0000
94	0.0360	0.0000
95	0.0359	0.0000
96	0.0358	0.0000
97	0.0353	0.0000
98	0.0352	0.0000
99	0.0344	0.0000
100	0.0338	0.0000
101	0.0332	0.0000
102	0.0330	0.0000
103	0.0325	0.0000
104	0.0323	0.0000
105	0.0322	0.0000
106	0.0321	0.0000
107	0.0320	0.0000
108	0.0318	0.0000
109	0.0317	0.0000
110	0.0311	0.0000
111	0.0308	0.0000
112	0.0305	0.0000
113	0.0299	0.0000
114	0.0280	0.0000
115	0.0280	0.0000
116	0.0274	0.0000
117	0.0272	0.0000
118	0.0271	0.0000
119	0.0270	0.0000
120	0.0269	0.0000
121	0.0268	0.0000
122	0.0267	0.0000
123	0.0266	0.0000
124	0.0263	0.0000
125	0.0262	0.0000
126	0.0250	0.0000
127	0.0247	0.0000
128	0.0239	0.0000
129	0.0230	0.0000
130	0.0228	0.0000
131	0.0228	0.0000
132	0.0227	0.0000
133	0.0227	0.0000
134	0.0218	0.0000
135	0.0212	0.0000
136	0.0209	0.0000
137	0.0208	0.0000
138	0.0194	0.0000

139	0.0189	0.0000
140	0.0189	0.0000
141	0.0189	0.0000
142	0.0184	0.0000
143	0.0183	0.0000
144	0.0183	0.0000
145	0.0170	0.0000
146	0.0170	0.0000
147	0.0170	0.0000
148	0.0168	0.0000
149	0.0166	0.0000
150	0.0166	0.0000
151	0.0159	0.0000
152	0.0145	0.0000
153	0.0140	0.0000
154	0.0129	0.0000
155	0.0094	0.0000
156	0.0043	0.0000
157	0.0035	0.0000
158	0.0022	0.0000

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0218	54342	0	0	Pass
0.0226	50165	0	0	Pass
0.0234	46597	0	0	Pass
0.0242	43351	0	0	Pass
0.0250	40265	0	0	Pass
0.0259	37462	0	0	Pass
0.0267	34936	0	0	Pass
0.0275	32564	0	0	Pass
0.0283	30332	0	0	Pass
0.0291	28288	0	0	Pass
0.0299	26432	0	0	Pass
0.0307	24792	0	0	Pass
0.0315	23296	0	0	Pass
0.0324	21928	0	0	Pass
0.0332	20637	0	0	Pass
0.0340	19429	0	0	Pass
0.0348	18282	0	0	Pass
0.0356	17219	0	0	Pass
0.0364	16160	0	0	Pass
0.0372	15141	0	0	Pass
0.0381	14271	0	0	Pass
0.0389	13451	0	0	Pass
0.0397	12659	0	0	Pass
0.0405	11939	0	0	Pass
0.0413	11246	0	0	Pass
0.0421	10559	0	0	Pass
0.0429	9972	0	0	Pass
0.0437	9379	0	0	Pass
0.0446	8842	0	0	Pass
0.0454	8332	0	0	Pass
0.0462	7861	0	0	Pass
0.0470	7457	0	0	Pass
0.0478	7030	0	0	Pass
0.0486	6615	0	0	Pass
0.0494	6271	0	0	Pass
0.0503	5978	0	0	Pass
0.0511	5701	0	0	Pass
0.0519	5437	0	0	Pass
0.0527	5197	0	0	Pass
0.0535	4943	0	0	Pass
0.0543	4703	0	0	Pass
0.0551	4512	0	0	Pass
0.0559	4337	0	0	Pass
0.0568	4154	0	0	Pass
0.0576	3958	0	0	Pass
0.0584	3766	0	0	Pass
0.0592	3577	0	0	Pass
0.0600	3412	0	0	Pass
0.0608	3263	0	0	Pass
0.0616	3134	0	0	Pass
0.0625	3026	0	0	Pass
0.0633	2928	0	0	Pass
0.0641	2813	0	0	Pass

0.0649	2682	0	0	Pass
0.0657	2555	0	0	Pass
0.0665	2451	0	0	Pass
0.0673	2359	0	0	Pass
0.0681	2256	0	0	Pass
0.0690	2139	0	0	Pass
0.0698	2038	0	0	Pass
0.0706	1952	0	0	Pass
0.0714	1859	0	0	Pass
0.0722	1778	0	0	Pass
0.0730	1689	0	0	Pass
0.0738	1618	0	0	Pass
0.0747	1561	0	0	Pass
0.0755	1482	0	0	Pass
0.0763	1407	0	0	Pass
0.0771	1338	0	0	Pass
0.0779	1270	0	0	Pass
0.0787	1217	0	0	Pass
0.0795	1163	0	0	Pass
0.0803	1103	0	0	Pass
0.0812	1055	0	0	Pass
0.0820	1006	0	0	Pass
0.0828	964	0	0	Pass
0.0836	919	0	0	Pass
0.0844	872	0	0	Pass
0.0852	814	0	0	Pass
0.0860	772	0	0	Pass
0.0869	737	0	0	Pass
0.0877	694	0	0	Pass
0.0885	636	0	0	Pass
0.0893	601	0	0	Pass
0.0901	553	0	0	Pass
0.0909	517	0	0	Pass
0.0917	478	0	0	Pass
0.0925	434	0	0	Pass
0.0934	394	0	0	Pass
0.0942	363	0	0	Pass
0.0950	339	0	0	Pass
0.0958	310	0	0	Pass
0.0966	295	0	0	Pass
0.0974	273	0	0	Pass
0.0982	252	0	0	Pass
0.0991	237	0	0	Pass
0.0999	223	0	0	Pass
0.1007	207	0	0	Pass
0.1015	195	0	0	Pass
0.1023	180	0	0	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	615.12			☐	100.00			
Total Volume Infiltrated		615.12	0.00	0.00		100.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

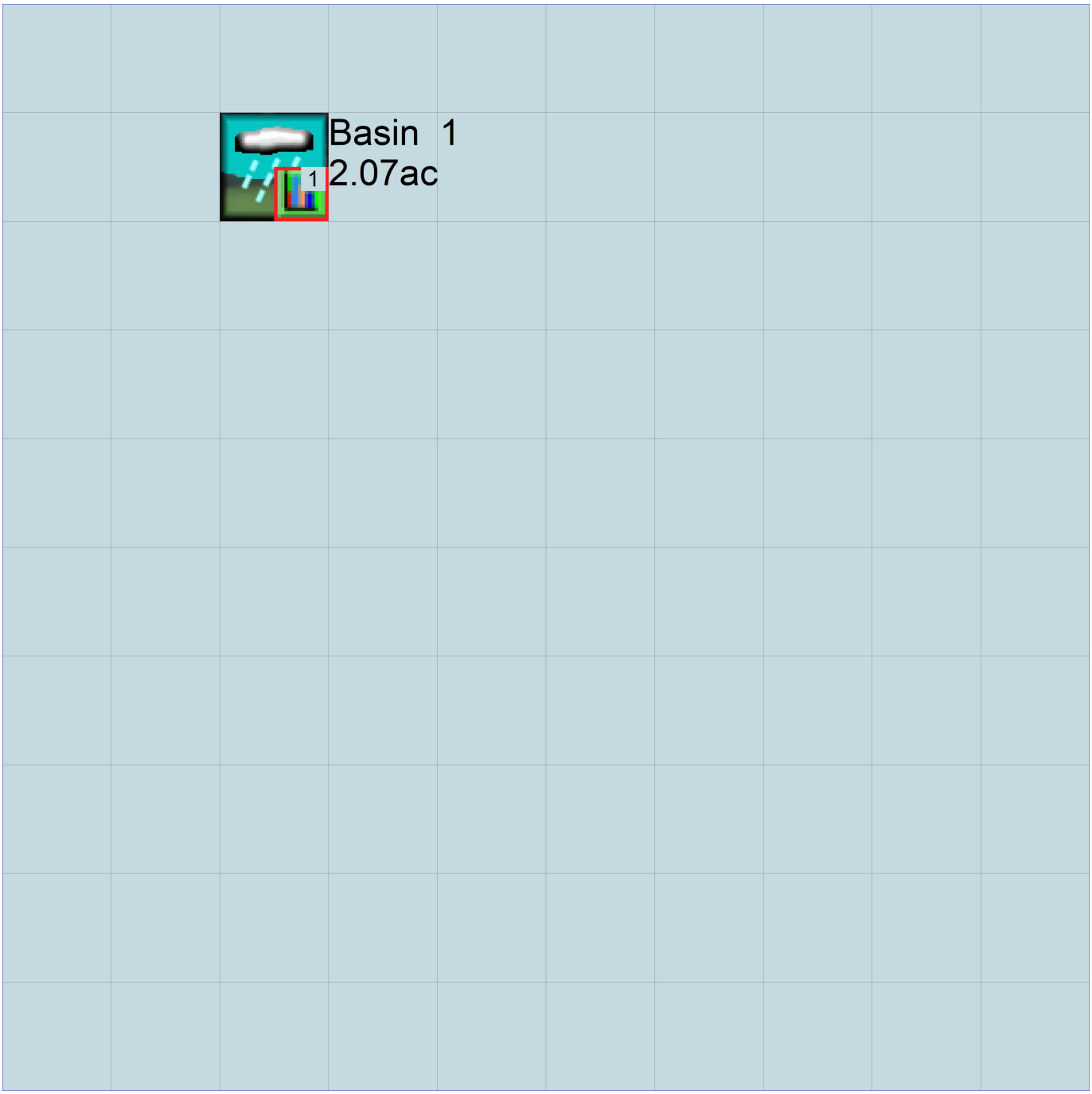
PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin P-2.wdm
MESSU       25   PreBasin P-2.MES
            27   PreBasin P-2.L61
            28   PreBasin P-2.L62
            30   POCBasin P-21.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                     1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                       2.068     COPY   501     12
PERLND  10                       2.068     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><--->
```

```
WDM      1 EVAP     ENGL    1             PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1             IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin P-2.wdm
MESSU       25   MitBasin P-2.MES
            27   MitBasin P-2.L61
            28   MitBasin P-2.L62
            30   POCBasin P-21.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       7
      IMPLND       1
      IMPLND       8
      IMPLND      14
      RCHRES       1
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Trapezoidal Pond  1         MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
    7     A/B, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    7         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
```

```
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
    7         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    7         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    7              0         5       0.8       400      0.05       0.3     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    7              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                 ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    7          0.1       0.5      0.25         0       0.7      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
    7              0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                   in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
   14      POND                   1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    8         0    0    1    0    0    0
   14         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
   14         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    8         0    0    0    0    0
   14         0    0    0    0    0
```

```
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
   14            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    8              0         0
   14              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    8              0         0
   14              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND   7                      0.389     RCHRES   1      2
PERLND   7                      0.389     RCHRES   1      3
IMPLND   1                      1.165     RCHRES   1      5
IMPLND   8                      0.448     RCHRES   1      5
IMPLND  14                      0.066     RCHRES   1      5

******Routing******
PERLND   7                      0.389     COPY     1     12
IMPLND   1                      1.165     COPY     1     15
IMPLND   8                      0.448     COPY     1     15
IMPLND  14                      0.066     COPY     1     15
PERLND   7                      0.389     COPY     1     13
RCHRES   1                          1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG             ***
                                        in  out                             ***
    1     Trapezoidal Pond-005    2    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
```

```
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                    ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
    1        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1              1      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                       ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.016197  0.000000  0.000000  0.000000
  0.077778  0.016771  0.001282  0.000000  0.163319
  0.155556  0.017355  0.002609  0.000000  0.163319
  0.233333  0.017949  0.003982  0.000000  0.163319
  0.311111  0.018553  0.005402  0.000000  0.163319
  0.388889  0.019168  0.006869  0.000000  0.163319
  0.466667  0.019792  0.008384  0.000000  0.163319
  0.544444  0.020426  0.009948  0.000000  0.163319
  0.622222  0.021070  0.011561  0.000000  0.163319
  0.700000  0.021724  0.013226  0.000000  0.163319
  0.777778  0.022388  0.014941  0.000000  0.163319
  0.855556  0.023062  0.016709  0.000000  0.163319
  0.933333  0.023746  0.018529  0.000000  0.163319
  1.011111  0.024440  0.020403  0.000000  0.163319
  1.088889  0.025145  0.022331  0.000000  0.163319
  1.166667  0.025859  0.024315  0.000000  0.163319
  1.244444  0.026583  0.026354  0.000000  0.163319
  1.322222  0.027317  0.028450  0.000000  0.163319
  1.400000  0.028061  0.030604  0.000000  0.163319
  1.477778  0.028815  0.032816  0.000000  0.163319
  1.555556  0.029579  0.035086  0.000000  0.163319
  1.633333  0.030353  0.037417  0.000000  0.163319
  1.711111  0.031137  0.039808  0.000000  0.163319
  1.788889  0.031932  0.042261  0.000000  0.163319
  1.866667  0.032736  0.044776  0.000000  0.163319
  1.944444  0.033550  0.047354  0.000000  0.163319
  2.022222  0.034374  0.049995  0.000000  0.163319
  2.100000  0.035208  0.052701  0.000000  0.163319
  2.177778  0.036052  0.055472  0.000000  0.163319
  2.255556  0.036906  0.058310  0.000000  0.163319
  2.333333  0.037770  0.061214  0.000000  0.163319
  2.411111  0.038644  0.064185  0.000000  0.163319
```

```
  2.488889  0.039528  0.067225  0.000000  0.163319
  2.566667  0.040422  0.070335  0.000000  0.163319
  2.644444  0.041327  0.073514  0.000000  0.163319
  2.722222  0.042241  0.076764  0.000000  0.163319
  2.800000  0.043165  0.080085  0.000000  0.163319
  2.877778  0.044099  0.083479  0.000000  0.163319
  2.955556  0.045043  0.086945  0.000000  0.163319
  3.033333  0.045997  0.090486  0.000000  0.163319
  3.111111  0.046961  0.094101  0.000000  0.163319
  3.188889  0.047935  0.097791  0.000000  0.163319
  3.266667  0.048919  0.101558  0.000000  0.163319
  3.344444  0.049913  0.105401  0.000000  0.163319
  3.422222  0.050917  0.109322  0.000000  0.163319
  3.500000  0.051932  0.113322  0.000000  0.163319
  3.577778  0.052956  0.117401  0.000000  0.163319
  3.655556  0.053990  0.121560  0.000000  0.163319
  3.733333  0.055034  0.125800  0.000000  0.163319
  3.811111  0.056088  0.130121  0.000000  0.163319
  3.888889  0.057152  0.134525  0.000000  0.163319
  3.966667  0.058226  0.139012  0.000000  0.163319
  4.044444  0.059310  0.143583  0.000000  0.163319
  4.122222  0.060404  0.148238  0.000000  0.163319
  4.200000  0.061508  0.152979  0.000000  0.163319
  4.277778  0.062622  0.157807  0.000000  0.163319
  4.355556  0.063746  0.162721  0.000000  0.163319
  4.433333  0.064880  0.167723  0.000000  0.163319
  4.511111  0.066024  0.172814  0.000000  0.163319
  4.588889  0.067179  0.177994  0.000000  0.163319
  4.666667  0.068343  0.183264  0.000000  0.163319
  4.744444  0.069517  0.188625  0.000000  0.163319
  4.822222  0.070701  0.194078  0.000000  0.163319
  4.900000  0.071895  0.199624  0.000000  0.163319
  4.977778  0.073099  0.205262  0.000000  0.163319
  5.055556  0.074313  0.210995  0.000000  0.163319
  5.133333  0.075537  0.216822  0.000000  0.163319
  5.211111  0.076771  0.222746  0.000000  0.163319
  5.288889  0.078015  0.228765  0.000000  0.163319
  5.366667  0.079269  0.234882  0.000000  0.163319
  5.444444  0.080533  0.241096  0.000000  0.163319
  5.522222  0.081807  0.247409  0.000000  0.163319
  5.600000  0.083091  0.253822  0.000000  0.163319
  5.677778  0.084385  0.260335  0.000000  0.163319
  5.755556  0.085689  0.266949  0.000000  0.163319
  5.833333  0.087003  0.273665  0.000000  0.163319
  5.911111  0.088328  0.280483  0.000000  0.163319
  5.988889  0.089662  0.287405  0.000000  0.163319
  6.066667  0.091006  0.294431  0.182234  0.163319
  6.144444  0.092360  0.301562  0.572643  0.163319
  6.222222  0.093724  0.308799  1.046030  0.163319
  6.300000  0.095098  0.316142  1.509672  0.163319
  6.377778  0.096482  0.323592  1.879270  0.163319
  6.455556  0.097876  0.331150  2.114227  0.163319
  6.533333  0.099280  0.338817  2.300165  0.163319
  6.611111  0.100694  0.346594  2.462179  0.163319
  6.688889  0.102118  0.354481  2.614172  0.163319
  6.766667  0.103552  0.362480  2.757800  0.163319
  6.844444  0.104996  0.370590  2.894310  0.163319
  6.922222  0.106450  0.378813  3.024665  0.163319
  7.000000  0.107914  0.387149  3.149630  0.163319
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1             PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1             IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1             PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1             IMPLND   1 999 EXTNL  PETINP
```

```
END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   1 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1001 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      2 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1003 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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WWHM2012

PROJECT REPORT

Pond P-3

General Model Information

Project Name:	Basin P-3
Site Name:	
Site Address:	
City:	
Report Date:	8/10/2022
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	1.742
Pervious Total	1.742
Impervious Land Use	acre
Impervious Total	0
Basin Total	1.742

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	0.344
Pervious Total	0.344

Impervious Land Use	acre
ROADS FLAT	0.918
SIDEWALKS FLAT	0.425
POND	0.055
Impervious Total	1.398
Basin Total	1.742

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length:	23.76 ft.	
Bottom Width:	23.76 ft.	
Depth:	7 ft.	
Volume at riser head:	0.2606 acre-feet.	
Infiltration On		
Infiltration rate:	10	
Infiltration safety factor:	1	
Total Volume Infiltrated (ac-ft.):		562.808
Total Volume Through Riser (ac-ft.):		0
Total Volume Through Facility (ac-ft.):		562.808
Percent Infiltrated:		100
Total Precip Applied to Facility:		0
Total Evap From Facility:		0
Side slope 1:	3 To 1	
Side slope 2:	3 To 1	
Side slope 3:	3 To 1	
Side slope 4:	3 To 1	
Discharge Structure		
Riser Height:	6 ft.	
Riser Diameter:	12 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Pond Hydraulic Table

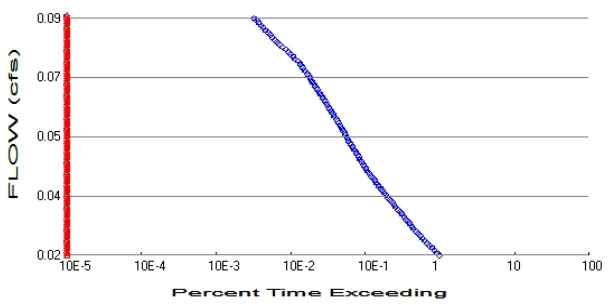
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.013	0.000	0.000	0.000
0.0778	0.013	0.001	0.000	0.130
0.1556	0.014	0.002	0.000	0.130
0.2333	0.014	0.003	0.000	0.130
0.3111	0.015	0.004	0.000	0.130
0.3889	0.015	0.005	0.000	0.130
0.4667	0.016	0.006	0.000	0.130
0.5444	0.016	0.008	0.000	0.130
0.6222	0.017	0.009	0.000	0.130
0.7000	0.017	0.010	0.000	0.130
0.7778	0.018	0.012	0.000	0.130
0.8556	0.019	0.013	0.000	0.130
0.9333	0.019	0.015	0.000	0.130
1.0111	0.020	0.016	0.000	0.130
1.0889	0.021	0.018	0.000	0.130
1.1667	0.021	0.020	0.000	0.130
1.2444	0.022	0.021	0.000	0.130
1.3222	0.023	0.023	0.000	0.130
1.4000	0.023	0.025	0.000	0.130
1.4778	0.024	0.027	0.000	0.130
1.5556	0.025	0.029	0.000	0.130
1.6333	0.025	0.031	0.000	0.130
1.7111	0.026	0.033	0.000	0.130
1.7889	0.027	0.035	0.000	0.130
1.8667	0.028	0.037	0.000	0.130
1.9444	0.028	0.039	0.000	0.130
2.0222	0.029	0.041	0.000	0.130

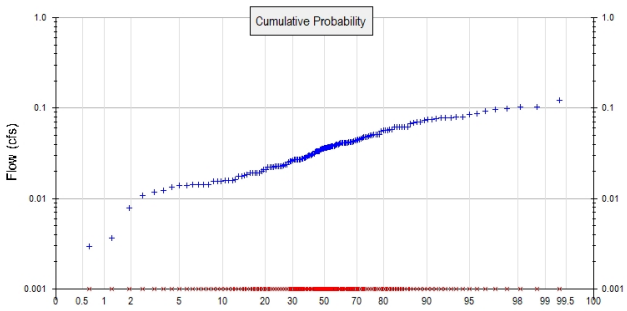
2.1000	0.030	0.044	0.000	0.130
2.1778	0.031	0.046	0.000	0.130
2.2556	0.031	0.049	0.000	0.130
2.3333	0.032	0.051	0.000	0.130
2.4111	0.033	0.054	0.000	0.130
2.4889	0.034	0.056	0.000	0.130
2.5667	0.035	0.059	0.000	0.130
2.6444	0.036	0.062	0.000	0.130
2.7222	0.036	0.065	0.000	0.130
2.8000	0.037	0.068	0.000	0.130
2.8778	0.038	0.071	0.000	0.130
2.9556	0.039	0.074	0.000	0.130
3.0333	0.040	0.077	0.000	0.130
3.1111	0.041	0.080	0.000	0.130
3.1889	0.042	0.083	0.000	0.130
3.2667	0.043	0.086	0.000	0.130
3.3444	0.044	0.090	0.000	0.130
3.4222	0.045	0.093	0.000	0.130
3.5000	0.046	0.097	0.000	0.130
3.5778	0.047	0.100	0.000	0.130
3.6556	0.047	0.104	0.000	0.130
3.7333	0.048	0.108	0.000	0.130
3.8111	0.049	0.112	0.000	0.130
3.8889	0.050	0.116	0.000	0.130
3.9667	0.051	0.120	0.000	0.130
4.0444	0.053	0.124	0.000	0.130
4.1222	0.054	0.128	0.000	0.130
4.2000	0.055	0.132	0.000	0.130
4.2778	0.056	0.136	0.000	0.130
4.3556	0.057	0.141	0.000	0.130
4.4333	0.058	0.145	0.000	0.130
4.5111	0.059	0.150	0.000	0.130
4.5889	0.060	0.155	0.000	0.130
4.6667	0.061	0.159	0.000	0.130
4.7444	0.062	0.164	0.000	0.130
4.8222	0.063	0.169	0.000	0.130
4.9000	0.064	0.174	0.000	0.130
4.9778	0.066	0.179	0.000	0.130
5.0556	0.067	0.184	0.000	0.130
5.1333	0.068	0.190	0.000	0.130
5.2111	0.069	0.195	0.000	0.130
5.2889	0.070	0.200	0.000	0.130
5.3667	0.071	0.206	0.000	0.130
5.4444	0.073	0.212	0.000	0.130
5.5222	0.074	0.217	0.000	0.130
5.6000	0.075	0.223	0.000	0.130
5.6778	0.076	0.229	0.000	0.130
5.7556	0.078	0.235	0.000	0.130
5.8333	0.079	0.241	0.000	0.130
5.9111	0.080	0.247	0.000	0.130
5.9889	0.081	0.254	0.000	0.130
6.0667	0.083	0.260	0.182	0.130
6.1444	0.084	0.267	0.572	0.130
6.2222	0.085	0.273	1.046	0.130
6.3000	0.087	0.280	1.509	0.130
6.3778	0.088	0.287	1.879	0.130
6.4556	0.089	0.294	2.114	0.130
6.5333	0.091	0.301	2.300	0.130

6.6111	0.092	0.308	2.462	0.130
6.6889	0.093	0.315	2.614	0.130
6.7667	0.095	0.322	2.757	0.130
6.8444	0.096	0.330	2.894	0.130
6.9222	0.097	0.337	3.024	0.130
7.0000	0.099	0.345	3.149	0.130
7.0778	0.100	0.353	3.269	0.130

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 1.742
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.344
Total Impervious Area: 1.398

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.036709
5 year	0.057108
10 year	0.068192
25 year	0.079474
50 year	0.08618
100 year	0.091693

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.027	0.000
1903	0.022	0.000
1904	0.037	0.000
1905	0.018	0.000
1906	0.008	0.000
1907	0.056	0.000
1908	0.042	0.000
1909	0.041	0.000
1910	0.057	0.000
1911	0.037	0.000

1912	0.122	0.000
1913	0.059	0.000
1914	0.014	0.000
1915	0.024	0.000
1916	0.037	0.000
1917	0.012	0.000
1918	0.039	0.000
1919	0.029	0.000
1920	0.037	0.000
1921	0.042	0.000
1922	0.042	0.000
1923	0.034	0.000
1924	0.015	0.000
1925	0.019	0.000
1926	0.036	0.000
1927	0.023	0.000
1928	0.028	0.000
1929	0.058	0.000
1930	0.037	0.000
1931	0.035	0.000
1932	0.027	0.000
1933	0.026	0.000
1934	0.077	0.000
1935	0.036	0.000
1936	0.031	0.000
1937	0.050	0.000
1938	0.030	0.000
1939	0.002	0.000
1940	0.033	0.000
1941	0.016	0.000
1942	0.050	0.000
1943	0.026	0.000
1944	0.047	0.000
1945	0.042	0.000
1946	0.023	0.000
1947	0.014	0.000
1948	0.079	0.000
1949	0.068	0.000
1950	0.019	0.000
1951	0.024	0.000
1952	0.103	0.000
1953	0.093	0.000
1954	0.034	0.000
1955	0.027	0.000
1956	0.013	0.000
1957	0.048	0.000
1958	0.099	0.000
1959	0.061	0.000
1960	0.016	0.000
1961	0.062	0.000
1962	0.033	0.000
1963	0.016	0.000
1964	0.017	0.000
1965	0.069	0.000
1966	0.019	0.000
1967	0.030	0.000
1968	0.030	0.000
1969	0.030	0.000

1970	0.047	0.000
1971	0.075	0.000
1972	0.048	0.000
1973	0.062	0.000
1974	0.033	0.000
1975	0.078	0.000
1976	0.041	0.000
1977	0.014	0.000
1978	0.070	0.000
1979	0.019	0.000
1980	0.039	0.000
1981	0.038	0.000
1982	0.015	0.000
1983	0.062	0.000
1984	0.025	0.000
1985	0.041	0.000
1986	0.037	0.000
1987	0.070	0.000
1988	0.044	0.000
1989	0.040	0.000
1990	0.045	0.000
1991	0.035	0.000
1992	0.051	0.000
1993	0.049	0.000
1994	0.074	0.000
1995	0.014	0.000
1996	0.081	0.000
1997	0.031	0.000
1998	0.037	0.000
1999	0.003	0.000
2000	0.028	0.000
2001	0.014	0.000
2002	0.051	0.000
2003	0.045	0.000
2004	0.041	0.000
2005	0.075	0.000
2006	0.023	0.000
2007	0.023	0.000
2008	0.039	0.000
2009	0.027	0.000
2010	0.023	0.000
2011	0.018	0.000
2012	0.027	0.000
2013	0.021	0.000
2014	0.016	0.000
2015	0.030	0.000
2016	0.012	0.000
2017	0.057	0.000
2018	0.103	0.000
2019	0.096	0.000
2020	0.031	0.000
2021	0.051	0.000
2022	0.021	0.000
2023	0.043	0.000
2024	0.081	0.000
2025	0.038	0.000
2026	0.062	0.000
2027	0.022	0.000

2028	0.019	0.000
2029	0.042	0.000
2030	0.078	0.000
2031	0.026	0.000
2032	0.014	0.000
2033	0.022	0.000
2034	0.022	0.000
2035	0.088	0.000
2036	0.045	0.000
2037	0.011	0.000
2038	0.036	0.000
2039	0.004	0.000
2040	0.020	0.000
2041	0.027	0.000
2042	0.085	0.000
2043	0.041	0.000
2044	0.056	0.000
2045	0.038	0.000
2046	0.044	0.000
2047	0.033	0.000
2048	0.042	0.000
2049	0.038	0.000
2050	0.027	0.000
2051	0.039	0.000
2052	0.023	0.000
2053	0.040	0.000
2054	0.051	0.000
2055	0.016	0.000
2056	0.018	0.000
2057	0.028	0.000
2058	0.035	0.000
2059	0.062	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.1222	0.0000
2	0.1030	0.0000
3	0.1029	0.0000
4	0.0994	0.0000
5	0.0959	0.0000
6	0.0929	0.0000
7	0.0876	0.0000
8	0.0852	0.0000
9	0.0807	0.0000
10	0.0806	0.0000
11	0.0790	0.0000
12	0.0782	0.0000
13	0.0776	0.0000
14	0.0769	0.0000
15	0.0755	0.0000
16	0.0745	0.0000
17	0.0736	0.0000
18	0.0701	0.0000
19	0.0697	0.0000
20	0.0691	0.0000
21	0.0677	0.0000
22	0.0621	0.0000

23	0.0618	0.0000
24	0.0618	0.0000
25	0.0618	0.0000
26	0.0616	0.0000
27	0.0614	0.0000
28	0.0586	0.0000
29	0.0583	0.0000
30	0.0569	0.0000
31	0.0566	0.0000
32	0.0563	0.0000
33	0.0555	0.0000
34	0.0514	0.0000
35	0.0512	0.0000
36	0.0509	0.0000
37	0.0506	0.0000
38	0.0504	0.0000
39	0.0495	0.0000
40	0.0491	0.0000
41	0.0483	0.0000
42	0.0476	0.0000
43	0.0475	0.0000
44	0.0473	0.0000
45	0.0455	0.0000
46	0.0452	0.0000
47	0.0446	0.0000
48	0.0444	0.0000
49	0.0443	0.0000
50	0.0428	0.0000
51	0.0422	0.0000
52	0.0420	0.0000
53	0.0419	0.0000
54	0.0419	0.0000
55	0.0418	0.0000
56	0.0417	0.0000
57	0.0414	0.0000
58	0.0413	0.0000
59	0.0411	0.0000
60	0.0410	0.0000
61	0.0410	0.0000
62	0.0404	0.0000
63	0.0399	0.0000
64	0.0394	0.0000
65	0.0393	0.0000
66	0.0392	0.0000
67	0.0390	0.0000
68	0.0378	0.0000
69	0.0378	0.0000
70	0.0378	0.0000
71	0.0377	0.0000
72	0.0375	0.0000
73	0.0373	0.0000
74	0.0370	0.0000
75	0.0368	0.0000
76	0.0367	0.0000
77	0.0366	0.0000
78	0.0366	0.0000
79	0.0363	0.0000
80	0.0357	0.0000

81	0.0356	0.0000
82	0.0354	0.0000
83	0.0352	0.0000
84	0.0347	0.0000
85	0.0337	0.0000
86	0.0335	0.0000
87	0.0334	0.0000
88	0.0333	0.0000
89	0.0332	0.0000
90	0.0326	0.0000
91	0.0313	0.0000
92	0.0310	0.0000
93	0.0309	0.0000
94	0.0303	0.0000
95	0.0302	0.0000
96	0.0302	0.0000
97	0.0297	0.0000
98	0.0297	0.0000
99	0.0290	0.0000
100	0.0285	0.0000
101	0.0280	0.0000
102	0.0278	0.0000
103	0.0274	0.0000
104	0.0272	0.0000
105	0.0271	0.0000
106	0.0271	0.0000
107	0.0269	0.0000
108	0.0268	0.0000
109	0.0267	0.0000
110	0.0262	0.0000
111	0.0259	0.0000
112	0.0257	0.0000
113	0.0252	0.0000
114	0.0236	0.0000
115	0.0236	0.0000
116	0.0231	0.0000
117	0.0229	0.0000
118	0.0228	0.0000
119	0.0228	0.0000
120	0.0227	0.0000
121	0.0226	0.0000
122	0.0225	0.0000
123	0.0224	0.0000
124	0.0222	0.0000
125	0.0221	0.0000
126	0.0211	0.0000
127	0.0208	0.0000
128	0.0202	0.0000
129	0.0194	0.0000
130	0.0192	0.0000
131	0.0192	0.0000
132	0.0191	0.0000
133	0.0191	0.0000
134	0.0184	0.0000
135	0.0179	0.0000
136	0.0176	0.0000
137	0.0175	0.0000
138	0.0163	0.0000

139	0.0159	0.0000
140	0.0159	0.0000
141	0.0159	0.0000
142	0.0155	0.0000
143	0.0154	0.0000
144	0.0154	0.0000
145	0.0143	0.0000
146	0.0143	0.0000
147	0.0143	0.0000
148	0.0141	0.0000
149	0.0140	0.0000
150	0.0139	0.0000
151	0.0134	0.0000
152	0.0122	0.0000
153	0.0118	0.0000
154	0.0109	0.0000
155	0.0079	0.0000
156	0.0036	0.0000
157	0.0030	0.0000
158	0.0019	0.0000

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0184	54315	0	0	Pass
0.0190	50210	0	0	Pass
0.0197	46597	0	0	Pass
0.0204	43357	0	0	Pass
0.0211	40276	0	0	Pass
0.0218	37451	0	0	Pass
0.0225	34925	0	0	Pass
0.0232	32553	0	0	Pass
0.0238	30332	0	0	Pass
0.0245	28265	0	0	Pass
0.0252	26432	0	0	Pass
0.0259	24786	0	0	Pass
0.0266	23296	0	0	Pass
0.0273	21922	0	0	Pass
0.0279	20642	0	0	Pass
0.0286	19412	0	0	Pass
0.0293	18288	0	0	Pass
0.0300	17219	0	0	Pass
0.0307	16160	0	0	Pass
0.0314	15141	0	0	Pass
0.0321	14277	0	0	Pass
0.0327	13446	0	0	Pass
0.0334	12665	0	0	Pass
0.0341	11933	0	0	Pass
0.0348	11246	0	0	Pass
0.0355	10559	0	0	Pass
0.0362	9978	0	0	Pass
0.0369	9374	0	0	Pass
0.0375	8847	0	0	Pass
0.0382	8332	0	0	Pass
0.0389	7861	0	0	Pass
0.0396	7457	0	0	Pass
0.0403	7030	0	0	Pass
0.0410	6609	0	0	Pass
0.0416	6277	0	0	Pass
0.0423	5978	0	0	Pass
0.0430	5701	0	0	Pass
0.0437	5437	0	0	Pass
0.0444	5198	0	0	Pass
0.0451	4942	0	0	Pass
0.0458	4706	0	0	Pass
0.0464	4511	0	0	Pass
0.0471	4338	0	0	Pass
0.0478	4155	0	0	Pass
0.0485	3958	0	0	Pass
0.0492	3764	0	0	Pass
0.0499	3581	0	0	Pass
0.0506	3412	0	0	Pass
0.0512	3265	0	0	Pass
0.0519	3134	0	0	Pass
0.0526	3027	0	0	Pass
0.0533	2926	0	0	Pass
0.0540	2813	0	0	Pass

0.0547	2682	0	0	Pass
0.0554	2555	0	0	Pass
0.0560	2451	0	0	Pass
0.0567	2358	0	0	Pass
0.0574	2256	0	0	Pass
0.0581	2139	0	0	Pass
0.0588	2038	0	0	Pass
0.0595	1952	0	0	Pass
0.0601	1860	0	0	Pass
0.0608	1777	0	0	Pass
0.0615	1689	0	0	Pass
0.0622	1618	0	0	Pass
0.0629	1561	0	0	Pass
0.0636	1482	0	0	Pass
0.0643	1407	0	0	Pass
0.0649	1338	0	0	Pass
0.0656	1270	0	0	Pass
0.0663	1217	0	0	Pass
0.0670	1163	0	0	Pass
0.0677	1103	0	0	Pass
0.0684	1055	0	0	Pass
0.0691	1005	0	0	Pass
0.0697	964	0	0	Pass
0.0704	919	0	0	Pass
0.0711	872	0	0	Pass
0.0718	814	0	0	Pass
0.0725	774	0	0	Pass
0.0732	737	0	0	Pass
0.0738	694	0	0	Pass
0.0745	636	0	0	Pass
0.0752	601	0	0	Pass
0.0759	553	0	0	Pass
0.0766	517	0	0	Pass
0.0773	478	0	0	Pass
0.0780	434	0	0	Pass
0.0786	394	0	0	Pass
0.0793	363	0	0	Pass
0.0800	339	0	0	Pass
0.0807	310	0	0	Pass
0.0814	295	0	0	Pass
0.0821	273	0	0	Pass
0.0828	252	0	0	Pass
0.0834	237	0	0	Pass
0.0841	223	0	0	Pass
0.0848	206	0	0	Pass
0.0855	194	0	0	Pass
0.0862	179	0	0	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	512.16			☐	100.00			
Total Volume Infiltrated		512.16	0.00	0.00		100.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

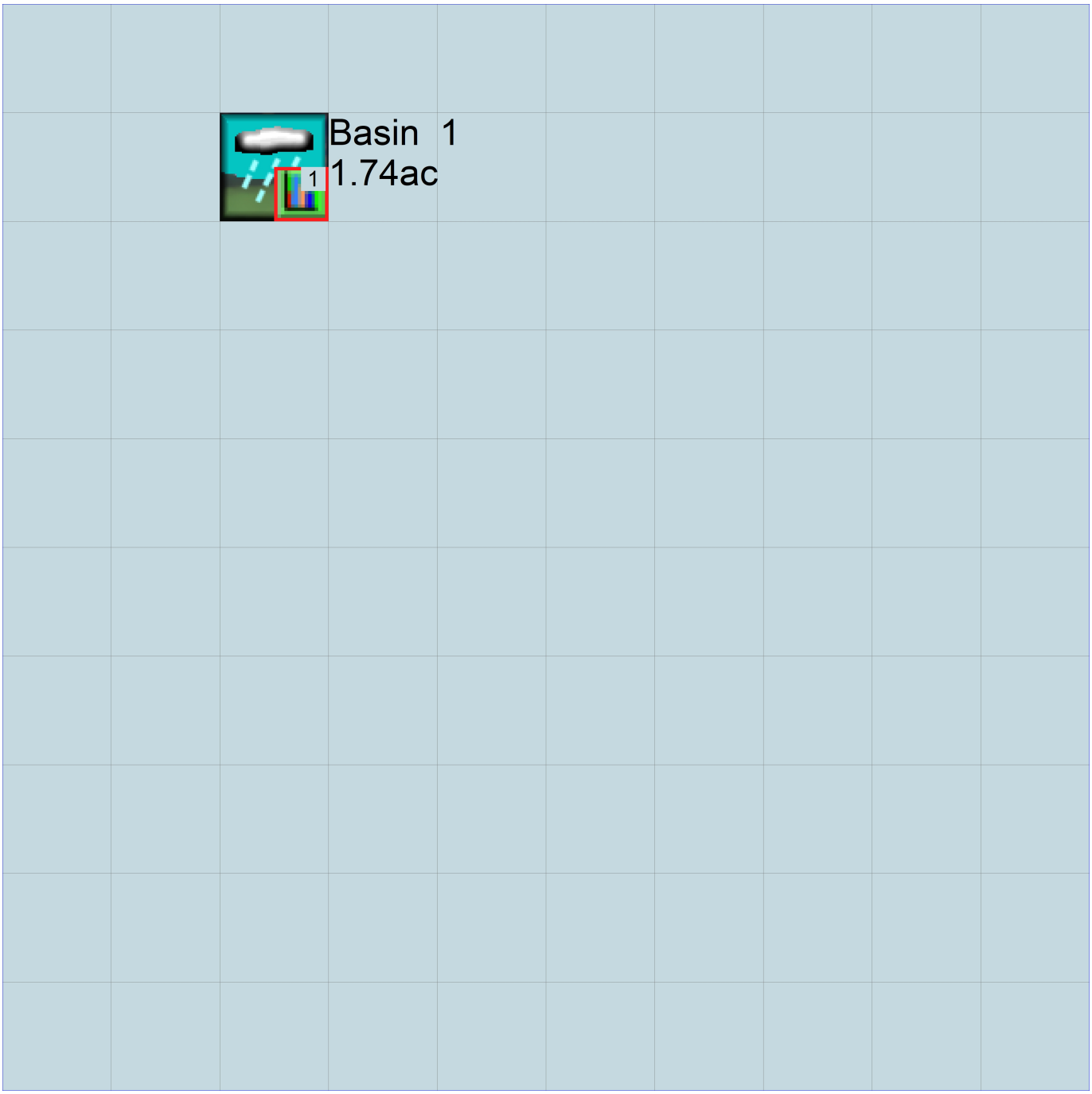
PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin P-3.wdm
MESSU       25   PreBasin P-3.MES
            27   PreBasin P-3.L61
            28   PreBasin P-3.L62
            30   POCBasin P-31.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                     1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                       1.742     COPY   501     12
PERLND  10                       1.742     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><--->
```

```
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin P-3.wdm
MESSU       25   MitBasin P-3.MES
            27   MitBasin P-3.L61
            28   MitBasin P-3.L62
            30   POCBasin P-31.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       7
      IMPLND       1
      IMPLND       8
      IMPLND      14
      RCHRES       1
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Trapezoidal Pond  1         MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
    7     A/B, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    7         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
```

```
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
    7         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    7         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    7              0         5       0.8       400      0.05       0.3     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    7              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                 ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    7          0.1       0.5      0.25         0       0.7      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
    7              0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                   in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
   14      POND                   1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    8         0    0    1    0    0    0
   14         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
   14         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    8         0    0    0    0    0
   14         0    0    0    0    0
```

```
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >       IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
   14            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >       IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    8              0         0
   14              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    8              0         0
   14              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND   7                      0.344     RCHRES   1      2
PERLND   7                      0.344     RCHRES   1      3
IMPLND   1                      0.918     RCHRES   1      5
IMPLND   8                      0.425     RCHRES   1      5
IMPLND  14                      0.055     RCHRES   1      5

******Routing******
PERLND   7                      0.344     COPY     1     12
IMPLND   1                      0.918     COPY     1     15
IMPLND   8                      0.425     COPY     1     15
IMPLND  14                      0.055     COPY     1     15
PERLND   7                      0.344     COPY     1     13
RCHRES   1                          1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG             ***
                                        in  out                             ***
    1     Trapezoidal Pond-005    2    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
```

```
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                    ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
    1        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1              1      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                       ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.012960  0.000000  0.000000  0.000000
  0.077778  0.013474  0.001028  0.000000  0.130683
  0.155556  0.013998  0.002096  0.000000  0.130683
  0.233333  0.014533  0.003206  0.000000  0.130683
  0.311111  0.015077  0.004357  0.000000  0.130683
  0.388889  0.015631  0.005552  0.000000  0.130683
  0.466667  0.016195  0.006789  0.000000  0.130683
  0.544444  0.016769  0.008071  0.000000  0.130683
  0.622222  0.017353  0.009398  0.000000  0.130683
  0.700000  0.017947  0.010771  0.000000  0.130683
  0.777778  0.018551  0.012190  0.000000  0.130683
  0.855556  0.019165  0.013657  0.000000  0.130683
  0.933333  0.019789  0.015172  0.000000  0.130683
  1.011111  0.020423  0.016736  0.000000  0.130683
  1.088889  0.021067  0.018349  0.000000  0.130683
  1.166667  0.021722  0.020013  0.000000  0.130683
  1.244444  0.022386  0.021729  0.000000  0.130683
  1.322222  0.023060  0.023496  0.000000  0.130683
  1.400000  0.023744  0.025316  0.000000  0.130683
  1.477778  0.024438  0.027190  0.000000  0.130683
  1.555556  0.025142  0.029118  0.000000  0.130683
  1.633333  0.025856  0.031101  0.000000  0.130683
  1.711111  0.026580  0.033140  0.000000  0.130683
  1.788889  0.027314  0.035236  0.000000  0.130683
  1.866667  0.028058  0.037390  0.000000  0.130683
  1.944444  0.028812  0.039601  0.000000  0.130683
  2.022222  0.029576  0.041872  0.000000  0.130683
  2.100000  0.030350  0.044202  0.000000  0.130683
  2.177778  0.031135  0.046593  0.000000  0.130683
  2.255556  0.031929  0.049046  0.000000  0.130683
  2.333333  0.032733  0.051561  0.000000  0.130683
  2.411111  0.033547  0.054138  0.000000  0.130683
```

```
  2.488889  0.034371  0.056779  0.000000  0.130683
  2.566667  0.035205  0.059485  0.000000  0.130683
  2.644444  0.036049  0.062256  0.000000  0.130683
  2.722222  0.036903  0.065093  0.000000  0.130683
  2.800000  0.037767  0.067997  0.000000  0.130683
  2.877778  0.038641  0.070968  0.000000  0.130683
  2.955556  0.039525  0.074008  0.000000  0.130683
  3.033333  0.040419  0.077117  0.000000  0.130683
  3.111111  0.041323  0.080296  0.000000  0.130683
  3.188889  0.042237  0.083545  0.000000  0.130683
  3.266667  0.043161  0.086867  0.000000  0.130683
  3.344444  0.044095  0.090260  0.000000  0.130683
  3.422222  0.045039  0.093726  0.000000  0.130683
  3.500000  0.045994  0.097266  0.000000  0.130683
  3.577778  0.046958  0.100881  0.000000  0.130683
  3.655556  0.047932  0.104571  0.000000  0.130683
  3.733333  0.048916  0.108338  0.000000  0.130683
  3.811111  0.049910  0.112181  0.000000  0.130683
  3.888889  0.050914  0.116102  0.000000  0.130683
  3.966667  0.051928  0.120101  0.000000  0.130683
  4.044444  0.052952  0.124180  0.000000  0.130683
  4.122222  0.053986  0.128338  0.000000  0.130683
  4.200000  0.055030  0.132578  0.000000  0.130683
  4.277778  0.056084  0.136899  0.000000  0.130683
  4.355556  0.057148  0.141302  0.000000  0.130683
  4.433333  0.058222  0.145789  0.000000  0.130683
  4.511111  0.059306  0.150360  0.000000  0.130683
  4.588889  0.060400  0.155015  0.000000  0.130683
  4.666667  0.061504  0.159756  0.000000  0.130683
  4.744444  0.062618  0.164583  0.000000  0.130683
  4.822222  0.063742  0.169497  0.000000  0.130683
  4.900000  0.064876  0.174498  0.000000  0.130683
  4.977778  0.066020  0.179589  0.000000  0.130683
  5.055556  0.067174  0.184769  0.000000  0.130683
  5.133333  0.068338  0.190039  0.000000  0.130683
  5.211111  0.069512  0.195399  0.000000  0.130683
  5.288889  0.070696  0.200852  0.000000  0.130683
  5.366667  0.071890  0.206397  0.000000  0.130683
  5.444444  0.073094  0.212035  0.000000  0.130683
  5.522222  0.074308  0.217768  0.000000  0.130683
  5.600000  0.075533  0.223595  0.000000  0.130683
  5.677778  0.076767  0.229518  0.000000  0.130683
  5.755556  0.078011  0.235537  0.000000  0.130683
  5.833333  0.079265  0.241653  0.000000  0.130683
  5.911111  0.080529  0.247867  0.000000  0.130683
  5.988889  0.081803  0.254180  0.000000  0.130683
  6.066667  0.083087  0.260592  0.182234  0.130683
  6.144444  0.084381  0.267105  0.572643  0.130683
  6.222222  0.085685  0.273719  1.046030  0.130683
  6.300000  0.086999  0.280434  1.509672  0.130683
  6.377778  0.088323  0.287252  1.879270  0.130683
  6.455556  0.089657  0.294174  2.114227  0.130683
  6.533333  0.091001  0.301199  2.300165  0.130683
  6.611111  0.092355  0.308330  2.462179  0.130683
  6.688889  0.093719  0.315566  2.614172  0.130683
  6.766667  0.095093  0.322908  2.757800  0.130683
  6.844444  0.096477  0.330358  2.894310  0.130683
  6.922222  0.097871  0.337916  3.024665  0.130683
  7.000000  0.099275  0.345583  3.149630  0.130683
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1             PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1             IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1             PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1             IMPLND   1 999 EXTNL  PETINP
```

```
END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   1 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1001 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      2 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1003 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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WWHM2012

PROJECT REPORT

Pond P-4

General Model Information

Project Name:	Basin P-4
Site Name:	
Site Address:	
City:	
Report Date:	8/10/2022
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	0.806
Pervious Total	0.806
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.806

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	0.159
Pervious Total	0.159

Impervious Land Use	acre
ROADS FLAT	0.44
SIDEWALKS FLAT	0.181
POND	0.026
Impervious Total	0.647
Basin Total	0.806

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length:	13.42 ft.	
Bottom Width:	13.42 ft.	
Depth:	7 ft.	
Volume at riser head:	0.1546 acre-feet.	
Infiltration On		
Infiltration rate:	10	
Infiltration safety factor:	1	
Total Volume Infiltrated (ac-ft.):		260.36
Total Volume Through Riser (ac-ft.):		0
Total Volume Through Facility (ac-ft.):		260.36
Percent Infiltrated:		100
Total Precip Applied to Facility:		0
Total Evap From Facility:		0
Side slope 1:	3 To 1	
Side slope 2:	3 To 1	
Side slope 3:	3 To 1	
Side slope 4:	3 To 1	
Discharge Structure		
Riser Height:	6 ft.	
Riser Diameter:	12 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Pond Hydraulic Table

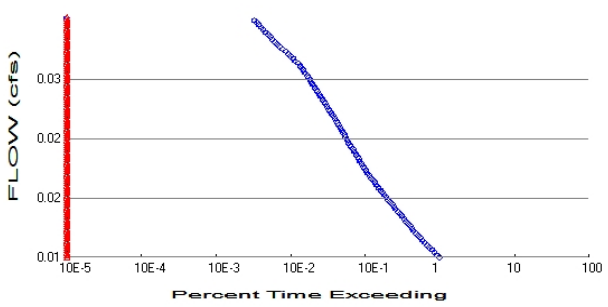
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.004	0.000	0.000	0.000
0.0778	0.004	0.000	0.000	0.041
0.1556	0.004	0.000	0.000	0.041
0.2333	0.005	0.001	0.000	0.041
0.3111	0.005	0.001	0.000	0.041
0.3889	0.005	0.001	0.000	0.041
0.4667	0.006	0.002	0.000	0.041
0.5444	0.006	0.002	0.000	0.041
0.6222	0.006	0.003	0.000	0.041
0.7000	0.007	0.003	0.000	0.041
0.7778	0.007	0.004	0.000	0.041
0.8556	0.007	0.005	0.000	0.041
0.9333	0.008	0.005	0.000	0.041
1.0111	0.008	0.006	0.000	0.041
1.0889	0.009	0.007	0.000	0.041
1.1667	0.009	0.007	0.000	0.041
1.2444	0.010	0.008	0.000	0.041
1.3222	0.010	0.009	0.000	0.041
1.4000	0.010	0.010	0.000	0.041
1.4778	0.011	0.011	0.000	0.041
1.5556	0.011	0.011	0.000	0.041
1.6333	0.012	0.012	0.000	0.041
1.7111	0.012	0.013	0.000	0.041
1.7889	0.013	0.014	0.000	0.041
1.8667	0.013	0.015	0.000	0.041
1.9444	0.014	0.017	0.000	0.041
2.0222	0.015	0.018	0.000	0.041

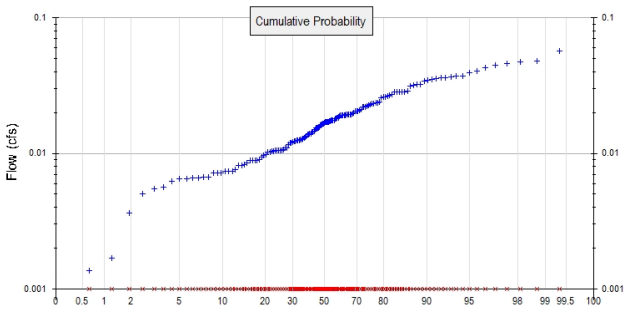
2.1000	0.015	0.019	0.000	0.041
2.1778	0.016	0.020	0.000	0.041
2.2556	0.016	0.021	0.000	0.041
2.3333	0.017	0.023	0.000	0.041
2.4111	0.017	0.024	0.000	0.041
2.4889	0.018	0.026	0.000	0.041
2.5667	0.019	0.027	0.000	0.041
2.6444	0.019	0.029	0.000	0.041
2.7222	0.020	0.030	0.000	0.041
2.8000	0.021	0.032	0.000	0.041
2.8778	0.021	0.033	0.000	0.041
2.9556	0.022	0.035	0.000	0.041
3.0333	0.022	0.037	0.000	0.041
3.1111	0.023	0.039	0.000	0.041
3.1889	0.024	0.040	0.000	0.041
3.2667	0.025	0.042	0.000	0.041
3.3444	0.025	0.044	0.000	0.041
3.4222	0.026	0.046	0.000	0.041
3.5000	0.027	0.048	0.000	0.041
3.5778	0.027	0.051	0.000	0.041
3.6556	0.028	0.053	0.000	0.041
3.7333	0.029	0.055	0.000	0.041
3.8111	0.030	0.057	0.000	0.041
3.8889	0.031	0.060	0.000	0.041
3.9667	0.031	0.062	0.000	0.041
4.0444	0.032	0.065	0.000	0.041
4.1222	0.033	0.067	0.000	0.041
4.2000	0.034	0.070	0.000	0.041
4.2778	0.035	0.073	0.000	0.041
4.3556	0.035	0.075	0.000	0.041
4.4333	0.036	0.078	0.000	0.041
4.5111	0.037	0.081	0.000	0.041
4.5889	0.038	0.084	0.000	0.041
4.6667	0.039	0.087	0.000	0.041
4.7444	0.040	0.090	0.000	0.041
4.8222	0.041	0.093	0.000	0.041
4.9000	0.042	0.097	0.000	0.041
4.9778	0.043	0.100	0.000	0.041
5.0556	0.043	0.103	0.000	0.041
5.1333	0.044	0.107	0.000	0.041
5.2111	0.045	0.110	0.000	0.041
5.2889	0.046	0.114	0.000	0.041
5.3667	0.047	0.118	0.000	0.041
5.4444	0.048	0.121	0.000	0.041
5.5222	0.049	0.125	0.000	0.041
5.6000	0.050	0.129	0.000	0.041
5.6778	0.051	0.133	0.000	0.041
5.7556	0.052	0.137	0.000	0.041
5.8333	0.053	0.141	0.000	0.041
5.9111	0.054	0.145	0.000	0.041
5.9889	0.055	0.150	0.000	0.041
6.0667	0.057	0.154	0.182	0.041
6.1444	0.058	0.159	0.572	0.041
6.2222	0.059	0.163	1.046	0.041
6.3000	0.060	0.168	1.509	0.041
6.3778	0.061	0.173	1.879	0.041
6.4556	0.062	0.177	2.114	0.041
6.5333	0.063	0.182	2.300	0.041

6.6111	0.064	0.187	2.462	0.041
6.6889	0.065	0.192	2.614	0.041
6.7667	0.067	0.198	2.757	0.041
6.8444	0.068	0.203	2.894	0.041
6.9222	0.069	0.208	3.024	0.041
7.0000	0.070	0.214	3.149	0.041
7.0778	0.071	0.219	3.269	0.041

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.806
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.159
Total Impervious Area: 0.647

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.016985
5 year	0.026423
10 year	0.031552
25 year	0.036772
50 year	0.039874
100 year	0.042425

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.012	0.000
1903	0.010	0.000
1904	0.017	0.000
1905	0.008	0.000
1906	0.004	0.000
1907	0.026	0.000
1908	0.019	0.000
1909	0.019	0.000
1910	0.026	0.000
1911	0.017	0.000

1912	0.057	0.000
1913	0.027	0.000
1914	0.007	0.000
1915	0.011	0.000
1916	0.017	0.000
1917	0.006	0.000
1918	0.018	0.000
1919	0.013	0.000
1920	0.017	0.000
1921	0.019	0.000
1922	0.019	0.000
1923	0.016	0.000
1924	0.007	0.000
1925	0.009	0.000
1926	0.016	0.000
1927	0.011	0.000
1928	0.013	0.000
1929	0.027	0.000
1930	0.017	0.000
1931	0.016	0.000
1932	0.013	0.000
1933	0.012	0.000
1934	0.036	0.000
1935	0.017	0.000
1936	0.014	0.000
1937	0.023	0.000
1938	0.014	0.000
1939	0.001	0.000
1940	0.015	0.000
1941	0.007	0.000
1942	0.023	0.000
1943	0.012	0.000
1944	0.022	0.000
1945	0.019	0.000
1946	0.010	0.000
1947	0.007	0.000
1948	0.037	0.000
1949	0.031	0.000
1950	0.009	0.000
1951	0.011	0.000
1952	0.048	0.000
1953	0.043	0.000
1954	0.016	0.000
1955	0.013	0.000
1956	0.006	0.000
1957	0.022	0.000
1958	0.046	0.000
1959	0.028	0.000
1960	0.008	0.000
1961	0.029	0.000
1962	0.015	0.000
1963	0.007	0.000
1964	0.008	0.000
1965	0.032	0.000
1966	0.009	0.000
1967	0.014	0.000
1968	0.014	0.000
1969	0.014	0.000

1970	0.022	0.000
1971	0.034	0.000
1972	0.022	0.000
1973	0.029	0.000
1974	0.015	0.000
1975	0.036	0.000
1976	0.019	0.000
1977	0.006	0.000
1978	0.032	0.000
1979	0.009	0.000
1980	0.018	0.000
1981	0.017	0.000
1982	0.007	0.000
1983	0.029	0.000
1984	0.012	0.000
1985	0.019	0.000
1986	0.017	0.000
1987	0.032	0.000
1988	0.021	0.000
1989	0.018	0.000
1990	0.021	0.000
1991	0.016	0.000
1992	0.023	0.000
1993	0.023	0.000
1994	0.034	0.000
1995	0.007	0.000
1996	0.037	0.000
1997	0.014	0.000
1998	0.017	0.000
1999	0.001	0.000
2000	0.013	0.000
2001	0.007	0.000
2002	0.024	0.000
2003	0.021	0.000
2004	0.019	0.000
2005	0.035	0.000
2006	0.011	0.000
2007	0.011	0.000
2008	0.018	0.000
2009	0.012	0.000
2010	0.011	0.000
2011	0.009	0.000
2012	0.012	0.000
2013	0.010	0.000
2014	0.007	0.000
2015	0.014	0.000
2016	0.005	0.000
2017	0.026	0.000
2018	0.048	0.000
2019	0.044	0.000
2020	0.014	0.000
2021	0.024	0.000
2022	0.010	0.000
2023	0.020	0.000
2024	0.037	0.000
2025	0.018	0.000
2026	0.029	0.000
2027	0.010	0.000

2028	0.009	0.000
2029	0.019	0.000
2030	0.036	0.000
2031	0.012	0.000
2032	0.006	0.000
2033	0.010	0.000
2034	0.010	0.000
2035	0.041	0.000
2036	0.021	0.000
2037	0.005	0.000
2038	0.017	0.000
2039	0.002	0.000
2040	0.009	0.000
2041	0.013	0.000
2042	0.039	0.000
2043	0.019	0.000
2044	0.026	0.000
2045	0.017	0.000
2046	0.020	0.000
2047	0.015	0.000
2048	0.020	0.000
2049	0.017	0.000
2050	0.013	0.000
2051	0.018	0.000
2052	0.010	0.000
2053	0.019	0.000
2054	0.024	0.000
2055	0.007	0.000
2056	0.008	0.000
2057	0.013	0.000
2058	0.016	0.000
2059	0.029	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.0565	0.0000
2	0.0476	0.0000
3	0.0476	0.0000
4	0.0460	0.0000
5	0.0444	0.0000
6	0.0430	0.0000
7	0.0405	0.0000
8	0.0394	0.0000
9	0.0373	0.0000
10	0.0373	0.0000
11	0.0365	0.0000
12	0.0362	0.0000
13	0.0359	0.0000
14	0.0356	0.0000
15	0.0349	0.0000
16	0.0345	0.0000
17	0.0341	0.0000
18	0.0324	0.0000
19	0.0322	0.0000
20	0.0320	0.0000
21	0.0313	0.0000
22	0.0287	0.0000

23	0.0286	0.0000
24	0.0286	0.0000
25	0.0286	0.0000
26	0.0285	0.0000
27	0.0284	0.0000
28	0.0271	0.0000
29	0.0270	0.0000
30	0.0263	0.0000
31	0.0262	0.0000
32	0.0261	0.0000
33	0.0257	0.0000
34	0.0238	0.0000
35	0.0237	0.0000
36	0.0236	0.0000
37	0.0234	0.0000
38	0.0233	0.0000
39	0.0229	0.0000
40	0.0227	0.0000
41	0.0224	0.0000
42	0.0220	0.0000
43	0.0220	0.0000
44	0.0219	0.0000
45	0.0210	0.0000
46	0.0209	0.0000
47	0.0206	0.0000
48	0.0206	0.0000
49	0.0205	0.0000
50	0.0198	0.0000
51	0.0195	0.0000
52	0.0194	0.0000
53	0.0194	0.0000
54	0.0194	0.0000
55	0.0193	0.0000
56	0.0193	0.0000
57	0.0192	0.0000
58	0.0191	0.0000
59	0.0190	0.0000
60	0.0190	0.0000
61	0.0190	0.0000
62	0.0187	0.0000
63	0.0185	0.0000
64	0.0183	0.0000
65	0.0182	0.0000
66	0.0181	0.0000
67	0.0180	0.0000
68	0.0175	0.0000
69	0.0175	0.0000
70	0.0175	0.0000
71	0.0174	0.0000
72	0.0173	0.0000
73	0.0173	0.0000
74	0.0171	0.0000
75	0.0170	0.0000
76	0.0170	0.0000
77	0.0170	0.0000
78	0.0169	0.0000
79	0.0168	0.0000
80	0.0165	0.0000

81	0.0164	0.0000
82	0.0164	0.0000
83	0.0163	0.0000
84	0.0160	0.0000
85	0.0156	0.0000
86	0.0155	0.0000
87	0.0155	0.0000
88	0.0154	0.0000
89	0.0153	0.0000
90	0.0151	0.0000
91	0.0145	0.0000
92	0.0144	0.0000
93	0.0143	0.0000
94	0.0140	0.0000
95	0.0140	0.0000
96	0.0140	0.0000
97	0.0138	0.0000
98	0.0137	0.0000
99	0.0134	0.0000
100	0.0132	0.0000
101	0.0130	0.0000
102	0.0129	0.0000
103	0.0127	0.0000
104	0.0126	0.0000
105	0.0126	0.0000
106	0.0125	0.0000
107	0.0125	0.0000
108	0.0124	0.0000
109	0.0123	0.0000
110	0.0121	0.0000
111	0.0120	0.0000
112	0.0119	0.0000
113	0.0116	0.0000
114	0.0109	0.0000
115	0.0109	0.0000
116	0.0107	0.0000
117	0.0106	0.0000
118	0.0106	0.0000
119	0.0105	0.0000
120	0.0105	0.0000
121	0.0105	0.0000
122	0.0104	0.0000
123	0.0104	0.0000
124	0.0103	0.0000
125	0.0102	0.0000
126	0.0098	0.0000
127	0.0096	0.0000
128	0.0093	0.0000
129	0.0090	0.0000
130	0.0089	0.0000
131	0.0089	0.0000
132	0.0088	0.0000
133	0.0088	0.0000
134	0.0085	0.0000
135	0.0083	0.0000
136	0.0082	0.0000
137	0.0081	0.0000
138	0.0076	0.0000

139	0.0074	0.0000
140	0.0074	0.0000
141	0.0074	0.0000
142	0.0072	0.0000
143	0.0071	0.0000
144	0.0071	0.0000
145	0.0066	0.0000
146	0.0066	0.0000
147	0.0066	0.0000
148	0.0065	0.0000
149	0.0065	0.0000
150	0.0065	0.0000
151	0.0062	0.0000
152	0.0057	0.0000
153	0.0055	0.0000
154	0.0050	0.0000
155	0.0036	0.0000
156	0.0017	0.0000
157	0.0014	0.0000
158	0.0009	0.0000

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0085	54282	0	0	Pass
0.0088	50160	0	0	Pass
0.0091	46564	0	0	Pass
0.0094	43312	0	0	Pass
0.0098	40260	0	0	Pass
0.0101	37517	0	0	Pass
0.0104	34941	0	0	Pass
0.0107	32564	0	0	Pass
0.0110	30371	0	0	Pass
0.0113	28299	0	0	Pass
0.0117	26432	0	0	Pass
0.0120	24825	0	0	Pass
0.0123	23313	0	0	Pass
0.0126	21933	0	0	Pass
0.0129	20626	0	0	Pass
0.0132	19440	0	0	Pass
0.0136	18293	0	0	Pass
0.0139	17219	0	0	Pass
0.0142	16177	0	0	Pass
0.0145	15152	0	0	Pass
0.0148	14271	0	0	Pass
0.0151	13462	0	0	Pass
0.0155	12676	0	0	Pass
0.0158	11944	0	0	Pass
0.0161	11235	0	0	Pass
0.0164	10582	0	0	Pass
0.0167	9978	0	0	Pass
0.0171	9374	0	0	Pass
0.0174	8859	0	0	Pass
0.0177	8332	0	0	Pass
0.0180	7856	0	0	Pass
0.0183	7468	0	0	Pass
0.0186	7036	0	0	Pass
0.0190	6615	0	0	Pass
0.0193	6277	0	0	Pass
0.0196	5983	0	0	Pass
0.0199	5701	0	0	Pass
0.0202	5437	0	0	Pass
0.0205	5200	0	0	Pass
0.0209	4945	0	0	Pass
0.0212	4703	0	0	Pass
0.0215	4515	0	0	Pass
0.0218	4339	0	0	Pass
0.0221	4158	0	0	Pass
0.0224	3958	0	0	Pass
0.0228	3770	0	0	Pass
0.0231	3581	0	0	Pass
0.0234	3411	0	0	Pass
0.0237	3267	0	0	Pass
0.0240	3134	0	0	Pass
0.0243	3026	0	0	Pass
0.0247	2931	0	0	Pass
0.0250	2815	0	0	Pass

0.0253	2682	0	0	Pass
0.0256	2559	0	0	Pass
0.0259	2454	0	0	Pass
0.0262	2359	0	0	Pass
0.0266	2255	0	0	Pass
0.0269	2143	0	0	Pass
0.0272	2039	0	0	Pass
0.0275	1952	0	0	Pass
0.0278	1862	0	0	Pass
0.0281	1778	0	0	Pass
0.0285	1689	0	0	Pass
0.0288	1619	0	0	Pass
0.0291	1561	0	0	Pass
0.0294	1482	0	0	Pass
0.0297	1407	0	0	Pass
0.0300	1340	0	0	Pass
0.0304	1270	0	0	Pass
0.0307	1217	0	0	Pass
0.0310	1164	0	0	Pass
0.0313	1103	0	0	Pass
0.0316	1055	0	0	Pass
0.0319	1007	0	0	Pass
0.0323	964	0	0	Pass
0.0326	919	0	0	Pass
0.0329	872	0	0	Pass
0.0332	815	0	0	Pass
0.0335	774	0	0	Pass
0.0339	737	0	0	Pass
0.0342	695	0	0	Pass
0.0345	637	0	0	Pass
0.0348	601	0	0	Pass
0.0351	556	0	0	Pass
0.0354	517	0	0	Pass
0.0358	478	0	0	Pass
0.0361	433	0	0	Pass
0.0364	394	0	0	Pass
0.0367	363	0	0	Pass
0.0370	339	0	0	Pass
0.0373	310	0	0	Pass
0.0377	296	0	0	Pass
0.0380	273	0	0	Pass
0.0383	252	0	0	Pass
0.0386	237	0	0	Pass
0.0389	223	0	0	Pass
0.0392	206	0	0	Pass
0.0396	195	0	0	Pass
0.0399	180	0	0	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	236.93			☐	100.00			
Total Volume Infiltrated		236.93	0.00	0.00		100.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

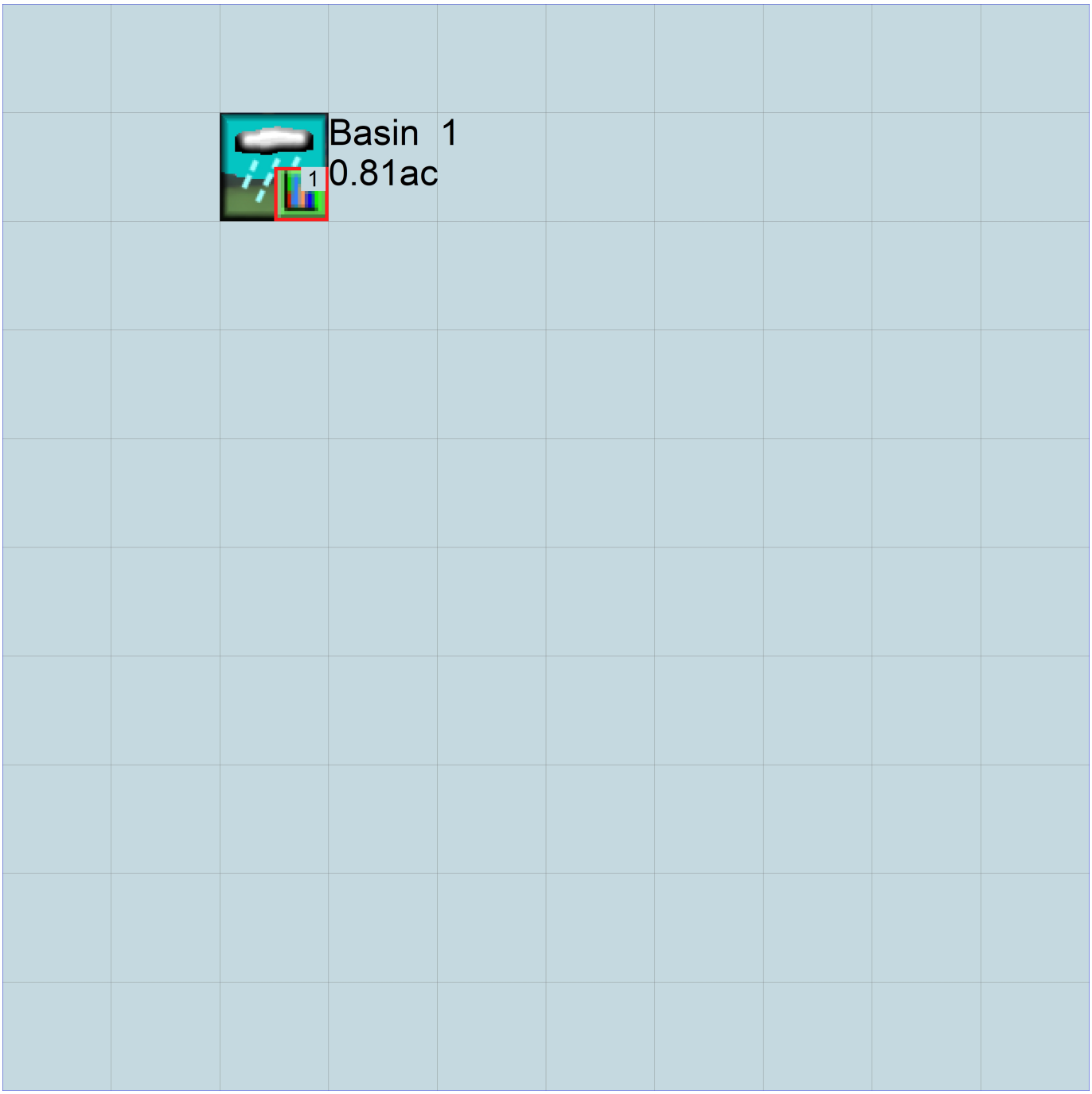
PERLND Changes

No PERLND changes have been made.

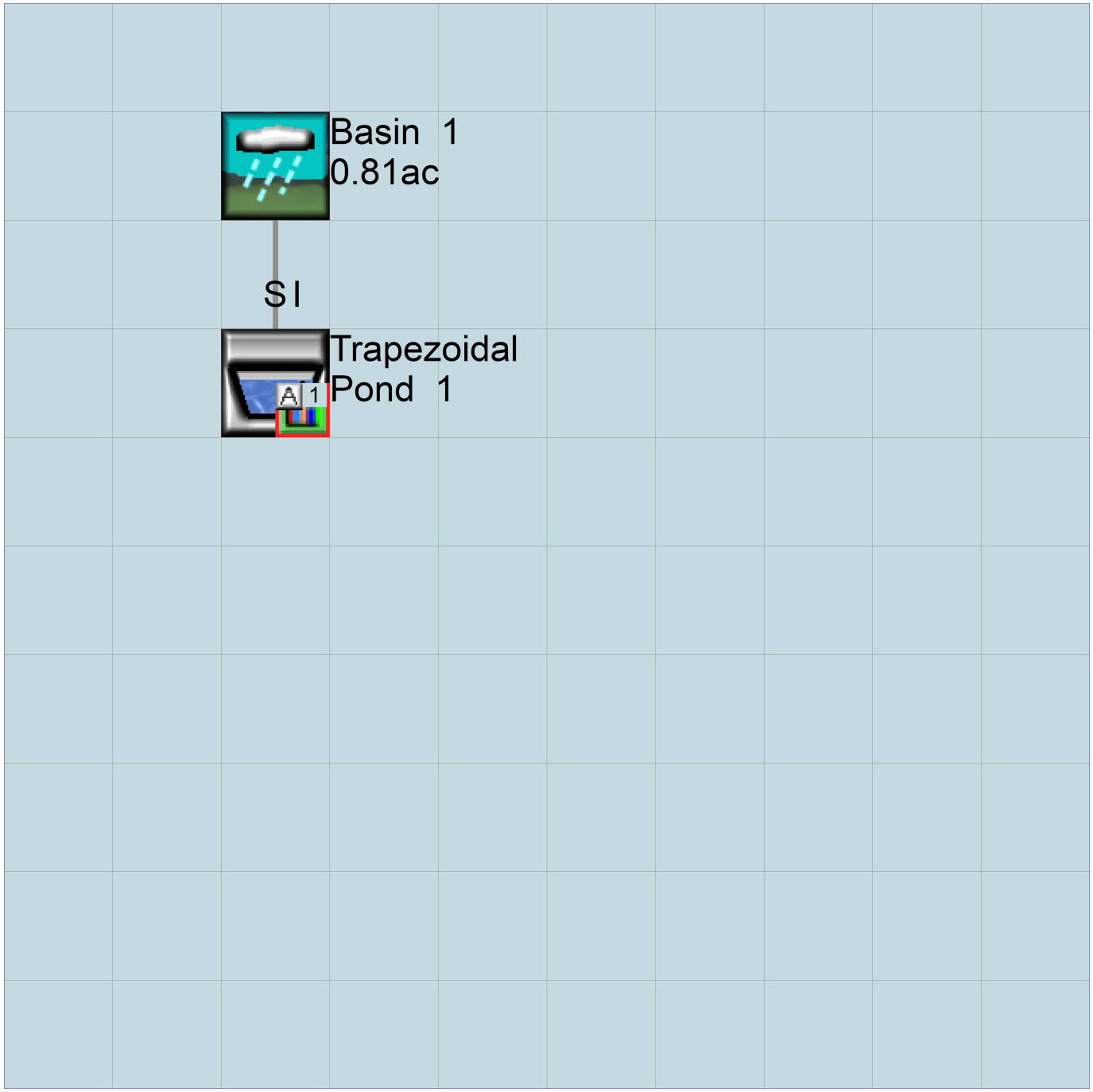
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin P-4.wdm
MESSU       25   PreBasin P-4.MES
            27   PreBasin P-4.L61
            28   PreBasin P-4.L62
            30   POCBasin P-41.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                         User  t-series Engl Metr ***
                                      in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                       0.806     COPY   501     12
PERLND  10                       0.806     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><--->
```

```
WDM      1 EVAP     ENGL    1             PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1             IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin P-4.wdm
MESSU       25   MitBasin P-4.MES
            27   MitBasin P-4.L61
            28   MitBasin P-4.L62
            30   POCBasin P-41.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       7
      IMPLND       1
      IMPLND       8
      IMPLND      14
      RCHRES       1
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Trapezoidal Pond  1         MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
    7     A/B, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    7         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
```

```
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
    7         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    7         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    7              0         5       0.8       400      0.05       0.3     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    7              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                 ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    7          0.1       0.5      0.25         0       0.7      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
    7              0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                   in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
   14      POND                   1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    8         0    0    1    0    0    0
   14         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
   14         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    8         0    0    0    0    0
   14         0    0    0    0    0
```

```
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
   14            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    8              0         0
   14              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    8              0         0
   14              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND   7                      0.159     RCHRES   1      2
PERLND   7                      0.159     RCHRES   1      3
IMPLND   1                       0.44     RCHRES   1      5
IMPLND   8                      0.181     RCHRES   1      5
IMPLND  14                      0.026     RCHRES   1      5

******Routing******
PERLND   7                      0.159     COPY     1     12
IMPLND   1                       0.44     COPY     1     15
IMPLND   8                      0.181     COPY     1     15
IMPLND  14                      0.026     COPY     1     15
PERLND   7                      0.159     COPY     1     13
RCHRES   1                          1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG            ***
                                        in  out                             ***
    1     Trapezoidal Pond-005    2    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
```

```
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                    ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
    1        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1               1      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                       ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.004133  0.000000  0.000000  0.000000
  0.077778  0.004426  0.000333  0.000000  0.041675
  0.155556  0.004728  0.000689  0.000000  0.041675
  0.233333  0.005041  0.001069  0.000000  0.041675
  0.311111  0.005363  0.001473  0.000000  0.041675
  0.388889  0.005696  0.001903  0.000000  0.041675
  0.466667  0.006038  0.002360  0.000000  0.041675
  0.544444  0.006391  0.002843  0.000000  0.041675
  0.622222  0.006753  0.003354  0.000000  0.041675
  0.700000  0.007126  0.003894  0.000000  0.041675
  0.777778  0.007508  0.004463  0.000000  0.041675
  0.855556  0.007900  0.005062  0.000000  0.041675
  0.933333  0.008303  0.005692  0.000000  0.041675
  1.011111  0.008715  0.006354  0.000000  0.041675
  1.088889  0.009138  0.007048  0.000000  0.041675
  1.166667  0.009570  0.007776  0.000000  0.041675
  1.244444  0.010013  0.008538  0.000000  0.041675
  1.322222  0.010465  0.009334  0.000000  0.041675
  1.400000  0.010928  0.010166  0.000000  0.041675
  1.477778  0.011400  0.011034  0.000000  0.041675
  1.555556  0.011883  0.011940  0.000000  0.041675
  1.633333  0.012375  0.012883  0.000000  0.041675
  1.711111  0.012878  0.013865  0.000000  0.041675
  1.788889  0.013390  0.014887  0.000000  0.041675
  1.866667  0.013913  0.015948  0.000000  0.041675
  1.944444  0.014445  0.017051  0.000000  0.041675
  2.022222  0.014988  0.018196  0.000000  0.041675
  2.100000  0.015540  0.019383  0.000000  0.041675
  2.177778  0.016103  0.020614  0.000000  0.041675
  2.255556  0.016675  0.021888  0.000000  0.041675
  2.333333  0.017258  0.023208  0.000000  0.041675
  2.411111  0.017850  0.024573  0.000000  0.041675
```

```
  2.488889  0.018452  0.025985  0.000000  0.041675
  2.566667  0.019065  0.027444  0.000000  0.041675
  2.644444  0.019687  0.028951  0.000000  0.041675
  2.722222  0.020320  0.030507  0.000000  0.041675
  2.800000  0.020962  0.032112  0.000000  0.041675
  2.877778  0.021615  0.033768  0.000000  0.041675
  2.955556  0.022277  0.035475  0.000000  0.041675
  3.033333  0.022950  0.037234  0.000000  0.041675
  3.111111  0.023632  0.039045  0.000000  0.041675
  3.188889  0.024325  0.040910  0.000000  0.041675
  3.266667  0.025027  0.042829  0.000000  0.041675
  3.344444  0.025739  0.044804  0.000000  0.041675
  3.422222  0.026462  0.046834  0.000000  0.041675
  3.500000  0.027194  0.048920  0.000000  0.041675
  3.577778  0.027937  0.051064  0.000000  0.041675
  3.655556  0.028689  0.053266  0.000000  0.041675
  3.733333  0.029452  0.055528  0.000000  0.041675
  3.811111  0.030224  0.057848  0.000000  0.041675
  3.888889  0.031007  0.060229  0.000000  0.041675
  3.966667  0.031799  0.062672  0.000000  0.041675
  4.044444  0.032601  0.065176  0.000000  0.041675
  4.122222  0.033414  0.067744  0.000000  0.041675
  4.200000  0.034236  0.070374  0.000000  0.041675
  4.277778  0.035069  0.073070  0.000000  0.041675
  4.355556  0.035911  0.075830  0.000000  0.041675
  4.433333  0.036764  0.078656  0.000000  0.041675
  4.511111  0.037626  0.081549  0.000000  0.041675
  4.588889  0.038499  0.084510  0.000000  0.041675
  4.666667  0.039381  0.087538  0.000000  0.041675
  4.744444  0.040273  0.090636  0.000000  0.041675
  4.822222  0.041176  0.093803  0.000000  0.041675
  4.900000  0.042088  0.097041  0.000000  0.041675
  4.977778  0.043011  0.100351  0.000000  0.041675
  5.055556  0.043943  0.103732  0.000000  0.041675
  5.133333  0.044886  0.107187  0.000000  0.041675
  5.211111  0.045838  0.110715  0.000000  0.041675
  5.288889  0.046800  0.114318  0.000000  0.041675
  5.366667  0.047773  0.117995  0.000000  0.041675
  5.444444  0.048755  0.121749  0.000000  0.041675
  5.522222  0.049748  0.125580  0.000000  0.041675
  5.600000  0.050750  0.129488  0.000000  0.041675
  5.677778  0.051763  0.133475  0.000000  0.041675
  5.755556  0.052785  0.137541  0.000000  0.041675
  5.833333  0.053817  0.141686  0.000000  0.041675
  5.911111  0.054860  0.145913  0.000000  0.041675
  5.988889  0.055912  0.150220  0.000000  0.041675
  6.066667  0.056975  0.154610  0.182234  0.041675
  6.144444  0.058047  0.159083  0.572643  0.041675
  6.222222  0.059129  0.163640  1.046030  0.041675
  6.300000  0.060222  0.168282  1.509672  0.041675
  6.377778  0.061324  0.173009  1.879270  0.041675
  6.455556  0.062437  0.177822  2.114227  0.041675
  6.533333  0.063559  0.182721  2.300165  0.041675
  6.611111  0.064692  0.187709  2.462179  0.041675
  6.688889  0.065834  0.192785  2.614172  0.041675
  6.766667  0.066986  0.197950  2.757800  0.041675
  6.844444  0.068149  0.203205  2.894310  0.041675
  6.922222  0.069321  0.208551  3.024665  0.041675
  7.000000  0.070504  0.213989  3.149630  0.041675
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP
```

```
END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   1 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1001 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      2 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1003 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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WWHM2012

PROJECT REPORT

Pond P-5

General Model Information

Project Name:	Basin P-5
Site Name:	
Site Address:	
City:	
Report Date:	8/10/2022
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	4.471
Pervious Total	4.471
Impervious Land Use	acre
Impervious Total	0
Basin Total	4.471

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	0.882
Pervious Total	0.882

Impervious Land Use	acre
ROADS FLAT	2.499
SIDEWALKS FLAT	0.948
POND	0.142
Impervious Total	3.589
Basin Total	4.471

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length:	42.31 ft.	
Bottom Width:	42.31 ft.	
Depth:	7 ft.	
Volume at riser head:	0.5253 acre-feet.	
Infiltration On		
Infiltration rate:	10	
Infiltration safety factor:	1	
Total Volume Infiltrated (ac-ft.):		1445.247
Total Volume Through Riser (ac-ft.):		0
Total Volume Through Facility (ac-ft.):		1445.247
Percent Infiltrated:		100
Total Precip Applied to Facility:		0
Total Evap From Facility:		0
Side slope 1:	3 To 1	
Side slope 2:	3 To 1	
Side slope 3:	3 To 1	
Side slope 4:	3 To 1	
Discharge Structure		
Riser Height:	6 ft.	
Riser Diameter:	12 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Pond Hydraulic Table

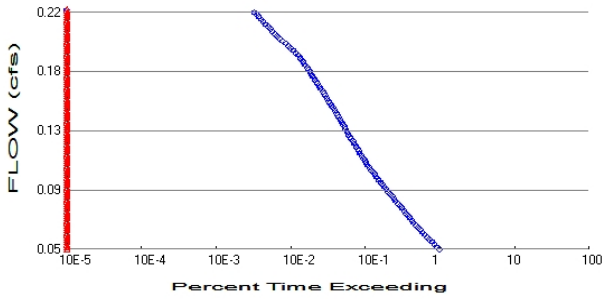
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.041	0.000	0.000	0.000
0.0778	0.042	0.003	0.000	0.414
0.1556	0.042	0.006	0.000	0.414
0.2333	0.043	0.009	0.000	0.414
0.3111	0.044	0.013	0.000	0.414
0.3889	0.045	0.016	0.000	0.414
0.4667	0.046	0.020	0.000	0.414
0.5444	0.047	0.024	0.000	0.414
0.6222	0.048	0.027	0.000	0.414
0.7000	0.049	0.031	0.000	0.414
0.7778	0.050	0.035	0.000	0.414
0.8556	0.051	0.039	0.000	0.414
0.9333	0.052	0.043	0.000	0.414
1.0111	0.053	0.047	0.000	0.414
1.0889	0.054	0.052	0.000	0.414
1.1667	0.055	0.056	0.000	0.414
1.2444	0.056	0.060	0.000	0.414
1.3222	0.057	0.065	0.000	0.414
1.4000	0.059	0.069	0.000	0.414
1.4778	0.060	0.074	0.000	0.414
1.5556	0.061	0.079	0.000	0.414
1.6333	0.062	0.083	0.000	0.414
1.7111	0.063	0.088	0.000	0.414
1.7889	0.064	0.093	0.000	0.414
1.8667	0.065	0.098	0.000	0.414
1.9444	0.066	0.104	0.000	0.414
2.0222	0.068	0.109	0.000	0.414

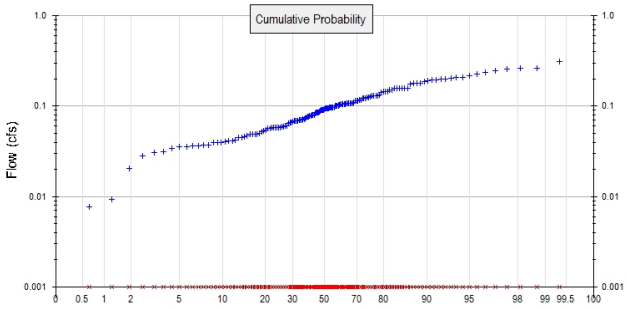
2.1000	0.069	0.114	0.000	0.414
2.1778	0.070	0.120	0.000	0.414
2.2556	0.071	0.125	0.000	0.414
2.3333	0.072	0.131	0.000	0.414
2.4111	0.074	0.136	0.000	0.414
2.4889	0.075	0.142	0.000	0.414
2.5667	0.076	0.148	0.000	0.414
2.6444	0.077	0.154	0.000	0.414
2.7222	0.078	0.160	0.000	0.414
2.8000	0.080	0.166	0.000	0.414
2.8778	0.081	0.173	0.000	0.414
2.9556	0.082	0.179	0.000	0.414
3.0333	0.084	0.186	0.000	0.414
3.1111	0.085	0.192	0.000	0.414
3.1889	0.086	0.199	0.000	0.414
3.2667	0.088	0.206	0.000	0.414
3.3444	0.089	0.212	0.000	0.414
3.4222	0.090	0.219	0.000	0.414
3.5000	0.092	0.227	0.000	0.414
3.5778	0.093	0.234	0.000	0.414
3.6556	0.094	0.241	0.000	0.414
3.7333	0.096	0.249	0.000	0.414
3.8111	0.097	0.256	0.000	0.414
3.8889	0.098	0.264	0.000	0.414
3.9667	0.100	0.271	0.000	0.414
4.0444	0.101	0.279	0.000	0.414
4.1222	0.103	0.287	0.000	0.414
4.2000	0.104	0.295	0.000	0.414
4.2778	0.106	0.304	0.000	0.414
4.3556	0.107	0.312	0.000	0.414
4.4333	0.109	0.320	0.000	0.414
4.5111	0.110	0.329	0.000	0.414
4.5889	0.112	0.337	0.000	0.414
4.6667	0.113	0.346	0.000	0.414
4.7444	0.115	0.355	0.000	0.414
4.8222	0.116	0.364	0.000	0.414
4.9000	0.118	0.373	0.000	0.414
4.9778	0.119	0.382	0.000	0.414
5.0556	0.121	0.392	0.000	0.414
5.1333	0.122	0.401	0.000	0.414
5.2111	0.124	0.411	0.000	0.414
5.2889	0.125	0.421	0.000	0.414
5.3667	0.127	0.431	0.000	0.414
5.4444	0.129	0.440	0.000	0.414
5.5222	0.130	0.451	0.000	0.414
5.6000	0.132	0.461	0.000	0.414
5.6778	0.133	0.471	0.000	0.414
5.7556	0.135	0.482	0.000	0.414
5.8333	0.137	0.492	0.000	0.414
5.9111	0.138	0.503	0.000	0.414
5.9889	0.140	0.514	0.000	0.414
6.0667	0.142	0.525	0.182	0.414
6.1444	0.143	0.536	0.572	0.414
6.2222	0.145	0.547	1.046	0.414
6.3000	0.147	0.559	1.509	0.414
6.3778	0.149	0.570	1.879	0.414
6.4556	0.150	0.582	2.114	0.414
6.5333	0.152	0.594	2.300	0.414

6.6111	0.154	0.606	2.462	0.414
6.6889	0.156	0.618	2.614	0.414
6.7667	0.157	0.630	2.757	0.414
6.8444	0.159	0.642	2.894	0.414
6.9222	0.161	0.655	3.024	0.414
7.0000	0.163	0.667	3.149	0.414
7.0778	0.165	0.680	3.269	0.414

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 4.471
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.882
Total Impervious Area: 3.589

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.094216
5 year	0.146573
10 year	0.175022
25 year	0.203977
50 year	0.221187
100 year	0.235339

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.069	0.000
1903	0.057	0.000
1904	0.094	0.000
1905	0.045	0.000
1906	0.020	0.000
1907	0.145	0.000
1908	0.107	0.000
1909	0.106	0.000
1910	0.146	0.000
1911	0.095	0.000

1912	0.314	0.000
1913	0.150	0.000
1914	0.037	0.000
1915	0.061	0.000
1916	0.094	0.000
1917	0.031	0.000
1918	0.101	0.000
1919	0.074	0.000
1920	0.096	0.000
1921	0.107	0.000
1922	0.107	0.000
1923	0.086	0.000
1924	0.039	0.000
1925	0.049	0.000
1926	0.091	0.000
1927	0.059	0.000
1928	0.073	0.000
1929	0.150	0.000
1930	0.096	0.000
1931	0.089	0.000
1932	0.070	0.000
1933	0.067	0.000
1934	0.197	0.000
1935	0.092	0.000
1936	0.080	0.000
1937	0.127	0.000
1938	0.077	0.000
1939	0.005	0.000
1940	0.086	0.000
1941	0.041	0.000
1942	0.129	0.000
1943	0.067	0.000
1944	0.122	0.000
1945	0.108	0.000
1946	0.058	0.000
1947	0.037	0.000
1948	0.203	0.000
1949	0.174	0.000
1950	0.049	0.000
1951	0.061	0.000
1952	0.264	0.000
1953	0.238	0.000
1954	0.086	0.000
1955	0.070	0.000
1956	0.034	0.000
1957	0.122	0.000
1958	0.255	0.000
1959	0.158	0.000
1960	0.042	0.000
1961	0.159	0.000
1962	0.085	0.000
1963	0.041	0.000
1964	0.045	0.000
1965	0.177	0.000
1966	0.050	0.000
1967	0.076	0.000
1968	0.078	0.000
1969	0.078	0.000

1970	0.122	0.000
1971	0.191	0.000
1972	0.124	0.000
1973	0.158	0.000
1974	0.086	0.000
1975	0.201	0.000
1976	0.106	0.000
1977	0.036	0.000
1978	0.179	0.000
1979	0.049	0.000
1980	0.101	0.000
1981	0.097	0.000
1982	0.040	0.000
1983	0.159	0.000
1984	0.065	0.000
1985	0.105	0.000
1986	0.094	0.000
1987	0.180	0.000
1988	0.114	0.000
1989	0.103	0.000
1990	0.116	0.000
1991	0.091	0.000
1992	0.130	0.000
1993	0.126	0.000
1994	0.189	0.000
1995	0.036	0.000
1996	0.207	0.000
1997	0.079	0.000
1998	0.094	0.000
1999	0.008	0.000
2000	0.072	0.000
2001	0.037	0.000
2002	0.131	0.000
2003	0.114	0.000
2004	0.105	0.000
2005	0.194	0.000
2006	0.059	0.000
2007	0.059	0.000
2008	0.100	0.000
2009	0.069	0.000
2010	0.058	0.000
2011	0.047	0.000
2012	0.069	0.000
2013	0.053	0.000
2014	0.040	0.000
2015	0.076	0.000
2016	0.030	0.000
2017	0.145	0.000
2018	0.264	0.000
2019	0.246	0.000
2020	0.080	0.000
2021	0.131	0.000
2022	0.054	0.000
2023	0.110	0.000
2024	0.207	0.000
2025	0.097	0.000
2026	0.158	0.000
2027	0.057	0.000

2028	0.049	0.000
2029	0.107	0.000
2030	0.199	0.000
2031	0.066	0.000
2032	0.036	0.000
2033	0.058	0.000
2034	0.057	0.000
2035	0.225	0.000
2036	0.117	0.000
2037	0.028	0.000
2038	0.093	0.000
2039	0.009	0.000
2040	0.052	0.000
2041	0.070	0.000
2042	0.219	0.000
2043	0.106	0.000
2044	0.142	0.000
2045	0.097	0.000
2046	0.114	0.000
2047	0.084	0.000
2048	0.108	0.000
2049	0.097	0.000
2050	0.069	0.000
2051	0.101	0.000
2052	0.058	0.000
2053	0.104	0.000
2054	0.132	0.000
2055	0.041	0.000
2056	0.046	0.000
2057	0.071	0.000
2058	0.090	0.000
2059	0.159	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.3136	0.0000
2	0.2643	0.0000
3	0.2640	0.0000
4	0.2550	0.0000
5	0.2463	0.0000
6	0.2384	0.0000
7	0.2248	0.0000
8	0.2186	0.0000
9	0.2071	0.0000
10	0.2068	0.0000
11	0.2027	0.0000
12	0.2008	0.0000
13	0.1992	0.0000
14	0.1973	0.0000
15	0.1937	0.0000
16	0.1913	0.0000
17	0.1889	0.0000
18	0.1799	0.0000
19	0.1788	0.0000
20	0.1774	0.0000
21	0.1737	0.0000
22	0.1594	0.0000

23	0.1586	0.0000
24	0.1585	0.0000
25	0.1585	0.0000
26	0.1581	0.0000
27	0.1577	0.0000
28	0.1503	0.0000
29	0.1496	0.0000
30	0.1460	0.0000
31	0.1452	0.0000
32	0.1446	0.0000
33	0.1425	0.0000
34	0.1320	0.0000
35	0.1314	0.0000
36	0.1307	0.0000
37	0.1299	0.0000
38	0.1293	0.0000
39	0.1271	0.0000
40	0.1260	0.0000
41	0.1241	0.0000
42	0.1221	0.0000
43	0.1218	0.0000
44	0.1215	0.0000
45	0.1167	0.0000
46	0.1160	0.0000
47	0.1144	0.0000
48	0.1140	0.0000
49	0.1136	0.0000
50	0.1100	0.0000
51	0.1083	0.0000
52	0.1077	0.0000
53	0.1075	0.0000
54	0.1074	0.0000
55	0.1072	0.0000
56	0.1071	0.0000
57	0.1063	0.0000
58	0.1059	0.0000
59	0.1056	0.0000
60	0.1052	0.0000
61	0.1051	0.0000
62	0.1038	0.0000
63	0.1025	0.0000
64	0.1012	0.0000
65	0.1009	0.0000
66	0.1007	0.0000
67	0.1001	0.0000
68	0.0971	0.0000
69	0.0970	0.0000
70	0.0969	0.0000
71	0.0968	0.0000
72	0.0962	0.0000
73	0.0958	0.0000
74	0.0951	0.0000
75	0.0945	0.0000
76	0.0943	0.0000
77	0.0941	0.0000
78	0.0940	0.0000
79	0.0931	0.0000
80	0.0916	0.0000

81	0.0912	0.0000
82	0.0909	0.0000
83	0.0903	0.0000
84	0.0890	0.0000
85	0.0864	0.0000
86	0.0860	0.0000
87	0.0858	0.0000
88	0.0856	0.0000
89	0.0851	0.0000
90	0.0837	0.0000
91	0.0803	0.0000
92	0.0796	0.0000
93	0.0794	0.0000
94	0.0778	0.0000
95	0.0776	0.0000
96	0.0775	0.0000
97	0.0763	0.0000
98	0.0762	0.0000
99	0.0744	0.0000
100	0.0730	0.0000
101	0.0719	0.0000
102	0.0713	0.0000
103	0.0703	0.0000
104	0.0698	0.0000
105	0.0696	0.0000
106	0.0695	0.0000
107	0.0691	0.0000
108	0.0687	0.0000
109	0.0685	0.0000
110	0.0672	0.0000
111	0.0665	0.0000
112	0.0658	0.0000
113	0.0646	0.0000
114	0.0606	0.0000
115	0.0605	0.0000
116	0.0592	0.0000
117	0.0588	0.0000
118	0.0586	0.0000
119	0.0585	0.0000
120	0.0582	0.0000
121	0.0580	0.0000
122	0.0576	0.0000
123	0.0575	0.0000
124	0.0570	0.0000
125	0.0567	0.0000
126	0.0541	0.0000
127	0.0535	0.0000
128	0.0517	0.0000
129	0.0497	0.0000
130	0.0494	0.0000
131	0.0492	0.0000
132	0.0490	0.0000
133	0.0490	0.0000
134	0.0472	0.0000
135	0.0459	0.0000
136	0.0452	0.0000
137	0.0449	0.0000
138	0.0419	0.0000

139	0.0409	0.0000
140	0.0409	0.0000
141	0.0408	0.0000
142	0.0398	0.0000
143	0.0396	0.0000
144	0.0395	0.0000
145	0.0368	0.0000
146	0.0368	0.0000
147	0.0367	0.0000
148	0.0363	0.0000
149	0.0358	0.0000
150	0.0358	0.0000
151	0.0345	0.0000
152	0.0314	0.0000
153	0.0304	0.0000
154	0.0279	0.0000
155	0.0202	0.0000
156	0.0093	0.0000
157	0.0076	0.0000
158	0.0048	0.0000

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0471	54298	0	0	Pass
0.0489	50165	0	0	Pass
0.0506	46575	0	0	Pass
0.0524	43312	0	0	Pass
0.0541	40260	0	0	Pass
0.0559	37462	0	0	Pass
0.0577	34925	0	0	Pass
0.0594	32564	0	0	Pass
0.0612	30321	0	0	Pass
0.0629	28265	0	0	Pass
0.0647	26426	0	0	Pass
0.0665	24786	0	0	Pass
0.0682	23290	0	0	Pass
0.0700	21928	0	0	Pass
0.0717	20637	0	0	Pass
0.0735	19412	0	0	Pass
0.0752	18282	0	0	Pass
0.0770	17213	0	0	Pass
0.0788	16155	0	0	Pass
0.0805	15141	0	0	Pass
0.0823	14266	0	0	Pass
0.0840	13446	0	0	Pass
0.0858	12659	0	0	Pass
0.0876	11933	0	0	Pass
0.0893	11241	0	0	Pass
0.0911	10559	0	0	Pass
0.0928	9972	0	0	Pass
0.0946	9374	0	0	Pass
0.0963	8842	0	0	Pass
0.0981	8332	0	0	Pass
0.0999	7856	0	0	Pass
0.1016	7462	0	0	Pass
0.1034	7047	0	0	Pass
0.1051	6620	0	0	Pass
0.1069	6282	0	0	Pass
0.1087	5983	0	0	Pass
0.1104	5701	0	0	Pass
0.1122	5447	0	0	Pass
0.1139	5198	0	0	Pass
0.1157	4950	0	0	Pass
0.1174	4707	0	0	Pass
0.1192	4510	0	0	Pass
0.1210	4342	0	0	Pass
0.1227	4159	0	0	Pass
0.1245	3964	0	0	Pass
0.1262	3770	0	0	Pass
0.1280	3587	0	0	Pass
0.1298	3417	0	0	Pass
0.1315	3260	0	0	Pass
0.1333	3136	0	0	Pass
0.1350	3027	0	0	Pass
0.1368	2934	0	0	Pass
0.1385	2815	0	0	Pass

0.1403	2681	0	0	Pass
0.1421	2559	0	0	Pass
0.1438	2451	0	0	Pass
0.1456	2363	0	0	Pass
0.1473	2256	0	0	Pass
0.1491	2148	0	0	Pass
0.1509	2041	0	0	Pass
0.1526	1952	0	0	Pass
0.1544	1862	0	0	Pass
0.1561	1778	0	0	Pass
0.1579	1696	0	0	Pass
0.1596	1619	0	0	Pass
0.1614	1561	0	0	Pass
0.1632	1484	0	0	Pass
0.1649	1407	0	0	Pass
0.1667	1341	0	0	Pass
0.1684	1270	0	0	Pass
0.1702	1219	0	0	Pass
0.1720	1164	0	0	Pass
0.1737	1103	0	0	Pass
0.1755	1057	0	0	Pass
0.1772	1006	0	0	Pass
0.1790	965	0	0	Pass
0.1807	920	0	0	Pass
0.1825	872	0	0	Pass
0.1843	815	0	0	Pass
0.1860	774	0	0	Pass
0.1878	738	0	0	Pass
0.1895	695	0	0	Pass
0.1913	640	0	0	Pass
0.1931	601	0	0	Pass
0.1948	553	0	0	Pass
0.1966	517	0	0	Pass
0.1983	478	0	0	Pass
0.2001	434	0	0	Pass
0.2018	394	0	0	Pass
0.2036	363	0	0	Pass
0.2054	340	0	0	Pass
0.2071	310	0	0	Pass
0.2089	297	0	0	Pass
0.2106	273	0	0	Pass
0.2124	253	0	0	Pass
0.2142	237	0	0	Pass
0.2159	223	0	0	Pass
0.2177	206	0	0	Pass
0.2194	194	0	0	Pass
0.2212	180	0	0	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	1315.17			☐	100.00			
Total Volume Infiltrated		1315.17	0.00	0.00		100.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin P-5.wdm
MESSU       25   PreBasin P-5.MES
            27   PreBasin P-5.L61
            28   PreBasin P-5.L62
            30   POCBasin P-51.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                       4.471     COPY   501     12
PERLND  10                       4.471     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><--->
```

```
WDM      1 EVAP     ENGL    1             PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1             IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin P-5.wdm
MESSU       25   MitBasin P-5.MES
            27   MitBasin P-5.L61
            28   MitBasin P-5.L62
            30   POCBasin P-51.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       7
      IMPLND       1
      IMPLND       8
      IMPLND      14
      RCHRES       1
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Trapezoidal Pond  1         MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
    7     A/B, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    7         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
```

```
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
    7         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    7         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    7              0         5       0.8       400      0.05       0.3     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    7              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                 ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    7          0.1       0.5      0.25         0       0.7      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
    7              0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                   in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
   14      POND                   1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    8         0    0    1    0    0    0
   14         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
   14         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    8         0    0    0    0    0
   14         0    0    0    0    0
```

```
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
   14            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    8              0         0
   14              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    8              0         0
   14              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND   7                      0.882     RCHRES   1      2
PERLND   7                      0.882     RCHRES   1      3
IMPLND   1                      2.499     RCHRES   1      5
IMPLND   8                      0.948     RCHRES   1      5
IMPLND  14                      0.142     RCHRES   1      5

******Routing******
PERLND   7                      0.882     COPY     1     12
IMPLND   1                      2.499     COPY     1     15
IMPLND   8                      0.948     COPY     1     15
IMPLND  14                      0.142     COPY     1     15
PERLND   7                      0.882     COPY     1     13
RCHRES   1                          1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG             ***
                                        in  out                             ***
    1     Trapezoidal Pond-005    2    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
```

```
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                    ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
    1        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1               1      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                       ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.041092  0.000000  0.000000  0.000000
  0.077778  0.042004  0.003232  0.000000  0.414346
  0.155556  0.042925  0.006534  0.000000  0.414346
  0.233333  0.043857  0.009909  0.000000  0.414346
  0.311111  0.044798  0.013357  0.000000  0.414346
  0.388889  0.045750  0.016878  0.000000  0.414346
  0.466667  0.046711  0.020474  0.000000  0.414346
  0.544444  0.047683  0.024145  0.000000  0.414346
  0.622222  0.048664  0.027892  0.000000  0.414346
  0.700000  0.049656  0.031715  0.000000  0.414346
  0.777778  0.050657  0.035616  0.000000  0.414346
  0.855556  0.051669  0.039595  0.000000  0.414346
  0.933333  0.052690  0.043654  0.000000  0.414346
  1.011111  0.053722  0.047792  0.000000  0.414346
  1.088889  0.054763  0.052011  0.000000  0.414346
  1.166667  0.055815  0.056311  0.000000  0.414346
  1.244444  0.056876  0.060694  0.000000  0.414346
  1.322222  0.057948  0.065159  0.000000  0.414346
  1.400000  0.059029  0.069708  0.000000  0.414346
  1.477778  0.060121  0.074342  0.000000  0.414346
  1.555556  0.061222  0.079061  0.000000  0.414346
  1.633333  0.062334  0.083866  0.000000  0.414346
  1.711111  0.063455  0.088757  0.000000  0.414346
  1.788889  0.064587  0.093737  0.000000  0.414346
  1.866667  0.065728  0.098805  0.000000  0.414346
  1.944444  0.066880  0.103962  0.000000  0.414346
  2.022222  0.068041  0.109208  0.000000  0.414346
  2.100000  0.069213  0.114546  0.000000  0.414346
  2.177778  0.070394  0.119975  0.000000  0.414346
  2.255556  0.071586  0.125497  0.000000  0.414346
  2.333333  0.072787  0.131111  0.000000  0.414346
  2.411111  0.073998  0.136819  0.000000  0.414346
```

```
  2.488889  0.075220  0.142622  0.000000  0.414346
  2.566667  0.076451  0.148521  0.000000  0.414346
  2.644444  0.077693  0.154515  0.000000  0.414346
  2.722222  0.078944  0.160607  0.000000  0.414346
  2.800000  0.080206  0.166796  0.000000  0.414346
  2.877778  0.081477  0.173084  0.000000  0.414346
  2.955556  0.082759  0.179470  0.000000  0.414346
  3.033333  0.084050  0.185958  0.000000  0.414346
  3.111111  0.085352  0.192545  0.000000  0.414346
  3.188889  0.086663  0.199235  0.000000  0.414346
  3.266667  0.087985  0.206027  0.000000  0.414346
  3.344444  0.089316  0.212922  0.000000  0.414346
  3.422222  0.090658  0.219921  0.000000  0.414346
  3.500000  0.092009  0.227024  0.000000  0.414346
  3.577778  0.093371  0.234234  0.000000  0.414346
  3.655556  0.094742  0.241549  0.000000  0.414346
  3.733333  0.096123  0.248972  0.000000  0.414346
  3.811111  0.097515  0.256502  0.000000  0.414346
  3.888889  0.098916  0.264141  0.000000  0.414346
  3.966667  0.100328  0.271889  0.000000  0.414346
  4.044444  0.101749  0.279748  0.000000  0.414346
  4.122222  0.103181  0.287717  0.000000  0.414346
  4.200000  0.104622  0.295799  0.000000  0.414346
  4.277778  0.106074  0.303992  0.000000  0.414346
  4.355556  0.107535  0.312299  0.000000  0.414346
  4.433333  0.109007  0.320720  0.000000  0.414346
  4.511111  0.110488  0.329256  0.000000  0.414346
  4.588889  0.111979  0.337908  0.000000  0.414346
  4.666667  0.113481  0.346676  0.000000  0.414346
  4.744444  0.114992  0.355561  0.000000  0.414346
  4.822222  0.116514  0.364564  0.000000  0.414346
  4.900000  0.118045  0.373686  0.000000  0.414346
  4.977778  0.119587  0.382927  0.000000  0.414346
  5.055556  0.121138  0.392288  0.000000  0.414346
  5.133333  0.122700  0.401771  0.000000  0.414346
  5.211111  0.124271  0.411375  0.000000  0.414346
  5.288889  0.125852  0.421102  0.000000  0.414346
  5.366667  0.127444  0.430953  0.000000  0.414346
  5.444444  0.129045  0.440927  0.000000  0.414346
  5.522222  0.130657  0.451027  0.000000  0.414346
  5.600000  0.132278  0.461252  0.000000  0.414346
  5.677778  0.133910  0.471604  0.000000  0.414346
  5.755556  0.135551  0.482083  0.000000  0.414346
  5.833333  0.137203  0.492690  0.000000  0.414346
  5.911111  0.138864  0.503426  0.000000  0.414346
  5.988889  0.140535  0.514291  0.000000  0.414346
  6.066667  0.142217  0.525287  0.182234  0.414346
  6.144444  0.143908  0.536414  0.572643  0.414346
  6.222222  0.145610  0.547673  1.046030  0.414346
  6.300000  0.147321  0.559065  1.509672  0.414346
  6.377778  0.149043  0.570590  1.879270  0.414346
  6.455556  0.150774  0.582250  2.114227  0.414346
  6.533333  0.152515  0.594045  2.300165  0.414346
  6.611111  0.154267  0.605975  2.462179  0.414346
  6.688889  0.156028  0.618042  2.614172  0.414346
  6.766667  0.157800  0.630246  2.757800  0.414346
  6.844444  0.159581  0.642589  2.894310  0.414346
  6.922222  0.161372  0.655071  3.024665  0.414346
  7.000000  0.163174  0.667692  3.149630  0.414346
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1             PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1             IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1             PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1             IMPLND   1 999 EXTNL  PETINP
```

```
END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   1 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1001 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      2 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1003 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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WWHM2012

PROJECT REPORT

Pond P-6

General Model Information

Project Name:	Basin P-6
Site Name:	
Site Address:	
City:	
Report Date:	8/10/2022
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	0.979
Pervious Total	0.979
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.979

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	0.519
Pervious Total	0.519

Impervious Land Use	acre
ROADS FLAT	0.429
POND	0.031
Impervious Total	0.46
Basin Total	0.979

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length:	9.91 ft.	
Bottom Width:	9.91 ft.	
Depth:	7 ft.	
Volume at riser head:	0.1254 acre-feet.	
Infiltration On		
Infiltration rate:	10	
Infiltration safety factor:	1	
Total Volume Infiltrated (ac-ft.):		185.367
Total Volume Through Riser (ac-ft.):		0
Total Volume Through Facility (ac-ft.):		185.367
Percent Infiltrated:		100
Total Precip Applied to Facility:		0
Total Evap From Facility:		0
Side slope 1:	3 To 1	
Side slope 2:	3 To 1	
Side slope 3:	3 To 1	
Side slope 4:	3 To 1	
Discharge Structure		
Riser Height:	6 ft.	
Riser Diameter:	12 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Pond Hydraulic Table

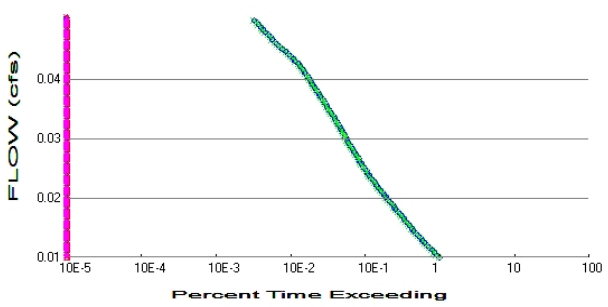
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.002255	0.000000	0.000	0.000
0.0778	0.002472	0.000184	0.000	0.022
0.1556	0.002699	0.000385	0.000	0.022
0.2333	0.002937	0.000604	0.000	0.022
0.3111	0.003184	0.000842	0.000	0.022
0.3889	0.003441	0.001100	0.000	0.022
0.4667	0.003709	0.001378	0.000	0.022
0.5444	0.003986	0.001677	0.000	0.022
0.6222	0.004273	0.001998	0.000	0.022
0.7000	0.004571	0.002342	0.000	0.022
0.7778	0.004878	0.002710	0.000	0.022
0.8556	0.005195	0.003101	0.000	0.022
0.9333	0.005522	0.003518	0.000	0.022
1.0111	0.005860	0.003961	0.000	0.022
1.0889	0.006207	0.004430	0.000	0.022
1.1667	0.006564	0.004927	0.000	0.022
1.2444	0.006932	0.005452	0.000	0.022
1.3222	0.007309	0.006005	0.000	0.022
1.4000	0.007696	0.006589	0.000	0.022
1.4778	0.008094	0.007203	0.000	0.022
1.5556	0.008501	0.007848	0.000	0.022
1.6333	0.008918	0.008526	0.000	0.022
1.7111	0.009346	0.009236	0.000	0.022
1.7889	0.009783	0.009980	0.000	0.022
1.8667	0.010230	0.010758	0.000	0.022
1.9444	0.010688	0.011572	0.000	0.022
2.0222	0.011155	0.012421	0.000	0.022

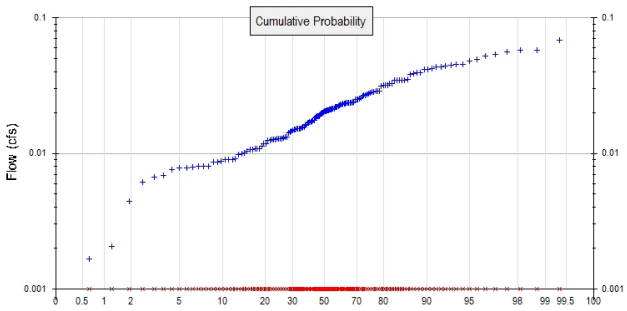
2.1000	0.011632	0.013307	0.000	0.022
2.1778	0.012120	0.014231	0.000	0.022
2.2556	0.012617	0.015193	0.000	0.022
2.3333	0.013124	0.016194	0.000	0.022
2.4111	0.013641	0.017235	0.000	0.022
2.4889	0.014169	0.018316	0.000	0.022
2.5667	0.014706	0.019439	0.000	0.022
2.6444	0.015253	0.020604	0.000	0.022
2.7222	0.015811	0.021812	0.000	0.022
2.8000	0.016378	0.023064	0.000	0.022
2.8778	0.016955	0.024360	0.000	0.022
2.9556	0.017543	0.025702	0.000	0.022
3.0333	0.018140	0.027090	0.000	0.022
3.1111	0.018747	0.028524	0.000	0.022
3.1889	0.019364	0.030006	0.000	0.022
3.2667	0.019992	0.031537	0.000	0.022
3.3444	0.020629	0.033116	0.000	0.022
3.4222	0.021276	0.034746	0.000	0.022
3.5000	0.021934	0.036427	0.000	0.022
3.5778	0.022601	0.038158	0.000	0.022
3.6556	0.023278	0.039943	0.000	0.022
3.7333	0.023965	0.041780	0.000	0.022
3.8111	0.024663	0.043671	0.000	0.022
3.8889	0.025370	0.045617	0.000	0.022
3.9667	0.026087	0.047618	0.000	0.022
4.0444	0.026815	0.049675	0.000	0.022
4.1222	0.027552	0.051789	0.000	0.022
4.2000	0.028299	0.053961	0.000	0.022
4.2778	0.029056	0.056192	0.000	0.022
4.3556	0.029824	0.058482	0.000	0.022
4.4333	0.030601	0.060831	0.000	0.022
4.5111	0.031388	0.063242	0.000	0.022
4.5889	0.032186	0.065714	0.000	0.022
4.6667	0.032993	0.068249	0.000	0.022
4.7444	0.033810	0.070847	0.000	0.022
4.8222	0.034637	0.073509	0.000	0.022
4.9000	0.035475	0.076236	0.000	0.022
4.9778	0.036322	0.079028	0.000	0.022
5.0556	0.037179	0.081886	0.000	0.022
5.1333	0.038046	0.084811	0.000	0.022
5.2111	0.038924	0.087805	0.000	0.022
5.2889	0.039811	0.090867	0.000	0.022
5.3667	0.040708	0.093998	0.000	0.022
5.4444	0.041616	0.097199	0.000	0.022
5.5222	0.042533	0.100472	0.000	0.022
5.6000	0.043460	0.103816	0.000	0.022
5.6778	0.044397	0.107233	0.000	0.022
5.7556	0.045345	0.110723	0.000	0.022
5.8333	0.046302	0.114287	0.000	0.022
5.9111	0.047269	0.117926	0.000	0.022
5.9889	0.048246	0.121640	0.000	0.022
6.0667	0.049234	0.125431	0.182	0.022
6.1444	0.050231	0.129299	0.572	0.022
6.2222	0.051238	0.133245	1.046	0.022
6.3000	0.052255	0.137270	1.509	0.022
6.3778	0.053283	0.141374	1.879	0.022
6.4556	0.054320	0.145559	2.114	0.022
6.5333	0.055367	0.149824	2.300	0.022

6.6111	0.056424	0.154172	2.462	0.022
6.6889	0.057492	0.158602	2.614	0.022
6.7667	0.058569	0.163115	2.757	0.022
6.8444	0.059656	0.167713	2.894	0.022
6.9222	0.060753	0.172395	3.024	0.022
7.0000	0.061861	0.177164	3.149	0.022
7.0778	0.062978	0.182018	3.269	0.022

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.979
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.519
Total Impervious Area: 0.46

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.02063
5 year	0.032095
10 year	0.038324
25 year	0.044664
50 year	0.048433
100 year	0.051531

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.015	0.000
1903	0.013	0.000
1904	0.021	0.000
1905	0.010	0.000
1906	0.004	0.000
1907	0.032	0.000
1908	0.023	0.000
1909	0.023	0.000
1910	0.032	0.000
1911	0.021	0.000

1912	0.069	0.000
1913	0.033	0.000
1914	0.008	0.000
1915	0.013	0.000
1916	0.021	0.000
1917	0.007	0.000
1918	0.022	0.000
1919	0.016	0.000
1920	0.021	0.000
1921	0.023	0.000
1922	0.024	0.000
1923	0.019	0.000
1924	0.009	0.000
1925	0.011	0.000
1926	0.020	0.000
1927	0.013	0.000
1928	0.016	0.000
1929	0.033	0.000
1930	0.021	0.000
1931	0.019	0.000
1932	0.015	0.000
1933	0.015	0.000
1934	0.043	0.000
1935	0.020	0.000
1936	0.017	0.000
1937	0.028	0.000
1938	0.017	0.000
1939	0.001	0.000
1940	0.019	0.000
1941	0.009	0.000
1942	0.028	0.000
1943	0.015	0.000
1944	0.027	0.000
1945	0.024	0.000
1946	0.013	0.000
1947	0.008	0.000
1948	0.044	0.000
1949	0.038	0.000
1950	0.011	0.000
1951	0.013	0.000
1952	0.058	0.000
1953	0.052	0.000
1954	0.019	0.000
1955	0.015	0.000
1956	0.008	0.000
1957	0.027	0.000
1958	0.056	0.000
1959	0.035	0.000
1960	0.009	0.000
1961	0.035	0.000
1962	0.019	0.000
1963	0.009	0.000
1964	0.010	0.000
1965	0.039	0.000
1966	0.011	0.000
1967	0.017	0.000
1968	0.017	0.000
1969	0.017	0.000

1970	0.027	0.000
1971	0.042	0.000
1972	0.027	0.000
1973	0.035	0.000
1974	0.019	0.000
1975	0.044	0.000
1976	0.023	0.000
1977	0.008	0.000
1978	0.039	0.000
1979	0.011	0.000
1980	0.022	0.000
1981	0.021	0.000
1982	0.009	0.000
1983	0.035	0.000
1984	0.014	0.000
1985	0.023	0.000
1986	0.021	0.000
1987	0.039	0.000
1988	0.025	0.000
1989	0.022	0.000
1990	0.025	0.000
1991	0.020	0.000
1992	0.028	0.000
1993	0.028	0.000
1994	0.041	0.000
1995	0.008	0.000
1996	0.045	0.000
1997	0.017	0.000
1998	0.021	0.000
1999	0.002	0.000
2000	0.016	0.000
2001	0.008	0.000
2002	0.029	0.000
2003	0.025	0.000
2004	0.023	0.000
2005	0.042	0.000
2006	0.013	0.000
2007	0.013	0.000
2008	0.022	0.000
2009	0.015	0.000
2010	0.013	0.000
2011	0.010	0.000
2012	0.015	0.000
2013	0.012	0.000
2014	0.009	0.000
2015	0.017	0.000
2016	0.007	0.000
2017	0.032	0.000
2018	0.058	0.000
2019	0.054	0.000
2020	0.018	0.000
2021	0.029	0.000
2022	0.012	0.000
2023	0.024	0.000
2024	0.045	0.000
2025	0.021	0.000
2026	0.035	0.000
2027	0.012	0.000

2028	0.011	0.000
2029	0.024	0.000
2030	0.044	0.000
2031	0.014	0.000
2032	0.008	0.000
2033	0.013	0.000
2034	0.012	0.000
2035	0.049	0.000
2036	0.026	0.000
2037	0.006	0.000
2038	0.020	0.000
2039	0.002	0.000
2040	0.011	0.000
2041	0.015	0.000
2042	0.048	0.000
2043	0.023	0.000
2044	0.031	0.000
2045	0.021	0.000
2046	0.025	0.000
2047	0.018	0.000
2048	0.024	0.000
2049	0.021	0.000
2050	0.015	0.000
2051	0.022	0.000
2052	0.013	0.000
2053	0.023	0.000
2054	0.029	0.000
2055	0.009	0.000
2056	0.010	0.000
2057	0.016	0.000
2058	0.020	0.000
2059	0.035	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.0687	0.0000
2	0.0579	0.0000
3	0.0578	0.0000
4	0.0558	0.0000
5	0.0539	0.0000
6	0.0522	0.0000
7	0.0492	0.0000
8	0.0479	0.0000
9	0.0453	0.0000
10	0.0453	0.0000
11	0.0444	0.0000
12	0.0440	0.0000
13	0.0436	0.0000
14	0.0432	0.0000
15	0.0424	0.0000
16	0.0419	0.0000
17	0.0414	0.0000
18	0.0394	0.0000
19	0.0391	0.0000
20	0.0388	0.0000
21	0.0380	0.0000
22	0.0349	0.0000

23	0.0347	0.0000
24	0.0347	0.0000
25	0.0347	0.0000
26	0.0346	0.0000
27	0.0345	0.0000
28	0.0329	0.0000
29	0.0328	0.0000
30	0.0320	0.0000
31	0.0318	0.0000
32	0.0317	0.0000
33	0.0312	0.0000
34	0.0289	0.0000
35	0.0288	0.0000
36	0.0286	0.0000
37	0.0285	0.0000
38	0.0283	0.0000
39	0.0278	0.0000
40	0.0276	0.0000
41	0.0272	0.0000
42	0.0267	0.0000
43	0.0267	0.0000
44	0.0266	0.0000
45	0.0256	0.0000
46	0.0254	0.0000
47	0.0250	0.0000
48	0.0250	0.0000
49	0.0249	0.0000
50	0.0241	0.0000
51	0.0237	0.0000
52	0.0236	0.0000
53	0.0235	0.0000
54	0.0235	0.0000
55	0.0235	0.0000
56	0.0235	0.0000
57	0.0233	0.0000
58	0.0232	0.0000
59	0.0231	0.0000
60	0.0230	0.0000
61	0.0230	0.0000
62	0.0227	0.0000
63	0.0225	0.0000
64	0.0222	0.0000
65	0.0221	0.0000
66	0.0220	0.0000
67	0.0219	0.0000
68	0.0213	0.0000
69	0.0212	0.0000
70	0.0212	0.0000
71	0.0212	0.0000
72	0.0211	0.0000
73	0.0210	0.0000
74	0.0208	0.0000
75	0.0207	0.0000
76	0.0206	0.0000
77	0.0206	0.0000
78	0.0206	0.0000
79	0.0204	0.0000
80	0.0201	0.0000

81	0.0200	0.0000
82	0.0199	0.0000
83	0.0198	0.0000
84	0.0195	0.0000
85	0.0189	0.0000
86	0.0188	0.0000
87	0.0188	0.0000
88	0.0187	0.0000
89	0.0186	0.0000
90	0.0183	0.0000
91	0.0176	0.0000
92	0.0174	0.0000
93	0.0174	0.0000
94	0.0170	0.0000
95	0.0170	0.0000
96	0.0170	0.0000
97	0.0167	0.0000
98	0.0167	0.0000
99	0.0163	0.0000
100	0.0160	0.0000
101	0.0157	0.0000
102	0.0156	0.0000
103	0.0154	0.0000
104	0.0153	0.0000
105	0.0153	0.0000
106	0.0152	0.0000
107	0.0151	0.0000
108	0.0150	0.0000
109	0.0150	0.0000
110	0.0147	0.0000
111	0.0146	0.0000
112	0.0144	0.0000
113	0.0141	0.0000
114	0.0133	0.0000
115	0.0133	0.0000
116	0.0130	0.0000
117	0.0129	0.0000
118	0.0128	0.0000
119	0.0128	0.0000
120	0.0128	0.0000
121	0.0127	0.0000
122	0.0126	0.0000
123	0.0126	0.0000
124	0.0125	0.0000
125	0.0124	0.0000
126	0.0119	0.0000
127	0.0117	0.0000
128	0.0113	0.0000
129	0.0109	0.0000
130	0.0108	0.0000
131	0.0108	0.0000
132	0.0107	0.0000
133	0.0107	0.0000
134	0.0103	0.0000
135	0.0100	0.0000
136	0.0099	0.0000
137	0.0098	0.0000
138	0.0092	0.0000

139	0.0090	0.0000
140	0.0090	0.0000
141	0.0089	0.0000
142	0.0087	0.0000
143	0.0087	0.0000
144	0.0086	0.0000
145	0.0081	0.0000
146	0.0081	0.0000
147	0.0080	0.0000
148	0.0079	0.0000
149	0.0078	0.0000
150	0.0078	0.0000
151	0.0075	0.0000
152	0.0069	0.0000
153	0.0067	0.0000
154	0.0061	0.0000
155	0.0044	0.0000
156	0.0020	0.0000
157	0.0017	0.0000
158	0.0011	0.0000

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0103	54354	0	0	Pass
0.0107	50160	0	0	Pass
0.0111	46609	0	0	Pass
0.0115	43312	0	0	Pass
0.0119	40293	0	0	Pass
0.0122	37451	0	0	Pass
0.0126	34941	0	0	Pass
0.0130	32553	0	0	Pass
0.0134	30348	0	0	Pass
0.0138	28265	0	0	Pass
0.0142	26443	0	0	Pass
0.0146	24786	0	0	Pass
0.0149	23302	0	0	Pass
0.0153	21928	0	0	Pass
0.0157	20648	0	0	Pass
0.0161	19412	0	0	Pass
0.0165	18293	0	0	Pass
0.0169	17219	0	0	Pass
0.0172	16166	0	0	Pass
0.0176	15141	0	0	Pass
0.0180	14282	0	0	Pass
0.0184	13446	0	0	Pass
0.0188	12676	0	0	Pass
0.0192	11933	0	0	Pass
0.0196	11246	0	0	Pass
0.0199	10559	0	0	Pass
0.0203	9978	0	0	Pass
0.0207	9374	0	0	Pass
0.0211	8853	0	0	Pass
0.0215	8332	0	0	Pass
0.0219	7861	0	0	Pass
0.0223	7457	0	0	Pass
0.0226	7036	0	0	Pass
0.0230	6609	0	0	Pass
0.0234	6277	0	0	Pass
0.0238	5978	0	0	Pass
0.0242	5706	0	0	Pass
0.0246	5437	0	0	Pass
0.0249	5199	0	0	Pass
0.0253	4942	0	0	Pass
0.0257	4706	0	0	Pass
0.0261	4511	0	0	Pass
0.0265	4339	0	0	Pass
0.0269	4154	0	0	Pass
0.0273	3958	0	0	Pass
0.0276	3764	0	0	Pass
0.0280	3582	0	0	Pass
0.0284	3412	0	0	Pass
0.0288	3265	0	0	Pass
0.0292	3134	0	0	Pass
0.0296	3027	0	0	Pass
0.0300	2926	0	0	Pass
0.0303	2815	0	0	Pass

0.0307	2682	0	0	Pass
0.0311	2556	0	0	Pass
0.0315	2451	0	0	Pass
0.0319	2361	0	0	Pass
0.0323	2256	0	0	Pass
0.0326	2143	0	0	Pass
0.0330	2038	0	0	Pass
0.0334	1952	0	0	Pass
0.0338	1860	0	0	Pass
0.0342	1778	0	0	Pass
0.0346	1688	0	0	Pass
0.0350	1619	0	0	Pass
0.0353	1561	0	0	Pass
0.0357	1483	0	0	Pass
0.0361	1407	0	0	Pass
0.0365	1340	0	0	Pass
0.0369	1270	0	0	Pass
0.0373	1218	0	0	Pass
0.0377	1163	0	0	Pass
0.0380	1103	0	0	Pass
0.0384	1055	0	0	Pass
0.0388	1006	0	0	Pass
0.0392	963	0	0	Pass
0.0396	920	0	0	Pass
0.0400	872	0	0	Pass
0.0403	815	0	0	Pass
0.0407	773	0	0	Pass
0.0411	738	0	0	Pass
0.0415	694	0	0	Pass
0.0419	637	0	0	Pass
0.0423	601	0	0	Pass
0.0427	555	0	0	Pass
0.0430	517	0	0	Pass
0.0434	478	0	0	Pass
0.0438	434	0	0	Pass
0.0442	394	0	0	Pass
0.0446	363	0	0	Pass
0.0450	339	0	0	Pass
0.0454	310	0	0	Pass
0.0457	296	0	0	Pass
0.0461	273	0	0	Pass
0.0465	252	0	0	Pass
0.0469	237	0	0	Pass
0.0473	223	0	0	Pass
0.0477	206	0	0	Pass
0.0480	195	0	0	Pass
0.0484	180	0	0	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	168.68			☐	100.00			
Total Volume Infiltrated		168.68	0.00	0.00		100.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

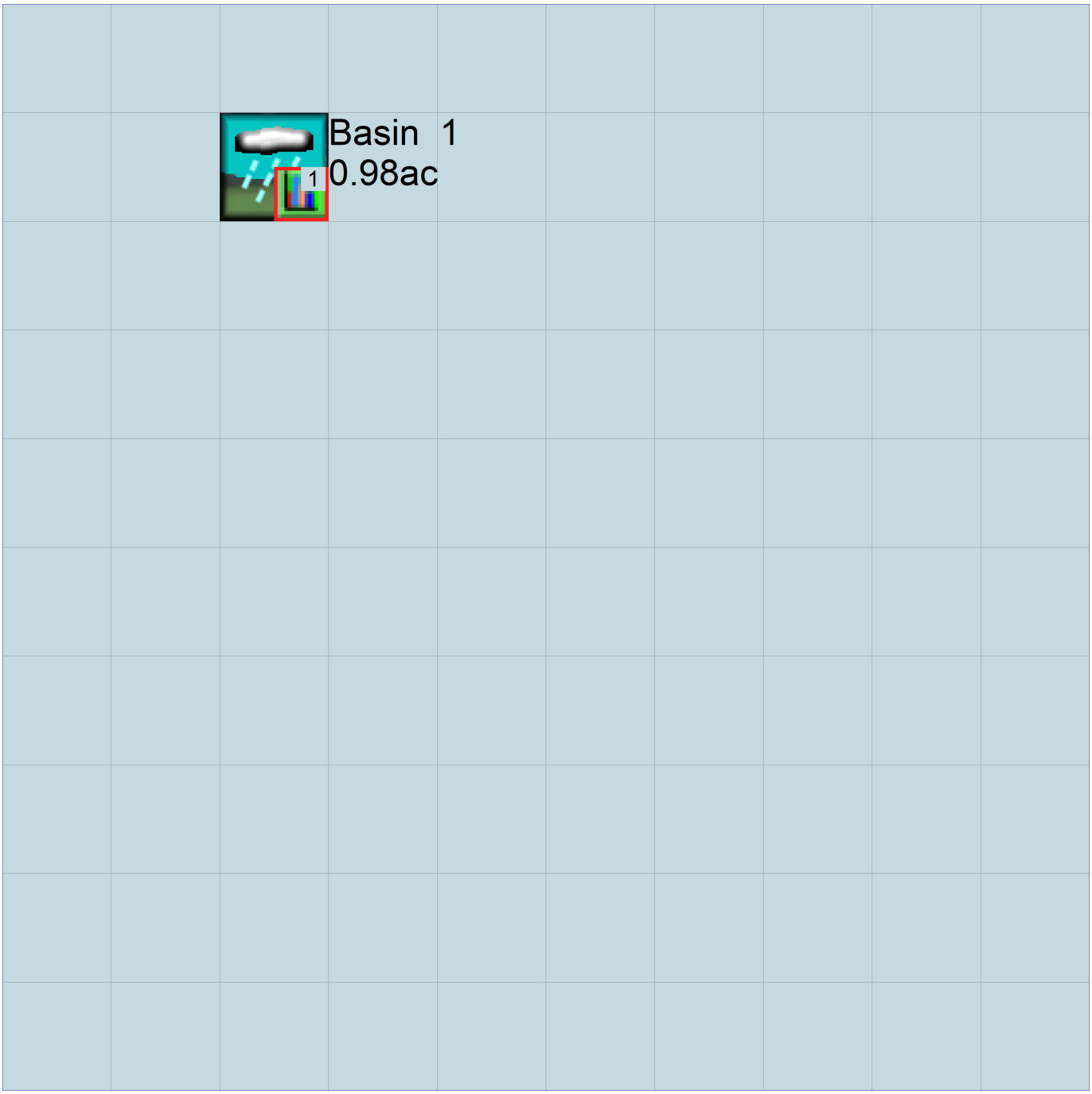
PERLND Changes

No PERLND changes have been made.

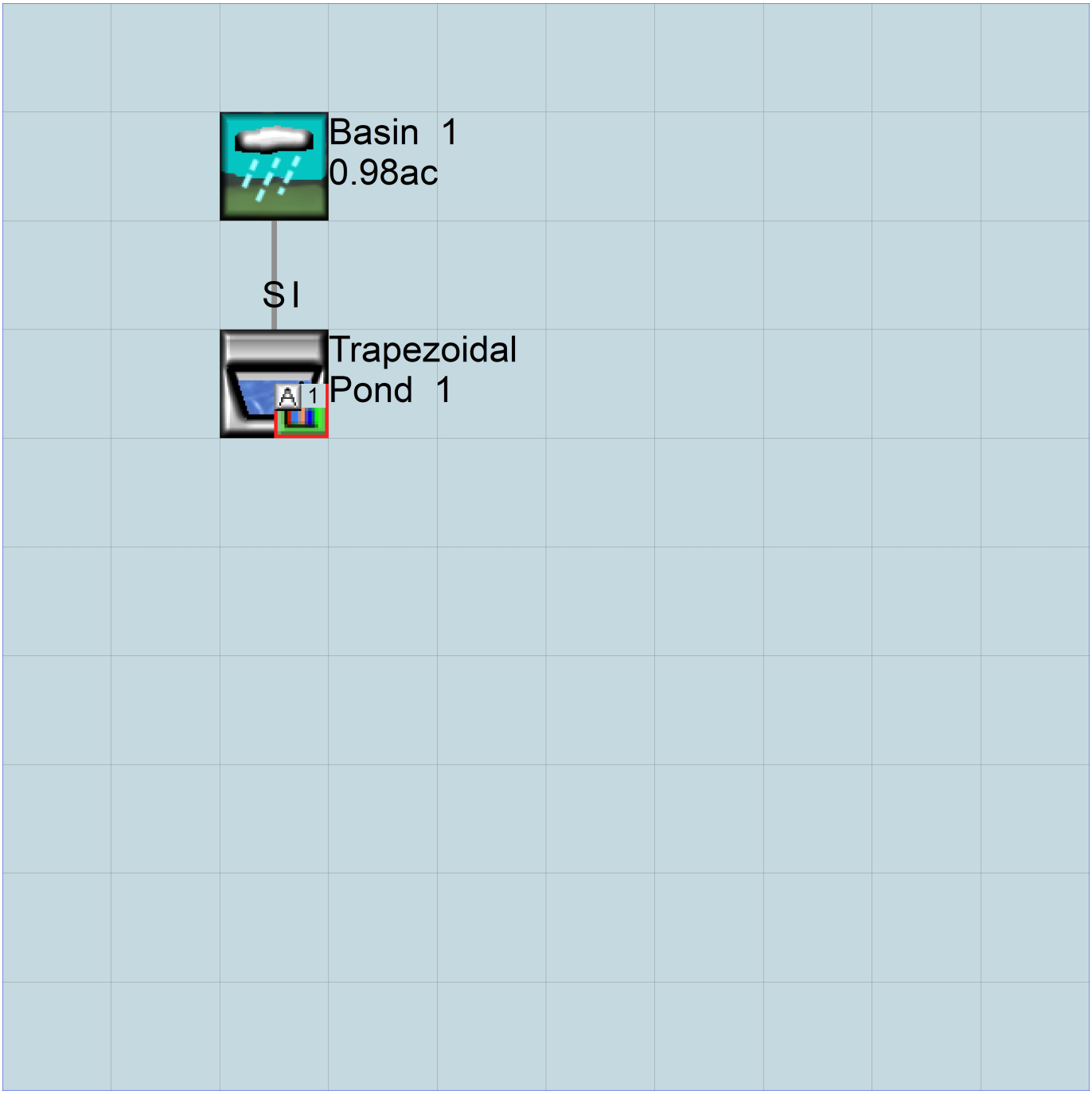
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin P-6.wdm
MESSU       25   PreBasin P-6.MES
            27   PreBasin P-6.L61
            28   PreBasin P-6.L62
            30   POCBasin P-61.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                     1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10             0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                       0.979     COPY   501     12
PERLND  10                       0.979     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><--->
```

```
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin P-6.wdm
MESSU       25   MitBasin P-6.MES
            27   MitBasin P-6.L61
            28   MitBasin P-6.L62
            30   POCBasin P-61.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       7
      IMPLND       1
      IMPLND      14
      RCHRES       1
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Trapezoidal Pond  1         MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
    7     A/B, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    7         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
```

```
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
    7         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    7         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    7             0         5       0.8       400      0.05       0.3     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    7             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    7          0.1       0.5      0.25         0       0.7      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
    7             0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
   14      POND                   1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
   14         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
   14         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
   14         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
```

```
    1            400      0.01       0.1       0.1
   14            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
   14              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
   14              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND   7                       0.519     RCHRES   1      2
PERLND   7                       0.519     RCHRES   1      3
IMPLND   1                       0.429     RCHRES   1      5
IMPLND  14                       0.031     RCHRES   1      5

******Routing******
PERLND   7                       0.519     COPY     1     12
IMPLND   1                       0.429     COPY     1     15
IMPLND  14                       0.031     COPY     1     15
PERLND   7                       0.519     COPY     1     13
RCHRES   1                           1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
    1     Trapezoidal Pond-005    2    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
```

```
    RCHRES  Flags for each HYDR Section                                    ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *      *  *  *  *  *         ***
    1       0  1  0  0    4  5  0  0  0       0  0  0  0  0         2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1              1      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                       ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)     (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.002255  0.000000  0.000000  0.000000
  0.077778  0.002472  0.000184  0.000000  0.022733
  0.155556  0.002699  0.000385  0.000000  0.022733
  0.233333  0.002937  0.000604  0.000000  0.022733
  0.311111  0.003184  0.000842  0.000000  0.022733
  0.388889  0.003441  0.001100  0.000000  0.022733
  0.466667  0.003709  0.001378  0.000000  0.022733
  0.544444  0.003986  0.001677  0.000000  0.022733
  0.622222  0.004273  0.001998  0.000000  0.022733
  0.700000  0.004571  0.002342  0.000000  0.022733
  0.777778  0.004878  0.002710  0.000000  0.022733
  0.855556  0.005195  0.003101  0.000000  0.022733
  0.933333  0.005522  0.003518  0.000000  0.022733
  1.011111  0.005860  0.003961  0.000000  0.022733
  1.088889  0.006207  0.004430  0.000000  0.022733
  1.166667  0.006564  0.004927  0.000000  0.022733
  1.244444  0.006932  0.005452  0.000000  0.022733
  1.322222  0.007309  0.006005  0.000000  0.022733
  1.400000  0.007696  0.006589  0.000000  0.022733
  1.477778  0.008094  0.007203  0.000000  0.022733
  1.555556  0.008501  0.007848  0.000000  0.022733
  1.633333  0.008918  0.008526  0.000000  0.022733
  1.711111  0.009346  0.009236  0.000000  0.022733
  1.788889  0.009783  0.009980  0.000000  0.022733
  1.866667  0.010230  0.010758  0.000000  0.022733
  1.944444  0.010688  0.011572  0.000000  0.022733
  2.022222  0.011155  0.012421  0.000000  0.022733
  2.100000  0.011632  0.013307  0.000000  0.022733
  2.177778  0.012120  0.014231  0.000000  0.022733
  2.255556  0.012617  0.015193  0.000000  0.022733
  2.333333  0.013124  0.016194  0.000000  0.022733
  2.411111  0.013641  0.017235  0.000000  0.022733
  2.488889  0.014169  0.018316  0.000000  0.022733
  2.566667  0.014706  0.019439  0.000000  0.022733
  2.644444  0.015253  0.020604  0.000000  0.022733
  2.722222  0.015811  0.021812  0.000000  0.022733
  2.800000  0.016378  0.023064  0.000000  0.022733
  2.877778  0.016955  0.024360  0.000000  0.022733
  2.955556  0.017543  0.025702  0.000000  0.022733
  3.033333  0.018140  0.027090  0.000000  0.022733
  3.111111  0.018747  0.028524  0.000000  0.022733
  3.188889  0.019364  0.030006  0.000000  0.022733
```

```
  3.266667  0.019992  0.031537  0.000000  0.022733
  3.344444  0.020629  0.033116  0.000000  0.022733
  3.422222  0.021276  0.034746  0.000000  0.022733
  3.500000  0.021934  0.036427  0.000000  0.022733
  3.577778  0.022601  0.038158  0.000000  0.022733
  3.655556  0.023278  0.039943  0.000000  0.022733
  3.733333  0.023965  0.041780  0.000000  0.022733
  3.811111  0.024663  0.043671  0.000000  0.022733
  3.888889  0.025370  0.045617  0.000000  0.022733
  3.966667  0.026087  0.047618  0.000000  0.022733
  4.044444  0.026815  0.049675  0.000000  0.022733
  4.122222  0.027552  0.051789  0.000000  0.022733
  4.200000  0.028299  0.053961  0.000000  0.022733
  4.277778  0.029056  0.056192  0.000000  0.022733
  4.355556  0.029824  0.058482  0.000000  0.022733
  4.433333  0.030601  0.060831  0.000000  0.022733
  4.511111  0.031388  0.063242  0.000000  0.022733
  4.588889  0.032186  0.065714  0.000000  0.022733
  4.666667  0.032993  0.068249  0.000000  0.022733
  4.744444  0.033810  0.070847  0.000000  0.022733
  4.822222  0.034637  0.073509  0.000000  0.022733
  4.900000  0.035475  0.076236  0.000000  0.022733
  4.977778  0.036322  0.079028  0.000000  0.022733
  5.055556  0.037179  0.081886  0.000000  0.022733
  5.133333  0.038046  0.084811  0.000000  0.022733
  5.211111  0.038924  0.087805  0.000000  0.022733
  5.288889  0.039811  0.090867  0.000000  0.022733
  5.366667  0.040708  0.093998  0.000000  0.022733
  5.444444  0.041616  0.097199  0.000000  0.022733
  5.522222  0.042533  0.100472  0.000000  0.022733
  5.600000  0.043460  0.103816  0.000000  0.022733
  5.677778  0.044397  0.107233  0.000000  0.022733
  5.755556  0.045345  0.110723  0.000000  0.022733
  5.833333  0.046302  0.114287  0.000000  0.022733
  5.911111  0.047269  0.117926  0.000000  0.022733
  5.988889  0.048246  0.121640  0.000000  0.022733
  6.066667  0.049234  0.125431  0.182234  0.022733
  6.144444  0.050231  0.129299  0.572643  0.022733
  6.222222  0.051238  0.133245  1.046030  0.022733
  6.300000  0.052255  0.137270  1.509672  0.022733
  6.377778  0.053283  0.141374  1.879270  0.022733
  6.455556  0.054320  0.145559  2.114227  0.022733
  6.533333  0.055367  0.149824  2.300165  0.022733
  6.611111  0.056424  0.154172  2.462179  0.022733
  6.688889  0.057492  0.158602  2.614172  0.022733
  6.766667  0.058569  0.163115  2.757800  0.022733
  6.844444  0.059656  0.167713  2.894310  0.022733
  6.922222  0.060753  0.172395  3.024665  0.022733
  7.000000  0.061861  0.177164  3.149630  0.022733
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1             PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1             IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1             PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1             IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   1 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1001 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      2 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1003 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
```

```
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

Disclaimer

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APPENDIX B: Conveyance Calculations

This will be included with final report

APPENDIX C:
SWPPP

Construction Stormwater General Permit

Stormwater Pollution Prevention Plan (SWPPP)

for

First Park Northwest Landing

Prepared for:

The Washington State Department of Ecology

Southwest Regional Office

Permittee / Owner	Developer	Operator / Contractor
Northpoint Development 4825 NW 41st St, Suite 500 Riverside, MO 64150	Northpoint Development 4825 NW 41st St, Suite 500 Riverside, MO 64150	TBD

A PORTION OF SECTIONS 22, 56 AND 27, TOWNSHIP 19 NORTH, RANGE 1 EAST

W.M.Certified Erosion and Sediment Control Lead (CESCL)

Name	Organization	Contact Phone Number
TBD	TBD	TBD

SWPPP Prepared By

Name	Organization	Contact Phone Number
Ben Eldridge	Barghausen Consulting Engineers, Inc.	(425) 251-6222

SWPPP Preparation Date

March 18, 2021

Project Construction Dates

Start Date	End Date
TBD	TBD

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Appendix/Glossary

A. Site Map

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List of Acronyms and Abbreviations

Acronym / Abbreviation	Explanation
303(d)	Section of the Clean Water Act pertaining to Impaired Waterbodies
BFO	Bellingham Field Office of the Department of Ecology
BMP(s)	Best Management Practice(s)
CESCL	Certified Erosion and Sediment Control Lead
CO_2	Carbon Dioxide
CRO	Central Regional Office of the Department of Ecology
CSWGP	Construction Stormwater General Permit
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
ERO	Eastern Regional Office of the Department of Ecology
ERTS	Environmental Report Tracking System
ESC	Erosion and Sediment Control
GULD	General Use Level Designation
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
NWRO	Northwest Regional Office of the Department of Ecology
pH	Power of Hydrogen
RCW	Revised Code of Washington
SPCC	Spill Prevention, Control, and Countermeasure
su	Standard Units
SWMMEW	Stormwater Management Manual for Eastern Washington
SWMMWW	Stormwater Management Manual for Western Washington
SWPPP	Stormwater Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
SWRO	Southwest Regional Office of the Department of Ecology
TMDL	Total Maximum Daily Load
VFO	Vancouver Field Office of the Department of Ecology
WAC	Washington Administrative Code
WSDOT	Washington Department of Transportation
WWHM	Western Washington Hydrology Model

1 Project Information

Project/Site Name: First Park Northwest Landing
Street/Location: A Portion of Sections 22, 56 And 27, Township 19 North, Range 1 East, W.M.
City: DuPont **State:** WA **Zip code:** 98327
Subdivision: Northwest Landing
Receiving waterbody: Full Infiltration

1.1 Existing Conditions

Total acreage (including support activities such as off-site equipment staging yards, material storage areas, borrow areas).

Total acreage:	261.71 ac
Disturbed acreage:	261.71 ac
Total Industrial Acrage on this submittal	114.56 ac
Disturbed industrial acrage	31.38 ac
Existing structures:	None.
Landscape topography:	The existing parcel is vacant/undeveloped with existing landscaping at the perimeter and some vegetation including small brush and shrubs through out the site. The parcel is has been previously cleared and graded. The site is relatively flat in grade
Drainage patterns:	The site currently infiltrates on-site through outwash soils.
Existing Vegetation:	The existing site has grasses and other small shrubs.
Critical Areas:	None.

List of known impairments for 303(d) listed or Total Maximum Daily Load (TMDL) for the receiving waterbody: No impairments for 303(d) are known for the receiving waterbody.

Table 1 – Summary of Site Pollutant Constituents

Constituent (Pollutant)	Location	Depth	Max. Concentration Detected (mg/kg)

1.2 Proposed Construction Activities

Description of site development (example: subdivision):
The proposed conditions for this site include vehicular parking and drive aisles, industrial building, sidewalks, landscape area, and an underground infiltration pond for stormwater management.

Description of construction activities (example: site preparation, demolition, excavation):
The construction activities covered under this SWPPP for this project will include site preparation, TESC installation, site grading, utility installation, building footprint construction and site paving.

Description of site drainage including flow from and onto adjacent properties. Must be consistent with Site Map in Appendix A:

The sites and roadways surrounding this project have conveyance systems in place, so there is no runoff expected to enter this site from off site properties. The soils on site are outwash soils with high infiltration rates, therefore any potential site runoff is assumed to infiltrate into these soils.

Description of final stabilization (example: extent of revegetation, paving, landscaping):
With the completion of construction, the entire Industrial site area of 114.56 acres will be approximately 73% impervious surfaces and 27% will be landscape areas or existing vegetation.

Contaminated Site Information:

Proposed activities regarding contaminated soils or groundwater (example: on-site treatment system, authorized sanitary sewer discharge):
The site is not expected to encounter any contaminated soils or groundwater.

2 Construction Stormwater Best Management Practices (BMPs)

The SWPPP is a living document reflecting current conditions and changes throughout the life of the project. These changes may be informal (i.e., hand-written notes and deletions). Update the SWPPP when the CESCL has noted a deficiency in BMPs or deviation from original design.

2.1 The 13 Elements

2.1.1 Element 1: Preserve Vegetation / Mark Clearing Limits

To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction will be clearly marked before land-disturbing activities begin. Areas that are to be preserved, as well as all sensitive areas and their buffers, shall be clearly delineated, both in the field and on the plans. A silt fence will be installed around the perimeter of the project site to mark the limits of construction as well as protect surrounding properties from any possible sediment laden runoff and grading will occur around the perimeter the site to insure there is no runoff of any ponded stormwater.

List and describe BMPs:

BMP C233: Silt Fence

Installation Schedules: TBD

Inspection and Maintenance plan:

Silt Fence Maintenance

- Repair any damage immediately.
- Intercept and convey all evident concentrated flows uphill of the silt fence to a sediment pond.
- Check the uphill side of the fence for signs of the fence clogging and acting as a barrier to flow and then causing channelization of flows parallel to the fence. If this occurs, replace the fence or remove the trapped sediment.
- Remove sediment deposits when the deposit reaches approximately one-third the height of the silt fence, or install a second silt fence.
- Replace filter fabric that has deteriorated due to ultraviolet breakdown.

Responsible Staff: Contractor/CESL

2.1.2 Element 2: Establish Construction Access

Access points shall be stabilized to prevent the tracking of sediment onto public roads. Street sweeping and street cleaning shall be employed to prevent sediment from entering state waters.

One stabilized construction entrance will be installed to the southeast entrance to the project site. The roads shall be swept daily should sediment collect on them.

List and describe BMPs:

BMP C105: Stabilized Construction Entrance

Installation Schedules: TBD

Inspection and Maintenance plan:

Stabilized Construction Entrance Maintenance

- Quarry spalls shall be added if the pad is no longer in accordance with the specifications.
- If the entrance is not preventing sediment from being tracked onto pavement, then alternative measures to keep the streets free of sediment shall be used. This may include replacement/cleaning of the existing quarry spalls, street sweeping, and an increase in the dimensions of the entrance.
- Any sediment that is tracked onto pavement shall be removed by shoveling or street sweeping. The sediment collected by sweeping shall be removed or stabilized on site. The pavement shall not be cleaned by washing down the street, except when high efficiency sweeping is ineffective and there is a threat to public safety. If it is necessary to wash the streets, the construction of a small sump to contain the wash water shall be considered. The sediment would then be washed into the sump where it can be controlled.
- Perform street sweeping by hand or with a high efficiency sweeper. Do not use a non-high efficiency mechanical sweeper because this creates dust and throws soils into storm systems or conveyance ditches.
- Any quarry spalls that are loosened from the pad, which end up on the roadway shall be removed immediately.
- If vehicles are entering or exiting the site at points other than the construction entrance(s), fencing (see BMP C103) shall be installed to control traffic.
- Upon project completion and site stabilization, all construction accesses intended as permanent access for maintenance shall be permanently stabilized.

Responsible Staff: Contractor/CESL

2.1.3 Element 3: Control Flow Rates

In order to protect the properties and waterways downstream of the project site, stormwater from the site will be controlled by construction of temporary sediment trap as one of the first items of construction along with installation of silt fence around the downstream property boundary areas. Once the trap is constructed, stormwater during construction will be captured through v-ditches with rock check dams in order to control the flow of stormwater runoff before reaching the temporary sediment trap. The temporary trap has been located at a low point on site with adequate surface area for sediment settlement per the DOE requirements from BMP C240 and also outside the limits of permanent infiltration facilities. The sediment trap discharge will infiltrate onsite. The facilities must be functioning properly before construction of site improvements.

Will you construct stormwater retention and/or detention facilities?
☒ Yes ☐ No

Will you use permanent infiltration ponds or other low impact development (example: rain gardens, bio-retention, porous pavement) to control flow during construction?
☐ Yes ☒ No

List and describe BMPs:
BMP C240: Sediment Trap

BMP C207: Check Dams

Installation Schedules: TBD

Inspection and Maintenance plan:

Sediment Trap Maintenance

- Sediment shall be removed from the trap when it reaches 1-foot in depth.
- Any damage to the pond embankments or slopes shall be repaired.

Check Dam Maintenance

- Check dams shall be monitored for performance and sediment accumulation during and after each runoff producing rainfall.
- Sediment shall be removed when it reaches one half the sump depth.
- Anticipate submergence and deposition above the check dam and erosion from high flows around the edges of the dam.
- If significant erosion occurs between dams, install a protective riprap liner in that portion of the channel.

Responsible Staff: Contractor/CESCL

2.1.4 Element 4: Install Sediment Controls

Constructing the silt fence and sediment trap are the first steps to create the necessary gradients to prevent off-site discharge of sediment. Rock check dams and v-ditches will be used to convey stormwater runoff into the sediment trap to collect out sediment. The sediment trap is expected to be adequate for sediment control for the site. The surface area requirements for the sediment trap is met with the designed TESC plan and it is not expected that further treatment or other sediment controlling measures are necessary.

However, if the proposed sediment controls are ineffective as determined by the CESCL, they will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix B.

List and describe BMPs:

BMP C233: Silt Fence

BMP C240: Sediment Trap

Installation Schedules: TBD

Inspection and Maintenance plan:

Silt Fence Maintenance

- Repair any damage immediately.
- Intercept and convey all evident concentrated flows uphill of the silt fence to a sediment pond.
- Check the uphill side of the fence for signs of the fence clogging and acting as a barrier to flow and then causing channelization of flows parallel to the fence. If this occurs, replace the fence or remove the trapped sediment.
- Remove sediment deposits when the deposit reaches approximately one-third the height of the silt fence, or install a second silt fence.
- Replace filter fabric that has deteriorated due to ultraviolet breakdown.

Sediment Trap Maintenance

- Sediment shall be removed from the trap when it reaches 1-foot in depth.
- Any damage to the pond embankments or slopes shall be repaired.

Responsible Staff: Contractor/CESL

2.1.5 Element 5: Stabilize Soils

Exposed and unworked soils shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project. In general, cut and fill slopes will be stabilized as soon as possible and soil stockpiles will be stabilized through hydroseeding. All stockpiled soils shall be stabilized from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels. To minimize the amount of soil exposed through the life of the project, grading will be completed within a reasonable time frame after the preloading of the building footprints is completed. To minimize soil compaction, a construction entrance will be used as well as keeping heavy equipment and machinery off unpaved areas as much as possible.

West of the Cascade Mountains Crest

Season	Dates	Number of Days Soils Can be Left Exposed
During the Dry Season	May 1 – September 30	7 days
During the Wet Season	October 1 – April 30	2 days
Soils must be stabilized at the end of the shift before a holiday or weekend if needed based on the weather forecast.		

Anticipated project dates: Start date: May 2021 **End date:** May 2022

Will you construct during the wet season?
☒ Yes ☐ No

List and describe BMPs:

BMP C121: Mulching

BMP C140: Dust Control

Installation Schedules: TBD

Inspection and Maintenance plan:

Dust Control Maintenance

- Respray area as necessary to keep dust to a minimum.

Mulching Maintenance

- The thickness of the cover must be maintained.
- Any areas that experience erosion shall be remulched and/or protected with a net or blanket. If the erosion problem is drainage related, then the problem shall be fixed and the eroded area remulched.

Responsible Staff: Contractor/CESL

2.1.6 Element 6: Protect Slopes

All cut and fill slopes will be designed, constructed, and protected in a manner that minimizes erosion. It is required that any temporary pipe slope drains must handle the peak 10-minute flow rate from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. For modeling the condition with the Western Washington Hydrology Model (WWHM) to predict flows, bare soil areas have been modeled as "landscaped area". Scouring will be reduced by using v-ditches to convey stormwater to the sediment trap on site. However, if the proposed BMPs to protect slopes are ineffective as determined by the CESCL, they will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix B.

Will steep slopes be present at the site during construction?
☐ Yes ☒ No

List and describe BMPs:

BMP C120: Temporary and Permanent Seeding

Installation Schedules: TBD

Inspection and Maintenance plan:

Temporary and Permanent Seeding Maintenance

- Reseed any seeded areas that fail to establish at least 80 percent cover (100 percent cover for areas that receive sheet or concentrated flows). If reseeding is ineffective, use an alternate method such as sodding, mulching, or nets/blankets. If winter weather prevents adequate grass growth, this time limit may be relaxed at the discretion of the local authority when sensitive areas would otherwise be protected.
- Reseed and protect by mulch any areas that experience erosion after achieving adequate cover. Reseed and protect by mulch any eroded area.
- Supply seeded areas with adequate moisture, but do not water to the extent that it causes runoff.

Responsible Staff: Contractor/CESL

2.1.7 Element 7: Protect Drain Inlets

All storm drain inlets and culverts made operable during construction shall be protected to prevent unfiltered or untreated water from entering the drainage conveyance system. However, the first priority is to keep all access roads clean of sediment and keep wash water separate from entering storm drains until treatment can be provided. Storm Drain Inlet Protection (BMP C220) will be implemented for all drainage inlets and culverts that could potentially be impacted by sediment-laden runoff on and near the project site. If this is deemed ineffective by the CESCL, additional BMPs may be necessary, as listed in Appendix B. Inlet protection is the last component of a treatment train and protection of drain inlets include additional sediment and erosion control measures. Inlet protection devices will be cleaned (or removed and replaced), when sediment has filled the device by one third (1/3) or as specified by the manufacturer.

List and describe BMPs:

BMP C220: Storm Drain Inlet Protection

Installation Schedules: TBD

Inspection and Maintenance plan:

Storm Drain Inlet Protection Maintenance

- Inspect catch basin filters frequently, especially after storm events. Clean and replace clogged inserts. For systems with clogged stone filters: pull away the stones from the inlet and clean or replace. An alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.
- Do not wash sediment into storm drains while cleaning. Spread all excavated material evenly over the surrounding land area or stockpile and stabilize as appropriate.
- Inlets to be inspected weekly and a minimum of daily during storm events

Responsible Staff: Contractor/CESL

2.1.8 Element 8: Stabilize Channels and Outlets

For construction stormwater conveyance, v-ditches with rock check dams will be installed to stabilize channels. Stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent streambanks, slopes, and downstream reaches shall be provided at the outlets of all conveyance systems. The project site is located west of the Cascade Mountain Crest. As such, all temporary on-site conveyance channels shall be designed, constructed, and stabilized to prevent erosion from the expected peak 10 minute velocity of flow from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the WWHM to predict flows, bare soil areas should be modeled as "landscaped area".

Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches, will be installed at the outlets of all conveyance systems.

List and describe BMPs:

BMP C207: Check Dams

Installation Schedules: TBD

Inspection and Maintenance plan:

Check Dam Maintenance

- Check dams shall be monitored for performance and sediment accumulation during and after each runoff producing rainfall. Sediment shall be removed when it reaches one-half the sump depth.
- Anticipate submergence and deposition above the check dam and erosion from high flows around the edges of the dam.
- If significant erosion occurs between dams, install a protective riprap liner in that portion of the channel.

Responsible Staff: Contractor/CESCL

2.1.9 Element 9: Control Pollutants

The following pollutants are anticipated to be present on-site:

Table 2 – Pollutants

Pollutant (List pollutants and source, if applicable)
Hydraulic fluid - May be present on site with construction equipment.
Diesel - May be present on site with construction equipment.
Motor Oil - May be present on site with construction equipment.

All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well-organized, and free of debris. Chemicals, liquid products, petroleum products, and other polluting materials will be kept covered, stored appropriately, and locked when not in use to prevent vandalism or misuse of these materials that may pollute state waters.

If required, BMPs to be implemented to control specific sources of pollutants are discussed below. Vehicles, construction equipment, and/or petroleum product storage/dispensing:

All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.

On-site fueling tanks and petroleum product storage containers shall include secondary containment.

Spill prevention measures, such as drip pans, will be used when conducting maintenance and repair of vehicles or equipment.

In order to perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle.

Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.

Storm drain inlets vulnerable to stormwater discharge carrying dust, soil, or debris will be protected using Storm Drain Inlet Protection (BMP C220 as described above for Element 7).

Process water and slurry resulting from sawcutting and surfacing operations will be prevented from entering the waters of the State by implementing Sawcutting and Surfacing Pollution Prevention measures (BMP C152).

Concrete and grout:

Process water and slurry resulting from concrete work will be prevented from entering the waters of the State by implementing Concrete Handling measures (BMP C151).

List and describe BMPs:

BMP C151: Concrete Handling

BMP C152: Sawcutting and Surfacing Pollution Prevention

Installation Schedules: TBD

Inspection and Maintenance plan:

Concrete Handling Maintenance

- Check containers for holes in the liner daily during concrete pours and repair the same day.

Sawcutting and Surfacing Pollution Prevention

- Continually monitor operations to determine whether slurry, cuttings, or process water could enter waters of the state. If inspections show that a violation of water quality standards could occur, stop operations and immediately implement preventive measures such as berms, barriers, secondary containment, and vacuum trucks.

Responsible Staff: Contractor/CESL

Will maintenance, fueling, and/or repair of heavy equipment and vehicles occur on-site?
☐ Yes ☒ No

Will wheel wash or tire bath system BMPs be used during construction?
☐ Yes ☒ No

Will pH-modifying sources be present on-site?
☐ Yes ☒ No

Table 3 – pH-Modifying Sources

☒	None
☐	Bulk cement
☐	Cement kiln dust
☐	Fly ash
☐	Other cementitious materials
☐	New concrete washing or curing waters
☐	Waste streams generated from concrete grinding and sawing
☐	Exposed aggregate processes
☐	Dewatering concrete vaults

☐	Concrete pumping and mixer washout waters
☐	Recycled concrete
☐	Recycled concrete stockpiles
☐	Other (i.e., calcium lignosulfate) [please describe:]

Concrete trucks must not be washed out onto the ground, or into storm drains, open ditches, streets, or streams. Excess concrete must not be dumped on-site, except in designated concrete washout areas with appropriate BMPs installed.

Will uncontaminated water from water-only based shaft drilling for construction of building, road, and bridge foundations be infiltrated provided the wastewater is managed in a way that prohibits discharge to surface waters?

☐ Yes ☒ No

2.1.10 Element 10: Control Dewatering

All dewatering water from open cut excavation, tunneling, foundation work, trench, or underground vaults will be collected into a controlled holding tank prior to discharge to the sanitary sewer. Highly turbid dewatering water from soils known or suspected to be contaminated, or from use of construction equipment, may require additional monitoring and treatment as required for the specific pollutants based on the sanitary sewer permit conditions. Such monitoring is the responsibility of the contractor. It is not anticipated that any dewatering will be needed however, BMPs from Appendix B may be implemented by the CESCL if needed.

Table 4 – Dewatering BMPs

☒	Infiltration
☐	Transport off-site in a vehicle (vacuum truck for legal disposal)
☐	Ecology-approved on-site chemical treatment or other suitable treatment technologies
☐	Sanitary or combined sewer discharge with local sewer district approval (last resort)
☐	Use of sedimentation bag with discharge to ditch or swale (small volumes of localized dewatering)

List and describe BMPs: N/A

Installation Schedules: N/A

Inspection and Maintenance plan: N/A

Responsible Staff: N/A

2.1.11 Element 11: Maintain BMPs

All temporary and permanent Erosion and Sediment Control (ESC) BMPs shall be maintained and repaired as needed to ensure continued performance of their intended function.

Maintenance and repair shall be conducted in accordance with each particular BMP specification (see *Volume II of the SWMMWW or Chapter 7 of the SWMMEW*).

Visual monitoring of all BMPs installed at the site will be conducted at least once every calendar week and within 24 hours of any stormwater or non-stormwater discharge from the site. If the site becomes inactive and is temporarily stabilized, the inspection frequency may be reduced to once every calendar month.

All temporary ESC BMPs shall be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed.

Trapped sediment shall be stabilized on-site or removed. Disturbed soil resulting from removal of either BMPs or vegetation shall be permanently stabilized.

Additionally, protection must be provided for all BMPs installed for the permanent control of stormwater from sediment and compaction. BMPs that are to remain in place following completion of construction shall be examined and restored to full operating condition. If sediment enters these BMPs during construction, the sediment shall be removed and the facility shall be returned to conditions specified in the construction documents.

2.1.12 Element 12: Manage the Project

The project will be managed based on the following principles:

- Projects will be phased to the maximum extent practicable and seasonal work limitations will be taken into account.
- Inspection and monitoring:
    - Inspection, maintenance and repair of all BMPs will occur as needed to ensure performance of their intended function.
    - Site inspections and monitoring will be conducted in accordance with Special Condition S4 of the CSWGP. Sampling locations are indicated on the Site Map. Sampling station(s) are located in accordance with applicable requirements of the CSWGP.
- Maintain an updated SWPPP.
    - The SWPPP will be updated, maintained, and implemented in accordance with Special Conditions S3, S4, and S9 of the CSWGP.

As site work progresses, the SWPPP will be modified routinely to reflect changing site conditions. The SWPPP will be reviewed monthly to ensure the content is current.

Table 5 – Management

☒	Design the project to fit the existing topography, soils, and drainage patterns
☒	Emphasize erosion control rather than sediment control
☒	Minimize the extent and duration of the area exposed
☒	Keep runoff velocities low
☒	Retain sediment on-site
☒	Thoroughly monitor site and maintain all ESC measures
☒	Schedule major earthwork during the dry season
☐	Other (please describe)

Table 6 – BMP Implementation Schedule

Phase of Construction Project	Stormwater BMPs	Date	Wet/Dry Season
TBD			

2.1.13 Element 13: Protect Low Impact Development (LID) BMPS

In order to protect LID BMPs during the construction process, many steps can be taken through proper erosion and sedimentation control. For this project, an infiltration trench is proposed for the flow control. In order to protect the BMP care should be taken not to compact the area for the trench during construction. To ensure the high infiltration rate of the soil is maintained, the site should be swept before the stormwater facility goes online as well. Care should also be taken not to discharge sediment laden water to the existing infiltration galleries for the southern developed sites.

3 Pollution Prevention Team

Table 7 – Team Information

Title	Name(s)	Phone Number
Certified Erosion and Sediment Control Lead (CESCL)	TBD	
Resident Engineer	Dan Balmelli	(425) 251-6222
Emergency Ecology Contact	Southwest Regional Office: WA Emergency Management Division	1-800-258-5990
Emergency Permittee/ Owner Contact	TBD	(818) 888-7380
Non-Emergency Owner Contact	TBD	
Monitoring Personnel	TBD	
Ecology Regional Office	Southwest Regional Office	(360) 407-6300

4 Monitoring and Sampling Requirements

Monitoring includes visual inspection, sampling for water quality parameters of concern, and documentation of the inspection and sampling findings in a site log book. A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements
- Site inspections
- Stormwater sampling data

File a blank form under Appendix D.

The site log book must be maintained on-site within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

4.1 Site Inspection

Site inspections will be conducted at least once every calendar week and within 24 hours following any discharge from the site. For sites that are temporarily stabilized and inactive, the required frequency is reduced to once per calendar month.

The discharge point(s) to the sanitary sewer are indicated on the Site Map (see Appendix A) and in accordance with the applicable requirements of the CSWGP.

5 Reporting and Record Keeping

5.1 Record Keeping

5.1.1 Site Log Book

A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements
- Site inspections
- Sample logs

5.1.2 Records Retention

Records will be retained during the life of the project and for a minimum of three (3) years following the termination of permit coverage in accordance with Special Condition S5.C of the CSWGP.

Permit documentation to be retained on-site:

- CSWGP
- Permit Coverage Letter
- SWPPP
- Site Log Book

Permit documentation will be provided within 14 days of receipt of a written request from Ecology. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with Special Condition S5.G.2.b of the CSWGP.

5.1.3 Updating the SWPPP

The SWPPP will be modified if:

- Found ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site.
- There is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the State.

The SWPPP will be modified within seven (7) days if inspection(s) or investigation(s) determine additional or modified BMPs are necessary for compliance. An updated timeline for BMP implementation will be prepared.

5.2 Reporting

5.2.1 Discharge Monitoring Reports

Cumulative soil disturbance is one (1) acre or larger; therefore, Discharge Monitoring Reports (DMRs) will be submitted to Ecology monthly. If there was no discharge during a given monitoring period the DMR will be submitted as required, reporting “No Discharge”. The DMR due date is fifteen (15) days following the end of each calendar month.

DMRs will be reported online through Ecology’s WQWebDMR System.

5.2.2 Notification of Noncompliance

If any of the terms and conditions of the permit is not met, and the resulting noncompliance may cause a threat to human health or the environment, the following actions will be taken:

1. Ecology will be notified within 24-hours of the failure to comply by calling the applicable Regional office ERTS phone number (Regional office numbers listed below).
2. Immediate action will be taken to prevent the discharge/pollution or otherwise stop or correct the noncompliance. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.
3. A detailed written report describing the noncompliance will be submitted to Ecology within five (5) days, unless requested earlier by Ecology.

Anytime turbidity sampling indicates turbidity is 250 NTUs or greater, or water transparency is 6 cm or less, the Ecology Regional office will be notified by phone within 24 hours of analysis as required by Special Condition S5.A of the CSWGP.

- **Central Region** at (509) 575-2490 for Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, or Yakima County
- **Eastern Region** at (509) 329-3400 for Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, or Whitman County
- **Northwest Region** at (425) 649-7000 for Island, King, Kitsap, San Juan, Skagit, Snohomish, or Whatcom County
- **Southwest Region** at (360) 407-6300 for Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, or Wahkiakum

Include the following information:

1. Your name and / Phone number
2. Permit number
3. City / County of project
4. Sample results

5. Date / Time of call
6. Date / Time of sample
7. Project name

In accordance with Special Condition S4.D.5.b of the CSWGP, the Ecology Regional office will be notified if chemical treatment other than CO_2 sparging is planned for adjustment of high pH water.

A. Site Map

B. BMP Detail

Please see following pages for appropriate BMP details.
Below is a list of Alternative BMPs to be used if the BMPs listed in the body of this document are deemed ineffective by the CESCL.

Element No. 1 - Mark Clearing Limits
BMP C101: Preserving Natural Vegetation
BMP C102: Buffer Zones
BMP C103: High Visibility Fence

Element No. 2 - Establish Construction Access
BMP C107: Construction Road/Parking Area Stabilization

Element No. 3 - Control Flow Rates
BMP C203: Water Bars
BMP C209: Outlet Protection
BMP C235: Wattles

Element No. 4 - Install Sediment Controls
BMP C231: Brush Barrier
BMP C232: Gravel Filter Berm
BMP C234: Vegetated Strip
BMP C235: Wattles
BMP C250: Construction Stormwater Chemical Treatment
BMP C251: Construction Stormwater Filtration
Other Proprietary Sediment Control Technologies

Element No. 5 - Stabilize Soils
BMP C122: Nets and Blankets
BMP C124: Sodding
BMP C125 Compost
BMP C126: Topsoiling
BMP C127: Polyacrylamide for Soil Erosion Protection
BMP C130: Surface Roughening
BMP C131: Gradient Terraces

Element No. 6 - Protect Slopes
BMP C121: Mulching
BMP C122: Nets and Blankets
BMP C131: Gradient Terraces
BMP C200: Interceptor Dike and Swale
BMP C201: Grass-Lined Channels
BMP C203: Water Bars
BMP C204: Pipe Slope Drains
BMP C205: Subsurface Drains
BMP C206: Level Spreader
BMP C208: Triangular Silt Dike (Geotextile-Encased Check Dam)

Element No. 7 - Protect Drain Inlets
BMP C220: Storm Drain Inlet Protection

Element No. 8 - Stabilize Channels and Outlets
BMP C122: Nets and Blankets
BMP C202: Channel Lining
BMP C209: Outlet Protection

Element No. 9 - Control Pollutants
BMP C152: Sawcutting and Surface Pollution Prevention
BMP C153: Material Delivery, Storage, Containment
BMP C154: Concrete Washout Area
BMP C250: Construction Stormwater Chemical Treatment
BMP C251: Construction Stormwater Filtration
BMP C252: High pH Neutralization Using Co_2
BMP C253: pH Control for High pH Water
Source Control BMPs As Appropriate

Element No. 10 - Control Dewatering
BMP C203: Water Bars
BMP C226: Vegetative Filtration

Element No. 11 - Maintain BMPs
BMP C150: Materials on Hand
BMP C160 Erosion and Sedimentation Control Lead

Element No. 12 - Manage the Project
BMP C150: Materials on Hand
BMP C160: Erosion and Sediment Control Lead
BMP C162: Scheduling

Element No. 13: Protect Low Impact Development
BMP C102: Buffer Zone
BMP C103: High Visibility Fence
BMP C200: Interceptor Dike and Swale
BMP C201: Grass-Lined Channels
BMP C207: Check Dams
BMP C208: Triangular Silt Dike (TSD) (Geotextile-Encased Check Dam)
BMP C231: Brush Barrier
BMP C233: Silt Fence
BMP C234: Vegetated Strip

BMP C103: High Visibility Fence

Purpose

Fencing is intended to:

1. Restrict clearing to approved limits.
2. Prevent disturbance of sensitive areas, their buffers, and other areas required to be left undisturbed.
3. Limit construction traffic to designated construction entrances, exits, or internal roads.
4. Protect areas where marking with survey tape may not provide adequate protection.

Conditions of Use

To establish clearing limits plastic, fabric, or metal fence may be used:

- At the boundary of sensitive areas, their buffers, and other areas required to be left uncleared.
- As necessary to control vehicle access to and on the site.

Design and Installation Specifications

High visibility plastic fence shall be composed of a high-density polyethylene material and shall be at least four feet in height. Posts for the fencing shall be steel or wood and placed every 6 feet on center (maximum) or as needed to ensure rigidity. The fencing shall be fastened to the post every six inches with a polyethylene tie. On long continuous lengths of fencing, a tension wire or rope shall be used as a top stringer to prevent sagging between posts. The fence color shall be high visibility orange. The fence tensile strength shall be 360 lbs./ft. using the ASTM D4595 testing method.

If appropriate install fabric silt fence in accordance with BMP C233: Silt Fence (p.367) to act as high visibility fence. Silt fence shall be at least 3 feet high and must be highly visible to meet the requirements of this BMP.

Metal fences shall be designed and installed according to the manufacturer's specifications.

Metal fences shall be at least 3 feet high and must be highly visible.

Fences shall not be wired or stapled to trees.

Maintenance Standards

If the fence has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.

BMP C105: Stabilized Construction Entrance / Exit

Purpose

Stabilized Construction entrances are established to reduce the amount of sediment transported onto paved roads by vehicles or equipment. This is done by constructing a stabilized pad of quarry spalls at entrances and exits for construction sites.

Conditions of Use

Construction entrances shall be stabilized wherever traffic will be entering or leaving a construction site if paved roads or other paved areas are within 1,000 feet of the site.

For residential construction provide stabilized construction entrances for each residence, rather than only at the main subdivision entrance. Stabilized surfaces shall be of sufficient length/width to provide vehicle access/parking, based on lot size/configuration.

On large commercial, highway, and road projects, the designer should include enough extra materials in the contract to allow for additional stabilized entrances not shown in the initial Construction SWPPP. It is difficult to determine exactly where access to these projects will take place; additional materials will enable the contractor to install them where needed.

Design and Installation Specifications

See Figure II-4.1.1 Stabilized Construction Entrance (p.273) for details. Note: the 100' minimum length of the entrance shall be reduced to the maximum practicable size when the size or configuration of the site does not allow the full length (100').

Construct stabilized construction entrances with a 12-inch thick pad of 4-inch to 8-inch quarry spalls, a 4-inch course of asphalt treated base (ATB), or use existing pavement. Do not use crushed concrete, cement, or calcium chloride for construction entrance stabilization because these products raise pH levels in stormwater and concrete discharge to surface waters of the State is prohibited.

A separation geotextile shall be placed under the spalls to prevent fine sediment from pumping up into the rock pad. The geotextile shall meet the following standards:

Grab Tensile Strength (ASTM D4751)	200 psi min.
Grab Tensile Elongation (ASTM D4632)	30% max.
Mullen Burst Strength (ASTM D3786-80a)	400 psi min.
AOS (ASTM D4751)	20-45 (U.S. standard sieve size)

- Consider early installation of the first lift of asphalt in areas that will paved; this can be used as a stabilized entrance. Also consider the installation of excess concrete as a stabilized entrance. During large concrete pours, excess concrete is often available for this purpose.
- Fencing (see BMP C103: High Visibility Fence (p.269)) shall be installed as necessary to restrict traffic to the construction entrance.
- Whenever possible, the entrance shall be constructed on a firm, compacted subgrade. This can substantially increase the effectiveness of the pad and reduce the need for maintenance.
- Construction entrances should avoid crossing existing sidewalks and back of walk drains if at all possible. If a construction entrance must cross a sidewalk or back of walk drain, the full length of the sidewalk and back of walk drain must be covered and protected from sediment leaving the site.

Maintenance Standards

Quarry spalls shall be added if the pad is no longer in accordance with the specifications.

- If the entrance is not preventing sediment from being tracked onto pavement, then alternative measures to keep the streets free of sediment shall be used. This may include replacement/cleaning of the existing quarry spalls, street sweeping, an increase in the dimensions of the entrance, or the installation of a wheel wash.
- Any sediment that is tracked onto pavement shall be removed by shoveling or street sweeping. The sediment collected by sweeping shall be removed or stabilized on site. The pavement shall not be cleaned by washing down the street, except when high efficiency sweeping is ineffective and there is a threat to public safety. If it is necessary to wash the streets, the construction of a small sump to contain the wash water shall be considered. The sediment would then be washed into the sump where it can be controlled.
- Perform street sweeping by hand or with a high efficiency sweeper. Do not use a non-high efficiency mechanical sweeper because this creates dust and throws soils into storm systems or conveyance ditches.

- Any quarry spalls that are loosened from the pad, which end up on the roadway shall be removed immediately.
- If vehicles are entering or exiting the site at points other than the construction entrance(s), fencing (see BMP C103) shall be installed to control traffic.
- Upon project completion and site stabilization, all construction accesses intended as permanent access for maintenance shall be permanently stabilized.

BMP C120: Temporary and Permanent Seeding

Purpose

Seeding reduces erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

Conditions of Use

Use seeding throughout the project on disturbed areas that have reached final grade or that will remain unworked for more than 30 days.

The optimum seeding windows for western Washington are April 1 through June 30 and September 1 through October 1.

Between July 1 and August 30 seeding requires irrigation until 75 percent grass cover is established.

Between October 1 and March 30 seeding requires a cover of mulch with straw or an erosion control blanket until 75 percent grass cover is established.

Review all disturbed areas in late August to early September and complete all seeding by the end of September. Otherwise, vegetation will not establish itself enough to provide more than average protection.

- Mulch is required at all times for seeding because it protects seeds from heat, moisture loss, and transport due to runoff. Mulch can be applied on top of the seed or simultaneously by hydroseeding. See BMP C121: Mulching (p.284) for specifications.
- Seed and mulch, all disturbed areas not otherwise vegetated at final site stabilization. Final stabilization means the completion of all soil disturbing activities at the site and the establishment of a permanent vegetative cover, or equivalent per-

manent stabilization measures (such as pavement, riprap, gabions, or geotextiles) which will prevent erosion.

Design and Installation Specifications

Seed retention/detention ponds as required.

Install channels intended for vegetation before starting major earthwork and hydroseed with a Bonded Fiber Matrix. For vegetated channels that will have high flows, install erosion control blankets over hydroseed. Before allowing water to flow in vegetated channels, establish 75 percent vegetation cover. If vegetated channels cannot be established by seed before water flow; install sod in the channel bottom—over hydromulch and erosion control blankets.

- Confirm the installation of all required surface water control measures to prevent seed from washing away.
- Hydroseed applications shall include a minimum of 1,500 pounds per acre of mulch with 3 percent tackifier. See BMP C121: Mulching (p.284) for specifications.
- Areas that will have seeding only and not landscaping may need compost or meal-based mulch included in the hydroseed in order to establish vegetation. Re-install native topsoil on the disturbed soil surface before application.
- When installing seed via hydroseeding operations, only about 1/3 of the seed actually ends up in contact with the soil surface. This reduces the ability to establish a good stand of grass quickly. To overcome this, consider increasing seed quantities by up to 50 percent.
- Enhance vegetation establishment by dividing the hydromulch operation into two phases:

  1. Phase 1- Install all seed and fertilizer with 25-30 percent mulch and tackifier onto soil in the first lift.
  2. Phase 2- Install the rest of the mulch and tackifier over the first lift.

  Or, enhance vegetation by:

  1. Installing the mulch, seed, fertilizer, and tackifier in one lift.
  2. Spread or blow straw over the top of the hydromulch at a rate of 800-1000 pounds per acre.
  3. Hold straw in place with a standard tackifier.

  Both of these approaches will increase cost moderately but will greatly improve and enhance vegetative establishment. The increased cost may be offset by the reduced need for:

- Irrigation.
- Reapplication of mulch.
- Repair of failed slope surfaces.

This technique works with standard hydromulch (1,500 pounds per acre minimum) and BFM/MBFMs (3,000 pounds per acre minimum).

- Seed may be installed by hand if:
  - Temporary and covered by straw, mulch, or topsoil.
  - Permanent in small areas (usually less than 1 acre) and covered with mulch, topsoil, or erosion blankets.
  - The seed mixes listed in the tables below include recommended mixes for both temporary and permanent seeding.
  - Apply these mixes, with the exception of the wetland mix, at a rate of 120 pounds per acre. This rate can be reduced if soil amendments or slow-release fertilizers are used.
  - Consult the local suppliers or the local conservation district for their recommendations because the appropriate mix depends on a variety of factors, including location, exposure, soil type, slope, and expected foot traffic. Alternative seed mixes approved by the local authority may be used.
  - Other mixes may be appropriate, depending on the soil type and hydrology of the area.
- Table II-4.1.2 Temporary Erosion Control Seed Mix (p.280) lists the standard mix for areas requiring a temporary vegetative cover.

Table II-4.1.2 Temporary Erosion Control Seed Mix

	% Weight	% Purity	% Germination
Chewings or annual blue grass *Festuca rubra var. commutata* or *Poa anna*	40	98	90
Perennial rye *Lolium perenne*	50	98	90
Redtop or colonial bentgrass *Agrostis alba* or *Agrostis tenuis*	5	92	85
White dutch clover *Trifolium repens*	5	98	90

- Table II-4.1.3 Landscaping Seed Mix (p.281) lists a recommended mix for landscaping seed.

Table II-4.1.3 Landscaping Seed Mix

	% Weight	% Purity	% Germination
Perennial rye blend *Lolium perenne*	70	98	90
Chewings and red fescue blend *Festuca rubra var. commutata* or *Festuca rubra*	30	98	90

- Table II-4.1.4 Low-Growing Turf Seed Mix (p.281) lists a turf seed mix for dry situations where there is no need for watering. This mix requires very little maintenance.

Table II-4.1.4 Low-Growing Turf Seed Mix

	% Weight	% Purity	% Germination
Dwarf tall fescue (several varieties) *Festuca arundinacea var.*	45	98	90
Dwarf perennial rye (Barclay) *Lolium perenne var. barclay*	30	98	90
Red fescue *Festuca rubra*	20	98	90
Colonial bentgrass *Agrostis tenuis*	5	98	90

- Table II-4.1.5 Bioswale Seed Mix* (p.281) lists a mix for bioswales and other intermittently wet areas.

Table II-4.1.5 Bioswale Seed Mix*

	% Weight	% Purity	% Germination
Tall or meadow fescue *Festuca arundinacea* or *Festuca elatior*	75-80	98	90
Seaside/Creeping bentgrass *Agrostis palustris*	10-15	92	85
Redtop bentgrass *Agrostis alba* or *Agrostis gigantea*	5-10	90	80
* Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix			

- Table II-4.1.6 Wet Area Seed Mix* (p.282) lists a low-growing, relatively non-invasive seed mix appropriate for very wet areas that are not regulated wetlands. Apply

this mixture at a rate of 60 pounds per acre. Consult Hydraulic Permit Authority (HPA) for seed mixes if applicable.

Table II-4.1.6 Wet Area Seed Mix*

	% Weight	% Purity	% Germination
Tall or meadow fescue *Festuca arundinacea* or *Festuca elatior*	60-70	98	90
Seaside/Creeping bentgrass *Agrostis palustris*	10-15	98	85
Meadow foxtail *Alepocurus pratensis*	10-15	90	80
Alsike clover *Trifolium hybridum*	1-6	98	90
Redtop bentgrass *Agrostis alba*	1-6	92	85
* Modified Briargreen, Inc. Hydroseeding Guide Wetlands Seed Mix			

- Table II-4.1.7 Meadow Seed Mix (p.282) lists a recommended meadow seed mix for infrequently maintained areas or non-maintained areas where colonization by native plants is desirable. Likely applications include rural road and utility right-of-way. Seeding should take place in September or very early October in order to obtain adequate establishment prior to the winter months. Consider the appropriateness of clover, a fairly invasive species, in the mix. Amending the soil can reduce the need for clover.

Table II-4.1.7 Meadow Seed Mix

	% Weight	% Purity	% Germination
Redtop or Oregon bentgrass *Agrostis alba* or *Agrostis oregonensis*	20	92	85
Red fescue *Festuca rubra*	70	98	90
White dutch clover *Trifolium repens*	10	98	90

- **Roughening and Rototilling:**
  - The seedbed should be firm and rough. Roughen all soil no matter what the slope. Track walk slopes before seeding if engineering purposes require

compaction. Backblading or smoothing of slopes greater than 4H:1V is not allowed if they are to be seeded.

- Restoration-based landscape practices require deeper incorporation than that provided by a simple single-pass rototilling treatment. Wherever practical, initially rip the subgrade to improve long-term permeability, infiltration, and water inflow qualities. At a minimum, permanent areas shall use soil amendments to achieve organic matter and permeability performance defined in engineered soil/landscape systems. For systems that are deeper than 8 inches complete the rototilling process in multiple lifts, or prepare the engineered soil system per specifications and place to achieve the specified depth.

- **Fertilizers:**

  - Conducting soil tests to determine the exact type and quantity of fertilizer is recommended. This will prevent the over-application of fertilizer.
  - Organic matter is the most appropriate form of fertilizer because it provides nutrients (including nitrogen, phosphorus, and potassium) in the least water-soluble form.
  - In general, use 10-4-6 N-P-K (nitrogen-phosphorus-potassium) fertilizer at a rate of 90 pounds per acre. Always use slow-release fertilizers because they are more efficient and have fewer environmental impacts. Do not add fertilizer to the hydromulch machine, or agitate, more than 20 minutes before use. Too much agitation destroys the slow-release coating.
  - There are numerous products available that take the place of chemical fertilizers. These include several with seaweed extracts that are beneficial to soil microbes and organisms. If 100 percent cottonseed meal is used as the mulch in hydroseed, chemical fertilizer may not be necessary. Cottonseed meal provides a good source of long-term, slow-release, available nitrogen.

- **Bonded Fiber Matrix and Mechanically Bonded Fiber Matrix:**

  - On steep slopes use Bonded Fiber Matrix (BFM) or Mechanically Bonded Fiber Matrix (MBFM) products. Apply BFM/MBFM products at a minimum rate of 3,000 pounds per acre of mulch with approximately 10 percent tackifier. Achieve a minimum of 95 percent soil coverage during application. Numerous products are available commercially. Installed products per manufacturer's instructions. Most products require 24-36 hours to cure before rainfall and cannot be installed on wet or saturated soils. Generally, products come in 40-50 pound bags and include all necessary ingredients except for seed and fertilizer.

- BFMs and MBFMs provide good alternatives to blankets in most areas requiring vegetation establishment. Advantages over blankets include:
    - BFM and MBFMs do not require surface preparation.
    - Helicopters can assist in installing BFM and MBFMs in remote areas.
    - On slopes steeper than 2.5H:1V, blanket installers may require ropes and harnesses for safety.
    - Installing BFM and MBFMs can save at least $1,000 per acre compared to blankets.

Maintenance Standards

Reseed any seeded areas that fail to establish at least 80 percent cover (100 percent cover for areas that receive sheet or concentrated flows). If reseeding is ineffective, use an alternate method such as sodding, mulching, or nets/blankets. If winter weather prevents adequate grass growth, this time limit may be relaxed at the discretion of the local authority when sensitive areas would otherwise be protected.

- Reseed and protect by mulch any areas that experience erosion after achieving adequate cover. Reseed and protect by mulch any eroded area.
- Supply seeded areas with adequate moisture, but do not water to the extent that it causes runoff.

Approved as Equivalent

Ecology has approved products as able to meet the requirements of BMP C120: Temporary and Permanent Seeding. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept this product approved as equivalent, or may require additional testing prior to consideration for local use. The products are available for review on Ecology's website at http://www.ecy.wa.gov/programs/wq/stormwater/newtech/equivalent.html.

BMP C121: Mulching

Purpose

Mulching soils provides immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures. There is an enormous variety of mulches that can be used. This section discusses only the most common types of mulch.

Conditions of Use

As a temporary cover measure, mulch should be used:

- For less than 30 days on disturbed areas that require cover.
- At all times for seeded areas, especially during the wet season and during the hot summer months.
- During the wet season on slopes steeper than 3H:1V with more than 10 feet of vertical relief.

Mulch may be applied at any time of the year and must be refreshed periodically.

- For seeded areas mulch may be made up of 100 percent: cottonseed meal; fibers made of wood, recycled cellulose, hemp, kenaf; compost; or blends of these. Tackifier shall be plant-based, such as guar or alpha plantago, or chemical-based such as polyacrylamide or polymers. Any mulch or tackifier product used shall be installed per manufacturer's instructions. Generally, mulches come in 40-50 pound bags. Seed and fertilizer are added at time of application.

Design and Installation Specifications

For mulch materials, application rates, and specifications, see Table II-4.1.8 Mulch Standards and Guidelines (p.286). Always use a 2-inch minimum mulch thickness; increase the thickness until the ground is 95% covered (i.e. not visible under the mulch layer). Note: Thickness may be increased for disturbed areas in or near sensitive areas or other areas highly susceptible to erosion.

Where the option of "Compost" is selected, it should be a coarse compost that meets the following size gradations when tested in accordance with the U.S. Composting Council "Test Methods for the Examination of Compost and Composting" (TMECC) Test Method 02.02-B.

Coarse Compost

Minimum Percent passing 3" sieve openings 100%

Minimum Percent passing 1" sieve openings 90%

Minimum Percent passing ¾" sieve openings 70%

Minimum Percent passing ¼" sieve openings 40%

Mulch used within the ordinary high-water mark of surface waters should be selected to minimize potential flotation of organic matter. Composted organic materials have higher specific gravities (densities) than straw, wood, or chipped material. Consult Hydraulic Permit Authority (HPA) for mulch mixes if applicable.

Maintenance Standards

- The thickness of the cover must be maintained.
- Any areas that experience erosion shall be remulched and/or protected with a net

or blanket. If the erosion problem is drainage related, then the problem shall be fixed and the eroded area remulched.

Table II-4.1.8 Mulch Standards and Guidelines

Mulch Material	Quality Standards	Application Rates	Remarks
Straw	Air-dried; free from undesirable seed and coarse material.	2"-3" thick; 5 bales per 1,000 sf or 2-3 tons per acre	Cost-effective protection when applied with adequate thickness. Hand-application generally requires greater thickness than blown straw. The thickness of straw may be reduced by half when used in conjunction with seeding. In windy areas straw must be held in place by crimping, using a tackifier, or covering with netting. Blown straw always has to be held in place with a tackifier as even light winds will blow it away. Straw, however, has several deficiencies that should be considered when selecting mulch materials. It often introduces and/or encourages the propagation of weed species and it has no significant long-term benefits It should also not be used within the ordinary high-water elevation of surface waters (due to flotation).
Hydromulch	No growth inhibiting factors.	Approx. 25-30 lbs per 1,000 sf or 1,500 - 2,000 lbs per acre	Shall be applied with hydromulcher. Shall not be used without seed and tackifier unless the application rate is at least doubled. Fibers longer than about 3/4 - 1 inch clog hydromulch equipment. Fibers should be kept to less than 3/4 inch.
Compost	No visible water or dust during handling. Must be produced per WAC 173-350, Solid Waste Handling Standards, but may have up to 35%	2" thick min.; approx. 100 tons per acre (approx. 800 lbs per yard)	More effective control can be obtained by increasing thickness to 3". Excellent mulch for protecting final grades until landscaping because it can be directly seeded or tilled into soil as an amendment. Compost used for mulch has a coarser size gradation than compost used for BMP C125: Topsoiling / Composting (p.297) or BMP T5.13: Post-Construction Soil Quality and Depth (p.911). It is more stable and practical to use in wet areas and during rainy weather conditions. Do not use near wetlands or near phosphorous impaired water bodies.

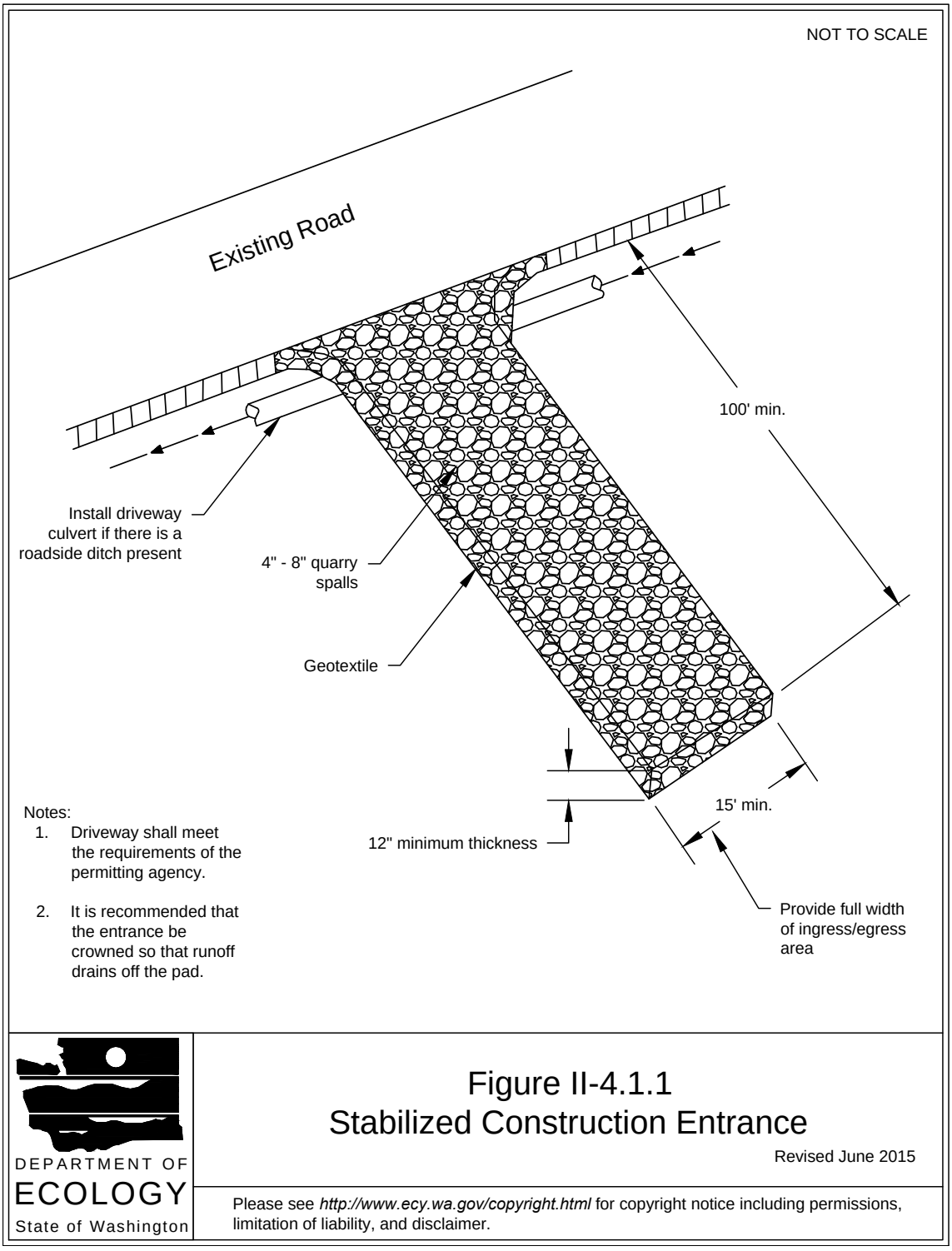
Table II-4.1.8 Mulch Standards and Guidelines (continued)

Mulch Material	Quality Standards	Application Rates	Remarks
	biosolids.		
Chipped Site Vegetation	Average size shall be several inches. Gradations from fines to 6 inches in length for texture, variation, and interlocking properties.	2" thick min.;	This is a cost-effective way to dispose of debris from clearing and grubbing, and it eliminates the problems associated with burning. Generally, it should not be used on slopes above approx. 10% because of its tendency to be transported by run-off. It is not recommended within 200 feet of surface waters. If seeding is expected shortly after mulch, the decomposition of the chipped vegetation may tie up nutrients important to grass establishment.
Wood-based Mulch or Wood Straw	No visible water or dust during handling. Must be purchased from a supplier with a Solid Waste Handling Permit or one exempt from solid waste regulations.	2" thick min.; approx. 100 tons per acre (approx. 800 lbs. per cubic yard)	This material is often called "hog or hogged fuel". The use of mulch ultimately improves the organic matter in the soil. Special caution is advised regarding the source and composition of wood-based mulches. Its preparation typically does not provide any weed seed control, so evidence of residual vegetation in its composition or known inclusion of weed plants or seeds should be monitored and prevented (or minimized).
Wood Strand Mulch	A blend of loose, long, thin wood pieces derived from native conifer or deciduous trees with	2" thick min.	Cost-effective protection when applied with adequate thickness. A minimum of 95-percent of the wood strand shall have lengths between 2 and 10-inches, with a width and thickness between 1/16 and 3/8-inches. The mulch shall not contain resin, tannin, or other compounds in quantities that would be detrimental to plant life. Sawdust or wood shavings shall not be used as mulch. (WSDOT specification (9-14.4(4))

Table II-4.1.8 Mulch Standards and Guidelines (continued)

Mulch Material	Quality Standards	Application Rates	Remarks
	high length-to-width ratio.		

Figure II-4.1.1 Stabilized Construction Entrance



BMP C140: Dust Control

Purpose

Dust control prevents wind transport of dust from disturbed soil surfaces onto roadways, drainage ways, and surface waters.

Conditions of Use

In areas (including roadways) subject to surface and air movement of dust where on-site and off-site impacts to roadways, drainage ways, or surface waters are likely.

Design and Installation Specifications

- Vegetate or mulch areas that will not receive vehicle traffic. In areas where planting, mulching, or paving is impractical, apply gravel or landscaping rock.
- Limit dust generation by clearing only those areas where immediate activity will take place, leaving the remaining area(s) in the original condition. Maintain the original ground cover as long as practical.
- Construct natural or artificial windbreaks or windscreens. These may be designed as enclosures for small dust sources.
- Sprinkle the site with water until surface is wet. Repeat as needed. To prevent carryout of mud onto street, refer to BMP C105: Stabilized Construction Entrance Exit (p.270)
- Irrigation water can be used for dust control. Irrigation systems should be installed as a first step on sites where dust control is a concern.
- Spray exposed soil areas with a dust palliative, following the manufacturer's instructions and cautions regarding handling and application. Used oil is prohibited from use as a dust suppressant. Local governments may approve other dust palliatives such as calcium chloride or PAM.
- PAM (BMP C126: Polyacrylamide (PAM) for Soil Erosion Protection (p.300)) added to water at a rate of 0.5 lbs. per 1,000 gallons of water per acre and applied from a water truck is more effective than water alone. This is due to increased infiltration of water into the soil and reduced evaporation. In addition, small soil particles are bonded together and are not as easily transported by wind. Adding PAM may actually reduce the quantity of water needed for dust control. Use of PAM could be a cost-effective dust control method.

Techniques that can be used for unpaved roads and lots include:

- Lower speed limits. High vehicle speed increases the amount of dust stirred up from unpaved roads and lots.
- Upgrade the road surface strength by improving particle size, shape, and mineral types that make up the surface and base materials.
- Add surface gravel to reduce the source of dust emission. Limit the amount of fine particles (those smaller than .075 mm) to 10 to 20 percent.
- Use geotextile fabrics to increase the strength of new roads or roads undergoing reconstruction.
- Encourage the use of alternate, paved routes, if available.

- Restrict use of paved roadways by tracked vehicles and heavy trucks to prevent damage to road surface and base.
- Apply chemical dust suppressants using the admix method, blending the product with the top few inches of surface material. Suppressants may also be applied as surface treatments.
- Pave unpaved permanent roads and other trafficked areas.
- Use vacuum street sweepers.
- Remove mud and other dirt promptly so it does not dry and then turn into dust.
- Limit dust-causing work on windy days.
- Contact your local Air Pollution Control Authority for guidance and training on other dust control measures. Compliance with the local Air Pollution Control Authority constitutes compliance with this BMP.
-

Maintenance Standards

Respray area as necessary to keep dust to a minimum.

BMP C151: Concrete Handling

Purpose

Concrete work can generate process water and slurry that contain fine particles and high pH, both of which can violate water quality standards in the receiving water. Concrete spillage or concrete discharge to surface waters of the State is prohibited. Use this BMP to minimize and eliminate concrete, concrete process water, and concrete slurry from entering waters of the state.

Conditions of Use

Any time concrete is used, utilize these management practices. Concrete construction projects include, but are not limited to, the following:

- Curbs
- Sidewalks
- Roads
- Bridges
- Foundations
- Floors
- Runways

Design and Installation Specifications

- Assure that washout of concrete trucks, chutes, pumps, and internals is performed at an approved off-site location or in designated concrete washout areas. Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams. Refer to BMP C154: Concrete Washout Area (p.317) for information on concrete washout areas.
- Return unused concrete remaining in the truck and pump to the originating batch plant for recycling. Do not dump excess concrete on site, except in designated concrete washout areas.
- Wash off hand tools including, but not limited to, screeds, shovels, rakes, floats, and trowels into formed areas only.
- Wash equipment difficult to move, such as concrete pavers in areas that do not directly drain to natural or constructed stormwater conveyances.
- Do not allow washdown from areas, such as concrete aggregate driveways, to drain directly to natural or constructed stormwater conveyances.
- Contain washwater and leftover product in a lined container when no formed areas are available. Dispose of contained concrete in a manner that does not violate ground water or surface water quality standards.
- Always use forms or solid barriers for concrete pours, such as pilings, within 15-feet of surface waters.
- Refer to BMP C252: High pH Neutralization Using CO2 (p.409) and BMP C253: pH Control for High pH Water (p.412) for pH adjustment requirements.
- Refer to the Construction Stormwater General Permit for pH monitoring requirements if the project involves one of the following activities:

- Significant concrete work (greater than 1,000 cubic yards poured concrete or recycled concrete used over the life of a project).
- The use of engineered soils amended with (but not limited to) Portland cement-treated base, cement kiln dust or fly ash.
- Discharging stormwater to segments of water bodies on the 303(d) list (Category 5) for high pH.

Maintenance Standards

Check containers for holes in the liner daily during concrete pours and repair the same day.

BMP C152: Sawcutting and Surfacing Pollution Prevention

Purpose

Sawcutting and surfacing operations generate slurry and process water that contains fine particles and high pH (concrete cutting), both of which can violate the water quality standards in the receiving water. Concrete spillage or concrete discharge to surface waters of the State is prohibited. Use this BMP to minimize and eliminate process water and slurry created through sawcutting or surfacing from entering waters of the State.

Conditions of Use

Utilize these management practices anytime sawcutting or surfacing operations take place. Sawcutting and surfacing operations include, but are not limited to, the following:

- Sawing
- Coring
- Grinding
- Roughening
- Hydro-demolition
- Bridge and road surfacing

Design and Installation Specifications

- Vacuum slurry and cuttings during cutting and surfacing operations.
- Slurry and cuttings shall not remain on permanent concrete or asphalt pavement overnight.
- Slurry and cuttings shall not drain to any natural or constructed drainage conveyance including stormwater systems. This may require temporarily blocking catch basins.
- Dispose of collected slurry and cuttings in a manner that does not violate ground water or surface water quality standards.
- Do not allow process water generated during hydro-demolition, surface roughening or similar operations to drain to any natural or constructed drainage conveyance including stormwater systems. Dispose process water in a manner that does not violate ground water or surface water quality standards.
- Handle and dispose cleaning waste material and demolition debris in a manner that does not cause contamination of water. Dispose of sweeping material from a pick-up sweeper at an appropriate disposal site.

Maintenance Standards

Continually monitor operations to determine whether slurry, cuttings, or process water could enter waters of the state. If inspections show that a violation of water quality standards could occur, stop operations and immediately implement preventive measures such as berms, barriers, secondary containment, and vacuum trucks.

BMP C154: Concrete Washout Area

Purpose

Prevent or reduce the discharge of pollutants to stormwater from concrete waste by conducting washout off-site, or performing on-site washout in a designated area to prevent pollutants from entering surface waters or ground water.

Conditions of Use

Concrete washout area best management practices are implemented on construction projects where:

- Concrete is used as a construction material
- It is not possible to dispose of all concrete wastewater and washout off-site (ready mix plant, etc.).
- Concrete trucks, pumpers, or other concrete coated equipment are washed on-site.
- Note: If less than 10 concrete trucks or pumpers need to be washed out on-site, the washwater may be disposed of in a formed area awaiting concrete or an upland disposal site where it will not contaminate surface or ground water. The upland disposal site shall be at least 50 feet from sensitive areas such as storm drains, open ditches, or water bodies, including wetlands.

Design and Installation Specifications

Implementation

The following steps will help reduce stormwater pollution from concrete wastes:

- Perform washout of concrete trucks at an approved off-site location or in designated concrete washout areas only.
- Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped on-site, except in designated concrete washout areas.
- Concrete washout areas may be prefabricated concrete washout containers, or self-installed structures (above-grade or below-grade).
- Prefabricated containers are most resistant to damage and protect against spills and leaks. Companies may offer delivery service and provide regular maintenance and disposal of solid and liquid waste.
- If self-installed concrete washout areas are used, below-grade structures are preferred over above-grade structures because they are less prone to spills and leaks.
- Self-installed above-grade structures should only be used if excavation is not practical.

Education

- Discuss the concrete management techniques described in this BMP with the ready-mix concrete supplier before any deliveries are made.

- Educate employees and subcontractors on the concrete waste management techniques described in this BMP.
- Arrange for contractor's superintendent or Certified Erosion and Sediment Control Lead (CESCL) to oversee and enforce concrete waste management procedures.
- A sign should be installed adjacent to each temporary concrete washout facility to inform concrete equipment operators to utilize the proper facilities.

Contracts

Incorporate requirements for concrete waste management into concrete supplier and subcontractor agreements.

Location and Placement

- Locate washout area at least 50 feet from sensitive areas such as storm drains, open ditches, or water bodies, including wetlands.
- Allow convenient access for concrete trucks, preferably near the area where the concrete is being poured.
- If trucks need to leave a paved area to access washout, prevent track-out with a pad of rock or quarry spalls (see BMP C105: Stabilized Construction Entrance / Exit (p.270)). These areas should be far enough away from other construction traffic to reduce the likelihood of accidental damage and spills.
- The number of facilities you install should depend on the expected demand for storage capacity.
- On large sites with extensive concrete work, washouts should be placed in multiple locations for ease of use by concrete truck drivers.

On-site Temporary Concrete Washout Facility, Transit Truck Washout Procedures:

- Temporary concrete washout facilities shall be located a minimum of 50 feet from sensitive areas including storm drain inlets, open drainage facilities, and watercourses. See Figure II-4.1.7a Concrete Washout Area (p.322), Figure II-4.1.7b Concrete Washout Area (p.323), and Figure II-4.1.8 Prefabricated Concrete Washout Container w/Ramp (p.324).
- Concrete washout facilities shall be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.
- Washout of concrete trucks shall be performed in designated areas only.
- Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed of off-site.
- Once concrete wastes are washed into the designated area and allowed to harden, the concrete should be broken up, removed, and disposed of per applicable solid waste regulations. Dispose of hardened concrete on a regular basis.
- Temporary Above-Grade Concrete Washout Facility

- Temporary concrete washout facility (type above grade) should be constructed as shown on the details below, with a recommended minimum length and minimum width of 10 ft, but with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations.
- Plastic lining material should be a minimum of 10 mil polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.
- Temporary Below-Grade Concrete Washout Facility.
- Temporary concrete washout facilities (type below grade) should be constructed as shown on the details below, with a recommended minimum length and minimum width of 10 ft. The quantity and volume should be sufficient to contain all liquid and concrete waste generated by washout operations.
- Lath and flagging should be commercial type.
- Plastic lining material shall be a minimum of 10 mil polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.
- Liner seams shall be installed in accordance with manufacturers' recommendations.
- Soil base shall be prepared free of rocks or other debris that may cause tears
- or holes in the plastic lining material.

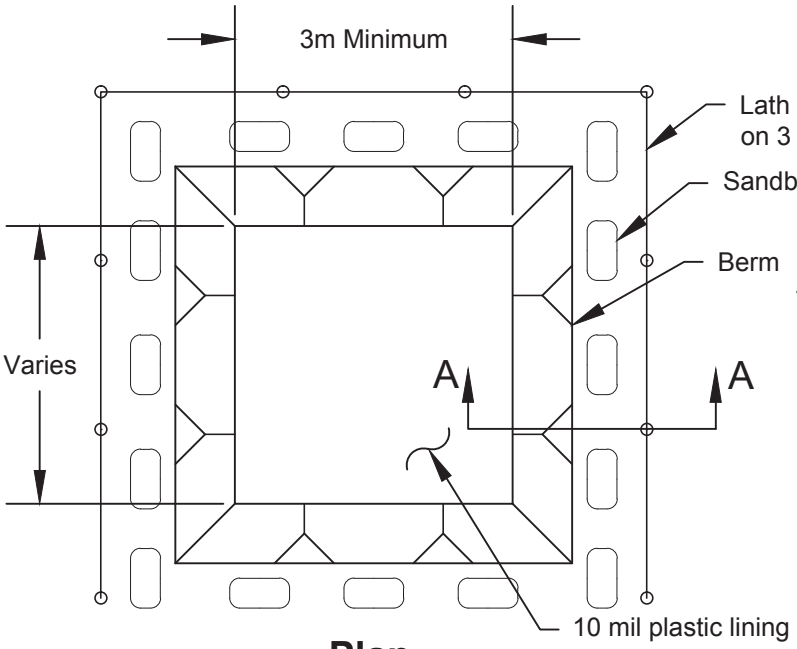
Maintenance Standards
Inspection and Maintenance

- Inspect and verify that concrete washout BMPs are in place prior to the commencement of concrete work.
- During periods of concrete work, inspect daily to verify continued performance.
    - Check overall condition and performance.
    - Check remaining capacity (% full).
    - If using self-installed washout facilities, verify plastic liners are intact and sidewalls are not damaged.
    - If using prefabricated containers, check for leaks.
- Washout facilities shall be maintained to provide adequate holding capacity with a minimum freeboard of 12 inches.
- Washout facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.
- If the washout is nearing capacity, vacuum and dispose of the waste material in an approved manner.
- Do not discharge liquid or slurry to waterways, storm drains or directly onto ground.
- Do not use sanitary sewer without local approval.
- Place a secure, non-collapsing, non-water collecting cover over the concrete washout facility prior to predicted wet weather to prevent accumulation and overflow of precipitation.

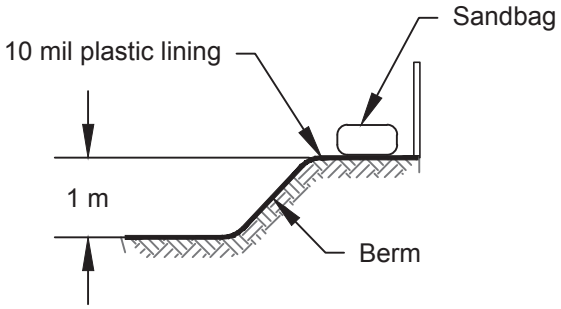
- Remove and dispose of hardened concrete and return the structure to a functional condition. Concrete may be reused on-site or hauled away for disposal or recycling.
- When you remove materials from the self-installed concrete washout, build a new structure; or, if the previous structure is still intact, inspect for signs of weakening or damage, and make any necessary repairs. Re-line the structure with new plastic after each cleaning.

Removal of Temporary Concrete Washout Facilities

- When temporary concrete washout facilities are no longer required for the work, the hardened concrete, slurries and liquids shall be removed and properly disposed of.
- Materials used to construct temporary concrete washout facilities shall be removed from the site of the work and disposed of or recycled.
- Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities shall be backfilled, repaired, and stabilized to prevent erosion.



Plan

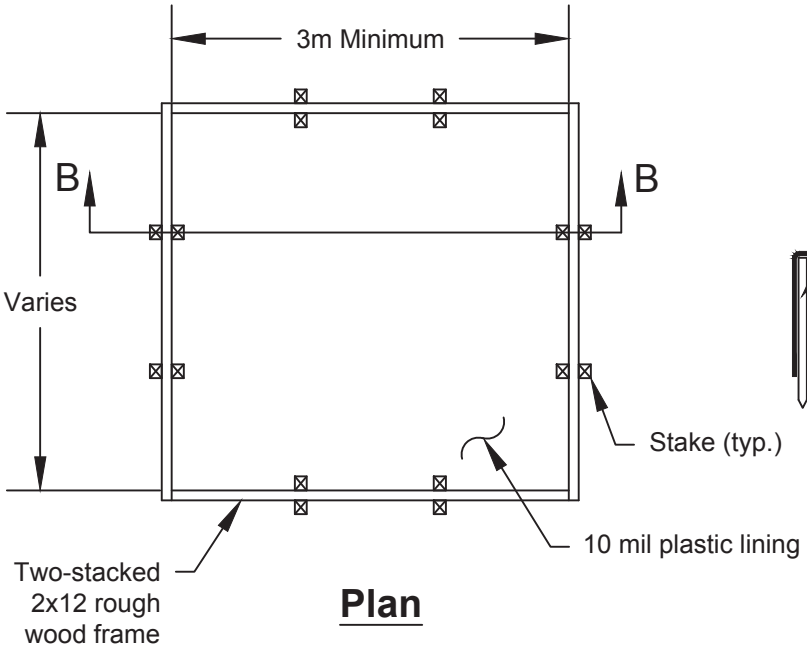


Section A-A

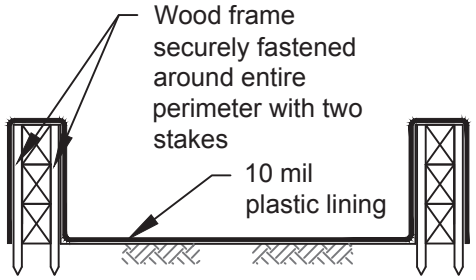
Type "Below Grade"

Notes:

1. Actual layout determined in the field.
2. A concrete washout sign shall be installed within 10 m of the temporary concrete washout facility.



Plan



Section B-B

Type "Above Grade" with Wood Planks

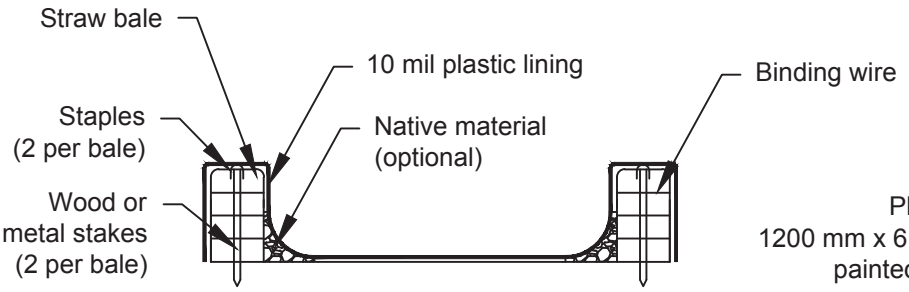
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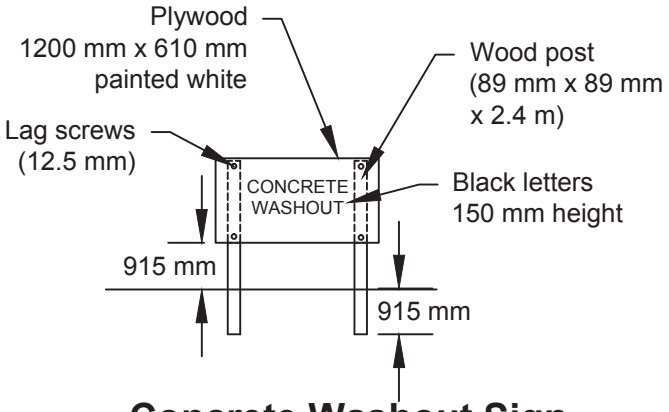
Figure II-4.1.7a
Concrete Washout Area

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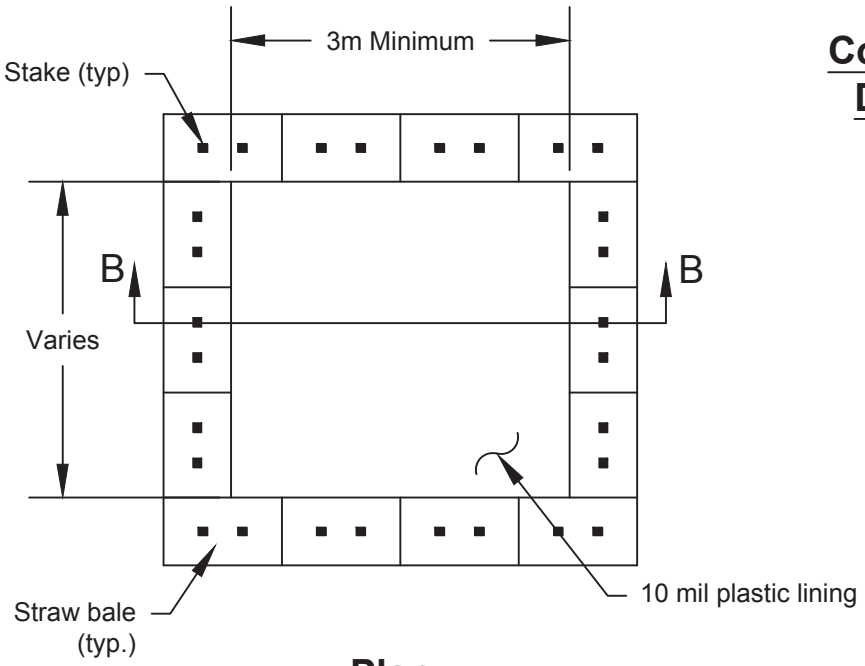
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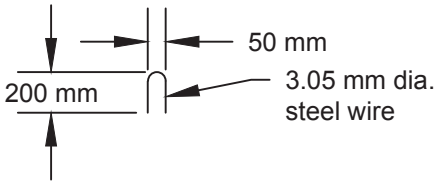
Section B-B



Concrete Washout Sign Detail (or equivalent)



Plan



Staple Detail

Notes:

1. Actual layout determined in the field.
2. The concrete washout sign shall be installed within 10 m of the temporary concrete washout facility.

Type "Above Grade" with Straw Bales

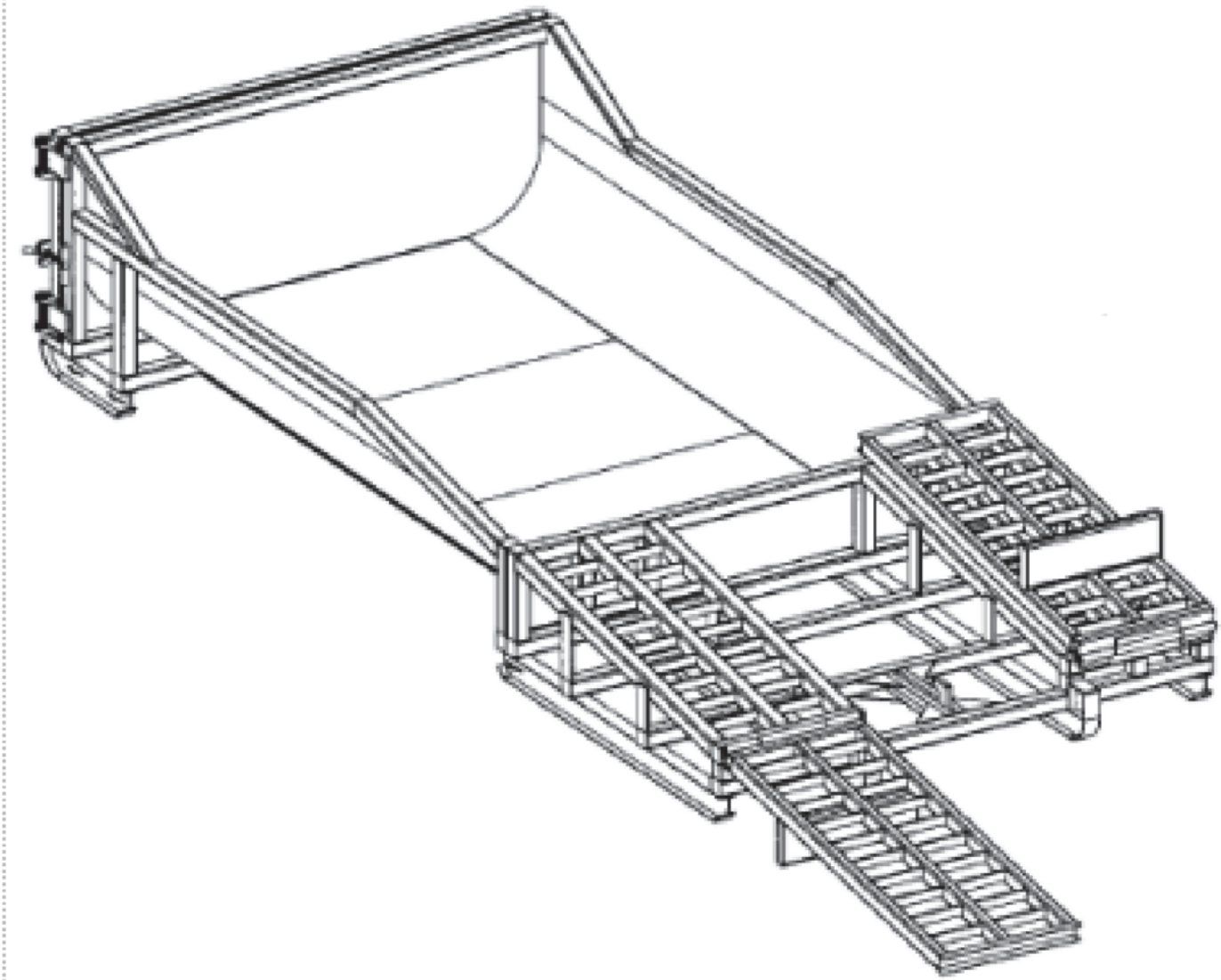
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Figure II-4.1.7b
Concrete Washout Area

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Figure II-4.1.8
Prefabricated Concrete Washout Container w/Ramp

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BMP C160: Certified Erosion and Sediment Control Lead

Purpose

The project proponent designates at least one person as the responsible representative in charge of erosion and sediment control (ESC), and water quality protection. The designated person shall be the Certified Erosion and Sediment Control Lead (CESCL) who is responsible for ensuring compliance with all local, state, and federal erosion and sediment control and water quality requirements.

Conditions of Use

A CESCL shall be made available on projects one acre or larger that discharge stormwater to surface waters of the state. Sites less than one acre may have a person without CESCL certification conduct inspections; sampling is not required on sites that disturb less than an acre.

The CESCL shall:

- Have a current certificate proving attendance in an erosion and sediment control training course that meets the minimum ESC training and certification requirements established by Ecology (see details below). Ecology will maintain a list of ESC training and certification providers at: http://www.ecy.wa.gov/programs/wq/stormwater/cescl.html

OR

- Be a Certified Professional in Erosion and Sediment Control (CPESC); for additional information go to: http://www.envirocertintl.org/cpesc/

Specifications

- Certification shall remain valid for three years.
- The CESCL shall have authority to act on behalf of the contractor or developer and shall be available, or on-call, 24 hours per day throughout the period of construction.
- The Construction SWPPP shall include the name, telephone number, fax number, and address of the designated CESCL.
- A CESCL may provide inspection and compliance services for multiple construction projects in the same geographic region.

Duties and responsibilities of the CESCL shall include, but are not limited to the following:

- Maintaining permit file on site at all times which includes the Construction SWPPP and any associated permits and plans.
- Directing BMP installation, inspection, maintenance, modification, and removal.
- Updating all project drawings and the Construction SWPPP with changes made.
- Completing any sampling requirements including reporting results using WebDMR.
- Keeping daily logs, and inspection reports. Inspection reports should include:
    - Inspection date/time.

- Weather information; general conditions during inspection and approximate amount of precipitation since the last inspection. A summary or list of all BMPs implemented, including observations of all erosion/sediment control structures or practices. The following shall be noted:
    - Locations of BMPs inspected.
    - Locations of BMPs that need maintenance.
    - Locations of BMPs that failed to operate as designed or intended
    - Locations of where additional or different BMPs are required.
- Visual monitoring results, including a description of discharged stormwater.
- The presence of suspended sediment, turbid water, discoloration, and oil sheen shall be noted, as applicable.
- Any water quality monitoring performed during inspection.
- General comments and notes, including a brief description of any BMP repairs, maintenance or installations made as a result of the inspection.
- Facilitate, participate in, and take corrective actions resulting from inspections performed by outside agencies or the owner.

BMP C162: Scheduling

Purpose
Sequencing a construction project reduces the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking.

Conditions of Use
The construction sequence schedule is an orderly listing of all major land-disturbing activities together with the necessary erosion and sedimentation control measures planned for the project. This type of schedule guides the contractor on work to be done before other work is started so that serious erosion and sedimentation problems can be avoided.

Following a specified work schedule that coordinates the timing of land-disturbing activities and the installation of control measures is perhaps the most cost-effective way of controlling erosion during construction. The removal of surface ground cover leaves a site vulnerable to accelerated erosion. Construction procedures that limit land clearing provide timely installation of erosion and sedimentation controls, and restore protective cover quickly can significantly reduce the erosion potential of a site.

Design Considerations
- Minimize construction during rainy periods.
- Schedule projects to disturb only small portions of the site at any one time. Complete grading as soon as possible. Immediately stabilize the disturbed portion before grading the next portion. Practice staged seeding in order to revegetate cut and fill slopes as the work progresses.

BMP C207: Check Dams

Purpose

Construction of small dams across a swale or ditch reduces the velocity of concentrated flow and dissipates energy at the check dam.

Conditions of Use

Where temporary channels or permanent channels are not yet vegetated, channel lining is infeasible, and/or velocity checks are required.

- Check dams may not be placed in streams unless approved by the State Department of Fish and Wildlife. Check dams may not be placed in wetlands without approval from a permitting agency.
- Do not place check dams below the expected backwater from any salmonid bearing water between October 1 and May 31 to ensure that there is no loss of high flow refuge habitat for overwintering juvenile salmonids and emergent salmonid fry.
- Construct rock check dams from appropriately sized rock. The rock used must be large enough to stay in place given the expected design flow through the channel. The rock must be placed by hand or by mechanical means (no dumping of rock to form dam) to achieve complete coverage of the ditch or swale and to ensure that the center of the dam is lower than the edges.
- Check dams may also be constructed of either rock or pea-gravel filled bags. Numerous new products are also available for this purpose. They tend to be reusable, quick and easy to install, effective, and cost efficient.
- Place check dams perpendicular to the flow of water.
- The dam should form a triangle when viewed from the side. This prevents undercutting as water flows over the face of the dam rather than falling directly onto the ditch bottom.
- Before installing check dams impound and bypass upstream water flow away from the work area. Options for bypassing include pumps, siphons, or temporary channels.
- Check dams in association with sumps work more effectively at slowing flow and retaining sediment than just a check dam alone. A deep sump should be provided immediately upstream of the check dam.
- In some cases, if carefully located and designed, check dams can remain as permanent installations with very minor regrading. They may be left as either spillways, in which case accumulated sediment would be graded and seeded, or as

check dams to prevent further sediment from leaving the site.

- The maximum spacing between the dams shall be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.
- Keep the maximum height at 2 feet at the center of the dam.
- Keep the center of the check dam at least 12 inches lower than the outer edges at natural ground elevation.
- Keep the side slopes of the check dam at 2H:1V or flatter.
- Key the stone into the ditch banks and extend it beyond the abutments a minimum of 18 inches to avoid washouts from overflow around the dam.
- Use filter fabric foundation under a rock or sand bag check dam. If a blanket ditch liner is used, filter fabric is not necessary. A piece of organic or synthetic blanket cut to fit will also work for this purpose.
- In the case of grass-lined ditches and swales, all check dams and accumulated sediment shall be removed when the grass has matured sufficiently to protect the ditch or swale - unless the slope of the swale is greater than 4 percent. The area beneath the check dams shall be seeded and mulched immediately after dam removal.
- Ensure that channel appurtenances, such as culvert entrances below check dams, are not subject to damage or blockage from displaced stones. Figure II-4.2.7 Rock Check Dam (p.354) depicts a typical rock check dam.

Maintenance Standards

Check dams shall be monitored for performance and sediment accumulation during and after each runoff producing rainfall. Sediment shall be removed when it reaches one half the sump depth.

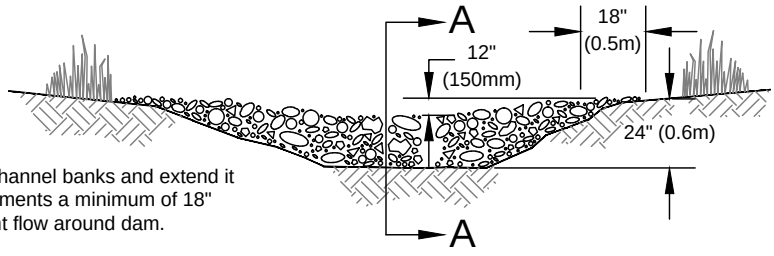
- Anticipate submergence and deposition above the check dam and erosion from high flows around the edges of the dam.
- If significant erosion occurs between dams, install a protective riprap liner in that portion of the channel.

Approved as Equivalent

Ecology has approved products as able to meet the requirements of BMP C207: Check Dams. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept this product approved as equivalent, or may require additional testing prior to consideration for local use. The products are available for review on Ecology's website at http://www.ecy.wa.gov-/programs/wq/stormwater/newtech/equivalent.html

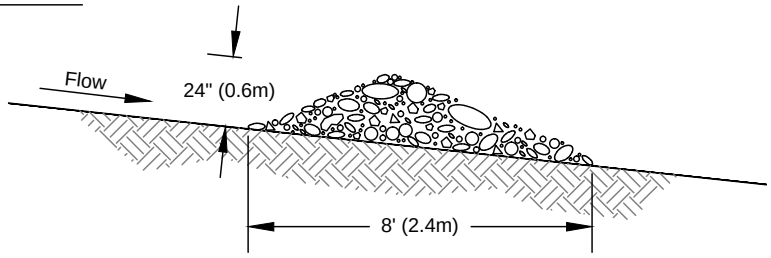
Figure II-4.2.7 Rock Check Dam

View Looking Upstream

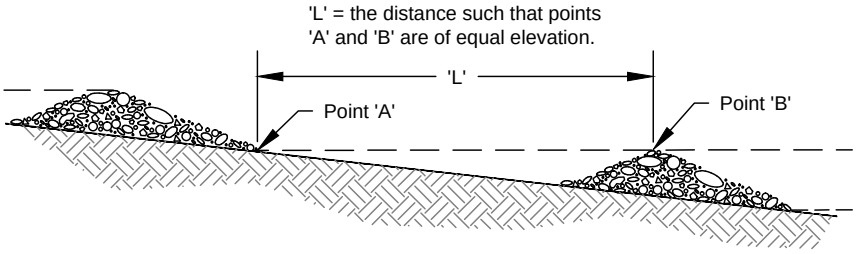


Note:
Key stone into channel banks and extend it beyond the abutments a minimum of 18" (0.5m) to prevent flow around dam.

Section A-A



Spacing Between Check Dams



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Figure II-4.2.7
Rock Check Dam

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BMP C220: Storm Drain Inlet Protection

Purpose
Storm drain inlet protection prevents coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed area.

Conditions of Use
Use storm drain inlet protection at inlets that are operational before permanent stabilization of the disturbed drainage area. Provide protection for all storm drain inlets downslope and within 500 feet of a disturbed or construction area, unless conveying runoff entering catch basins to a sediment pond or trap.

Also consider inlet protection for lawn and yard drains on new home construction. These small and numerous drains coupled with lack of gutters in new home construction can add significant amounts of sediment into the roof drain system. If possible delay installing lawn and yard drains until just before landscaping or cap these drains to pre- vent sediment from entering the system until completion of landscaping. Provide 18- inches of sod around each finished lawn and yard drain.

Table II-4.2.2 Storm Drain Inlet Protection (p.358) lists several options for inlet protection. All of the methods for storm drain inlet protection tend to plug and require a high frequency of maintenance. Limit drainage areas to one acre or less. Possibly provide emergency overflows with additional end-of-pipe treatment where stormwater ponding would cause a hazard.

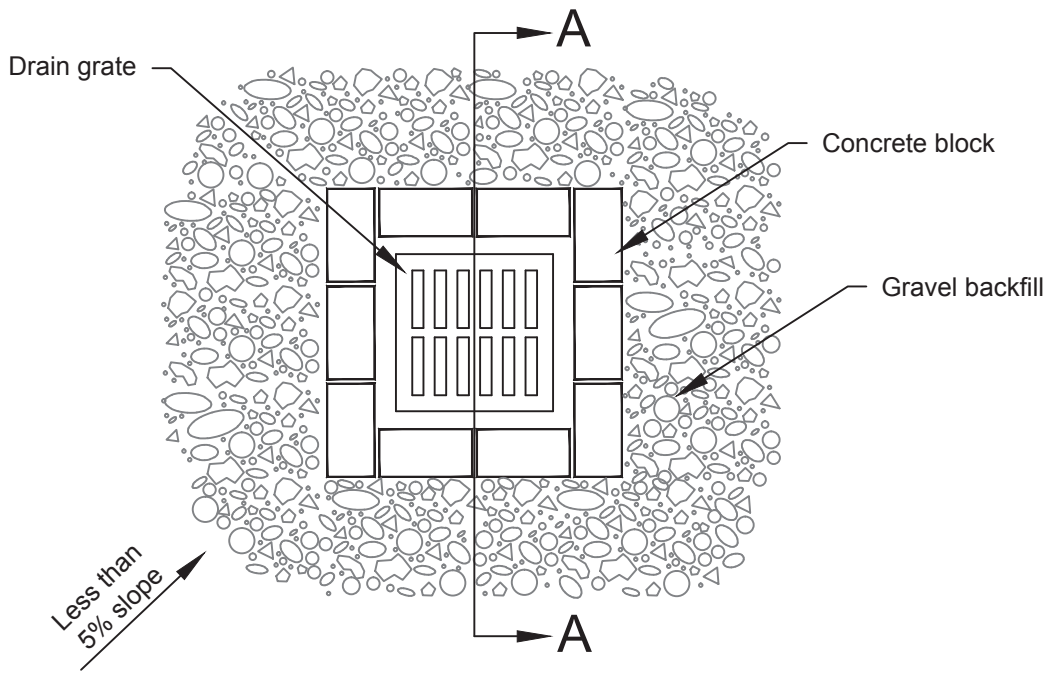
Design and Installation Specifications
Excavated Drop Inlet Protection - An excavated impoundment around the storm drain. Sediment settles out of the stormwater prior to entering the storm drain.

- Provide a depth of 1-2 ft as measured from the crest of the inlet structure.
- Slope sides of excavation no steeper than 2H:1V.
- Minimum volume of excavation 35 cubic yard.
- Shape basin to fit site with longest dimension oriented toward the longest inflow area.
- Install provisions for draining to prevent standing water problems.
- Clear the area of all debris.
- Grade the approach to the inlet uniformly.
- Drill weep holes into the side of the inlet.
- Protect weep holes with screen wire and washed aggregate.
- Seal weep holes when removing structure and stabilizing area.
- Build a temporary dike, if necessary, to the down slope side of the structure to prevent bypass flow.

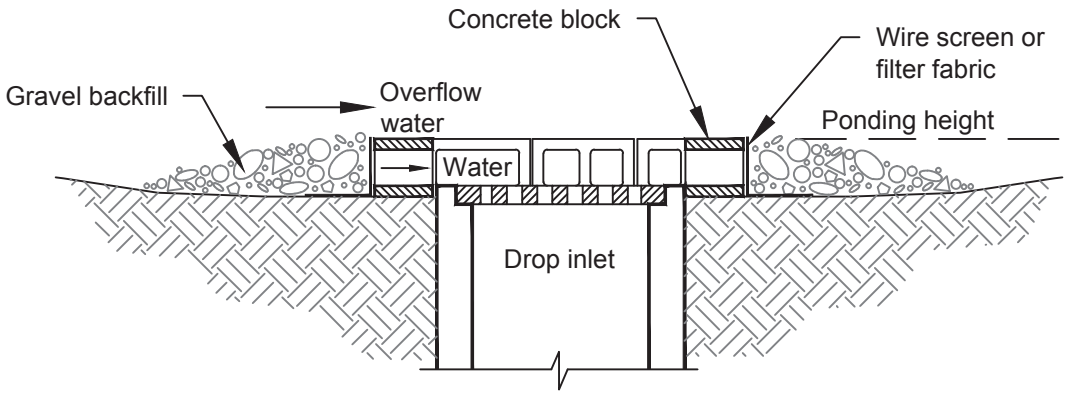
Block and Gravel Filter - A barrier formed around the storm drain inlet with standard concrete blocks and gravel. See Figure II-4.2.8 Block and Gravel Filter (p.360).

- Provide a height of 1 to 2 feet above inlet.

- Recess the first row 2-inches into the ground for stability.
- Support subsequent courses by placing a 2x4 through the block opening.
- Do not use mortar.
- Lay some blocks in the bottom row on their side for dewatering the pool.
- Place hardware cloth or comparable wire mesh with ½-inch openings over all
- Block openings.
- Place gravel just below the top of blocks on slopes of 2H:1V or flatter.
- An alternative design is a gravel donut.
- Provide an inlet slope of 3H:1V.
- Provide an outlet slope of 2H:1V.
- Provide a1-foot wide level stone area between the structure and the inlet.
- Use inlet slope stones 3 inches in diameter or larger.
- Use gravel ½- to ¾-inch at a minimum thickness of 1-foot for the outlet slope.



Plan View



Section A-A

Notes:

1. Drop inlet sediment barriers are to be used for small, nearly level drainage areas. (less than 5%)
2. Excavate a basin of sufficient size adjacent to the drop inlet.
3. The top of the structure (ponding height) must be well below the ground elevation downslope to prevent runoff from bypassing the inlet. A temporary dike may be necessary on the downslope side of the structure.

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Figure II-4.2.8
Block and Gravel Filter

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Gravel and Wire Mesh Filter - A gravel barrier placed over the top of the inlet. This structure does not provide an overflow.

- Use a hardware cloth or comparable wire mesh with ½-inch openings.
- Use coarse aggregate.
- Provide a height 1-foot or more, 18-inches wider than inlet on all sides.
- Place wire mesh over the drop inlet so that the wire extends a minimum of 1-foot beyond each side of the inlet structure.
- Overlap the strips if more than one strip of mesh is necessary.
- Place coarse aggregate over the wire mesh.
- Provide at least a 12-inch depth of gravel over the entire inlet opening and extend at least 18-inches on all sides.

Catchbasin Filters – Use inserts designed by manufacturers for construction sites. The limited sediment storage capacity increases the amount of inspection and maintenance required, which may be daily for heavy sediment loads. To reduce maintenance requirements combine a catchbasin filter with another type of inlet protection. This type of inlet protection provides flow bypass without overflow and therefore may be a better method for inlets located along active rights-of-way.

- Provides 5 cubic feet of storage.
- Requires dewatering provisions.
- Provides a high-flow bypass that will not clog under normal use at a construction site.
- Insert the catchbasin filter in the catchbasin just below the grating.

Curb Inlet Protection with Wooden Weir – Barrier formed around a curb inlet with a wooden frame and gravel.

- Use wire mesh with ½-inch openings.
- Use extra strength filter cloth.
- Construct a frame.
- Attach the wire and filter fabric to the frame.
- Pile coarse washed aggregate against wire/fabric.
- Place weight on frame anchors.

Block and Gravel Curb Inlet Protection – Barrier formed around a curb inlet with concrete blocks and gravel. See Figure II-4.2.9 Block and Gravel Curb Inlet Protection (p.363).

- Use wire mesh with ½-inch openings.
- Place two concrete blocks on their sides abutting the curb at either side of the inlet opening. These are spacer blocks.
- Place a 2x4 stud through the outer holes of each spacer block to align the front blocks.
- Place blocks on their sides across the front of the inlet and abutting the spacer blocks.
- Place wire mesh over the outside vertical face
- Pile coarse aggregate against the wire to the top of the barrier.

Curb and Gutter Sediment Barrier – Sandbag or rock berm (riprap and aggregate) 3 feet high and 3 feet wide in a horseshoe shape. See Figure II-4.2.10 Curb and Gutter Barrier (p.364).

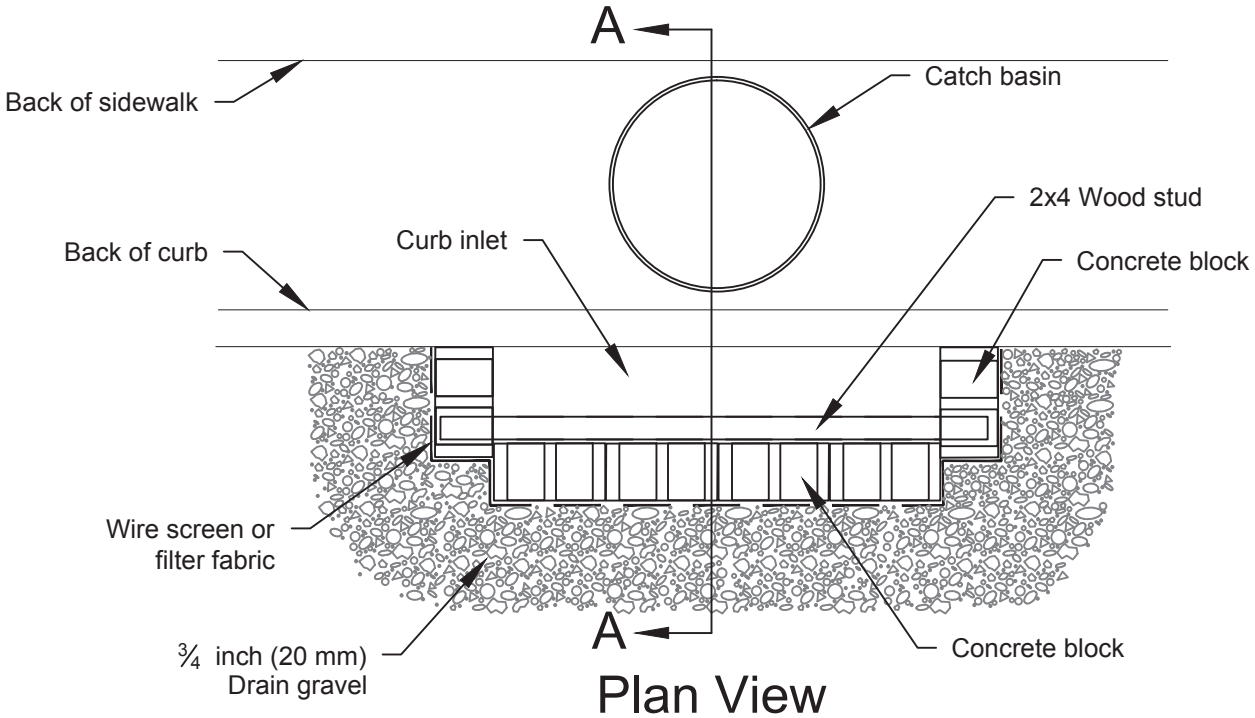
- Construct a horseshoe shaped berm, faced with coarse aggregate if using riprap, 3 feet high and 3 feet wide, at least 2 feet from the inlet.
- Construct a horseshoe shaped sedimentation trap on the outside of the berm sized to sediment trap standards for protecting a culvert inlet.

Maintenance Standards

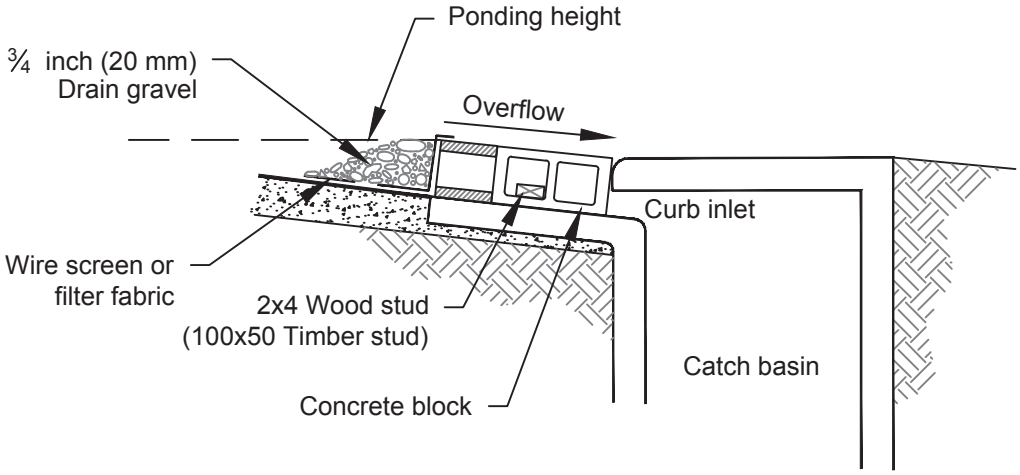
- Inspect catch basin filters frequently, especially after storm events. Clean and replace clogged inserts. For systems with clogged stone filters: pull away the stones from the inlet and clean or replace. An alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.
- Do not wash sediment into storm drains while cleaning. Spread all excavated material evenly over the surrounding land area or stockpile and stabilize as appropriate.

Approved as Equivalent

Ecology has approved products as able to meet the requirements of BMP C220: Storm Drain Inlet Protection. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept this product approved as equivalent, or may require additional testing prior to consideration for local use. The products are available for review on Ecology's website at http://www.ecy.wa.gov/programs/wq/stormwater/newtech/equivalent.html



Plan View



Section A-A

Notes:

1. Use block and gravel type sediment barrier when curb inlet is located in gently sloping street segment, where water can pond and allow sediment to separate from runoff.
2. Barrier shall allow for overflow from severe storm event.
3. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

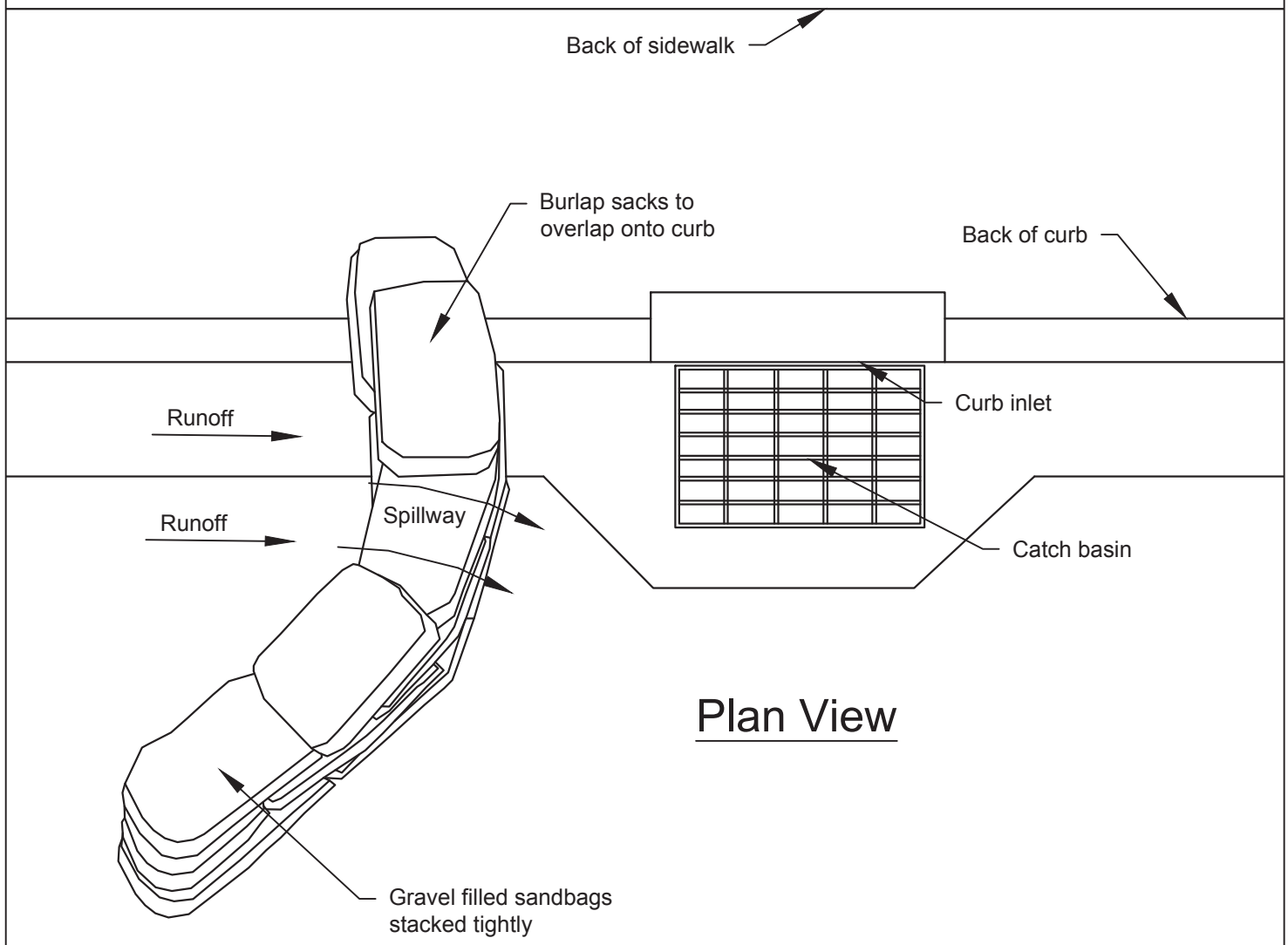
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Figure II-4.2.9
Block and Gravel Curb Inlet Protection

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Plan View

Notes:

1. Place curb type sediment barriers on gently sloping street segments, where water can pond and allow sediment to separate from runoff.
2. Sandbags of either burlap or woven 'geotextile' fabric, are filled with gravel, layered and packed tightly.
3. Leave a one sandbag gap in the top row to provide a spillway for overflow.
4. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

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Figure II-4.2.10
Curb and Gutter Barrier

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BMP C233: Silt Fence

Purpose

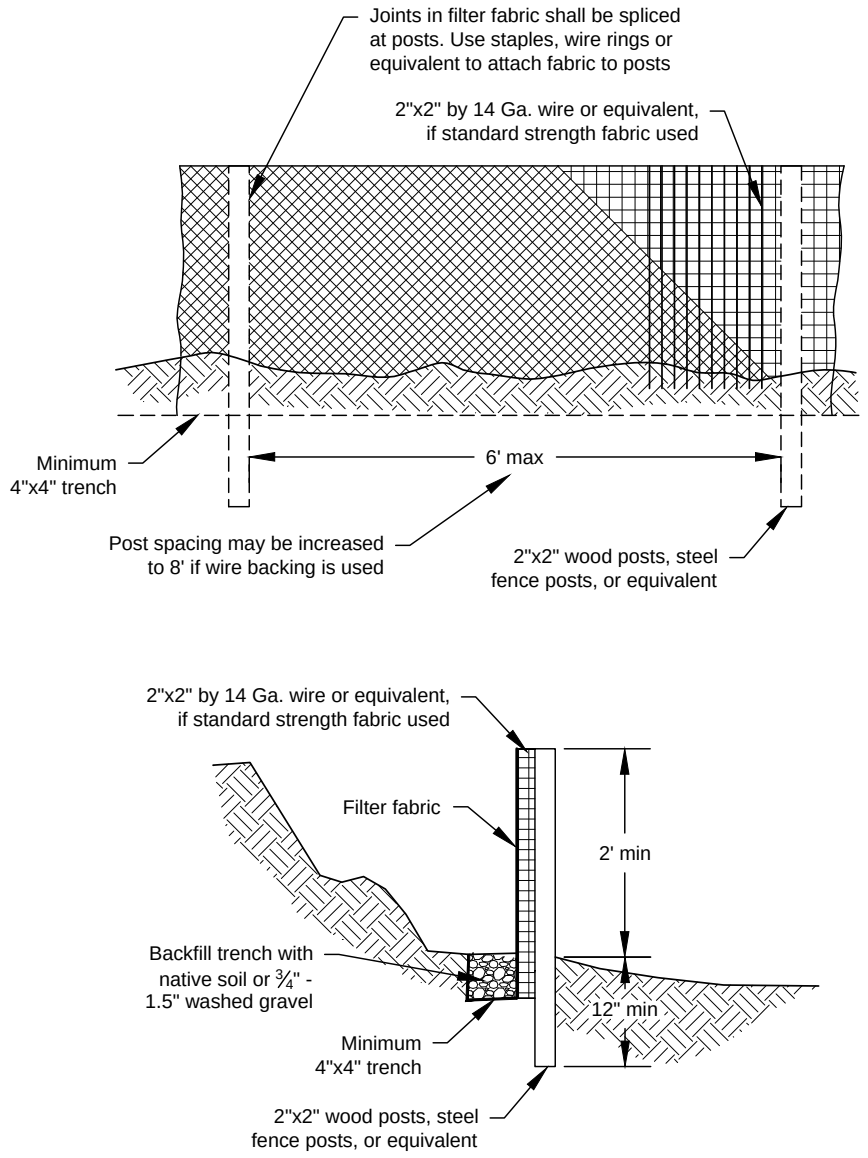
Use of a silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow. See Figure II-4.2.12 Silt Fence (p.369) for details on silt fence construction.

Conditions of Use

Silt fence may be used downslope of all disturbed areas.

- Silt fence shall prevent soil carried by runoff water from going beneath, through, or over the top of the silt fence, but shall allow the water to pass through the fence.
- Silt fence is not intended to treat concentrated flows, nor is it intended to treat substantial amounts of overland flow. Convey any concentrated flows through the drainage system to a sediment pond.
- Do not construct silt fences in streams or use in V-shaped ditches. Silt fences do not provide an adequate method of silt control for anything deeper than sheet or overland flow.

Figure II-4.2.12 Silt Fence



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Figure II-4.2.12
Silt Fence

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BMP C240: Sediment Trap

Purpose

A sediment trap is a small temporary ponding area with a gravel outlet used to collect and store sediment from sites cleared and/or graded during construction. Sediment traps, along with other perimeter controls, shall be installed before any land disturbance takes place in the drainage area.

Conditions of Use

Prior to leaving a construction site, stormwater runoff must pass through a sediment pond or trap or other appropriate sediment removal best management practice. Non-engineered sediment traps may be used on-site prior to an engineered sediment trap or sediment pond to provide additional sediment removal capacity.

It is intended for use on sites where the tributary drainage area is less than 3 acres, with no unusual drainage features, and a projected build-out time of six months or less. The sediment trap is a temporary measure (with a design life of approximately 6 months) and shall be maintained until the site area is permanently protected against erosion by vegetation and/or structures.

Sediment traps and ponds are only effective in removing sediment down to about the medium silt size fraction. Runoff with sediment of finer grades (fine silt and clay) will pass through untreated, emphasizing the need to control erosion to the maximum extent first.

Whenever possible, sediment-laden water shall be discharged into on-site, relatively level, vegetated areas (see BMP C234: Vegetated Strip (p.375)). This is the only way to effectively remove fine particles from runoff unless chemical treatment or filtration is used. This can be particularly useful after initial treatment in a sediment trap or pond. The areas of release must be evaluated on a site-by-site basis in order to determine appropriate locations for and methods of releasing runoff. Vegetated wetlands shall not be used for this purpose. Frequently, it may be possible to pump water from the collection point at the downhill end of the site to an upslope vegetated area. Pumping shall only augment the treatment system, not replace it, because of the possibility of pump failure or runoff volume in excess of pump capacity.

All projects that are constructing permanent facilities for runoff quantity control should use the rough-graded or final-graded permanent facilities for traps and ponds. This includes combined facilities and infiltration facilities. When permanent facilities are used as temporary sedimentation facilities, the surface area requirement of a sediment trap or pond must be met. If the surface area requirements are larger than the surface area of the permanent facility, then the trap or pond shall be enlarged to comply with the surface

area requirement. The permanent pond shall also be divided into two cells as required for sediment ponds.

Either a permanent control structure or the temporary control structure (described in BMP C241: Temporary Sediment Pond (p.388)) can be used. If a permanent control structure is used, it may be advisable to partially restrict the lower orifice with gravel to increase residence time while still allowing dewatering of the pond. A shut-off valve may be added to the control structure to allow complete retention of stormwater in emergency situations. In this case, an emergency overflow weir must be added.

A skimmer may be used for the sediment trap outlet if approved by the Local Permitting Authority.

Design and Installation Specifications

- See Figure II-4.2.16 Cross Section of Sediment Trap (p.386) and Figure II-4.2.17 Sediment Trap Outlet (p.387) for details.
- If permanent runoff control facilities are part of the project, they should be used for sediment retention.
- To determine the sediment trap geometry, first calculate the design surface area (SA) of the trap, measured at the invert of the weir. Use the following equation:

$$SA = FS(Q_2/V_s)$$

where

Q_2 = Design inflow based on the peak discharge from the developed 2-year runoff event from the contributing drainage area as computed in the hydrologic analysis. The 10-year peak flow shall be used if the project size, expected timing and duration of construction, or downstream conditions warrant a higher level of protection. If no hydrologic analysis is required, the Rational Method may be used.

V_s = The settling velocity of the soil particle of interest. The 0.02 mm (medium silt) particle with an assumed density of 2.65 g/cm3 has been selected as the particle of interest and has a settling velocity (Vs) of 0.00096 ft/sec.

FS = A safety factor of 2 to account for non-ideal settling.

Therefore, the equation for computing surface area becomes:

$$SA = 2 \times Q_2/0.00096$$

or

2080 square feet per cfs of inflow

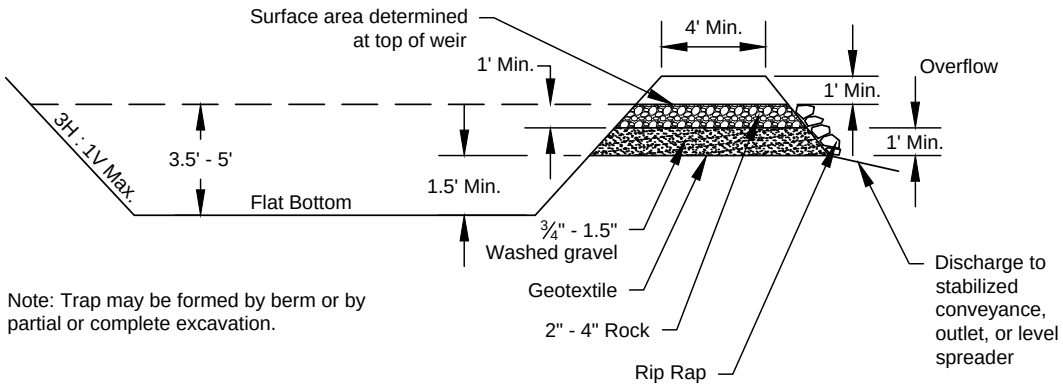
Note: Even if permanent facilities are used, they must still have a surface area that is at least as large as that derived from the above formula. If they do not, the pond must be enlarged.

- To aid in determining sediment depth, all sediment traps shall have a staff gauge with a prominent mark 1-foot above the bottom of the trap.
- Sediment traps may not be feasible on utility projects due to the limited work space or the short-term nature of the work. Portable tanks may be used in place of sediment traps for utility projects.

Maintenance Standards

- Sediment shall be removed from the trap when it reaches 1-foot in depth.
- Any damage to the pond embankments or slopes shall be repaired.

Figure II-4.2.16 Cross Section of Sediment Trap



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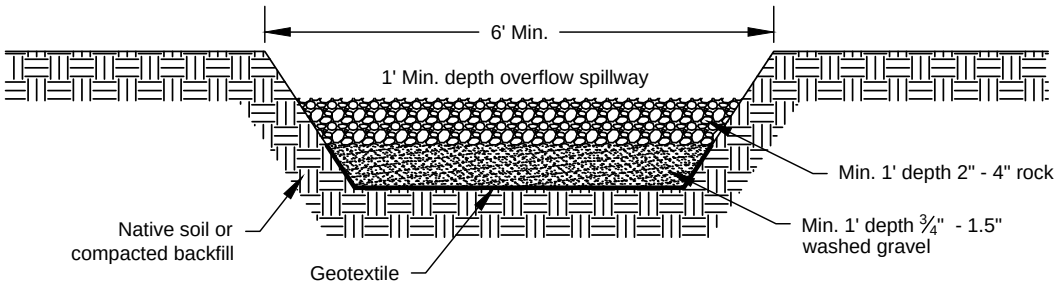
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Figure II-4.2.16
Cross Section of Sediment Trap

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Figure II-4.2.17 Sediment Trap Outlet



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Figure II-4.2.17
Sediment Trap Outlet

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BMP C241: Temporary Sediment Pond

Purpose

Sediment ponds remove sediment from runoff originating from disturbed areas of the site. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm). Consequently, they usually reduce turbidity only slightly.

Conditions of Use

Prior to leaving a construction site, stormwater runoff must pass through a sediment pond or other appropriate sediment removal best management practice.

A sediment pond shall be used where the contributing drainage area is 3 acres or more. Ponds must be used in conjunction with erosion control practices to reduce the amount of sediment flowing into the basin.

Design and Installation Specifications

- Sediment basins must be installed only on sites where failure of the structure would not result in loss of life, damage to homes or buildings, or interruption of use or service of public roads or utilities. Also, sediment traps and ponds are attractive to children and can be very dangerous. Compliance with local ordinances regarding health and safety must be addressed. If fencing of the pond is required, the type of fence and its location shall be shown on the ESC plan.
- Structures having a maximum storage capacity at the top of the dam of 10 acre-ft (435,600 ft^3) or more are subject to the Washington Dam Safety Regulations (Chapter 173-175 WAC).
- See Figure II-4.2.18 Sediment Pond Plan View (p.391), Figure II-4.2.19 Sediment Pond Cross Section (p.392), and Figure II-4.2.20 Sediment Pond Riser Detail (p.393) for details.
- If permanent runoff control facilities are part of the project, they should be used for sediment retention. The surface area requirements of the sediment basin must be met. This may require temporarily enlarging the permanent basin to comply with the surface area requirements. The permanent control structure must be temporarily replaced with a control structure that only allows water to leave the pond from the surface or by pumping. The permanent control structure must be installed after the site is fully stabilized. .
- Use of infiltration facilities for sedimentation basins during construction tends to clog the soils and reduce their capacity to infiltrate. If infiltration facilities are to be used, the sides and bottom of the facility must only be rough excavated to a minimum of 2 feet above final grade. Final grading of the infiltration facility shall occur only when all contributing drainage areas are fully stabilized. The infiltration

pretreatment facility should be fully constructed and used with the sedimentation basin to help prevent clogging.

- Determining Pond Geometry

  Obtain the discharge from the hydrologic calculations of the peak flow for the 2-year runoff event (Q_2). The 10-year peak flow shall be used if the project size, expected timing and duration of construction, or downstream conditions warrant a higher level of protection. If no hydrologic analysis is required, the Rational Method may be used.

  Determine the required surface area at the top of the riser pipe with the equation:

  $$SA = 2 \times Q_2/0.00096$$

  or

  2080 square feet per cfs of inflow

  See BMP C240: Sediment Trap (p.383) for more information on the derivation of the surface area calculation.

  The basic geometry of the pond can now be determined using the following design criteria:

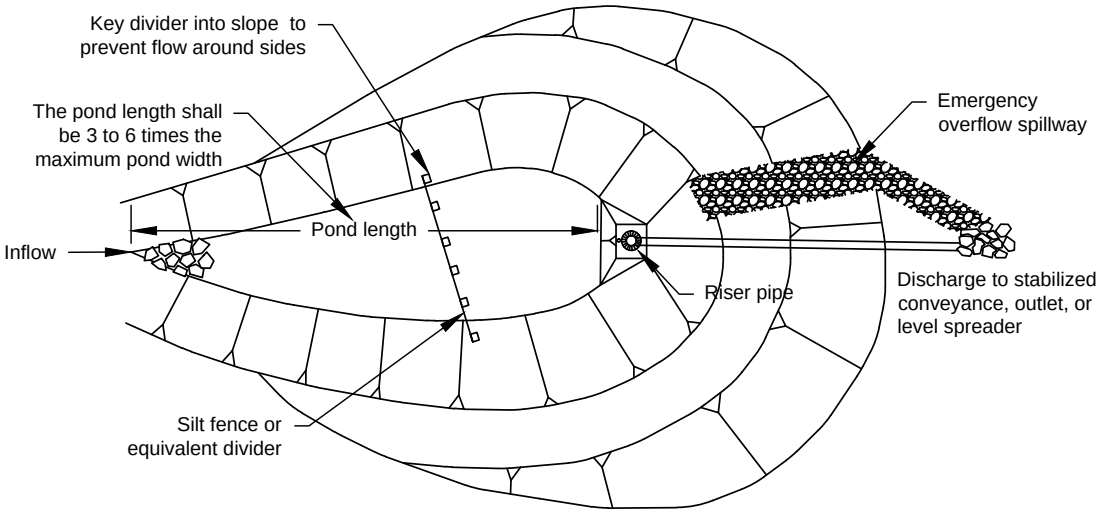
- Required surface area SA (from Step 2 above) at top of riser.
- Minimum 3.5-foot depth from top of riser to bottom of pond.
- Maximum 3H:1V interior side slopes and maximum 2H:1V exterior slopes. The interior slopes can be increased to a maximum of 2H:1V if fencing is provided at or above the maximum water surface.
- One foot of freeboard between the top of the riser and the crest of the emergency spillway.
- Flat bottom.
- Minimum 1-foot deep spillway.
- Length-to-width ratio between 3:1 and 6:1.
- Sizing of Discharge Mechanisms.

  The outlet for the basin consists of a combination of principal and emergency spill-ways. These outlets must pass the peak runoff expected from the contributing drain-age area for a 100-year storm. If, due to site conditions and basin geometry, a separate emergency spill-way is not feasible, the principal spillway must pass the entire peak runoff expected from the 100-year storm. However, an attempt to provide a separate emergency spillway should always be made. The runoff cal-culations should be based on the site conditions during construction. The flow

through the dewatering orifice cannot be utilized when calculating the 100-year storm elevation because of its potential to become clogged; therefore, available spillway storage must begin at the principal spillway riser crest.

The principal spillway designed by the procedures contained in this standard will result in some reduction in the peak rate of runoff. However, the riser outlet design will not adequately control the basin discharge to the predevelopment discharge limitations as stated in I-2.5.7 Minimum Requirement #7: Flow Control (p.64). However, if the basin for a permanent stormwater detention pond is used for a temporary sedimentation basin, the control structure for the permanent pond can be used to maintain predevelopment discharge limitations. The size of the basin, the expected life of the construction project, the anticipated downstream effects and the anticipated weather conditions during construction, should be considered to determine the need of additional discharge control. See Figure II-4.2.21 Riser Inflow Curves (p.394) for riser inflow curves.

Figure II-4.2.18 Sediment Pond Plan View



Note: Pond may be formed by berm or by partial or complete excavation

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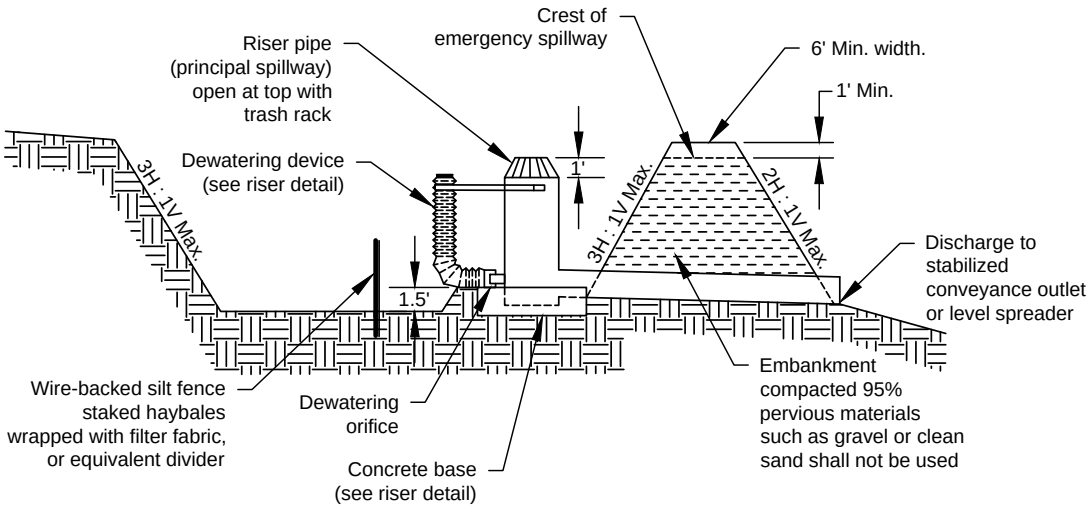
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Figure II-4.2.18
Sediment Pond Plan View

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Figure II-4.2.19 Sediment Pond Cross Section



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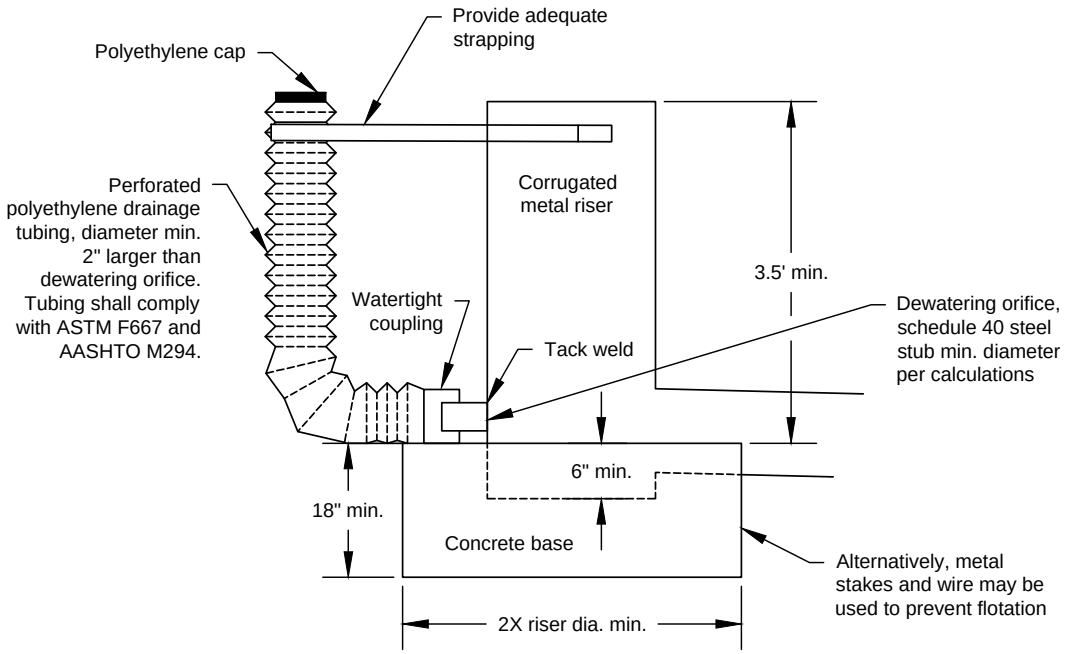
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Figure II-4.2.19
Sediment Pond Cross Section

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Figure II-4.2.20 Sediment Pond Riser Detail



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Figure II-4.2.20
Sediment Pond Riser Detail

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C. Site Inspection Form

Please see following pages for the site inspection form.

Construction Stormwater Site Inspection Form

Project Name _____ Permit # _____ Inspection Date _____ Time _____

Name of Certified Erosion Sediment Control Lead (CESCL) or qualified inspector if *less than one acre*
Print Name: _____

Approximate rainfall amount since the last inspection (in inches): _____

Approximate rainfall amount in the last 24 hours (in inches): _____

Current Weather Clear ☐ Cloudy ☐ Mist ☐ Rain ☐ Wind ☐ Fog ☐

A. Type of inspection: Weekly ☐ Post Storm Event ☐ Other ☐

B. Phase of Active Construction (*check all that apply*):

Pre Construction/installation of erosion/sediment controls	☐	Clearing/Demo/Grading	☐	Infrastructure/storm/roads	☐
Concrete pours	☐	Vertical Construction/buildings	☐	Utilities	☐
Offsite improvements	☐	Site temporary stabilized	☐	Final stabilization	☐

C. Questions:

1. Were all areas of construction and discharge points inspected? Yes ___ No ___
2. Did you observe the presence of suspended sediment, turbidity, discoloration, or oil sheen Yes ___ No ___
3. Was a water quality sample taken during inspection? (*refer to permit conditions S4 & S5*) Yes ___ No ___
4. Was there a turbid discharge 250 NTU or greater, or Transparency 6 cm or less?* Yes ___ No ___
5. If yes to #4 was it reported to Ecology? Yes ___ No ___
6. Is pH sampling required? pH range required is 6.5 to 8.5. Yes ___ No ___

If answering yes to a discharge, describe the event. Include when, where, and why it happened; what action was taken, and when.

_____

_____

_____

_____

*If answering yes to # 4 record NTU/Transparency with continual sampling daily until turbidity is 25 NTU or less/ transparency is 33 cm or greater.

Sampling Results: Date: _____

Parameter	Method (circle one)	Result			Other/Note
		NTU	cm	pH	
Turbidity	tube, meter, laboratory				
pH	Paper, kit, meter				

Construction Stormwater Site Inspection Form

D. Check the observed status of all items. Provide "Action Required "details and dates.

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
1 Clearing Limits	Before beginning land disturbing activities are all clearing limits, natural resource areas (streams, wetlands, buffers, trees) protected with barriers or similar BMPs? (high visibility recommended)						
2 Construction Access	Construction access is stabilized with quarry spalls or equivalent BMP to prevent sediment from being tracked onto roads?						
	Sediment tracked onto the road way was cleaned thoroughly at the end of the day or more frequent as necessary.						
3 Control Flow Rates	Are flow control measures installed to control stormwater volumes and velocity during construction and do they protect downstream properties and waterways from erosion?						
	If permanent infiltration ponds are used for flow control during construction, are they protected from siltation?						
4 Sediment Controls	All perimeter sediment controls (e.g. silt fence, wattles, compost socks, berms, etc.) installed, and maintained in accordance with the Stormwater Pollution Prevention Plan (SWPPP).						
	Sediment control BMPs (sediment ponds, traps, filters etc.) have been constructed and functional as the first step of grading.						
	Stormwater runoff from disturbed areas is directed to sediment removal BMP.						
5 Stabilize Soils	Have exposed un-worked soils been stabilized with effective BMP to prevent erosion and sediment deposition?						

Construction Stormwater Site Inspection Form

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
5 Stabilize Soils Cont.	Are stockpiles stabilized from erosion, protected with sediment trapping measures and located away from drain inlet, waterways, and drainage channels?						
	Have soils been stabilized at the end of the shift, before a holiday or weekend if needed based on the weather forecast?						
6 Protect Slopes	Has stormwater and ground water been diverted away from slopes and disturbed areas with interceptor dikes, pipes and or swales?						
	Is off-site storm water managed separately from stormwater generated on the site?						
	Is excavated material placed on uphill side of trenches consistent with safety and space considerations?						
	Have check dams been placed at regular intervals within constructed channels that are cut down a slope?						
7 Drain Inlets	Storm drain inlets made operable during construction are protected.						
	Are existing storm drains within the influence of the project protected?						
8 Stabilize Channel and Outlets	Have all on-site conveyance channels been designed, constructed and stabilized to prevent erosion from expected peak flows?						
	Is stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes and downstream conveyance systems?						
9 Control Pollutants	Are waste materials and demolition debris handled and disposed of to prevent contamination of stormwater?						
	Has cover been provided for all chemicals, liquid products, petroleum products, and other material?						
	Has secondary containment been provided capable of containing 110% of the volume?						
	Were contaminated surfaces cleaned immediately after a spill incident?						
	Were BMPs used to prevent contamination of stormwater by a pH modifying sources?						

Construction Stormwater Site Inspection Form

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
9 Cont.	Wheel wash wastewater is handled and disposed of properly.						
10 Control Dewatering	Concrete washout in designated areas. No washout or excess concrete on the ground.						
	Dewatering has been done to an approved source and in compliance with the SWPPP.						
	Were there any clean non turbid dewatering discharges?						
11 Maintain BMP	Are all temporary and permanent erosion and sediment control BMPs maintained to perform as intended?						
12 Manage the Project	Has the project been phased to the maximum degree practicable?						
	Has regular inspection, monitoring and maintenance been performed as required by the permit?						
	Has the SWPPP been updated, implemented and records maintained?						
13 Protect LID	Is all Bioretention and Rain Garden Facilities protected from sedimentation with appropriate BMPs?						
	Is the Bioretention and Rain Garden protected against over compaction of construction equipment and foot traffic to retain its infiltration capabilities?						
	Permeable pavements are clean and free of sediment and sediment laden-water runoff. Muddy construction equipment has not been on the base material or pavement.						
	Have soiled permeable pavements been cleaned of sediments and pass infiltration test as required by stormwater manual methodology?						
	Heavy equipment has been kept off existing soils under LID facilities to retain infiltration rate.						

E. Check all areas that have been inspected. ✔

All in place BMPs ☐ All disturbed soils ☐ All concrete wash out area ☐ All material storage areas ☐
All discharge locations ☐ All equipment storage areas ☐ All construction entrances/exits ☐

F. Elements checked "Action Required" (section D) describe corrective action to be taken. List the element number; be specific on location and work needed. Document, initial, and date when the corrective action has been completed and inspected.

Element #	Description and Location	Action Required	Completion Date	Initials

Attach additional page if needed

Sign the following certification:

"I certify that this report is true, accurate, and complete, to the best of my knowledge and belief"

Inspected by: (print) _____ (Signature) _____ Date: _____

Title/Qualification of Inspector: _____

WWHM2012

PROJECT REPORT

General Model Information

Project Name:	Basin P-6
Site Name:	
Site Address:	
City:	
Report Date:	8/10/2022
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	0.979
Pervious Total	0.979
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.979

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	0.519
Pervious Total	0.519

Impervious Land Use	acre
ROADS FLAT	0.429
POND	0.031
Impervious Total	0.46
Basin Total	0.979

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length:	9.91 ft.	
Bottom Width:	9.91 ft.	
Depth:	7 ft.	
Volume at riser head:	0.1254 acre-feet.	
Infiltration On		
Infiltration rate:	10	
Infiltration safety factor:	1	
Total Volume Infiltrated (ac-ft.):		185.367
Total Volume Through Riser (ac-ft.):		0
Total Volume Through Facility (ac-ft.):		185.367
Percent Infiltrated:		100
Total Precip Applied to Facility:		0
Total Evap From Facility:		0
Side slope 1:	3 To 1	
Side slope 2:	3 To 1	
Side slope 3:	3 To 1	
Side slope 4:	3 To 1	
Discharge Structure		
Riser Height:	6 ft.	
Riser Diameter:	12 in.	
Element Flows To:		
Outlet 1	Outlet 2	

Pond Hydraulic Table

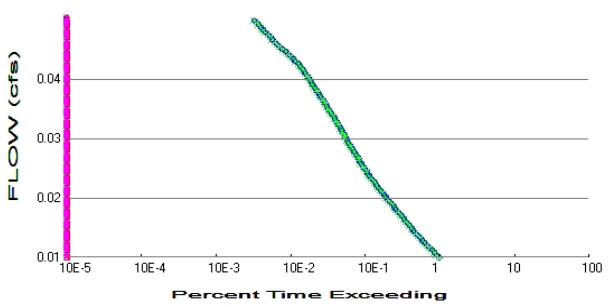
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.002255	0.000000	0.000	0.000
0.0778	0.002472	0.000184	0.000	0.022
0.1556	0.002699	0.000385	0.000	0.022
0.2333	0.002937	0.000604	0.000	0.022
0.3111	0.003184	0.000842	0.000	0.022
0.3889	0.003441	0.001100	0.000	0.022
0.4667	0.003709	0.001378	0.000	0.022
0.5444	0.003986	0.001677	0.000	0.022
0.6222	0.004273	0.001998	0.000	0.022
0.7000	0.004571	0.002342	0.000	0.022
0.7778	0.004878	0.002710	0.000	0.022
0.8556	0.005195	0.003101	0.000	0.022
0.9333	0.005522	0.003518	0.000	0.022
1.0111	0.005860	0.003961	0.000	0.022
1.0889	0.006207	0.004430	0.000	0.022
1.1667	0.006564	0.004927	0.000	0.022
1.2444	0.006932	0.005452	0.000	0.022
1.3222	0.007309	0.006005	0.000	0.022
1.4000	0.007696	0.006589	0.000	0.022
1.4778	0.008094	0.007203	0.000	0.022
1.5556	0.008501	0.007848	0.000	0.022
1.6333	0.008918	0.008526	0.000	0.022
1.7111	0.009346	0.009236	0.000	0.022
1.7889	0.009783	0.009980	0.000	0.022
1.8667	0.010230	0.010758	0.000	0.022
1.9444	0.010688	0.011572	0.000	0.022
2.0222	0.011155	0.012421	0.000	0.022

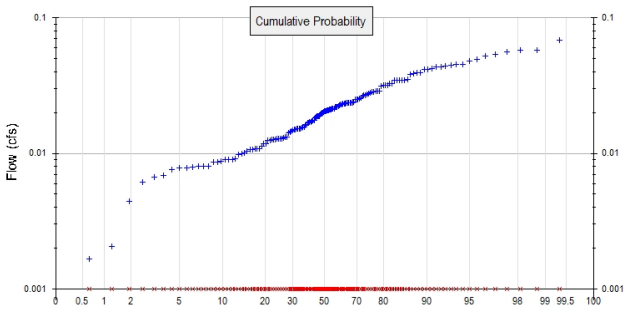
2.1000	0.011632	0.013307	0.000	0.022
2.1778	0.012120	0.014231	0.000	0.022
2.2556	0.012617	0.015193	0.000	0.022
2.3333	0.013124	0.016194	0.000	0.022
2.4111	0.013641	0.017235	0.000	0.022
2.4889	0.014169	0.018316	0.000	0.022
2.5667	0.014706	0.019439	0.000	0.022
2.6444	0.015253	0.020604	0.000	0.022
2.7222	0.015811	0.021812	0.000	0.022
2.8000	0.016378	0.023064	0.000	0.022
2.8778	0.016955	0.024360	0.000	0.022
2.9556	0.017543	0.025702	0.000	0.022
3.0333	0.018140	0.027090	0.000	0.022
3.1111	0.018747	0.028524	0.000	0.022
3.1889	0.019364	0.030006	0.000	0.022
3.2667	0.019992	0.031537	0.000	0.022
3.3444	0.020629	0.033116	0.000	0.022
3.4222	0.021276	0.034746	0.000	0.022
3.5000	0.021934	0.036427	0.000	0.022
3.5778	0.022601	0.038158	0.000	0.022
3.6556	0.023278	0.039943	0.000	0.022
3.7333	0.023965	0.041780	0.000	0.022
3.8111	0.024663	0.043671	0.000	0.022
3.8889	0.025370	0.045617	0.000	0.022
3.9667	0.026087	0.047618	0.000	0.022
4.0444	0.026815	0.049675	0.000	0.022
4.1222	0.027552	0.051789	0.000	0.022
4.2000	0.028299	0.053961	0.000	0.022
4.2778	0.029056	0.056192	0.000	0.022
4.3556	0.029824	0.058482	0.000	0.022
4.4333	0.030601	0.060831	0.000	0.022
4.5111	0.031388	0.063242	0.000	0.022
4.5889	0.032186	0.065714	0.000	0.022
4.6667	0.032993	0.068249	0.000	0.022
4.7444	0.033810	0.070847	0.000	0.022
4.8222	0.034637	0.073509	0.000	0.022
4.9000	0.035475	0.076236	0.000	0.022
4.9778	0.036322	0.079028	0.000	0.022
5.0556	0.037179	0.081886	0.000	0.022
5.1333	0.038046	0.084811	0.000	0.022
5.2111	0.038924	0.087805	0.000	0.022
5.2889	0.039811	0.090867	0.000	0.022
5.3667	0.040708	0.093998	0.000	0.022
5.4444	0.041616	0.097199	0.000	0.022
5.5222	0.042533	0.100472	0.000	0.022
5.6000	0.043460	0.103816	0.000	0.022
5.6778	0.044397	0.107233	0.000	0.022
5.7556	0.045345	0.110723	0.000	0.022
5.8333	0.046302	0.114287	0.000	0.022
5.9111	0.047269	0.117926	0.000	0.022
5.9889	0.048246	0.121640	0.000	0.022
6.0667	0.049234	0.125431	0.182	0.022
6.1444	0.050231	0.129299	0.572	0.022
6.2222	0.051238	0.133245	1.046	0.022
6.3000	0.052255	0.137270	1.509	0.022
6.3778	0.053283	0.141374	1.879	0.022
6.4556	0.054320	0.145559	2.114	0.022
6.5333	0.055367	0.149824	2.300	0.022

6.6111	0.056424	0.154172	2.462	0.022
6.6889	0.057492	0.158602	2.614	0.022
6.7667	0.058569	0.163115	2.757	0.022
6.8444	0.059656	0.167713	2.894	0.022
6.9222	0.060753	0.172395	3.024	0.022
7.0000	0.061861	0.177164	3.149	0.022
7.0778	0.062978	0.182018	3.269	0.022

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.979
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.519
Total Impervious Area: 0.46

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.02063
5 year	0.032095
10 year	0.038324
25 year	0.044664
50 year	0.048433
100 year	0.051531

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.015	0.000
1903	0.013	0.000
1904	0.021	0.000
1905	0.010	0.000
1906	0.004	0.000
1907	0.032	0.000
1908	0.023	0.000
1909	0.023	0.000
1910	0.032	0.000
1911	0.021	0.000

1912	0.069	0.000
1913	0.033	0.000
1914	0.008	0.000
1915	0.013	0.000
1916	0.021	0.000
1917	0.007	0.000
1918	0.022	0.000
1919	0.016	0.000
1920	0.021	0.000
1921	0.023	0.000
1922	0.024	0.000
1923	0.019	0.000
1924	0.009	0.000
1925	0.011	0.000
1926	0.020	0.000
1927	0.013	0.000
1928	0.016	0.000
1929	0.033	0.000
1930	0.021	0.000
1931	0.019	0.000
1932	0.015	0.000
1933	0.015	0.000
1934	0.043	0.000
1935	0.020	0.000
1936	0.017	0.000
1937	0.028	0.000
1938	0.017	0.000
1939	0.001	0.000
1940	0.019	0.000
1941	0.009	0.000
1942	0.028	0.000
1943	0.015	0.000
1944	0.027	0.000
1945	0.024	0.000
1946	0.013	0.000
1947	0.008	0.000
1948	0.044	0.000
1949	0.038	0.000
1950	0.011	0.000
1951	0.013	0.000
1952	0.058	0.000
1953	0.052	0.000
1954	0.019	0.000
1955	0.015	0.000
1956	0.008	0.000
1957	0.027	0.000
1958	0.056	0.000
1959	0.035	0.000
1960	0.009	0.000
1961	0.035	0.000
1962	0.019	0.000
1963	0.009	0.000
1964	0.010	0.000
1965	0.039	0.000
1966	0.011	0.000
1967	0.017	0.000
1968	0.017	0.000
1969	0.017	0.000

1970	0.027	0.000
1971	0.042	0.000
1972	0.027	0.000
1973	0.035	0.000
1974	0.019	0.000
1975	0.044	0.000
1976	0.023	0.000
1977	0.008	0.000
1978	0.039	0.000
1979	0.011	0.000
1980	0.022	0.000
1981	0.021	0.000
1982	0.009	0.000
1983	0.035	0.000
1984	0.014	0.000
1985	0.023	0.000
1986	0.021	0.000
1987	0.039	0.000
1988	0.025	0.000
1989	0.022	0.000
1990	0.025	0.000
1991	0.020	0.000
1992	0.028	0.000
1993	0.028	0.000
1994	0.041	0.000
1995	0.008	0.000
1996	0.045	0.000
1997	0.017	0.000
1998	0.021	0.000
1999	0.002	0.000
2000	0.016	0.000
2001	0.008	0.000
2002	0.029	0.000
2003	0.025	0.000
2004	0.023	0.000
2005	0.042	0.000
2006	0.013	0.000
2007	0.013	0.000
2008	0.022	0.000
2009	0.015	0.000
2010	0.013	0.000
2011	0.010	0.000
2012	0.015	0.000
2013	0.012	0.000
2014	0.009	0.000
2015	0.017	0.000
2016	0.007	0.000
2017	0.032	0.000
2018	0.058	0.000
2019	0.054	0.000
2020	0.018	0.000
2021	0.029	0.000
2022	0.012	0.000
2023	0.024	0.000
2024	0.045	0.000
2025	0.021	0.000
2026	0.035	0.000
2027	0.012	0.000

2028	0.011	0.000
2029	0.024	0.000
2030	0.044	0.000
2031	0.014	0.000
2032	0.008	0.000
2033	0.013	0.000
2034	0.012	0.000
2035	0.049	0.000
2036	0.026	0.000
2037	0.006	0.000
2038	0.020	0.000
2039	0.002	0.000
2040	0.011	0.000
2041	0.015	0.000
2042	0.048	0.000
2043	0.023	0.000
2044	0.031	0.000
2045	0.021	0.000
2046	0.025	0.000
2047	0.018	0.000
2048	0.024	0.000
2049	0.021	0.000
2050	0.015	0.000
2051	0.022	0.000
2052	0.013	0.000
2053	0.023	0.000
2054	0.029	0.000
2055	0.009	0.000
2056	0.010	0.000
2057	0.016	0.000
2058	0.020	0.000
2059	0.035	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.0687	0.0000
2	0.0579	0.0000
3	0.0578	0.0000
4	0.0558	0.0000
5	0.0539	0.0000
6	0.0522	0.0000
7	0.0492	0.0000
8	0.0479	0.0000
9	0.0453	0.0000
10	0.0453	0.0000
11	0.0444	0.0000
12	0.0440	0.0000
13	0.0436	0.0000
14	0.0432	0.0000
15	0.0424	0.0000
16	0.0419	0.0000
17	0.0414	0.0000
18	0.0394	0.0000
19	0.0391	0.0000
20	0.0388	0.0000
21	0.0380	0.0000
22	0.0349	0.0000

23	0.0347	0.0000
24	0.0347	0.0000
25	0.0347	0.0000
26	0.0346	0.0000
27	0.0345	0.0000
28	0.0329	0.0000
29	0.0328	0.0000
30	0.0320	0.0000
31	0.0318	0.0000
32	0.0317	0.0000
33	0.0312	0.0000
34	0.0289	0.0000
35	0.0288	0.0000
36	0.0286	0.0000
37	0.0285	0.0000
38	0.0283	0.0000
39	0.0278	0.0000
40	0.0276	0.0000
41	0.0272	0.0000
42	0.0267	0.0000
43	0.0267	0.0000
44	0.0266	0.0000
45	0.0256	0.0000
46	0.0254	0.0000
47	0.0250	0.0000
48	0.0250	0.0000
49	0.0249	0.0000
50	0.0241	0.0000
51	0.0237	0.0000
52	0.0236	0.0000
53	0.0235	0.0000
54	0.0235	0.0000
55	0.0235	0.0000
56	0.0235	0.0000
57	0.0233	0.0000
58	0.0232	0.0000
59	0.0231	0.0000
60	0.0230	0.0000
61	0.0230	0.0000
62	0.0227	0.0000
63	0.0225	0.0000
64	0.0222	0.0000
65	0.0221	0.0000
66	0.0220	0.0000
67	0.0219	0.0000
68	0.0213	0.0000
69	0.0212	0.0000
70	0.0212	0.0000
71	0.0212	0.0000
72	0.0211	0.0000
73	0.0210	0.0000
74	0.0208	0.0000
75	0.0207	0.0000
76	0.0206	0.0000
77	0.0206	0.0000
78	0.0206	0.0000
79	0.0204	0.0000
80	0.0201	0.0000

81	0.0200	0.0000
82	0.0199	0.0000
83	0.0198	0.0000
84	0.0195	0.0000
85	0.0189	0.0000
86	0.0188	0.0000
87	0.0188	0.0000
88	0.0187	0.0000
89	0.0186	0.0000
90	0.0183	0.0000
91	0.0176	0.0000
92	0.0174	0.0000
93	0.0174	0.0000
94	0.0170	0.0000
95	0.0170	0.0000
96	0.0170	0.0000
97	0.0167	0.0000
98	0.0167	0.0000
99	0.0163	0.0000
100	0.0160	0.0000
101	0.0157	0.0000
102	0.0156	0.0000
103	0.0154	0.0000
104	0.0153	0.0000
105	0.0153	0.0000
106	0.0152	0.0000
107	0.0151	0.0000
108	0.0150	0.0000
109	0.0150	0.0000
110	0.0147	0.0000
111	0.0146	0.0000
112	0.0144	0.0000
113	0.0141	0.0000
114	0.0133	0.0000
115	0.0133	0.0000
116	0.0130	0.0000
117	0.0129	0.0000
118	0.0128	0.0000
119	0.0128	0.0000
120	0.0128	0.0000
121	0.0127	0.0000
122	0.0126	0.0000
123	0.0126	0.0000
124	0.0125	0.0000
125	0.0124	0.0000
126	0.0119	0.0000
127	0.0117	0.0000
128	0.0113	0.0000
129	0.0109	0.0000
130	0.0108	0.0000
131	0.0108	0.0000
132	0.0107	0.0000
133	0.0107	0.0000
134	0.0103	0.0000
135	0.0100	0.0000
136	0.0099	0.0000
137	0.0098	0.0000
138	0.0092	0.0000

139	0.0090	0.0000
140	0.0090	0.0000
141	0.0089	0.0000
142	0.0087	0.0000
143	0.0087	0.0000
144	0.0086	0.0000
145	0.0081	0.0000
146	0.0081	0.0000
147	0.0080	0.0000
148	0.0079	0.0000
149	0.0078	0.0000
150	0.0078	0.0000
151	0.0075	0.0000
152	0.0069	0.0000
153	0.0067	0.0000
154	0.0061	0.0000
155	0.0044	0.0000
156	0.0020	0.0000
157	0.0017	0.0000
158	0.0011	0.0000

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0103	54354	0	0	Pass
0.0107	50160	0	0	Pass
0.0111	46609	0	0	Pass
0.0115	43312	0	0	Pass
0.0119	40293	0	0	Pass
0.0122	37451	0	0	Pass
0.0126	34941	0	0	Pass
0.0130	32553	0	0	Pass
0.0134	30348	0	0	Pass
0.0138	28265	0	0	Pass
0.0142	26443	0	0	Pass
0.0146	24786	0	0	Pass
0.0149	23302	0	0	Pass
0.0153	21928	0	0	Pass
0.0157	20648	0	0	Pass
0.0161	19412	0	0	Pass
0.0165	18293	0	0	Pass
0.0169	17219	0	0	Pass
0.0172	16166	0	0	Pass
0.0176	15141	0	0	Pass
0.0180	14282	0	0	Pass
0.0184	13446	0	0	Pass
0.0188	12676	0	0	Pass
0.0192	11933	0	0	Pass
0.0196	11246	0	0	Pass
0.0199	10559	0	0	Pass
0.0203	9978	0	0	Pass
0.0207	9374	0	0	Pass
0.0211	8853	0	0	Pass
0.0215	8332	0	0	Pass
0.0219	7861	0	0	Pass
0.0223	7457	0	0	Pass
0.0226	7036	0	0	Pass
0.0230	6609	0	0	Pass
0.0234	6277	0	0	Pass
0.0238	5978	0	0	Pass
0.0242	5706	0	0	Pass
0.0246	5437	0	0	Pass
0.0249	5199	0	0	Pass
0.0253	4942	0	0	Pass
0.0257	4706	0	0	Pass
0.0261	4511	0	0	Pass
0.0265	4339	0	0	Pass
0.0269	4154	0	0	Pass
0.0273	3958	0	0	Pass
0.0276	3764	0	0	Pass
0.0280	3582	0	0	Pass
0.0284	3412	0	0	Pass
0.0288	3265	0	0	Pass
0.0292	3134	0	0	Pass
0.0296	3027	0	0	Pass
0.0300	2926	0	0	Pass
0.0303	2815	0	0	Pass

0.0307	2682	0	0	Pass
0.0311	2556	0	0	Pass
0.0315	2451	0	0	Pass
0.0319	2361	0	0	Pass
0.0323	2256	0	0	Pass
0.0326	2143	0	0	Pass
0.0330	2038	0	0	Pass
0.0334	1952	0	0	Pass
0.0338	1860	0	0	Pass
0.0342	1778	0	0	Pass
0.0346	1688	0	0	Pass
0.0350	1619	0	0	Pass
0.0353	1561	0	0	Pass
0.0357	1483	0	0	Pass
0.0361	1407	0	0	Pass
0.0365	1340	0	0	Pass
0.0369	1270	0	0	Pass
0.0373	1218	0	0	Pass
0.0377	1163	0	0	Pass
0.0380	1103	0	0	Pass
0.0384	1055	0	0	Pass
0.0388	1006	0	0	Pass
0.0392	963	0	0	Pass
0.0396	920	0	0	Pass
0.0400	872	0	0	Pass
0.0403	815	0	0	Pass
0.0407	773	0	0	Pass
0.0411	738	0	0	Pass
0.0415	694	0	0	Pass
0.0419	637	0	0	Pass
0.0423	601	0	0	Pass
0.0427	555	0	0	Pass
0.0430	517	0	0	Pass
0.0434	478	0	0	Pass
0.0438	434	0	0	Pass
0.0442	394	0	0	Pass
0.0446	363	0	0	Pass
0.0450	339	0	0	Pass
0.0454	310	0	0	Pass
0.0457	296	0	0	Pass
0.0461	273	0	0	Pass
0.0465	252	0	0	Pass
0.0469	237	0	0	Pass
0.0473	223	0	0	Pass
0.0477	206	0	0	Pass
0.0480	195	0	0	Pass
0.0484	180	0	0	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	168.68			☐	100.00			
Total Volume Infiltrated		168.68	0.00	0.00		100.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

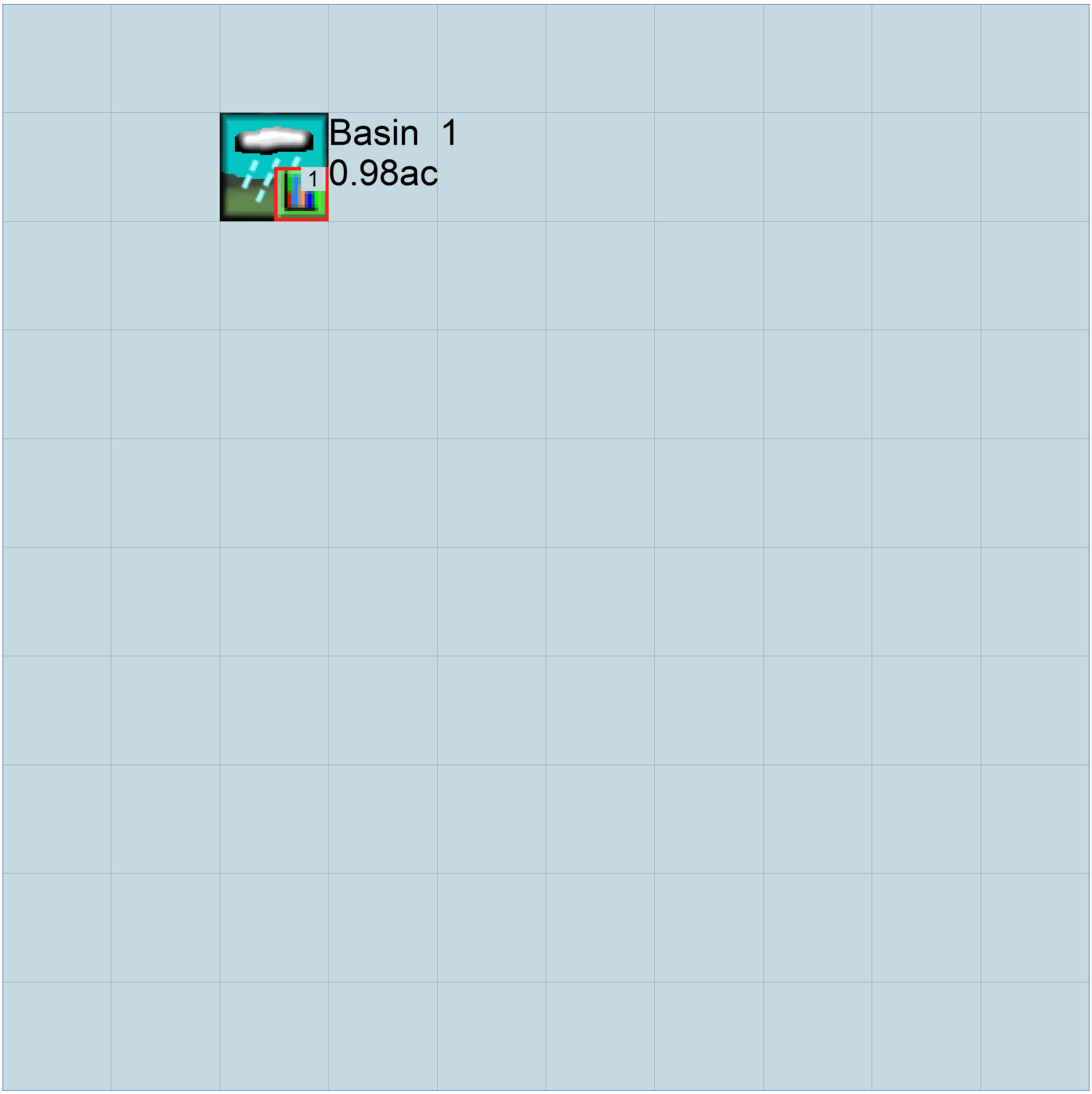
PERLND Changes

No PERLND changes have been made.

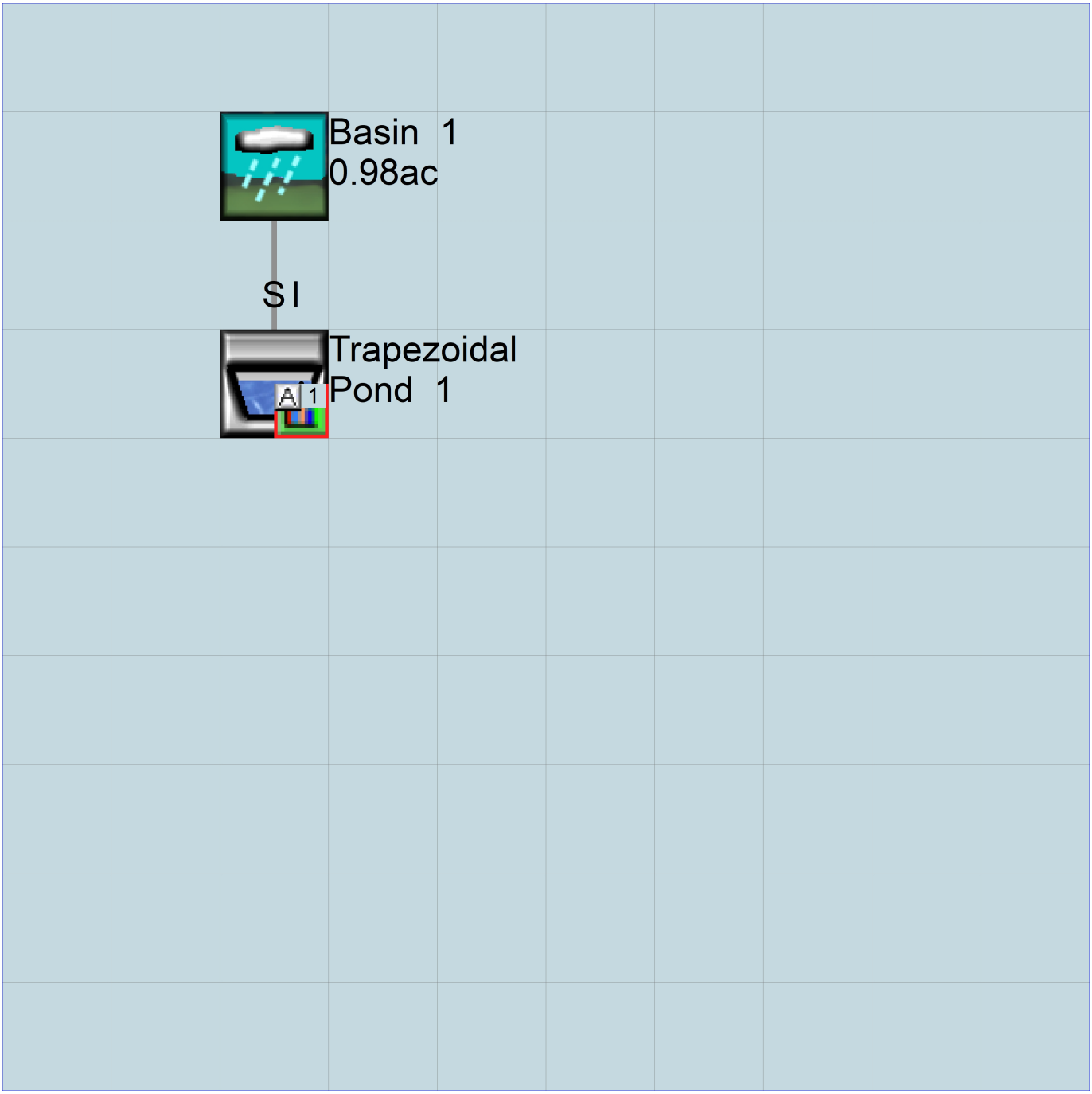
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin P-6.wdm
MESSU       25   PreBasin P-6.MES
            27   PreBasin P-6.L61
            28   PreBasin P-6.L62
            30   POCBasin P-61.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                     1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10             0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                       0.979     COPY   501     12
PERLND  10                       0.979     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><--->
```

```
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin P-6.wdm
MESSU       25   MitBasin P-6.MES
            27   MitBasin P-6.L61
            28   MitBasin P-6.L62
            30   POCBasin P-61.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       7
      IMPLND       1
      IMPLND      14
      RCHRES       1
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Trapezoidal Pond  1         MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
    7     A/B, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    7         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
```

```
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
    7         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    7         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    7             0         5       0.8       400      0.05       0.3     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    7             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    7          0.1       0.5      0.25         0       0.7      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
    7             0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
   14      POND                   1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
   14         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
   14         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
   14         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
```

```
    1            400      0.01       0.1       0.1
   14            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
   14              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
   14              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND   7                       0.519     RCHRES   1      2
PERLND   7                       0.519     RCHRES   1      3
IMPLND   1                       0.429     RCHRES   1      5
IMPLND  14                       0.031     RCHRES   1      5

******Routing******
PERLND   7                       0.519     COPY     1     12
IMPLND   1                       0.429     COPY     1     15
IMPLND  14                       0.031     COPY     1     15
PERLND   7                       0.519     COPY     1     13
RCHRES   1                           1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
    1     Trapezoidal Pond-005    2    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
```

```
    RCHRES  Flags for each HYDR Section                                    ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *      *  *  *  *  *         ***
    1       0  1  0  0    4  5  0  0  0       0  0  0  0  0         2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1              1      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                       ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)     (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.002255  0.000000  0.000000  0.000000
  0.077778  0.002472  0.000184  0.000000  0.022733
  0.155556  0.002699  0.000385  0.000000  0.022733
  0.233333  0.002937  0.000604  0.000000  0.022733
  0.311111  0.003184  0.000842  0.000000  0.022733
  0.388889  0.003441  0.001100  0.000000  0.022733
  0.466667  0.003709  0.001378  0.000000  0.022733
  0.544444  0.003986  0.001677  0.000000  0.022733
  0.622222  0.004273  0.001998  0.000000  0.022733
  0.700000  0.004571  0.002342  0.000000  0.022733
  0.777778  0.004878  0.002710  0.000000  0.022733
  0.855556  0.005195  0.003101  0.000000  0.022733
  0.933333  0.005522  0.003518  0.000000  0.022733
  1.011111  0.005860  0.003961  0.000000  0.022733
  1.088889  0.006207  0.004430  0.000000  0.022733
  1.166667  0.006564  0.004927  0.000000  0.022733
  1.244444  0.006932  0.005452  0.000000  0.022733
  1.322222  0.007309  0.006005  0.000000  0.022733
  1.400000  0.007696  0.006589  0.000000  0.022733
  1.477778  0.008094  0.007203  0.000000  0.022733
  1.555556  0.008501  0.007848  0.000000  0.022733
  1.633333  0.008918  0.008526  0.000000  0.022733
  1.711111  0.009346  0.009236  0.000000  0.022733
  1.788889  0.009783  0.009980  0.000000  0.022733
  1.866667  0.010230  0.010758  0.000000  0.022733
  1.944444  0.010688  0.011572  0.000000  0.022733
  2.022222  0.011155  0.012421  0.000000  0.022733
  2.100000  0.011632  0.013307  0.000000  0.022733
  2.177778  0.012120  0.014231  0.000000  0.022733
  2.255556  0.012617  0.015193  0.000000  0.022733
  2.333333  0.013124  0.016194  0.000000  0.022733
  2.411111  0.013641  0.017235  0.000000  0.022733
  2.488889  0.014169  0.018316  0.000000  0.022733
  2.566667  0.014706  0.019439  0.000000  0.022733
  2.644444  0.015253  0.020604  0.000000  0.022733
  2.722222  0.015811  0.021812  0.000000  0.022733
  2.800000  0.016378  0.023064  0.000000  0.022733
  2.877778  0.016955  0.024360  0.000000  0.022733
  2.955556  0.017543  0.025702  0.000000  0.022733
  3.033333  0.018140  0.027090  0.000000  0.022733
  3.111111  0.018747  0.028524  0.000000  0.022733
  3.188889  0.019364  0.030006  0.000000  0.022733
```

```
  3.266667  0.019992  0.031537  0.000000  0.022733
  3.344444  0.020629  0.033116  0.000000  0.022733
  3.422222  0.021276  0.034746  0.000000  0.022733
  3.500000  0.021934  0.036427  0.000000  0.022733
  3.577778  0.022601  0.038158  0.000000  0.022733
  3.655556  0.023278  0.039943  0.000000  0.022733
  3.733333  0.023965  0.041780  0.000000  0.022733
  3.811111  0.024663  0.043671  0.000000  0.022733
  3.888889  0.025370  0.045617  0.000000  0.022733
  3.966667  0.026087  0.047618  0.000000  0.022733
  4.044444  0.026815  0.049675  0.000000  0.022733
  4.122222  0.027552  0.051789  0.000000  0.022733
  4.200000  0.028299  0.053961  0.000000  0.022733
  4.277778  0.029056  0.056192  0.000000  0.022733
  4.355556  0.029824  0.058482  0.000000  0.022733
  4.433333  0.030601  0.060831  0.000000  0.022733
  4.511111  0.031388  0.063242  0.000000  0.022733
  4.588889  0.032186  0.065714  0.000000  0.022733
  4.666667  0.032993  0.068249  0.000000  0.022733
  4.744444  0.033810  0.070847  0.000000  0.022733
  4.822222  0.034637  0.073509  0.000000  0.022733
  4.900000  0.035475  0.076236  0.000000  0.022733
  4.977778  0.036322  0.079028  0.000000  0.022733
  5.055556  0.037179  0.081886  0.000000  0.022733
  5.133333  0.038046  0.084811  0.000000  0.022733
  5.211111  0.038924  0.087805  0.000000  0.022733
  5.288889  0.039811  0.090867  0.000000  0.022733
  5.366667  0.040708  0.093998  0.000000  0.022733
  5.444444  0.041616  0.097199  0.000000  0.022733
  5.522222  0.042533  0.100472  0.000000  0.022733
  5.600000  0.043460  0.103816  0.000000  0.022733
  5.677778  0.044397  0.107233  0.000000  0.022733
  5.755556  0.045345  0.110723  0.000000  0.022733
  5.833333  0.046302  0.114287  0.000000  0.022733
  5.911111  0.047269  0.117926  0.000000  0.022733
  5.988889  0.048246  0.121640  0.000000  0.022733
  6.066667  0.049234  0.125431  0.182234  0.022733
  6.144444  0.050231  0.129299  0.572643  0.022733
  6.222222  0.051238  0.133245  1.046030  0.022733
  6.300000  0.052255  0.137270  1.509672  0.022733
  6.377778  0.053283  0.141374  1.879270  0.022733
  6.455556  0.054320  0.145559  2.114227  0.022733
  6.533333  0.055367  0.149824  2.300165  0.022733
  6.611111  0.056424  0.154172  2.462179  0.022733
  6.688889  0.057492  0.158602  2.614172  0.022733
  6.766667  0.058569  0.163115  2.757800  0.022733
  6.844444  0.059656  0.167713  2.894310  0.022733
  6.922222  0.060753  0.172395  3.024665  0.022733
  7.000000  0.061861  0.177164  3.149630  0.022733
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1             PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1             IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1             PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1             IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   1 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1001 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      2 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1003 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
```

```
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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Attachment D
Geotechnical Engineering Study

APPENDIX D:
Geotech Report

APPENDIX E:
O&M Manual

APPENDIX F: Water Quality Calculations

Private Ponds

WWHM2012

PROJECT REPORT

General Model Information

Project Name:	Private Ponds - WQ
Site Name:	First Parking NW Landing
Site Address:	First Parking NW Landing
City:	Dupont, WA
Report Date:	8/10/2022
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year
Low Flow Threshold for POC2:	50 Percent of the 2 Year
High Flow Threshold for POC2:	50 Year
Low Flow Threshold for POC3:	50 Percent of the 2 Year
High Flow Threshold for POC3:	50 Year
Low Flow Threshold for POC4:	50 Percent of the 2 Year
High Flow Threshold for POC4:	50 Year

Landuse Basin Data
Predeveloped Land Use

Pond 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	15.07
Pervious Total	15.07
Impervious Land Use	acre
Impervious Total	0
Basin Total	15.07

Element Flows To:

Surface	Interflow	Groundwater

Pond 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Forest, Flat	8.56
Pervious Total	8.56

Impervious Land Use	acre
Impervious Total	0
Basin Total	8.56

Element Flows To:

Surface	Interflow	Groundwater

Pond 4

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	12.74
Pervious Total	12.74
Impervious Land Use	acre
Impervious Total	0
Basin Total	12.74

Element Flows To:

Surface	Interflow	Groundwater

Pond 5

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	15.56
Pervious Total	15.56
Impervious Land Use	acre
Impervious Total	0
Basin Total	15.56

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Pond 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Lawn, Flat	4.5
Pervious Total	4.5
Impervious Land Use	acre
ROADS FLAT	5.98
ROOF TOPS FLAT	4.59
Impervious Total	10.57
Basin Total	15.07

Element Flows To:

Surface	Interflow	Groundwater

Pond 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Lawn, Flat	2.59
Pervious Total	2.59

Impervious Land Use	acre
ROADS FLAT	3.15
ROOF TOPS FLAT	2.82
Impervious Total	5.97
Basin Total	8.56

Element Flows To:

Surface	Interflow	Groundwater

Pond 4

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Lawn, Flat	4
Pervious Total	4

Impervious Land Use	acre
ROADS FLAT	4.15
ROOF TOPS FLAT	4.59
Impervious Total	8.74
Basin Total	12.74

Element Flows To:

Surface	Interflow	Groundwater

Pond 5

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Lawn, Flat	4.25
Pervious Total	4.25

Impervious Land Use	acre
ROADS FLAT	6.72
ROOF TOPS FLAT	4.59
Impervious Total	11.31
Basin Total	15.56

Element Flows To:

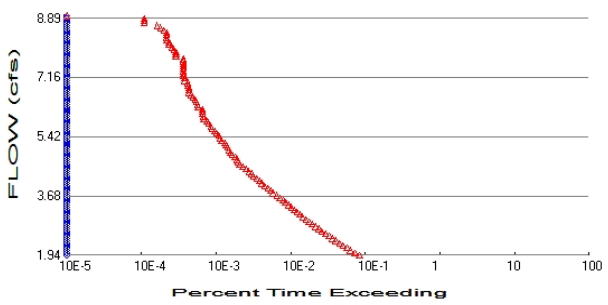
Surface	Interflow	Groundwater

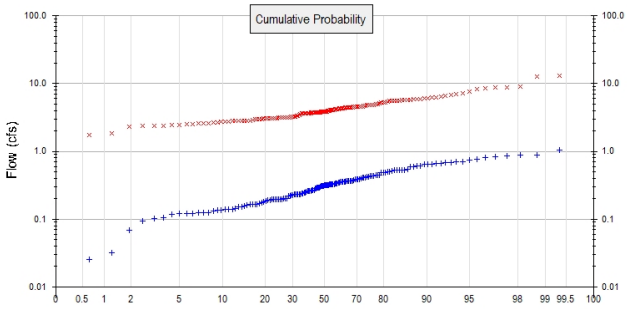
Routing Elements
Predeveloped Routing

Mitigated Routing

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 15.07
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 4.5
Total Impervious Area: 10.57

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.317567
5 year	0.494041
10 year	0.58993
25 year	0.687527
50 year	0.745537
100 year	0.793238

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	3.884381
5 year	5.287915
10 year	6.319144
25 year	7.74289
50 year	8.894381
100 year	10.126508

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.233	4.390
1903	0.194	4.875
1904	0.317	6.274
1905	0.152	2.543
1906	0.068	2.773
1907	0.487	4.076
1908	0.361	3.184
1909	0.357	3.743
1910	0.492	3.854
1911	0.320	4.289

1912	1.057	8.214
1913	0.507	2.913
1914	0.124	13.233
1915	0.204	2.603
1916	0.317	4.684
1917	0.106	1.762
1918	0.339	3.738
1919	0.251	2.406
1920	0.323	3.315
1921	0.361	2.812
1922	0.362	4.599
1923	0.291	3.073
1924	0.133	5.425
1925	0.165	2.353
1926	0.308	4.397
1927	0.199	3.595
1928	0.246	2.798
1929	0.504	5.656
1930	0.324	5.597
1931	0.300	2.795
1932	0.235	3.031
1933	0.226	2.955
1934	0.665	5.289
1935	0.309	2.465
1936	0.268	3.619
1937	0.428	5.128
1938	0.261	2.556
1939	0.016	3.191
1940	0.289	5.593
1941	0.138	5.509
1942	0.436	4.547
1943	0.224	4.286
1944	0.411	6.407
1945	0.363	4.567
1946	0.196	3.782
1947	0.124	2.751
1948	0.683	3.852
1949	0.585	5.762
1950	0.166	3.245
1951	0.204	4.910
1952	0.891	6.705
1953	0.804	6.016
1954	0.290	3.166
1955	0.237	2.809
1956	0.116	2.766
1957	0.412	3.088
1958	0.860	4.139
1959	0.531	4.204
1960	0.141	3.001
1961	0.534	9.019
1962	0.287	3.734
1963	0.137	2.691
1964	0.151	8.612
1965	0.598	3.763
1966	0.168	3.038
1967	0.257	4.551
1968	0.262	3.601
1969	0.262	3.284

1970	0.410	3.897
1971	0.645	3.839
1972	0.418	12.638
1973	0.533	6.599
1974	0.288	5.020
1975	0.677	5.897
1976	0.358	5.913
1977	0.121	2.310
1978	0.603	4.409
1979	0.165	4.208
1980	0.341	4.335
1981	0.327	3.810
1982	0.134	3.120
1983	0.534	4.423
1984	0.218	4.403
1985	0.354	5.242
1986	0.318	2.512
1987	0.606	4.137
1988	0.384	2.568
1989	0.346	2.361
1990	0.391	3.178
1991	0.306	4.786
1992	0.438	4.233
1993	0.425	4.850
1994	0.637	3.655
1995	0.122	2.676
1996	0.698	3.755
1997	0.268	3.239
1998	0.318	4.020
1999	0.026	3.995
2000	0.242	3.690
2001	0.124	2.815
2002	0.443	6.028
2003	0.385	3.138
2004	0.355	4.592
2005	0.653	8.741
2006	0.197	4.036
2007	0.198	4.723
2008	0.337	3.800
2009	0.231	2.821
2010	0.197	3.739
2011	0.159	3.809
2012	0.231	3.695
2013	0.180	3.616
2014	0.134	3.225
2015	0.257	6.324
2016	0.102	3.388
2017	0.489	5.572
2018	0.890	3.783
2019	0.830	5.639
2020	0.271	4.319
2021	0.441	3.555
2022	0.182	5.819
2023	0.371	6.998
2024	0.697	8.719
2025	0.327	3.638
2026	0.534	4.028
2027	0.192	4.467

2028	0.166	1.747
2029	0.362	3.057
2030	0.672	5.760
2031	0.222	1.860
2032	0.121	3.060
2033	0.194	3.838
2034	0.191	3.006
2035	0.758	4.173
2036	0.393	3.009
2037	0.094	4.038
2038	0.314	4.290
2039	0.031	7.721
2040	0.174	3.133
2041	0.235	3.990
2042	0.737	4.466
2043	0.356	4.889
2044	0.480	3.486
2045	0.327	2.844
2046	0.383	3.148
2047	0.282	3.716
2048	0.365	3.067
2049	0.326	4.559
2050	0.234	3.605
2051	0.340	5.340
2052	0.196	3.642
2053	0.350	3.107
2054	0.445	7.173
2055	0.138	3.762
2056	0.155	4.893
2057	0.240	2.419
2058	0.304	4.568
2059	0.537	5.699

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	1.0571	13.2326
2	0.8908	12.6375
3	0.8899	9.0186
4	0.8596	8.7408
5	0.8300	8.7191
6	0.8035	8.6123
7	0.7576	8.2139
8	0.7370	7.7209
9	0.6979	7.1733
10	0.6969	6.9982
11	0.6832	6.7052
12	0.6768	6.5987
13	0.6715	6.4073
14	0.6649	6.3243
15	0.6529	6.2744
16	0.6449	6.0280
17	0.6368	6.0160
18	0.6062	5.9131
19	0.6026	5.8970
20	0.5980	5.8185
21	0.5853	5.7619
22	0.5373	5.7595

23	0.5344	5.6993
24	0.5343	5.6556
25	0.5342	5.6388
26	0.5329	5.5967
27	0.5314	5.5926
28	0.5065	5.5719
29	0.5044	5.5087
30	0.4922	5.4249
31	0.4894	5.3397
32	0.4874	5.2887
33	0.4802	5.2423
34	0.4448	5.1284
35	0.4427	5.0202
36	0.4407	4.9098
37	0.4380	4.8931
38	0.4358	4.8891
39	0.4284	4.8746
40	0.4246	4.8499
41	0.4181	4.7859
42	0.4115	4.7234
43	0.4107	4.6844
44	0.4096	4.5993
45	0.3934	4.5916
46	0.3911	4.5679
47	0.3855	4.5667
48	0.3844	4.5586
49	0.3830	4.5506
50	0.3706	4.5475
51	0.3649	4.4673
52	0.3630	4.4663
53	0.3623	4.4227
54	0.3620	4.4085
55	0.3612	4.4034
56	0.3610	4.3966
57	0.3584	4.3895
58	0.3570	4.3351
59	0.3559	4.3191
60	0.3546	4.2903
61	0.3543	4.2893
62	0.3499	4.2859
63	0.3456	4.2329
64	0.3412	4.2080
65	0.3401	4.2038
66	0.3393	4.1729
67	0.3373	4.1389
68	0.3272	4.1365
69	0.3270	4.0761
70	0.3267	4.0382
71	0.3262	4.0364
72	0.3241	4.0276
73	0.3230	4.0196
74	0.3205	3.9946
75	0.3185	3.9901
76	0.3178	3.8970
77	0.3170	3.8540
78	0.3168	3.8524
79	0.3137	3.8394
80	0.3087	3.8380

81	0.3076	3.8097
82	0.3062	3.8086
83	0.3042	3.8000
84	0.2998	3.7830
85	0.2912	3.7824
86	0.2900	3.7629
87	0.2893	3.7619
88	0.2885	3.7555
89	0.2869	3.7434
90	0.2820	3.7391
91	0.2708	3.7383
92	0.2683	3.7339
93	0.2677	3.7160
94	0.2621	3.6949
95	0.2616	3.6900
96	0.2611	3.6547
97	0.2573	3.6416
98	0.2568	3.6377
99	0.2508	3.6191
100	0.2461	3.6162
101	0.2423	3.6048
102	0.2403	3.6008
103	0.2370	3.5950
104	0.2351	3.5545
105	0.2347	3.4855
106	0.2342	3.3876
107	0.2329	3.3154
108	0.2315	3.2842
109	0.2309	3.2449
110	0.2264	3.2389
111	0.2242	3.2251
112	0.2219	3.1914
113	0.2177	3.1837
114	0.2041	3.1784
115	0.2041	3.1655
116	0.1995	3.1482
117	0.1980	3.1375
118	0.1974	3.1332
119	0.1970	3.1204
120	0.1963	3.1066
121	0.1956	3.0879
122	0.1943	3.0729
123	0.1937	3.0667
124	0.1920	3.0598
125	0.1911	3.0566
126	0.1824	3.0380
127	0.1803	3.0313
128	0.1744	3.0094
129	0.1677	3.0056
130	0.1663	3.0011
131	0.1659	2.9548
132	0.1653	2.9133
133	0.1651	2.8441
134	0.1592	2.8210
135	0.1546	2.8146
136	0.1525	2.8120
137	0.1513	2.8093
138	0.1414	2.7981

139	0.1378	2.7949
140	0.1378	2.7727
141	0.1375	2.7655
142	0.1343	2.7509
143	0.1335	2.6906
144	0.1331	2.6761
145	0.1240	2.6031
146	0.1240	2.5679
147	0.1238	2.5558
148	0.1222	2.5428
149	0.1208	2.5124
150	0.1207	2.4648
151	0.1162	2.4195
152	0.1057	2.4063
153	0.1024	2.3612
154	0.0940	2.3527
155	0.0682	2.3097
156	0.0315	1.8602
157	0.0256	1.7624
158	0.0163	1.7472

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1588	0	4590	n/a	Fail
0.1647	0	4022	n/a	Fail
0.1706	0	3512	n/a	Fail
0.1766	0	3135	n/a	Fail
0.1825	0	2792	n/a	Fail
0.1884	0	2499	n/a	Fail
0.1943	0	2238	n/a	Fail
0.2003	0	2007	n/a	Fail
0.2062	0	1805	n/a	Fail
0.2121	0	1622	n/a	Fail
0.2181	0	1446	n/a	Fail
0.2240	0	1328	n/a	Fail
0.2299	0	1194	n/a	Fail
0.2358	0	1072	n/a	Fail
0.2418	0	974	n/a	Fail
0.2477	0	888	n/a	Fail
0.2536	0	804	n/a	Fail
0.2595	0	731	n/a	Fail
0.2655	0	675	n/a	Fail
0.2714	0	618	n/a	Fail
0.2773	0	564	n/a	Fail
0.2832	0	523	n/a	Fail
0.2892	0	473	n/a	Fail
0.2951	0	438	n/a	Fail
0.3010	0	397	n/a	Fail
0.3070	0	362	n/a	Fail
0.3129	0	324	n/a	Fail
0.3188	0	298	n/a	Fail
0.3247	0	273	n/a	Fail
0.3307	0	248	n/a	Fail
0.3366	0	225	n/a	Fail
0.3425	0	211	n/a	Fail
0.3484	0	195	n/a	Fail
0.3544	0	175	n/a	Fail
0.3603	0	165	n/a	Fail
0.3662	0	153	n/a	Fail
0.3721	0	139	n/a	Fail
0.3781	0	126	n/a	Fail
0.3840	0	114	n/a	Fail
0.3899	0	109	n/a	Fail
0.3959	0	105	n/a	Fail
0.4018	0	100	n/a	Fail
0.4077	0	91	n/a	Fail
0.4136	0	86	n/a	Fail
0.4196	0	82	n/a	Fail
0.4255	0	79	n/a	Fail
0.4314	0	76	n/a	Fail
0.4373	0	72	n/a	Fail
0.4433	0	65	n/a	Fail
0.4492	0	62	n/a	Fail
0.4551	0	60	n/a	Fail
0.4611	0	56	n/a	Fail
0.4670	0	53	n/a	Fail

0.4729	0	49	n/a	Fail
0.4788	0	47	n/a	Fail
0.4848	0	44	n/a	Fail
0.4907	0	42	n/a	Fail
0.4966	0	38	n/a	Fail
0.5025	0	38	n/a	Fail
0.5085	0	36	n/a	Fail
0.5144	0	36	n/a	Fail
0.5203	0	36	n/a	Fail
0.5262	0	32	n/a	Fail
0.5322	0	31	n/a	Fail
0.5381	0	30	n/a	Fail
0.5440	0	29	n/a	Fail
0.5500	0	27	n/a	Fail
0.5559	0	26	n/a	Fail
0.5618	0	24	n/a	Fail
0.5677	0	24	n/a	Fail
0.5737	0	24	n/a	Fail
0.5796	0	23	n/a	Fail
0.5855	0	23	n/a	Fail
0.5914	0	21	n/a	Fail
0.5974	0	21	n/a	Fail
0.6033	0	20	n/a	Fail
0.6092	0	20	n/a	Fail
0.6151	0	20	n/a	Fail
0.6211	0	20	n/a	Fail
0.6270	0	20	n/a	Fail
0.6329	0	20	n/a	Fail
0.6389	0	20	n/a	Fail
0.6448	0	20	n/a	Fail
0.6507	0	16	n/a	Fail
0.6566	0	16	n/a	Fail
0.6626	0	16	n/a	Fail
0.6685	0	15	n/a	Fail
0.6744	0	14	n/a	Fail
0.6803	0	13	n/a	Fail
0.6863	0	13	n/a	Fail
0.6922	0	12	n/a	Fail
0.6981	0	12	n/a	Fail
0.7040	0	12	n/a	Fail
0.7100	0	12	n/a	Fail
0.7159	0	11	n/a	Fail
0.7218	0	10	n/a	Fail
0.7278	0	9	n/a	Fail
0.7337	0	6	n/a	Fail
0.7396	0	6	n/a	Fail
0.7455	0	6	n/a	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

POND 1

Water Quality

Water Quality BMP Flow and Volume for POC #1

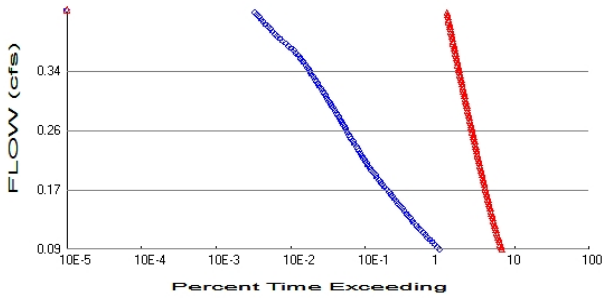
On-line facility volume:	1.2583 acre-feet
On-line facility target flow:	1.5448 cfs.
Adjusted for 15 min:	1.5448 cfs.
Off-line facility target flow:	0.8849 cfs.
Adjusted for 15 min:	0.8849 cfs.

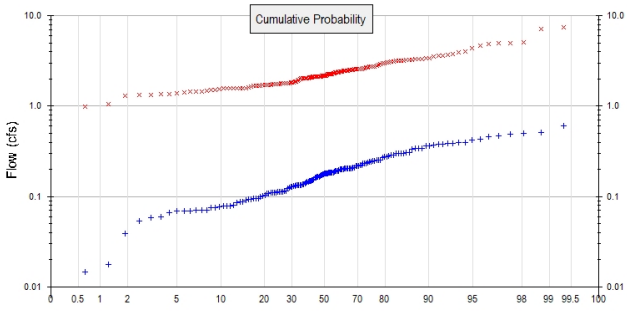
LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

POND 2

POC 2





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #2
Total Pervious Area: 8.56
Total Impervious Area: 0

Mitigated Landuse Totals for POC #2
Total Pervious Area: 2.59
Total Impervious Area: 5.97

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #2

Return Period	**Flow(cfs)**
2 year	0.180383
5 year	0.280623
10 year	0.33509
25 year	0.390527
50 year	0.423477
100 year	0.450572

Flow Frequency Return Periods for Mitigated. POC #2

Return Period	**Flow(cfs)**
2 year	2.195867
5 year	2.990174
10 year	3.573913
25 year	4.379988
50 year	5.032027
100 year	5.729816

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #2

Year	**Predeveloped**	**Mitigated**
1902	0.132	2.479
1903	0.110	2.753
1904	0.180	3.552
1905	0.087	1.437
1906	0.039	1.566
1907	0.277	2.306
1908	0.205	1.800
1909	0.203	2.114
1910	0.280	2.182
1911	0.182	2.426
1912	0.600	4.657

1913	0.288	1.646
1914	0.070	7.485
1915	0.116	1.471
1916	0.180	2.646
1917	0.060	0.995
1918	0.193	2.111
1919	0.142	1.360
1920	0.183	1.876
1921	0.205	1.590
1922	0.206	2.603
1923	0.165	1.738
1924	0.076	3.064
1925	0.094	1.330
1926	0.175	2.483
1927	0.113	2.031
1928	0.140	1.582
1929	0.287	3.198
1930	0.184	3.162
1931	0.170	1.580
1932	0.133	1.714
1933	0.129	1.670
1934	0.378	2.994
1935	0.175	1.392
1936	0.152	2.046
1937	0.243	2.897
1938	0.148	1.444
1939	0.009	1.803
1940	0.164	3.159
1941	0.078	3.111
1942	0.248	2.573
1943	0.127	2.423
1944	0.233	3.625
1945	0.206	2.580
1946	0.112	2.140
1947	0.070	1.554
1948	0.388	2.177
1949	0.332	3.255
1950	0.094	1.833
1951	0.116	2.773
1952	0.506	3.800
1953	0.456	3.408
1954	0.165	1.790
1955	0.135	1.587
1956	0.066	1.562
1957	0.234	1.745
1958	0.488	2.342
1959	0.302	2.380
1960	0.080	1.696
1961	0.303	5.100
1962	0.163	2.110
1963	0.078	1.520
1964	0.086	4.873
1965	0.340	2.128
1966	0.095	1.717
1967	0.146	2.575
1968	0.149	2.035
1969	0.149	1.857
1970	0.233	2.205

1971	0.366	2.173
1972	0.238	7.152
1973	0.303	3.727
1974	0.164	2.838
1975	0.384	3.341
1976	0.204	3.347
1977	0.069	1.305
1978	0.342	2.496
1979	0.094	2.379
1980	0.194	2.453
1981	0.186	2.153
1982	0.076	1.764
1983	0.304	2.501
1984	0.124	2.491
1985	0.201	2.967
1986	0.181	1.421
1987	0.344	2.336
1988	0.218	1.452
1989	0.196	1.335
1990	0.222	1.797
1991	0.174	2.707
1992	0.249	2.391
1993	0.241	2.739
1994	0.362	2.068
1995	0.069	1.513
1996	0.396	2.124
1997	0.152	1.831
1998	0.181	2.274
1999	0.015	2.256
2000	0.138	2.086
2001	0.070	1.590
2002	0.251	3.415
2003	0.219	1.774
2004	0.201	2.595
2005	0.371	4.939
2006	0.112	2.280
2007	0.112	2.670
2008	0.192	2.147
2009	0.131	1.593
2010	0.112	2.113
2011	0.090	2.151
2012	0.131	2.089
2013	0.102	2.046
2014	0.076	1.822
2015	0.146	3.582
2016	0.058	1.913
2017	0.278	3.149
2018	0.505	2.142
2019	0.471	3.194
2020	0.154	2.443
2021	0.250	2.010
2022	0.104	3.288
2023	0.211	3.953
2024	0.396	4.940
2025	0.186	2.055
2026	0.303	2.275
2027	0.109	2.523
2028	0.094	0.987

2029	0.206	1.728
2030	0.381	3.253
2031	0.126	1.051
2032	0.069	1.728
2033	0.110	2.168
2034	0.109	1.698
2035	0.430	2.362
2036	0.223	1.700
2037	0.053	2.281
2038	0.178	2.428
2039	0.018	4.361
2040	0.099	1.771
2041	0.134	2.255
2042	0.419	2.527
2043	0.202	2.762
2044	0.273	1.970
2045	0.186	1.608
2046	0.218	1.780
2047	0.160	2.099
2048	0.207	1.732
2049	0.185	2.575
2050	0.133	2.038
2051	0.193	3.022
2052	0.111	2.057
2053	0.199	1.755
2054	0.253	4.063
2055	0.078	2.125
2056	0.088	2.764
2057	0.136	1.368
2058	0.173	2.580
2059	0.305	3.219

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #2

Rank	Predeveloped	Mitigated
1	0.6004	7.4855
2	0.5060	7.1516
3	0.5055	5.1003
4	0.4883	4.9400
5	0.4715	4.9390
6	0.4564	4.8731
7	0.4303	4.6571
8	0.4186	4.3611
9	0.3964	4.0626
10	0.3959	3.9527
11	0.3880	3.8002
12	0.3844	3.7271
13	0.3814	3.6245
14	0.3777	3.5817
15	0.3708	3.5522
16	0.3663	3.4146
17	0.3617	3.4078
18	0.3443	3.3469
19	0.3423	3.3412
20	0.3397	3.2881
21	0.3325	3.2547
22	0.3052	3.2532
23	0.3036	3.2191

24	0.3035	3.1982
25	0.3034	3.1936
26	0.3027	3.1616
27	0.3019	3.1591
28	0.2877	3.1485
29	0.2865	3.1115
30	0.2796	3.0643
31	0.2780	3.0221
32	0.2768	2.9940
33	0.2728	2.9674
34	0.2526	2.8966
35	0.2515	2.8381
36	0.2503	2.7731
37	0.2488	2.7641
38	0.2475	2.7615
39	0.2433	2.7534
40	0.2412	2.7394
41	0.2375	2.7067
42	0.2338	2.6704
43	0.2333	2.6460
44	0.2327	2.6032
45	0.2235	2.5947
46	0.2222	2.5805
47	0.2190	2.5800
48	0.2183	2.5751
49	0.2176	2.5749
50	0.2105	2.5729
51	0.2073	2.5269
52	0.2062	2.5233
53	0.2058	2.5015
54	0.2056	2.4965
55	0.2052	2.4906
56	0.2050	2.4833
57	0.2036	2.4793
58	0.2028	2.4534
59	0.2022	2.4435
60	0.2014	2.4281
61	0.2013	2.4257
62	0.1988	2.4228
63	0.1963	2.3908
64	0.1938	2.3796
65	0.1932	2.3790
66	0.1927	2.3620
67	0.1916	2.3423
68	0.1859	2.3364
69	0.1857	2.3064
70	0.1856	2.2808
71	0.1853	2.2801
72	0.1841	2.2751
73	0.1834	2.2740
74	0.1820	2.2562
75	0.1809	2.2554
76	0.1805	2.2049
77	0.1801	2.1816
78	0.1800	2.1774
79	0.1782	2.1729
80	0.1754	2.1678
81	0.1747	2.1528

82	0.1739	2.1511
83	0.1728	2.1474
84	0.1703	2.1423
85	0.1654	2.1398
86	0.1647	2.1282
87	0.1643	2.1248
88	0.1639	2.1244
89	0.1630	2.1143
90	0.1602	2.1131
91	0.1538	2.1115
92	0.1524	2.1102
93	0.1521	2.0989
94	0.1489	2.0886
95	0.1486	2.0861
96	0.1483	2.0682
97	0.1461	2.0568
98	0.1459	2.0546
99	0.1425	2.0459
100	0.1398	2.0455
101	0.1376	2.0384
102	0.1365	2.0354
103	0.1346	2.0306
104	0.1335	2.0101
105	0.1333	1.9701
106	0.1330	1.9134
107	0.1323	1.8755
108	0.1315	1.8567
109	0.1312	1.8327
110	0.1286	1.8309
111	0.1273	1.8216
112	0.1260	1.8030
113	0.1237	1.7998
114	0.1159	1.7973
115	0.1159	1.7895
116	0.1133	1.7797
117	0.1125	1.7738
118	0.1122	1.7711
119	0.1119	1.7635
120	0.1115	1.7548
121	0.1111	1.7451
122	0.1104	1.7380
123	0.1100	1.7322
124	0.1090	1.7285
125	0.1086	1.7282
126	0.1036	1.7171
127	0.1024	1.7137
128	0.0990	1.6998
129	0.0952	1.6976
130	0.0945	1.6956
131	0.0942	1.6700
132	0.0939	1.6456
133	0.0938	1.6078
134	0.0904	1.5933
135	0.0878	1.5904
136	0.0866	1.5897
137	0.0859	1.5868
138	0.0803	1.5820
139	0.0783	1.5799

140	0.0783	1.5662
141	0.0781	1.5620
142	0.0763	1.5543
143	0.0758	1.5197
144	0.0756	1.5126
145	0.0704	1.4714
146	0.0704	1.4520
147	0.0703	1.4441
148	0.0694	1.4371
149	0.0686	1.4207
150	0.0685	1.3922
151	0.0660	1.3675
152	0.0601	1.3604
153	0.0582	1.3353
154	0.0534	1.3299
155	0.0387	1.3051
156	0.0179	1.0513
157	0.0146	0.9954
158	0.0093	0.9869

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0902	54520	373068	684	Fail
0.0936	50819	365146	718	Fail
0.0969	47506	357556	752	Fail
0.1003	43573	347916	798	Fail
0.1037	40808	340936	835	Fail
0.1070	37462	332127	886	Fail
0.1104	35190	325811	925	Fail
0.1138	33080	319606	966	Fail
0.1171	30398	311795	1025	Fail
0.1205	28542	306089	1072	Fail
0.1239	26858	300659	1119	Fail
0.1272	24886	293513	1179	Fail
0.1306	23551	288416	1224	Fail
0.1340	22315	283430	1270	Fail
0.1373	20748	276892	1334	Fail
0.1407	19662	272183	1384	Fail
0.1441	18299	266145	1454	Fail
0.1474	17346	261657	1508	Fail
0.1508	16399	257336	1569	Fail
0.1542	15174	251685	1658	Fail
0.1575	14393	247530	1719	Fail
0.1609	13651	243486	1783	Fail
0.1643	12726	238334	1872	Fail
0.1676	12055	234566	1945	Fail
0.1710	11451	230854	2016	Fail
0.1744	10631	226035	2126	Fail
0.1777	10088	222544	2206	Fail
0.1811	9385	218002	2322	Fail
0.1845	8931	214622	2403	Fail
0.1878	8449	211353	2501	Fail
0.1912	7884	207088	2626	Fail
0.1946	7518	203930	2712	Fail
0.1979	7147	200772	2809	Fail
0.2013	6643	196672	2960	Fail
0.2047	6327	193736	3062	Fail
0.2080	5978	189913	3176	Fail
0.2114	5740	187088	3259	Fail
0.2148	5495	184263	3353	Fail
0.2181	5204	180661	3471	Fail
0.2215	4980	178113	3576	Fail
0.2249	4752	175509	3693	Fail
0.2282	4522	172130	3806	Fail
0.2316	4359	169581	3890	Fail
0.2350	4197	167144	3982	Fail
0.2383	3970	163875	4127	Fail
0.2417	3805	161493	4244	Fail
0.2451	3582	158335	4420	Fail
0.2484	3432	156064	4547	Fail
0.2518	3293	153792	4670	Fail
0.2552	3137	150856	4808	Fail
0.2585	3046	148640	4879	Fail
0.2619	2951	146424	4961	Fail
0.2653	2817	143654	5099	Fail
0.2686	2702	141604	5240	Fail

0.2720	2589	139665	5394	Fail
0.2754	2464	137006	5560	Fail
0.2787	2375	135011	5684	Fail
0.2821	2257	132408	5866	Fail
0.2854	2155	130524	6056	Fail
0.2888	2059	128696	6250	Fail
0.2922	1953	126313	6467	Fail
0.2955	1874	124485	6642	Fail
0.2989	1797	122768	6831	Fail
0.3023	1699	120386	7085	Fail
0.3056	1631	118724	7279	Fail
0.3090	1561	116563	7467	Fail
0.3124	1490	114956	7715	Fail
0.3157	1425	113350	7954	Fail
0.3191	1340	111244	8301	Fail
0.3225	1277	109693	8589	Fail
0.3258	1230	108197	8796	Fail
0.3292	1166	106314	9117	Fail
0.3326	1112	104763	9421	Fail
0.3359	1071	103267	9642	Fail
0.3393	1010	101328	10032	Fail
0.3427	972	99943	10282	Fail
0.3460	919	98115	10676	Fail
0.3494	878	96785	11023	Fail
0.3528	820	95400	11634	Fail
0.3561	776	93627	12065	Fail
0.3595	742	92353	12446	Fail
0.3629	701	91079	12992	Fail
0.3662	641	89417	13949	Fail
0.3696	608	88198	14506	Fail
0.3730	563	86979	15449	Fail
0.3763	519	85428	16460	Fail
0.3797	485	84209	17362	Fail
0.3831	434	82713	19058	Fail
0.3864	396	81550	20593	Fail
0.3898	367	80442	21918	Fail
0.3932	341	78946	23151	Fail
0.3965	315	77893	24727	Fail
0.3999	298	76785	25766	Fail
0.4033	274	75400	27518	Fail
0.4066	254	74403	29292	Fail
0.4100	237	73073	30832	Fail
0.4134	224	72076	32176	Fail
0.4167	208	71134	34199	Fail
0.4201	195	69805	35797	Fail
0.4235	181	68918	38076	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

POND 2

Water Quality

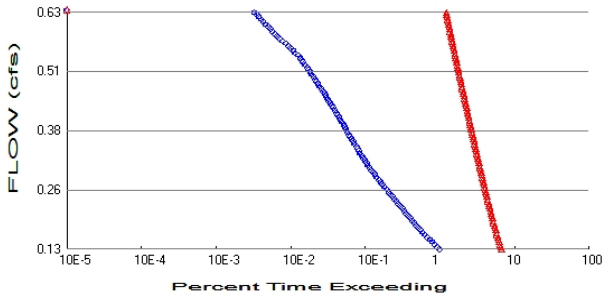
Water Quality BMP Flow and Volume for POC #2

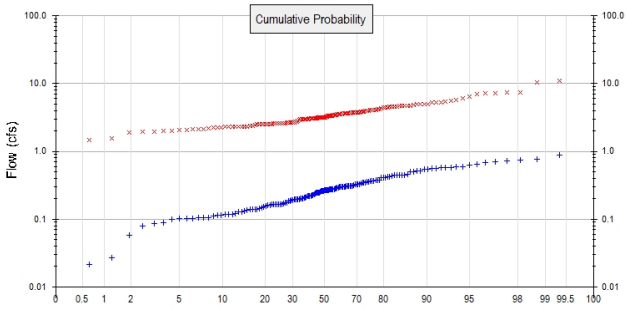
On-line facility volume:	0.7117 acre-feet
On-line facility target flow:	0.8724 cfs.
Adjusted for 15 min:	0.8724 cfs.
Off-line facility target flow:	0.4996 cfs.
Adjusted for 15 min:	0.4996 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

POC 3





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #3
Total Pervious Area: 12.74
Total Impervious Area: 0

Mitigated Landuse Totals for POC #3
Total Pervious Area: 4
Total Impervious Area: 8.74

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #3

Return Period	**Flow(cfs)**
2 year	0.268467
5 year	0.417656
10 year	0.49872
25 year	0.581228
50 year	0.630268
100 year	0.670594

Flow Frequency Return Periods for Mitigated. POC #3

Return Period	**Flow(cfs)**
2 year	3.223112
5 year	4.392788
10 year	5.25296
25 year	6.441392
50 year	7.403176
100 year	8.432828

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #3

Year	**Predeveloped**	**Mitigated**
1902	0.197	3.630
1903	0.164	4.032
1904	0.268	5.236
1905	0.129	2.107
1906	0.058	2.294
1907	0.412	3.395
1908	0.305	2.642
1909	0.302	3.096
1910	0.416	3.215
1911	0.271	3.564
1912	0.894	6.895

1913	0.428	2.410
1914	0.105	11.009
1915	0.173	2.159
1916	0.268	3.875
1917	0.089	1.457
1918	0.287	3.091
1919	0.212	1.997
1920	0.273	2.759
1921	0.305	2.338
1922	0.306	3.835
1923	0.246	2.555
1924	0.112	4.488
1925	0.140	1.952
1926	0.260	3.636
1927	0.169	2.974
1928	0.208	2.323
1929	0.426	4.699
1930	0.274	4.631
1931	0.253	2.319
1932	0.198	2.516
1933	0.191	2.453
1934	0.562	4.413
1935	0.261	2.038
1936	0.227	3.003
1937	0.362	4.241
1938	0.221	2.116
1939	0.014	2.641
1940	0.245	4.626
1941	0.116	4.556
1942	0.368	3.786
1943	0.190	3.556
1944	0.347	5.330
1945	0.307	3.783
1946	0.166	3.148
1947	0.105	2.278
1948	0.578	3.194
1949	0.495	4.766
1950	0.140	2.683
1951	0.173	4.060
1952	0.753	5.620
1953	0.679	5.032
1954	0.245	2.627
1955	0.200	2.323
1956	0.098	2.287
1957	0.348	2.559
1958	0.727	3.449
1959	0.449	3.506
1960	0.120	2.485
1961	0.452	7.495
1962	0.243	3.095
1963	0.116	2.225
1964	0.128	7.172
1965	0.506	3.128
1966	0.142	2.519
1967	0.217	3.791
1968	0.222	2.987
1969	0.221	2.726
1970	0.346	3.244

1971	0.545	3.200
1972	0.353	10.530
1973	0.451	5.457
1974	0.244	4.167
1975	0.572	4.937
1976	0.303	4.930
1977	0.102	1.913
1978	0.509	3.683
1979	0.140	3.493
1980	0.288	3.613
1981	0.276	3.156
1982	0.113	2.586
1983	0.452	3.677
1984	0.184	3.661
1985	0.300	4.372
1986	0.269	2.087
1987	0.512	3.421
1988	0.325	2.133
1989	0.292	1.962
1990	0.331	2.641
1991	0.259	3.978
1992	0.370	3.500
1993	0.359	4.011
1994	0.538	3.045
1995	0.103	2.219
1996	0.590	3.124
1997	0.226	2.687
1998	0.269	3.345
1999	0.022	3.303
2000	0.205	3.062
2001	0.105	2.327
2002	0.374	5.042
2003	0.326	2.604
2004	0.300	3.804
2005	0.552	7.240
2006	0.167	3.339
2007	0.167	3.921
2008	0.285	3.149
2009	0.196	2.333
2010	0.167	3.099
2011	0.135	3.149
2012	0.195	3.065
2013	0.152	3.008
2014	0.114	2.667
2015	0.218	5.286
2016	0.087	2.801
2017	0.414	4.616
2018	0.752	3.161
2019	0.702	4.713
2020	0.229	3.595
2021	0.373	2.953
2022	0.154	4.821
2023	0.313	5.787
2024	0.589	7.298
2025	0.277	3.008
2026	0.452	3.332
2027	0.162	3.695
2028	0.141	1.445

2029	0.306	2.539
2030	0.568	4.764
2031	0.188	1.542
2032	0.102	2.530
2033	0.164	3.174
2034	0.162	2.485
2035	0.640	3.480
2036	0.333	2.489
2037	0.079	3.339
2038	0.265	3.576
2039	0.027	6.386
2040	0.147	2.599
2041	0.199	3.310
2042	0.623	3.718
2043	0.301	4.043
2044	0.406	2.890
2045	0.276	2.360
2046	0.324	2.612
2047	0.238	3.073
2048	0.309	2.536
2049	0.276	3.770
2050	0.198	2.995
2051	0.287	4.451
2052	0.165	3.011
2053	0.296	2.570
2054	0.376	5.995
2055	0.117	3.111
2056	0.131	4.049
2057	0.203	2.006
2058	0.257	3.777
2059	0.454	4.713

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #3

Rank	Predeveloped	Mitigated
1	0.8936	11.0085
2	0.7531	10.5296
3	0.7523	7.4946
4	0.7267	7.2983
5	0.7017	7.2398
6	0.6793	7.1721
7	0.6404	6.8949
8	0.6230	6.3858
9	0.5900	5.9954
10	0.5892	5.7873
11	0.5775	5.6198
12	0.5722	5.4567
13	0.5677	5.3304
14	0.5621	5.2855
15	0.5519	5.2364
16	0.5452	5.0416
17	0.5384	5.0318
18	0.5125	4.9365
19	0.5095	4.9305
20	0.5055	4.8213
21	0.4948	4.7661
22	0.4542	4.7637
23	0.4518	4.7134

24	0.4517	4.7129
25	0.4516	4.6986
26	0.4505	4.6309
27	0.4493	4.6263
28	0.4282	4.6158
29	0.4264	4.5558
30	0.4161	4.4876
31	0.4137	4.4509
32	0.4120	4.4128
33	0.4060	4.3724
34	0.3760	4.2406
35	0.3743	4.1666
36	0.3726	4.0599
37	0.3703	4.0486
38	0.3684	4.0434
39	0.3621	4.0318
40	0.3590	4.0111
41	0.3535	3.9781
42	0.3479	3.9206
43	0.3472	3.8747
44	0.3463	3.8346
45	0.3326	3.8042
46	0.3307	3.7908
47	0.3259	3.7858
48	0.3250	3.7828
49	0.3238	3.7772
50	0.3133	3.7705
51	0.3085	3.7178
52	0.3069	3.6946
53	0.3063	3.6829
54	0.3061	3.6772
55	0.3054	3.6615
56	0.3052	3.6356
57	0.3030	3.6302
58	0.3018	3.6132
59	0.3009	3.5945
60	0.2997	3.5761
61	0.2995	3.5641
62	0.2958	3.5558
63	0.2922	3.5063
64	0.2885	3.5001
65	0.2875	3.4926
66	0.2868	3.4800
67	0.2851	3.4490
68	0.2766	3.4206
69	0.2764	3.3946
70	0.2762	3.3453
71	0.2758	3.3394
72	0.2740	3.3393
73	0.2730	3.3323
74	0.2709	3.3097
75	0.2693	3.3033
76	0.2687	3.2444
77	0.2680	3.2148
78	0.2679	3.2001
79	0.2652	3.1941
80	0.2610	3.1736
81	0.2600	3.1608

82	0.2589	3.1564
83	0.2572	3.1493
84	0.2535	3.1487
85	0.2462	3.1475
86	0.2451	3.1280
87	0.2446	3.1245
88	0.2439	3.1107
89	0.2425	3.0992
90	0.2384	3.0955
91	0.2289	3.0946
92	0.2268	3.0913
93	0.2263	3.0729
94	0.2216	3.0651
95	0.2211	3.0625
96	0.2207	3.0449
97	0.2175	3.0112
98	0.2171	3.0080
99	0.2121	3.0077
100	0.2081	3.0032
101	0.2048	2.9946
102	0.2031	2.9865
103	0.2004	2.9735
104	0.1988	2.9533
105	0.1985	2.8905
106	0.1980	2.8012
107	0.1969	2.7585
108	0.1957	2.7261
109	0.1952	2.6874
110	0.1914	2.6831
111	0.1895	2.6668
112	0.1876	2.6420
113	0.1841	2.6413
114	0.1725	2.6405
115	0.1725	2.6268
116	0.1686	2.6121
117	0.1674	2.6041
118	0.1669	2.5993
119	0.1666	2.5863
120	0.1660	2.5696
121	0.1653	2.5595
122	0.1642	2.5547
123	0.1638	2.5394
124	0.1623	2.5362
125	0.1616	2.5304
126	0.1542	2.5191
127	0.1524	2.5156
128	0.1474	2.4890
129	0.1417	2.4853
130	0.1406	2.4847
131	0.1402	2.4532
132	0.1397	2.4100
133	0.1396	2.3599
134	0.1345	2.3379
135	0.1307	2.3327
136	0.1289	2.3274
137	0.1279	2.3233
138	0.1195	2.3226
139	0.1165	2.3186

140	0.1165	2.2937
141	0.1162	2.2868
142	0.1135	2.2779
143	0.1129	2.2250
144	0.1125	2.2193
145	0.1048	2.1593
146	0.1048	2.1330
147	0.1046	2.1164
148	0.1033	2.1075
149	0.1021	2.0873
150	0.1020	2.0382
151	0.0982	2.0062
152	0.0894	1.9972
153	0.0866	1.9622
154	0.0795	1.9517
155	0.0577	1.9132
156	0.0266	1.5417
157	0.0217	1.4573
158	0.0138	1.4449

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1342	54475	371517	681	Fail
0.1392	50354	362486	719	Fail
0.1443	46736	354065	757	Fail
0.1493	43456	345922	796	Fail
0.1543	40404	338166	836	Fail
0.1593	37595	330631	879	Fail
0.1643	35046	323540	923	Fail
0.1693	32714	316670	967	Fail
0.1743	30470	310022	1017	Fail
0.1793	28387	303596	1069	Fail
0.1843	26531	297501	1121	Fail
0.1893	24892	291574	1171	Fail
0.1944	23401	285757	1221	Fail
0.1994	22022	280161	1272	Fail
0.2044	20725	274621	1325	Fail
0.2094	19518	269303	1379	Fail
0.2144	18365	264261	1438	Fail
0.2194	17302	259275	1498	Fail
0.2244	16243	254400	1566	Fail
0.2294	15219	249635	1640	Fail
0.2344	14349	244926	1706	Fail
0.2395	13507	240439	1780	Fail
0.2445	12737	236173	1854	Fail
0.2495	12000	231907	1932	Fail
0.2545	11307	227752	2014	Fail
0.2595	10631	223708	2104	Fail
0.2645	10022	219774	2192	Fail
0.2695	9424	215952	2291	Fail
0.2745	8908	212074	2380	Fail
0.2795	8382	208473	2487	Fail
0.2845	7911	204872	2589	Fail
0.2896	7501	201326	2683	Fail
0.2946	7080	197780	2793	Fail
0.2996	6654	194401	2921	Fail
0.3046	6299	191077	3033	Fail
0.3096	6017	187864	3122	Fail
0.3146	5740	184650	3216	Fail
0.3196	5469	181548	3319	Fail
0.3246	5218	178667	3424	Fail
0.3296	4978	175731	3530	Fail
0.3347	4724	172795	3657	Fail
0.3397	4533	169858	3747	Fail
0.3447	4356	167144	3837	Fail
0.3497	4179	164318	3931	Fail
0.3547	3977	161548	4062	Fail
0.3597	3789	158889	4193	Fail
0.3647	3602	156285	4338	Fail
0.3697	3433	153737	4478	Fail
0.3747	3285	151188	4602	Fail
0.3797	3148	148695	4723	Fail
0.3848	3044	146202	4802	Fail
0.3898	2942	143820	4888	Fail
0.3948	2826	141493	5006	Fail
0.3998	2699	139277	5160	Fail

0.4048	2570	137061	5333	Fail
0.4098	2470	134734	5454	Fail
0.4148	2372	132574	5589	Fail
0.4198	2272	130413	5740	Fail
0.4248	2159	128308	5942	Fail
0.4299	2052	126313	6155	Fail
0.4349	1965	124264	6323	Fail
0.4399	1875	122214	6518	Fail
0.4449	1790	120275	6719	Fail
0.4499	1707	118391	6935	Fail
0.4549	1630	116563	7151	Fail
0.4599	1571	114679	7299	Fail
0.4649	1498	112907	7537	Fail
0.4699	1421	111078	7816	Fail
0.4749	1354	109361	8076	Fail
0.4800	1282	107588	8392	Fail
0.4850	1227	105981	8637	Fail
0.4900	1172	104319	8900	Fail
0.4950	1113	102657	9223	Fail
0.5000	1069	100940	9442	Fail
0.5050	1005	99056	9856	Fail
0.5100	963	97505	10125	Fail
0.5150	919	96009	10447	Fail
0.5200	872	94513	10838	Fail
0.5250	814	93018	11427	Fail
0.5301	774	91577	11831	Fail
0.5351	738	90081	12206	Fail
0.5401	694	88696	12780	Fail
0.5451	637	87311	13706	Fail
0.5501	601	85982	14306	Fail
0.5551	555	84597	15242	Fail
0.5601	517	83323	16116	Fail
0.5651	478	82048	17164	Fail
0.5701	434	80774	18611	Fail
0.5752	394	79555	20191	Fail
0.5802	363	78226	21549	Fail
0.5852	340	77007	22649	Fail
0.5902	310	75788	24447	Fail
0.5952	297	74680	25144	Fail
0.6002	273	73517	26929	Fail
0.6052	253	72409	28620	Fail
0.6102	237	71301	30084	Fail
0.6152	224	70193	31336	Fail
0.6202	206	69140	33563	Fail
0.6253	195	68032	34888	Fail
0.6303	180	67035	37241	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

POND 4

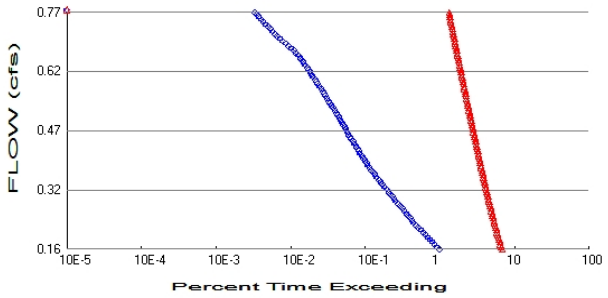
Water Quality

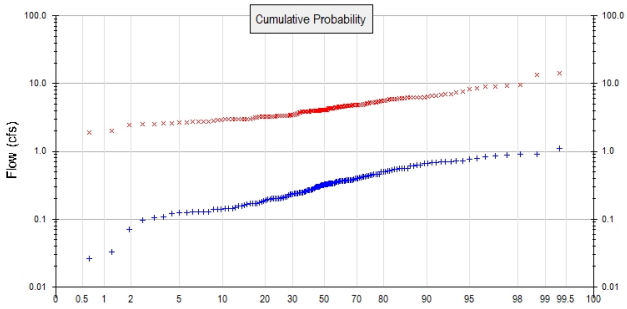
Water Quality BMP Flow and Volume for POC #3

On-line facility volume:	1.0459 acre-feet
On-line facility target flow:	1.2764 cfs.
Adjusted for 15 min:	1.2764 cfs.
Off-line facility target flow:	0.731 cfs.
Adjusted for 15 min:	0.731 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #4
Total Pervious Area: 15.56
Total Impervious Area: 0

Mitigated Landuse Totals for POC #4
Total Pervious Area: 4.25
Total Impervious Area: 11.31

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #4

Return Period	**Flow(cfs)**
2 year	0.327893
5 year	0.510105
10 year	0.609111
25 year	0.709882
50 year	0.769778
100 year	0.81903

Flow Frequency Return Periods for Mitigated. POC #4

Return Period	**Flow(cfs)**
2 year	4.133569
5 year	5.616975
10 year	6.705368
25 year	8.20635
50 year	9.419106
100 year	10.715767

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #4

Year	**Predeveloped**	**Mitigated**
1902	0.240	4.696
1903	0.200	5.213
1904	0.327	6.616
1905	0.157	2.711
1906	0.070	2.965
1907	0.503	4.312
1908	0.373	3.387
1909	0.369	4.005
1910	0.508	4.067
1911	0.331	4.555
1912	1.091	8.580

1913	0.523	3.115
1914	0.128	14.024
1915	0.211	2.771
1916	0.327	5.010
1917	0.109	1.886
1918	0.350	3.999
1919	0.259	2.559
1920	0.333	3.513
1921	0.373	2.983
1922	0.374	4.857
1923	0.301	3.260
1924	0.137	5.801
1925	0.170	2.505
1926	0.318	4.704
1927	0.206	3.845
1928	0.254	2.976
1929	0.521	6.007
1930	0.335	5.982
1931	0.310	2.975
1932	0.242	3.225
1933	0.234	3.150
1934	0.687	5.578
1935	0.319	2.637
1936	0.277	3.851
1937	0.442	5.487
1938	0.270	2.729
1939	0.017	3.410
1940	0.299	5.980
1941	0.142	5.893
1942	0.450	4.814
1943	0.231	4.562
1944	0.424	6.790
1945	0.375	4.873
1946	0.203	4.007
1947	0.128	2.937
1948	0.705	4.105
1949	0.604	6.162
1950	0.171	3.472
1951	0.211	5.253
1952	0.920	7.022
1953	0.830	6.321
1954	0.299	3.368
1955	0.245	3.005
1956	0.120	2.959
1957	0.425	3.292
1958	0.888	4.375
1959	0.549	4.437
1960	0.146	3.205
1961	0.552	9.574
1962	0.296	3.981
1963	0.142	2.879
1964	0.156	9.112
1965	0.617	3.993
1966	0.173	3.236
1967	0.265	4.812
1968	0.271	3.835
1969	0.270	3.493
1970	0.423	4.125

1971	0.666	4.057
1972	0.432	13.360
1973	0.550	7.060
1974	0.298	5.340
1975	0.699	6.187
1976	0.370	6.244
1977	0.125	2.464
1978	0.622	4.641
1979	0.171	4.476
1980	0.352	4.580
1981	0.337	4.064
1982	0.138	3.327
1983	0.552	4.692
1984	0.225	4.670
1985	0.366	5.533
1986	0.328	2.668
1987	0.626	4.426
1988	0.397	2.733
1989	0.357	2.507
1990	0.404	3.376
1991	0.316	5.079
1992	0.452	4.529
1993	0.438	5.188
1994	0.658	3.864
1995	0.126	2.850
1996	0.721	3.980
1997	0.276	3.447
1998	0.329	4.257
1999	0.026	4.274
2000	0.250	3.925
2001	0.128	3.011
2002	0.457	6.334
2003	0.398	3.337
2004	0.366	4.898
2005	0.674	9.328
2006	0.204	4.315
2007	0.204	5.024
2008	0.348	4.053
2009	0.239	3.018
2010	0.203	3.986
2011	0.164	4.075
2012	0.238	3.933
2013	0.186	3.834
2014	0.139	3.451
2015	0.266	6.653
2016	0.106	3.625
2017	0.505	5.945
2018	0.919	3.982
2019	0.857	5.931
2020	0.280	4.574
2021	0.455	3.775
2022	0.188	6.205
2023	0.383	7.487
2024	0.720	9.150
2025	0.338	3.892
2026	0.552	4.305
2027	0.198	4.779
2028	0.172	1.869

2029	0.374	3.246
2030	0.693	6.160
2031	0.229	1.983
2032	0.125	3.273
2033	0.201	4.107
2034	0.197	3.216
2035	0.782	4.405
2036	0.406	3.219
2037	0.097	4.321
2038	0.324	4.533
2039	0.033	8.258
2040	0.180	3.335
2041	0.243	4.248
2042	0.761	4.729
2043	0.367	5.230
2044	0.496	3.713
2045	0.338	3.027
2046	0.395	3.350
2047	0.291	3.976
2048	0.377	3.281
2049	0.337	4.875
2050	0.242	3.829
2051	0.351	5.642
2052	0.202	3.896
2053	0.361	3.322
2054	0.459	7.546
2055	0.142	4.025
2056	0.160	5.230
2057	0.248	2.578
2058	0.314	4.888
2059	0.555	6.098

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #4

Rank	Predeveloped	Mitigated
1	1.0915	14.0237
2	0.9198	13.3601
3	0.9188	9.5744
4	0.8876	9.3277
5	0.8570	9.1498
6	0.8297	9.1123
7	0.7822	8.5803
8	0.7609	8.2582
9	0.7206	7.5458
10	0.7196	7.4867
11	0.7054	7.0596
12	0.6988	7.0219
13	0.6934	6.7902
14	0.6865	6.6534
15	0.6741	6.6159
16	0.6658	6.3344
17	0.6575	6.3211
18	0.6259	6.2438
19	0.6222	6.2053
20	0.6174	6.1874
21	0.6044	6.1618
22	0.5548	6.1601
23	0.5518	6.0977

24	0.5517	6.0066
25	0.5516	5.9821
26	0.5502	5.9802
27	0.5487	5.9448
28	0.5230	5.9306
29	0.5208	5.8926
30	0.5082	5.8006
31	0.5053	5.6415
32	0.5032	5.5784
33	0.4958	5.5330
34	0.4592	5.4874
35	0.4571	5.3402
36	0.4550	5.2533
37	0.4522	5.2303
38	0.4499	5.2297
39	0.4423	5.2134
40	0.4384	5.1877
41	0.4317	5.0789
42	0.4249	5.0240
43	0.4240	5.0097
44	0.4229	4.8979
45	0.4062	4.8875
46	0.4039	4.8755
47	0.3980	4.8730
48	0.3969	4.8574
49	0.3955	4.8138
50	0.3827	4.8124
51	0.3768	4.7785
52	0.3748	4.7289
53	0.3741	4.7041
54	0.3738	4.6957
55	0.3730	4.6915
56	0.3727	4.6702
57	0.3700	4.6409
58	0.3686	4.5805
59	0.3675	4.5744
60	0.3661	4.5617
61	0.3658	4.5545
62	0.3613	4.5327
63	0.3568	4.5292
64	0.3523	4.4760
65	0.3511	4.4368
66	0.3503	4.4256
67	0.3482	4.4053
68	0.3378	4.3745
69	0.3376	4.3205
70	0.3374	4.3153
71	0.3369	4.3124
72	0.3347	4.3053
73	0.3335	4.2736
74	0.3309	4.2572
75	0.3289	4.2483
76	0.3281	4.1252
77	0.3273	4.1066
78	0.3271	4.1046
79	0.3239	4.0751
80	0.3187	4.0672
81	0.3176	4.0637

82	0.3162	4.0570
83	0.3141	4.0528
84	0.3096	4.0250
85	0.3007	4.0068
86	0.2994	4.0049
87	0.2987	3.9995
88	0.2979	3.9928
89	0.2962	3.9858
90	0.2912	3.9817
91	0.2796	3.9809
92	0.2770	3.9795
93	0.2764	3.9756
94	0.2706	3.9334
95	0.2701	3.9254
96	0.2695	3.8964
97	0.2657	3.8923
98	0.2652	3.8640
99	0.2590	3.8510
100	0.2542	3.8447
101	0.2502	3.8345
102	0.2481	3.8339
103	0.2447	3.8292
104	0.2428	3.7747
105	0.2424	3.7125
106	0.2418	3.6246
107	0.2405	3.5129
108	0.2390	3.4928
109	0.2384	3.4720
110	0.2338	3.4507
111	0.2315	3.4469
112	0.2291	3.4099
113	0.2248	3.3874
114	0.2107	3.3758
115	0.2107	3.3682
116	0.2060	3.3503
117	0.2045	3.3374
118	0.2039	3.3352
119	0.2034	3.3265
120	0.2027	3.3225
121	0.2019	3.2916
122	0.2006	3.2806
123	0.2000	3.2733
124	0.1982	3.2600
125	0.1974	3.2462
126	0.1884	3.2365
127	0.1861	3.2252
128	0.1800	3.2188
129	0.1731	3.2159
130	0.1718	3.2047
131	0.1713	3.1498
132	0.1707	3.1150
133	0.1705	3.0265
134	0.1643	3.0182
135	0.1596	3.0114
136	0.1574	3.0052
137	0.1562	2.9831
138	0.1460	2.9760
139	0.1423	2.9751

140	0.1423	2.9646
141	0.1420	2.9590
142	0.1387	2.9369
143	0.1379	2.8786
144	0.1374	2.8503
145	0.1280	2.7715
146	0.1280	2.7327
147	0.1278	2.7285
148	0.1262	2.7109
149	0.1247	2.6683
150	0.1246	2.6372
151	0.1200	2.5776
152	0.1092	2.5594
153	0.1057	2.5068
154	0.0971	2.5047
155	0.0704	2.4644
156	0.0325	1.9833
157	0.0265	1.8856
158	0.0169	1.8691

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1639	54957	377722	687	Fail
0.1701	50199	367805	732	Fail
0.1762	46669	359661	770	Fail
0.1823	43456	351960	809	Fail
0.1884	40476	344537	851	Fail
0.1945	37689	337279	894	Fail
0.2007	35168	330465	939	Fail
0.2068	32864	323817	985	Fail
0.2129	30637	317446	1036	Fail
0.2190	28265	310244	1097	Fail
0.2251	26454	304371	1150	Fail
0.2313	24842	298554	1201	Fail
0.2374	23379	293069	1253	Fail
0.2435	22027	287529	1305	Fail
0.2496	20753	282377	1360	Fail
0.2557	19556	277225	1417	Fail
0.2619	18437	272239	1476	Fail
0.2680	17385	267363	1537	Fail
0.2741	16166	261934	1620	Fail
0.2802	15163	257281	1696	Fail
0.2863	14310	252904	1767	Fail
0.2925	13496	248527	1841	Fail
0.2986	12737	244206	1917	Fail
0.3047	12011	239996	1998	Fail
0.3108	11329	236007	2083	Fail
0.3169	10670	232073	2175	Fail
0.3231	9972	227586	2282	Fail
0.3292	9390	223874	2384	Fail
0.3353	8875	220218	2481	Fail
0.3414	8360	216617	2591	Fail
0.3475	7895	213182	2700	Fail
0.3537	7501	209691	2795	Fail
0.3598	7080	206257	2913	Fail
0.3659	6665	202988	3045	Fail
0.3720	6271	199110	3175	Fail
0.3781	5978	195952	3277	Fail
0.3842	5712	192850	3376	Fail
0.3904	5453	189858	3481	Fail
0.3965	5215	186811	3582	Fail
0.4026	4968	183875	3701	Fail
0.4087	4720	181049	3835	Fail
0.4148	4533	178279	3932	Fail
0.4210	4358	175565	4028	Fail
0.4271	4159	172351	4144	Fail
0.4332	3959	169748	4287	Fail
0.4393	3773	167144	4430	Fail
0.4454	3587	164485	4585	Fail
0.4516	3428	161991	4725	Fail
0.4577	3277	159443	4865	Fail
0.4638	3144	157005	4993	Fail
0.4699	3044	154623	5079	Fail
0.4760	2926	151909	5191	Fail
0.4822	2815	149526	5311	Fail
0.4883	2685	147255	5484	Fail

0.4944	2560	144928	5661	Fail
0.5005	2461	142823	5803	Fail
0.5066	2367	140662	5942	Fail
0.5128	2268	138557	6109	Fail
0.5189	2156	136452	6328	Fail
0.5250	2051	134347	6550	Fail
0.5311	1952	132020	6763	Fail
0.5372	1862	130025	6983	Fail
0.5434	1786	128086	7171	Fail
0.5495	1698	126147	7429	Fail
0.5556	1624	124264	7651	Fail
0.5617	1568	122380	7804	Fail
0.5678	1494	120552	8069	Fail
0.5740	1419	118724	8366	Fail
0.5801	1339	116729	8717	Fail
0.5862	1273	115123	9043	Fail
0.5923	1219	113350	9298	Fail
0.5984	1167	111632	9565	Fail
0.6046	1108	110026	9930	Fail
0.6107	1064	108419	10189	Fail
0.6168	1012	106868	10560	Fail
0.6229	968	105317	10879	Fail
0.6290	919	103433	11254	Fail
0.6351	873	101937	11676	Fail
0.6413	815	100441	12324	Fail
0.6474	777	98946	12734	Fail
0.6535	738	97505	13212	Fail
0.6596	695	96065	13822	Fail
0.6657	646	94624	14647	Fail
0.6719	605	93295	15420	Fail
0.6780	561	91854	16373	Fail
0.6841	517	90358	17477	Fail
0.6902	478	89029	18625	Fail
0.6963	434	87755	20220	Fail
0.7025	395	86536	21907	Fail
0.7086	364	85262	23423	Fail
0.7147	342	83932	24541	Fail
0.7208	314	82713	26341	Fail
0.7269	297	81550	27457	Fail
0.7331	273	80109	29343	Fail
0.7392	252	79057	31371	Fail
0.7453	237	77782	32819	Fail
0.7514	224	76674	34229	Fail
0.7575	207	75566	36505	Fail
0.7637	195	74514	38212	Fail
0.7698	181	73461	40586	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

POND 5

Water Quality

Water Quality BMP Flow and Volume for POC #4

On-line facility volume:	1.3305 acre-feet
On-line facility target flow:	1.6536 cfs.
Adjusted for 15 min:	1.6536 cfs.
Off-line facility target flow:	0.9483 cfs.
Adjusted for 15 min:	0.9483 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

POC 5

POC #5 was not reported because POC must exist in both scenarios and both scenarios must have been run.

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Private Ponds - WQ.wdm
MESSU       25   PrePrivate Ponds - WQ.MES
            27   PrePrivate Ponds - WQ.L61
            28   PrePrivate Ponds - WQ.L62
            30   POCPrivate Ponds - WQ1.dat
            31   POCPrivate Ponds - WQ2.dat
            32   POCPrivate Ponds - WQ3.dat
            33   POCPrivate Ponds - WQ4.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      10
      COPY       501
      COPY       502
      COPY       503
      COPY       504
      DISPLY       1
      DISPLY       2
      DISPLY       3
      DISPLY       4
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Pond 1                     MAX                    1    2   30    9
    2        Pond 2                     MAX                    1    2   31    9
    3        Pond 4                     MAX                    1    2   32    9
    4        Pond 5                     MAX                    1    2   33    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  502         1    1
  503         1    1
  504         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
```

```
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10            0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10              0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1
```

```
  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Pond 1***
PERLND  10                       15.07     COPY   501     12
PERLND  10                       15.07     COPY   501     13
Pond 2***
PERLND  10                        8.56     COPY   502     12
PERLND  10                        8.56     COPY   502     13
Pond 4***
PERLND  10                       12.74     COPY   503     12
PERLND  10                       12.74     COPY   503     13
Pond 5***
PERLND  10                       15.56     COPY   504     12
PERLND  10                       15.56     COPY   504     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1
COPY   502 OUTPUT MEAN   1 1   48.4        DISPLY   2     INPUT  TIMSER 1
COPY   503 OUTPUT MEAN   1 1   48.4        DISPLY   3     INPUT  TIMSER 1
COPY   504 OUTPUT MEAN   1 1   48.4        DISPLY   4     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
```

```
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
             FG FG FG FG  possible  exit  *** possible  exit     possible  exit
              *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1             PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1             IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1             PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1             IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
COPY   502 OUTPUT MEAN   1 1     48.4      WDM    502 FLOW     ENGL      REPL
COPY   503 OUTPUT MEAN   1 1     48.4      WDM    503 FLOW     ENGL      REPL
COPY   504 OUTPUT MEAN   1 1     48.4      WDM    504 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Private Ponds - WQ.wdm
MESSU       25   MitPrivate Ponds - WQ.MES
            27   MitPrivate Ponds - WQ.L61
            28   MitPrivate Ponds - WQ.L62
            30   POCPrivate Ponds - WQ1.dat
            31   POCPrivate Ponds - WQ2.dat
            32   POCPrivate Ponds - WQ3.dat
            33   POCPrivate Ponds - WQ4.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      16
      IMPLND       1
      IMPLND       4
      COPY       501
      COPY       502
      COPY       503
      COPY       504
      DISPLY       1
      DISPLY       2
      DISPLY       3
      DISPLY       4
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Pond 1                     MAX                    1    2   30    9
    2        Pond 2                     MAX                    1    2   31    9
    3        Pond 4                     MAX                    1    2   32    9
    4        Pond 5                     MAX                    1    2   33    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  502         1    1
  503         1    1
  504         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                         User  t-series Engl Metr ***
```

```
                                        in  out          ***
 16     C, Lawn, Flat           1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   16         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   16         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   16         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   16              0       4.5      0.03       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   16              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   16            0.1      0.25      0.25         6       0.5      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   16              0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                      in  out          ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
```

```
    4         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    4         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Pond 1***
PERLND  16                       4.5     COPY   501     12
PERLND  16                       4.5     COPY   501     13
IMPLND   1                      5.98     COPY   501     15
IMPLND   4                      4.59     COPY   501     15
Pond 2***
PERLND  16                      2.59     COPY   502     12
PERLND  16                      2.59     COPY   502     13
IMPLND   1                      3.15     COPY   502     15
IMPLND   4                      2.82     COPY   502     15
Pond 4***
PERLND  16                         4     COPY   503     12
PERLND  16                         4     COPY   503     13
IMPLND   1                      4.15     COPY   503     15
IMPLND   4                      4.59     COPY   503     15
Pond 5***
PERLND  16                      4.25     COPY   504     12
PERLND  16                      4.25     COPY   504     13
IMPLND   1                      6.72     COPY   504     15
IMPLND   4                      4.59     COPY   504     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1
COPY   502 OUTPUT MEAN   1 1   48.4        DISPLY   2     INPUT  TIMSER 1
COPY   503 OUTPUT MEAN   1 1   48.4        DISPLY   3     INPUT  TIMSER 1
COPY   504 OUTPUT MEAN   1 1   48.4        DISPLY   4     INPUT  TIMSER 1
```

```
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG             ***
                                      in  out                               ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                   ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                      ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
COPY     2 OUTPUT MEAN   1 1     48.4      WDM    702 FLOW     ENGL      REPL
COPY   502 OUTPUT MEAN   1 1     48.4      WDM    802 FLOW     ENGL      REPL
COPY     3 OUTPUT MEAN   1 1     48.4      WDM    703 FLOW     ENGL      REPL
COPY   503 OUTPUT MEAN   1 1     48.4      WDM    803 FLOW     ENGL      REPL
COPY     4 OUTPUT MEAN   1 1     48.4      WDM    704 FLOW     ENGL      REPL
COPY   504 OUTPUT MEAN   1 1     48.4      WDM    804 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
```

```
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

Disclaimer

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Public Ponds

WWHM2012

PROJECT REPORT

General Model Information

Project Name:	Basin P-1 WQ
Site Name:	
Site Address:	
City:	
Report Date:	8/10/2022
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	0.000 (adjusted)
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	1.304
Pervious Total	1.304
Impervious Land Use	acre
Impervious Total	0
Basin Total	1.304

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	0.245
Pervious Total	0.245

Impervious Land Use	acre
ROADS FLAT	0.735
SIDEWALKS FLAT	0.283
POND	0.041
Impervious Total	1.059
Basin Total	1.304

Element Flows To:

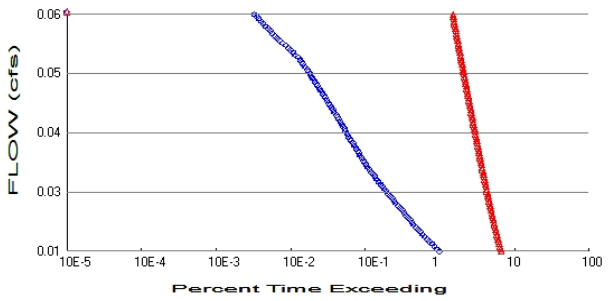
Surface	Interflow	Groundwater

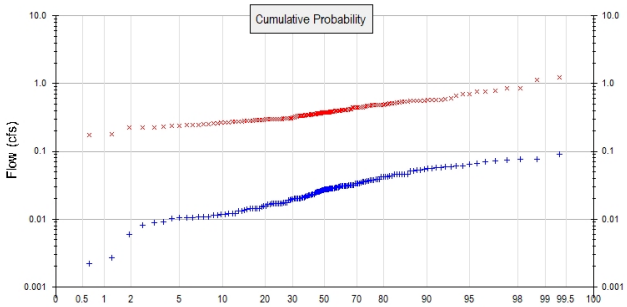
Routing Elements
Predeveloped Routing

Mitigated Routing

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 1.304
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.245
Total Impervious Area: 1.059

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.027479
5 year	0.042749
10 year	0.051046
25 year	0.059491
50 year	0.064511
100 year	0.068638

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.37149
5 year	0.498893
10 year	0.591524
25 year	0.71834
50 year	0.820143
100 year	0.928435

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.020	0.439
1903	0.017	0.486
1904	0.027	0.551
1905	0.013	0.247
1906	0.006	0.276
1907	0.042	0.369
1908	0.031	0.304
1909	0.031	0.375
1910	0.043	0.358
1911	0.028	0.402

1912	0.091	0.701
1913	0.044	0.290
1914	0.011	1.218
1915	0.018	0.250
1916	0.027	0.467
1917	0.009	0.176
1918	0.029	0.374
1919	0.022	0.229
1920	0.028	0.305
1921	0.031	0.261
1922	0.031	0.410
1923	0.025	0.286
1924	0.012	0.540
1925	0.014	0.226
1926	0.027	0.440
1927	0.017	0.359
1928	0.021	0.266
1929	0.044	0.531
1930	0.028	0.556
1931	0.026	0.268
1932	0.020	0.289
1933	0.020	0.287
1934	0.058	0.466
1935	0.027	0.247
1936	0.023	0.345
1937	0.037	0.514
1938	0.023	0.251
1939	0.001	0.316
1940	0.025	0.557
1941	0.012	0.551
1942	0.038	0.414
1943	0.019	0.410
1944	0.036	0.590
1945	0.031	0.447
1946	0.017	0.347
1947	0.011	0.271
1948	0.059	0.372
1949	0.051	0.575
1950	0.014	0.325
1951	0.018	0.492
1952	0.077	0.554
1953	0.070	0.511
1954	0.025	0.302
1955	0.021	0.281
1956	0.010	0.277
1957	0.036	0.300
1958	0.074	0.375
1959	0.046	0.378
1960	0.012	0.296
1961	0.046	0.843
1962	0.025	0.363
1963	0.012	0.269
1964	0.013	0.781
1965	0.052	0.351
1966	0.015	0.293
1967	0.022	0.411
1968	0.023	0.346
1969	0.023	0.312

1970	0.035	0.355
1971	0.056	0.344
1972	0.036	1.137
1973	0.046	0.660
1974	0.025	0.478
1975	0.059	0.494
1976	0.031	0.526
1977	0.010	0.226
1978	0.052	0.388
1979	0.014	0.400
1980	0.030	0.395
1981	0.028	0.372
1982	0.012	0.303
1983	0.046	0.411
1984	0.019	0.408
1985	0.031	0.464
1986	0.027	0.236
1987	0.052	0.414
1988	0.033	0.247
1989	0.030	0.226
1990	0.034	0.298
1991	0.026	0.446
1992	0.038	0.424
1993	0.037	0.485
1994	0.055	0.332
1995	0.011	0.258
1996	0.060	0.346
1997	0.023	0.310
1998	0.028	0.368
1999	0.002	0.400
2000	0.021	0.351
2001	0.011	0.282
2002	0.038	0.512
2003	0.033	0.299
2004	0.031	0.448
2005	0.056	0.856
2006	0.017	0.401
2007	0.017	0.449
2008	0.029	0.370
2009	0.020	0.283
2010	0.017	0.363
2011	0.014	0.382
2012	0.020	0.354
2013	0.016	0.334
2014	0.012	0.323
2015	0.022	0.543
2016	0.009	0.339
2017	0.042	0.544
2018	0.077	0.335
2019	0.072	0.483
2020	0.023	0.395
2021	0.038	0.333
2022	0.016	0.567
2023	0.032	0.700
2024	0.060	0.751
2025	0.028	0.365
2026	0.046	0.400
2027	0.017	0.446

2028	0.014	0.175
2029	0.031	0.287
2030	0.058	0.575
2031	0.019	0.181
2032	0.010	0.306
2033	0.017	0.385
2034	0.017	0.301
2035	0.066	0.370
2036	0.034	0.301
2037	0.008	0.404
2038	0.027	0.384
2039	0.003	0.771
2040	0.015	0.302
2041	0.020	0.383
2042	0.064	0.442
2043	0.031	0.489
2044	0.042	0.336
2045	0.028	0.272
2046	0.033	0.301
2047	0.024	0.372
2048	0.032	0.307
2049	0.028	0.455
2050	0.020	0.339
2051	0.029	0.477
2052	0.017	0.365
2053	0.030	0.310
2054	0.038	0.615
2055	0.012	0.377
2056	0.013	0.486
2057	0.021	0.239
2058	0.026	0.457
2059	0.046	0.570

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.0915	1.2178
2	0.0771	1.1369
3	0.0770	0.8560
4	0.0744	0.8432
5	0.0718	0.7809
6	0.0695	0.7709
7	0.0656	0.7509
8	0.0638	0.7012
9	0.0604	0.7000
10	0.0603	0.6603
11	0.0591	0.6152
12	0.0586	0.5895
13	0.0581	0.5750
14	0.0575	0.5745
15	0.0565	0.5705
16	0.0558	0.5666
17	0.0551	0.5572
18	0.0525	0.5556
19	0.0521	0.5544
20	0.0517	0.5506
21	0.0506	0.5505
22	0.0465	0.5445

23	0.0462	0.5430
24	0.0462	0.5403
25	0.0462	0.5308
26	0.0461	0.5260
27	0.0460	0.5137
28	0.0438	0.5119
29	0.0436	0.5112
30	0.0426	0.4938
31	0.0423	0.4917
32	0.0422	0.4886
33	0.0416	0.4864
34	0.0385	0.4860
35	0.0383	0.4845
36	0.0381	0.4830
37	0.0379	0.4779
38	0.0377	0.4775
39	0.0371	0.4672
40	0.0367	0.4656
41	0.0362	0.4643
42	0.0356	0.4575
43	0.0355	0.4549
44	0.0354	0.4492
45	0.0340	0.4479
46	0.0338	0.4468
47	0.0334	0.4464
48	0.0333	0.4459
49	0.0331	0.4418
50	0.0321	0.4402
51	0.0316	0.4388
52	0.0314	0.4240
53	0.0313	0.4141
54	0.0313	0.4141
55	0.0313	0.4106
56	0.0312	0.4105
57	0.0310	0.4104
58	0.0309	0.4100
59	0.0308	0.4081
60	0.0307	0.4043
61	0.0307	0.4017
62	0.0303	0.4015
63	0.0299	0.4004
64	0.0295	0.4002
65	0.0294	0.3999
66	0.0294	0.3953
67	0.0292	0.3948
68	0.0283	0.3883
69	0.0283	0.3846
70	0.0283	0.3836
71	0.0282	0.3829
72	0.0280	0.3816
73	0.0279	0.3784
74	0.0277	0.3767
75	0.0276	0.3747
76	0.0275	0.3747
77	0.0274	0.3743
78	0.0274	0.3720
79	0.0271	0.3720
80	0.0267	0.3715

81	0.0266	0.3705
82	0.0265	0.3701
83	0.0263	0.3693
84	0.0259	0.3678
85	0.0252	0.3649
86	0.0251	0.3645
87	0.0250	0.3628
88	0.0250	0.3626
89	0.0248	0.3586
90	0.0244	0.3580
91	0.0234	0.3549
92	0.0232	0.3541
93	0.0232	0.3514
94	0.0227	0.3505
95	0.0226	0.3467
96	0.0226	0.3461
97	0.0223	0.3460
98	0.0222	0.3454
99	0.0217	0.3440
100	0.0213	0.3393
101	0.0210	0.3388
102	0.0208	0.3356
103	0.0205	0.3352
104	0.0203	0.3340
105	0.0203	0.3332
106	0.0203	0.3315
107	0.0202	0.3250
108	0.0200	0.3230
109	0.0200	0.3159
110	0.0196	0.3121
111	0.0194	0.3100
112	0.0192	0.3096
113	0.0188	0.3067
114	0.0177	0.3060
115	0.0177	0.3045
116	0.0173	0.3036
117	0.0171	0.3027
118	0.0171	0.3021
119	0.0170	0.3017
120	0.0170	0.3013
121	0.0169	0.3011
122	0.0168	0.3006
123	0.0168	0.2996
124	0.0166	0.2986
125	0.0165	0.2984
126	0.0158	0.2955
127	0.0156	0.2930
128	0.0151	0.2901
129	0.0145	0.2891
130	0.0144	0.2872
131	0.0144	0.2866
132	0.0143	0.2860
133	0.0143	0.2825
134	0.0138	0.2818
135	0.0134	0.2810
136	0.0132	0.2770
137	0.0131	0.2762
138	0.0122	0.2717

139	0.0119	0.2705
140	0.0119	0.2694
141	0.0119	0.2679
142	0.0116	0.2660
143	0.0116	0.2612
144	0.0115	0.2576
145	0.0107	0.2511
146	0.0107	0.2497
147	0.0107	0.2470
148	0.0106	0.2470
149	0.0105	0.2469
150	0.0104	0.2390
151	0.0101	0.2358
152	0.0092	0.2289
153	0.0089	0.2259
154	0.0081	0.2259
155	0.0059	0.2257
156	0.0027	0.1808
157	0.0022	0.1765
158	0.0014	0.1748

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0137	54370	367528	675	Fail
0.0143	50171	360104	717	Fail
0.0148	46603	352957	757	Fail
0.0153	43362	346088	798	Fail
0.0158	40260	339329	842	Fail
0.0163	37462	333069	889	Fail
0.0168	34941	326919	935	Fail
0.0173	32603	321047	984	Fail
0.0178	30321	314953	1038	Fail
0.0184	28276	309302	1093	Fail
0.0189	26443	303873	1149	Fail
0.0194	24786	298443	1204	Fail
0.0199	23296	293457	1259	Fail
0.0204	21939	288582	1315	Fail
0.0209	20653	283596	1373	Fail
0.0214	19418	278831	1435	Fail
0.0219	18288	274233	1499	Fail
0.0225	17230	269746	1565	Fail
0.0230	16149	265258	1642	Fail
0.0235	15147	260992	1723	Fail
0.0240	14282	256893	1798	Fail
0.0245	13462	252849	1878	Fail
0.0250	12665	248693	1963	Fail
0.0255	11944	244815	2049	Fail
0.0260	11246	241104	2143	Fail
0.0266	10559	237281	2247	Fail
0.0271	9972	233569	2342	Fail
0.0276	9379	230023	2452	Fail
0.0281	8853	226422	2557	Fail
0.0286	8332	222821	2674	Fail
0.0291	7861	219497	2792	Fail
0.0296	7462	216229	2897	Fail
0.0302	7025	212905	3030	Fail
0.0307	6615	209691	3169	Fail
0.0312	6277	206644	3292	Fail
0.0317	5978	203597	3405	Fail
0.0322	5701	200606	3518	Fail
0.0327	5437	197669	3635	Fail
0.0332	5198	194789	3747	Fail
0.0337	4940	191742	3881	Fail
0.0343	4703	188972	4018	Fail
0.0348	4513	186257	4127	Fail
0.0353	4339	183598	4231	Fail
0.0358	4154	180883	4354	Fail
0.0363	3958	178335	4505	Fail
0.0368	3770	175731	4661	Fail
0.0373	3576	173127	4841	Fail
0.0378	3412	170689	5002	Fail
0.0384	3265	168307	5154	Fail
0.0389	3135	165814	5289	Fail
0.0394	3026	163543	5404	Fail
0.0399	2927	161160	5505	Fail
0.0404	2814	158834	5644	Fail
0.0409	2681	156562	5839	Fail

0.0414	2555	154402	6043	Fail
0.0419	2451	152241	6211	Fail
0.0425	2361	150080	6356	Fail
0.0430	2256	147920	6556	Fail
0.0435	2140	145870	6816	Fail
0.0440	2039	143765	7050	Fail
0.0445	1952	141715	7259	Fail
0.0450	1860	139720	7511	Fail
0.0455	1778	137781	7749	Fail
0.0460	1691	135787	8029	Fail
0.0466	1619	133903	8270	Fail
0.0471	1561	131964	8453	Fail
0.0476	1482	130192	8784	Fail
0.0481	1407	128363	9123	Fail
0.0486	1338	126535	9457	Fail
0.0491	1270	124762	9823	Fail
0.0496	1218	122989	10097	Fail
0.0502	1162	121217	10431	Fail
0.0507	1103	119499	10833	Fail
0.0512	1055	117893	11174	Fail
0.0517	1006	116175	11548	Fail
0.0522	963	114569	11897	Fail
0.0527	919	113017	12297	Fail
0.0532	872	111466	12782	Fail
0.0537	814	109915	13503	Fail
0.0543	773	108474	14032	Fail
0.0548	738	107034	14503	Fail
0.0553	695	105594	15193	Fail
0.0558	636	104098	16367	Fail
0.0563	601	102657	17081	Fail
0.0568	553	101272	18313	Fail
0.0573	517	99832	19309	Fail
0.0578	478	98447	20595	Fail
0.0584	434	97117	22377	Fail
0.0589	394	95788	24311	Fail
0.0594	363	94403	26006	Fail
0.0599	339	93184	27487	Fail
0.0604	310	91910	29648	Fail
0.0609	295	90691	30742	Fail
0.0614	273	89527	32793	Fail
0.0619	252	88198	34999	Fail
0.0625	237	87090	36746	Fail
0.0630	223	85871	38507	Fail
0.0635	206	84708	41120	Fail
0.0640	194	83600	43092	Fail
0.0645	179	82492	46084	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.1137 acre-feet
On-line facility target flow:	0.1569 cfs.
Adjusted for 15 min:	0.1569 cfs.
Off-line facility target flow:	0.0904 cfs.
Adjusted for 15 min:	0.0904 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

Model Default Modifications

Total of 0 changes have been made.

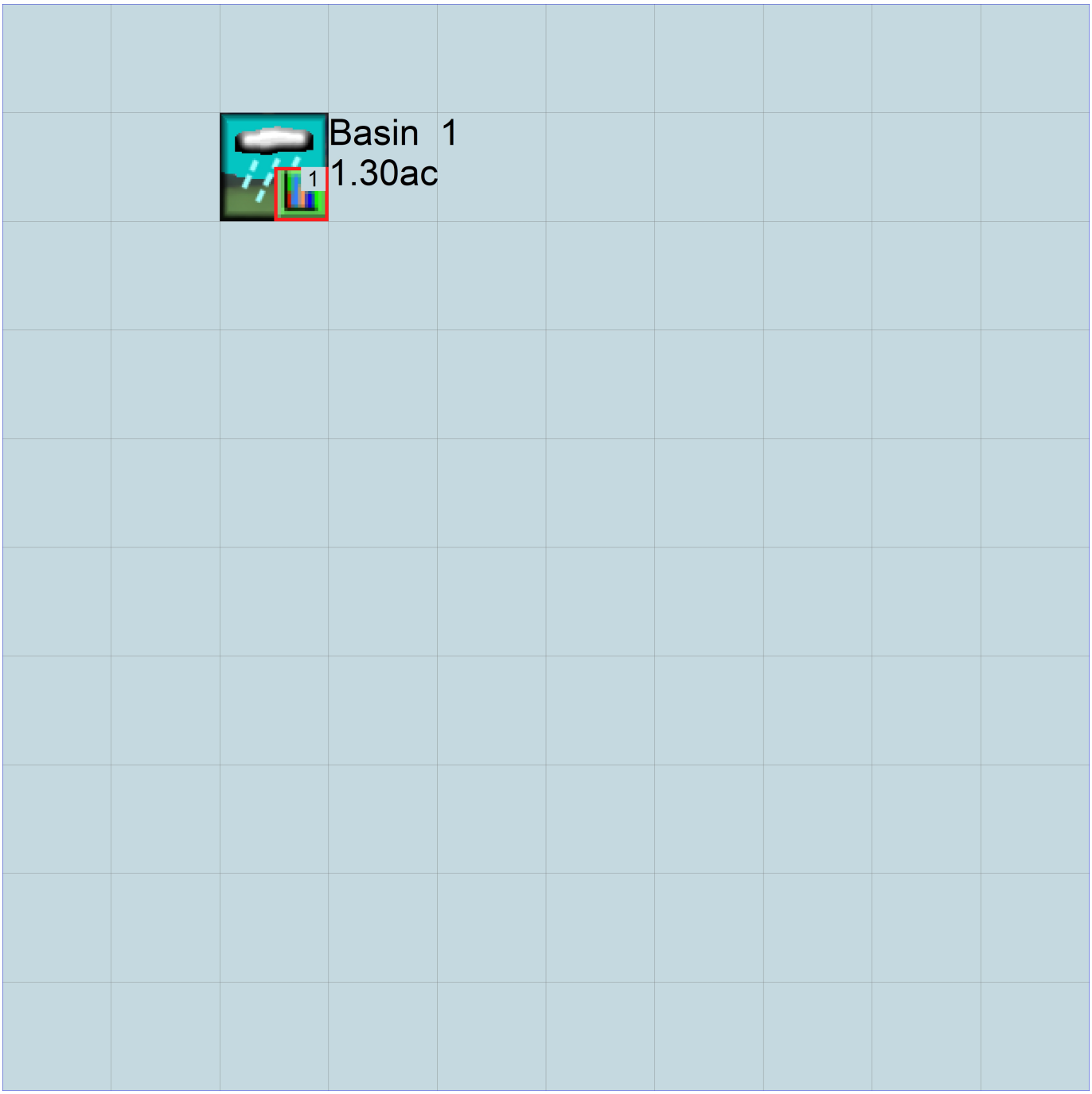
PERLND Changes

No PERLND changes have been made.

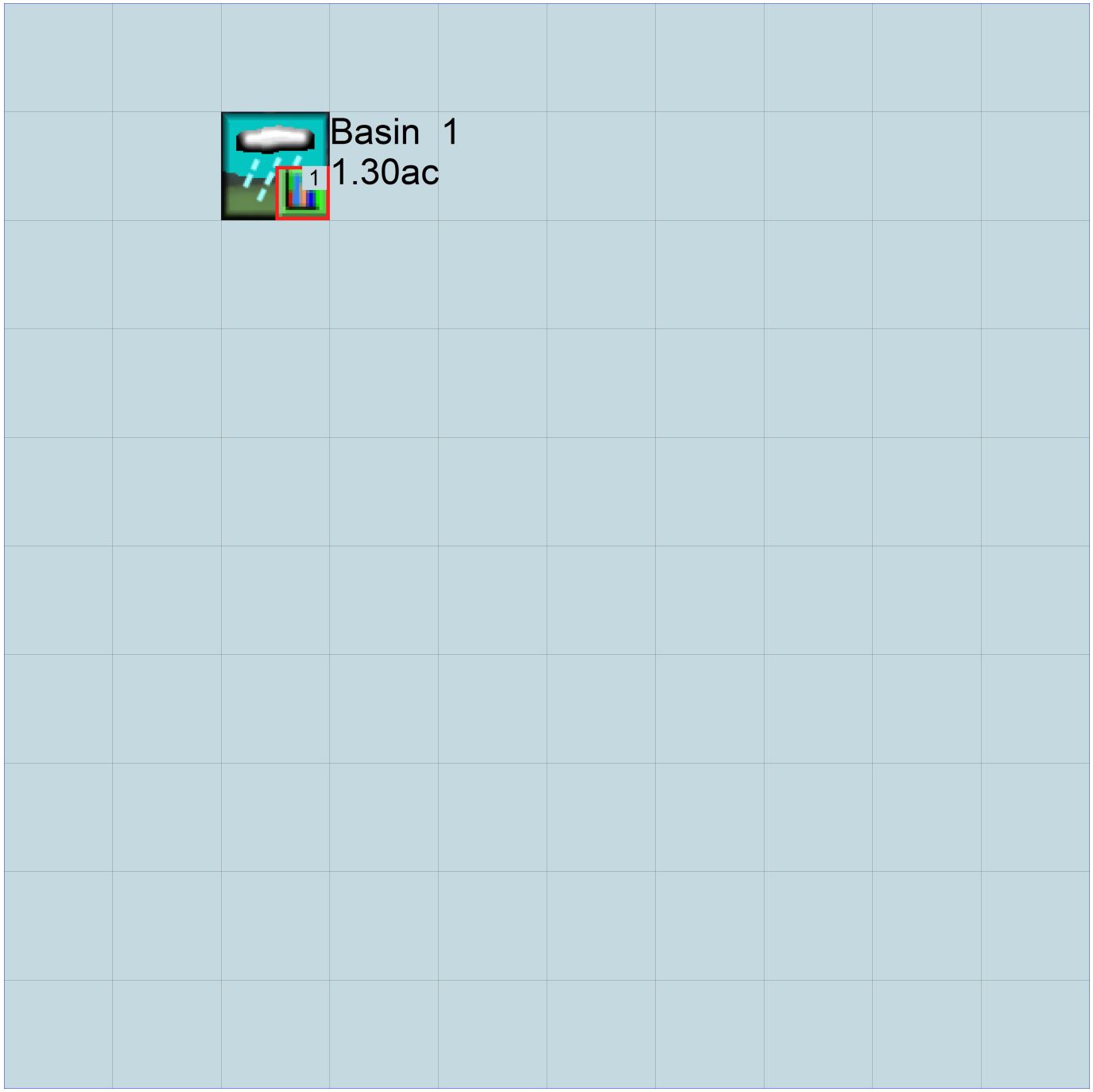
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin P-1 WQ.wdm
MESSU       25   PreBasin P-1 WQ.MES
            27   PreBasin P-1 WQ.L61
            28   PreBasin P-1 WQ.L62
            30   POCBasin P-1 WQ1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                       1.304     COPY   501     12
PERLND  10                       1.304     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><---><---><---><---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
```

```
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM        26   Basin P-1 WQ.wdm
MESSU      25   MitBasin P-1 WQ.MES
           27   MitBasin P-1 WQ.L61
           28   MitBasin P-1 WQ.L62
           30   POCBasin P-1 WQ1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       7
      IMPLND       1
      IMPLND       8
      IMPLND      14
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                      in  out           ***
    7     A/B, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    7         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
```

```
    7         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    7         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    7             0         5       0.8       400      0.05       0.3     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    7             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    7          0.1       0.5      0.25         0       0.7      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS       GWVS
    7             0         0         0         0         3         1          0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
   14      POND                   1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    8         0    0    1    0    0    0
   14         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
   14         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    8         0    0    0    0    0
   14         0    0    0    0    0
  END IWAT-PARM1
```

```
  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
   14            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    8              0         0
   14              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    8              0         0
   14              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND   7                      0.245     COPY   501     12
PERLND   7                      0.245     COPY   501     13
IMPLND   1                      0.735     COPY   501     15
IMPLND   8                      0.283     COPY   501     15
IMPLND  14                      0.041     COPY   501     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
```

```
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
             FG FG FG FG  possible  exit  *** possible  exit      possible  exit
              *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

Disclaimer

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WWHM2012

PROJECT REPORT

General Model Information

Project Name:	P-2-WQ
Site Name:	
Site Address:	
City:	
Report Date:	8/10/2022
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	2.068
Pervious Total	2.068
Impervious Land Use	acre
Impervious Total	0
Basin Total	2.068

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	0.389
Pervious Total	0.389

Impervious Land Use	acre
ROADS FLAT	1.165
SIDEWALKS FLAT	0.448
POND	0.066
Impervious Total	1.679
Basin Total	2.068

Element Flows To:

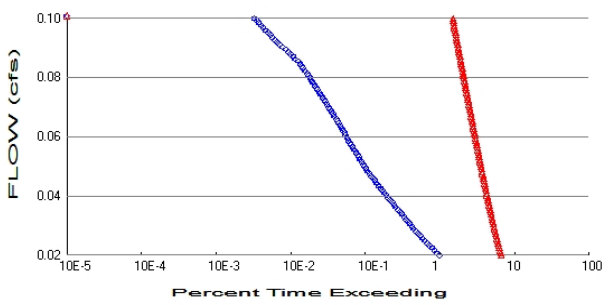
Surface	Interflow	Groundwater

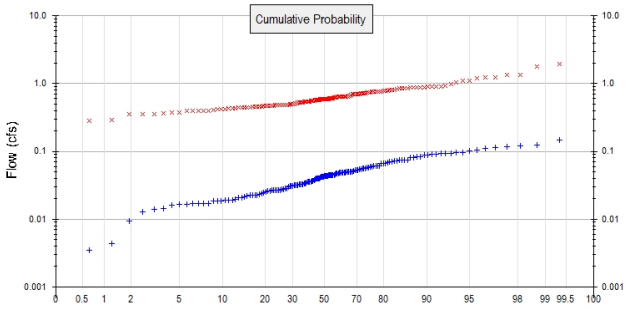
Routing Elements
Predeveloped Routing

Mitigated Routing

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 2.068
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.389
Total Impervious Area: 1.679

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.043579
5 year	0.067795
10 year	0.080954
25 year	0.094347
50 year	0.102307
100 year	0.108853

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.588982
5 year	0.790976
10 year	0.93784
25 year	1.138901
50 year	1.300308
100 year	1.472001

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.032	0.696
1903	0.027	0.771
1904	0.043	0.873
1905	0.021	0.392
1906	0.009	0.438
1907	0.067	0.585
1908	0.050	0.481
1909	0.049	0.594
1910	0.068	0.568
1911	0.044	0.637

1912	0.145	1.112
1913	0.070	0.460
1914	0.017	1.931
1915	0.028	0.396
1916	0.044	0.741
1917	0.015	0.280
1918	0.047	0.593
1919	0.034	0.363
1920	0.044	0.483
1921	0.050	0.414
1922	0.050	0.651
1923	0.040	0.453
1924	0.018	0.857
1925	0.023	0.358
1926	0.042	0.698
1927	0.027	0.569
1928	0.034	0.422
1929	0.069	0.842
1930	0.044	0.881
1931	0.041	0.425
1932	0.032	0.458
1933	0.031	0.454
1934	0.091	0.738
1935	0.042	0.392
1936	0.037	0.548
1937	0.059	0.814
1938	0.036	0.398
1939	0.002	0.501
1940	0.040	0.883
1941	0.019	0.873
1942	0.060	0.657
1943	0.031	0.650
1944	0.056	0.935
1945	0.050	0.708
1946	0.027	0.550
1947	0.017	0.429
1948	0.094	0.590
1949	0.080	0.911
1950	0.023	0.515
1951	0.028	0.780
1952	0.122	0.879
1953	0.110	0.810
1954	0.040	0.479
1955	0.033	0.445
1956	0.016	0.439
1957	0.056	0.475
1958	0.118	0.594
1959	0.073	0.600
1960	0.019	0.469
1961	0.073	1.337
1962	0.039	0.575
1963	0.019	0.427
1964	0.021	1.238
1965	0.082	0.556
1966	0.023	0.465
1967	0.035	0.651
1968	0.036	0.549
1969	0.036	0.495

1970	0.056	0.563
1971	0.088	0.545
1972	0.057	1.803
1973	0.073	1.047
1974	0.040	0.758
1975	0.093	0.783
1976	0.049	0.834
1977	0.017	0.358
1978	0.083	0.616
1979	0.023	0.635
1980	0.047	0.626
1981	0.045	0.589
1982	0.018	0.480
1983	0.073	0.651
1984	0.030	0.647
1985	0.049	0.736
1986	0.044	0.374
1987	0.083	0.656
1988	0.053	0.391
1989	0.047	0.358
1990	0.054	0.473
1991	0.042	0.707
1992	0.060	0.672
1993	0.058	0.768
1994	0.087	0.526
1995	0.017	0.408
1996	0.096	0.549
1997	0.037	0.491
1998	0.044	0.583
1999	0.004	0.634
2000	0.033	0.557
2001	0.017	0.447
2002	0.061	0.812
2003	0.053	0.473
2004	0.049	0.710
2005	0.090	1.357
2006	0.027	0.637
2007	0.027	0.712
2008	0.046	0.587
2009	0.032	0.448
2010	0.027	0.575
2011	0.022	0.605
2012	0.032	0.561
2013	0.025	0.530
2014	0.018	0.512
2015	0.035	0.861
2016	0.014	0.538
2017	0.067	0.863
2018	0.122	0.531
2019	0.114	0.766
2020	0.037	0.627
2021	0.060	0.528
2022	0.025	0.898
2023	0.051	1.110
2024	0.096	1.190
2025	0.045	0.578
2026	0.073	0.635
2027	0.026	0.708

2028	0.023	0.277
2029	0.050	0.455
2030	0.092	0.912
2031	0.030	0.287
2032	0.017	0.485
2033	0.027	0.610
2034	0.026	0.477
2035	0.104	0.587
2036	0.054	0.477
2037	0.013	0.641
2038	0.043	0.608
2039	0.004	1.222
2040	0.024	0.478
2041	0.032	0.607
2042	0.101	0.700
2043	0.049	0.775
2044	0.066	0.532
2045	0.045	0.431
2046	0.053	0.478
2047	0.039	0.590
2048	0.050	0.486
2049	0.045	0.721
2050	0.032	0.537
2051	0.047	0.757
2052	0.027	0.579
2053	0.048	0.491
2054	0.061	0.975
2055	0.019	0.597
2056	0.021	0.771
2057	0.033	0.379
2058	0.042	0.725
2059	0.074	0.904

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.1451	1.9308
2	0.1222	1.8025
3	0.1221	1.3571
4	0.1180	1.3369
5	0.1139	1.2381
6	0.1103	1.2223
7	0.1040	1.1905
8	0.1011	1.1118
9	0.0958	1.1098
10	0.0956	1.0469
11	0.0937	0.9754
12	0.0929	0.9347
13	0.0922	0.9116
14	0.0912	0.9108
15	0.0896	0.9045
16	0.0885	0.8983
17	0.0874	0.8834
18	0.0832	0.8809
19	0.0827	0.8791
20	0.0821	0.8730
21	0.0803	0.8729
22	0.0737	0.8633

23	0.0733	0.8609
24	0.0733	0.8567
25	0.0733	0.8416
26	0.0731	0.8339
27	0.0729	0.8145
28	0.0695	0.8116
29	0.0692	0.8105
30	0.0675	0.7829
31	0.0672	0.7796
32	0.0669	0.7746
33	0.0659	0.7712
34	0.0610	0.7705
35	0.0608	0.7682
36	0.0605	0.7657
37	0.0601	0.7576
38	0.0598	0.7570
39	0.0588	0.7408
40	0.0583	0.7382
41	0.0574	0.7361
42	0.0565	0.7253
43	0.0564	0.7212
44	0.0562	0.7122
45	0.0540	0.7101
46	0.0537	0.7084
47	0.0529	0.7078
48	0.0527	0.7070
49	0.0526	0.7004
50	0.0509	0.6979
51	0.0501	0.6958
52	0.0498	0.6723
53	0.0497	0.6565
54	0.0497	0.6565
55	0.0496	0.6510
56	0.0495	0.6509
57	0.0492	0.6507
58	0.0490	0.6501
59	0.0488	0.6471
60	0.0487	0.6410
61	0.0486	0.6369
62	0.0480	0.6365
63	0.0474	0.6348
64	0.0468	0.6345
65	0.0467	0.6340
66	0.0466	0.6267
67	0.0463	0.6259
68	0.0449	0.6156
69	0.0449	0.6097
70	0.0448	0.6082
71	0.0448	0.6070
72	0.0445	0.6051
73	0.0443	0.6000
74	0.0440	0.5972
75	0.0437	0.5941
76	0.0436	0.5940
77	0.0435	0.5934
78	0.0435	0.5898
79	0.0431	0.5897
80	0.0424	0.5891

81	0.0422	0.5874
82	0.0420	0.5869
83	0.0417	0.5854
84	0.0411	0.5832
85	0.0400	0.5785
86	0.0398	0.5779
87	0.0397	0.5752
88	0.0396	0.5748
89	0.0394	0.5686
90	0.0387	0.5676
91	0.0372	0.5626
92	0.0368	0.5614
93	0.0367	0.5571
94	0.0360	0.5558
95	0.0359	0.5497
96	0.0358	0.5487
97	0.0353	0.5485
98	0.0352	0.5477
99	0.0344	0.5455
100	0.0338	0.5379
101	0.0332	0.5372
102	0.0330	0.5321
103	0.0325	0.5314
104	0.0323	0.5295
105	0.0322	0.5283
106	0.0321	0.5256
107	0.0320	0.5153
108	0.0318	0.5121
109	0.0317	0.5009
110	0.0311	0.4948
111	0.0308	0.4914
112	0.0305	0.4908
113	0.0299	0.4862
114	0.0280	0.4852
115	0.0280	0.4828
116	0.0274	0.4814
117	0.0272	0.4800
118	0.0271	0.4789
119	0.0270	0.4784
120	0.0269	0.4776
121	0.0268	0.4774
122	0.0267	0.4766
123	0.0266	0.4750
124	0.0263	0.4734
125	0.0262	0.4731
126	0.0250	0.4685
127	0.0247	0.4646
128	0.0239	0.4600
129	0.0230	0.4583
130	0.0228	0.4554
131	0.0228	0.4544
132	0.0227	0.4534
133	0.0227	0.4479
134	0.0218	0.4468
135	0.0212	0.4455
136	0.0209	0.4392
137	0.0208	0.4379
138	0.0194	0.4307

139	0.0189	0.4289
140	0.0189	0.4270
141	0.0189	0.4247
142	0.0184	0.4217
143	0.0183	0.4142
144	0.0183	0.4085
145	0.0170	0.3981
146	0.0170	0.3960
147	0.0170	0.3915
148	0.0168	0.3915
149	0.0166	0.3915
150	0.0166	0.3789
151	0.0159	0.3738
152	0.0145	0.3629
153	0.0140	0.3582
154	0.0129	0.3582
155	0.0094	0.3578
156	0.0043	0.2866
157	0.0035	0.2798
158	0.0022	0.2771

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0218	54342	367417	676	Fail
0.0226	50165	360049	717	Fail
0.0234	46597	352902	757	Fail
0.0242	43351	345977	798	Fail
0.0250	40265	339274	842	Fail
0.0259	37462	333013	888	Fail
0.0267	34936	326864	935	Fail
0.0275	32564	320881	985	Fail
0.0283	30332	314953	1038	Fail
0.0291	28288	309246	1093	Fail
0.0299	26432	303762	1149	Fail
0.0307	24792	298388	1203	Fail
0.0315	23296	293402	1259	Fail
0.0324	21928	288471	1315	Fail
0.0332	20637	283485	1373	Fail
0.0340	19429	278831	1435	Fail
0.0348	18282	274122	1499	Fail
0.0356	17219	269690	1566	Fail
0.0364	16160	265258	1641	Fail
0.0372	15141	260882	1723	Fail
0.0381	14271	256782	1799	Fail
0.0389	13451	252738	1878	Fail
0.0397	12659	248638	1964	Fail
0.0405	11939	244760	2050	Fail
0.0413	11246	240993	2142	Fail
0.0421	10559	237226	2246	Fail
0.0429	9972	233514	2341	Fail
0.0437	9379	229968	2451	Fail
0.0446	8842	226312	2559	Fail
0.0454	8332	222821	2674	Fail
0.0462	7861	219442	2791	Fail
0.0470	7457	216118	2898	Fail
0.0478	7030	212849	3027	Fail
0.0486	6615	209636	3169	Fail
0.0494	6271	206589	3294	Fail
0.0503	5978	203487	3403	Fail
0.0511	5701	200550	3517	Fail
0.0519	5437	197614	3634	Fail
0.0527	5197	194733	3747	Fail
0.0535	4943	191742	3879	Fail
0.0543	4703	188916	4016	Fail
0.0551	4512	186202	4126	Fail
0.0559	4337	183487	4230	Fail
0.0568	4154	180828	4353	Fail
0.0576	3958	178279	4504	Fail
0.0584	3766	175675	4664	Fail
0.0592	3577	173072	4838	Fail
0.0600	3412	170634	5000	Fail
0.0608	3263	168252	5156	Fail
0.0616	3134	165759	5289	Fail
0.0625	3026	163487	5402	Fail
0.0633	2928	161105	5502	Fail
0.0641	2813	158778	5644	Fail
0.0649	2682	156562	5837	Fail

0.0657	2555	154402	6043	Fail
0.0665	2451	152186	6209	Fail
0.0673	2359	150025	6359	Fail
0.0681	2256	147864	6554	Fail
0.0690	2139	145814	6816	Fail
0.0698	2038	143709	7051	Fail
0.0706	1952	141715	7259	Fail
0.0714	1859	139665	7512	Fail
0.0722	1778	137726	7746	Fail
0.0730	1689	135732	8036	Fail
0.0738	1618	133848	8272	Fail
0.0747	1561	131964	8453	Fail
0.0755	1482	130136	8781	Fail
0.0763	1407	128308	9119	Fail
0.0771	1338	126535	9457	Fail
0.0779	1270	124707	9819	Fail
0.0787	1217	122934	10101	Fail
0.0795	1163	121217	10422	Fail
0.0803	1103	119499	10833	Fail
0.0812	1055	117782	11164	Fail
0.0820	1006	116120	11542	Fail
0.0828	964	114513	11878	Fail
0.0836	919	112962	12291	Fail
0.0844	872	111411	12776	Fail
0.0852	814	109915	13503	Fail
0.0860	772	108419	14043	Fail
0.0869	737	106979	14515	Fail
0.0877	694	105483	15199	Fail
0.0885	636	104042	16358	Fail
0.0893	601	102602	17071	Fail
0.0901	553	101217	18303	Fail
0.0909	517	99777	19299	Fail
0.0917	478	98447	20595	Fail
0.0925	434	97062	22364	Fail
0.0934	394	95732	24297	Fail
0.0942	363	94403	26006	Fail
0.0950	339	93128	27471	Fail
0.0958	310	91854	29630	Fail
0.0966	295	90635	30723	Fail
0.0974	273	89472	32773	Fail
0.0982	252	88142	34976	Fail
0.0991	237	87034	36723	Fail
0.0999	223	85816	38482	Fail
0.1007	207	84708	40921	Fail
0.1015	195	83710	42928	Fail
0.1023	180	82436	45797	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.1803 acre-feet
On-line facility target flow:	0.2487 cfs.
Adjusted for 15 min:	0.2487 cfs.
Off-line facility target flow:	0.1433 cfs.
Adjusted for 15 min:	0.1433 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

Model Default Modifications

Total of 0 changes have been made.

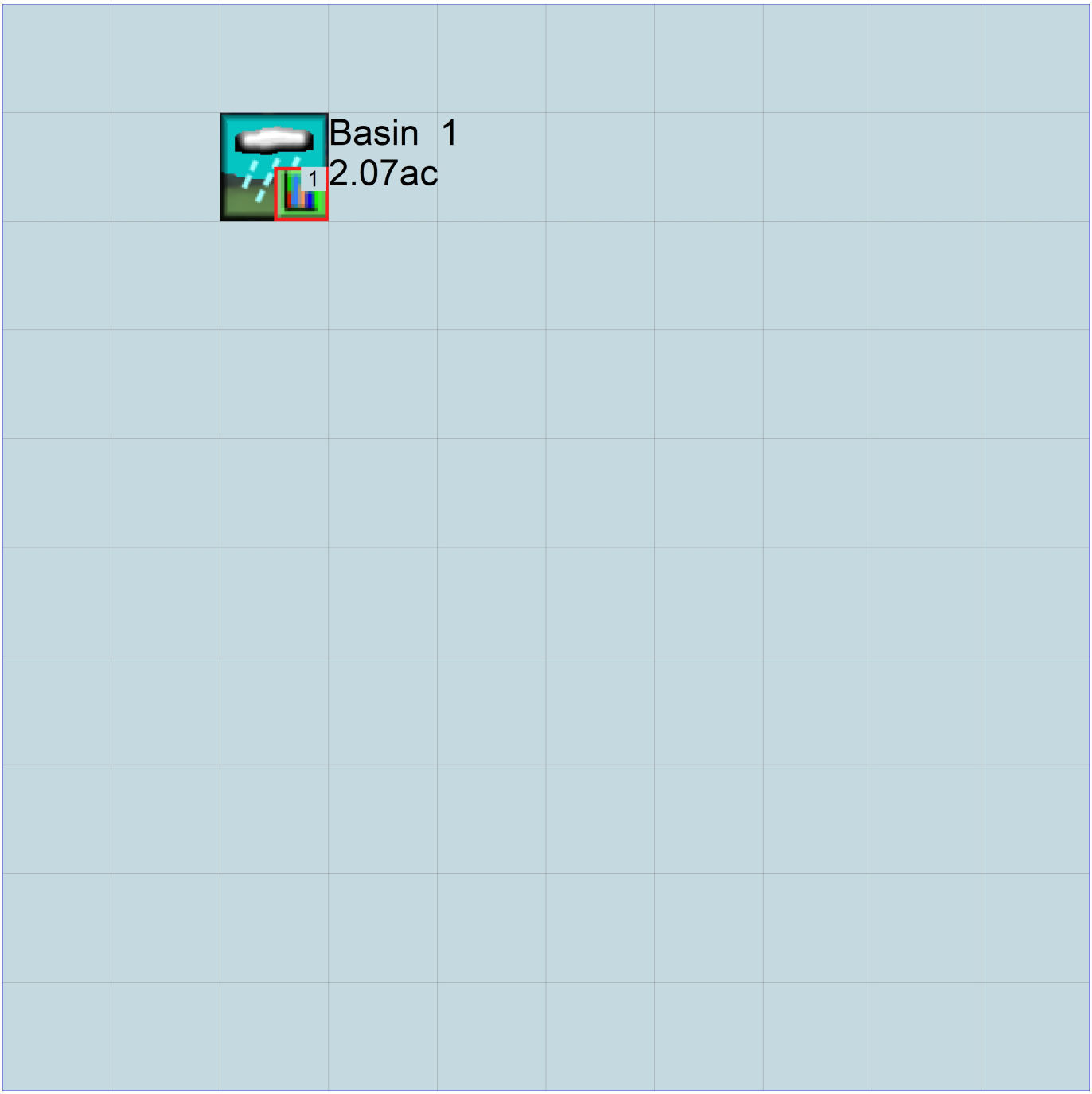
PERLND Changes

No PERLND changes have been made.

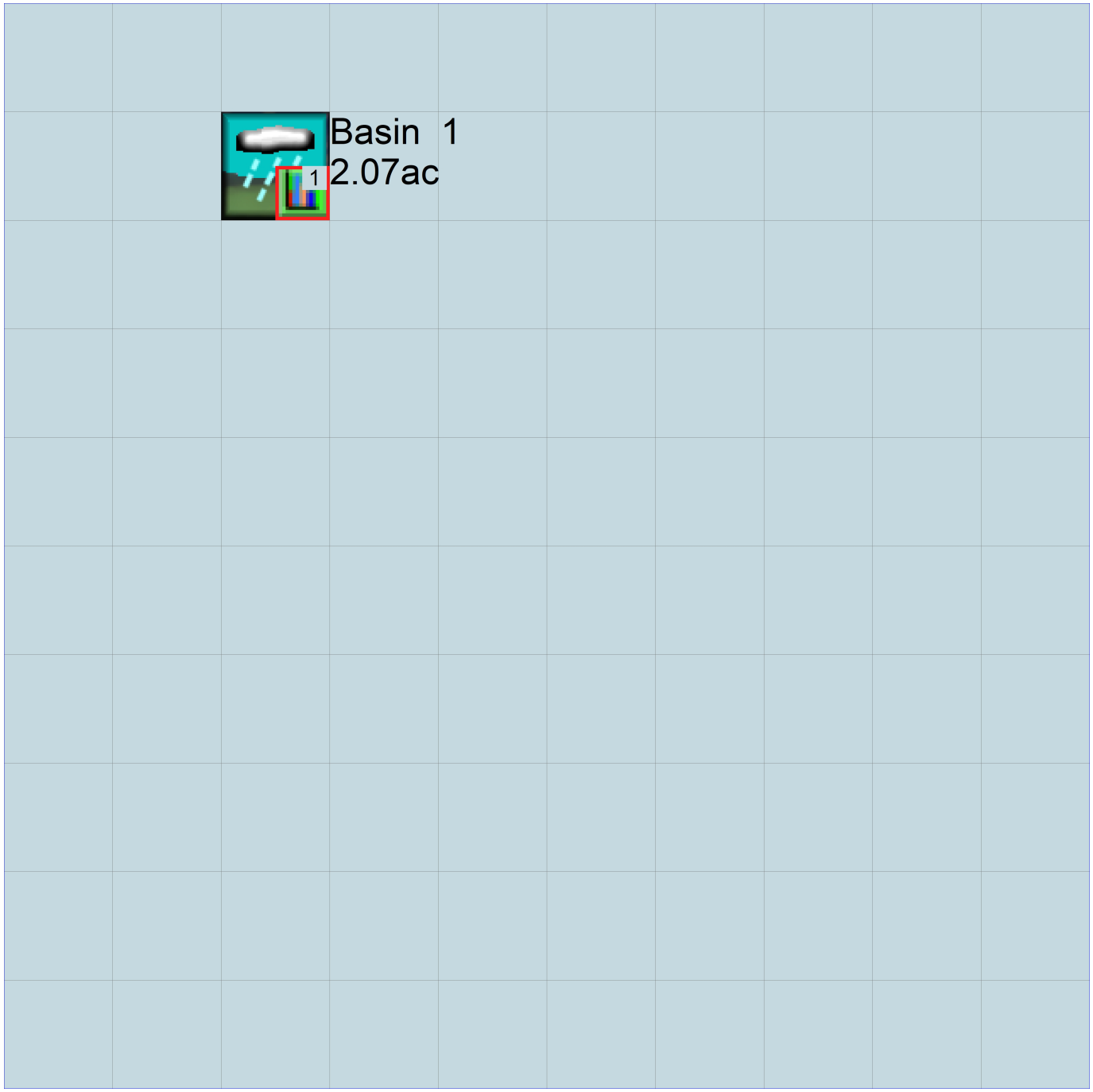
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   P-2-WQ.wdm
MESSU       25   PreP-2-WQ.MES
            27   PreP-2-WQ.L61
            28   PreP-2-WQ.L62
            30   POCP-2-WQ1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                         User  t-series Engl Metr ***
                                      in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                       2.068     COPY   501     12
PERLND  10                       2.068     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
```

```
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   P-2-WQ.wdm
MESSU       25   MitP-2-WQ.MES
            27   MitP-2-WQ.L61
            28   MitP-2-WQ.L62
            30   POCP-2-WQ1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       7
      IMPLND       1
      IMPLND       8
      IMPLND      14
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                      in  out           ***
    7     A/B, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    7         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
```

```
    7         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    7         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    7             0         5       0.8       400      0.05       0.3     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    7             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    7          0.1       0.5      0.25         0       0.7      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
    7             0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                   in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
   14      POND                   1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    8         0    0    1    0    0    0
   14         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
   14         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    8         0    0    0    0    0
   14         0    0    0    0    0
  END IWAT-PARM1
```

```
  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
   14            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    8              0         0
   14              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    8              0         0
   14              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND   7                      0.389     COPY   501     12
PERLND   7                      0.389     COPY   501     13
IMPLND   1                      1.165     COPY   501     15
IMPLND   8                      0.448     COPY   501     15
IMPLND  14                      0.066     COPY   501     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
```

```
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
             FG FG FG FG  possible  exit  *** possible  exit      possible  exit
              *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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WWHM2012

PROJECT REPORT

General Model Information

Project Name:	P-3-WQ
Site Name:	
Site Address:	
City:	
Report Date:	8/10/2022
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	1.742
Pervious Total	1.742
Impervious Land Use	acre
Impervious Total	0
Basin Total	1.742

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	0.344
Pervious Total	0.344

Impervious Land Use	acre
ROADS FLAT	0.918
SIDEWALKS FLAT	0.425
POND	0.055
Impervious Total	1.398
Basin Total	1.742

Element Flows To:

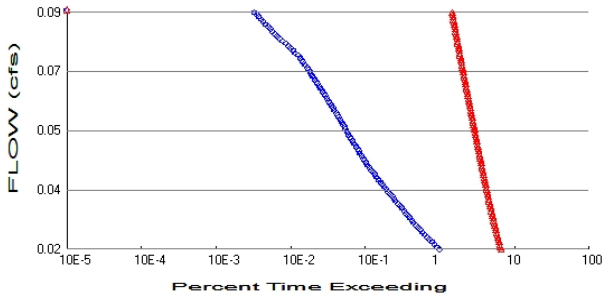
Surface	Interflow	Groundwater

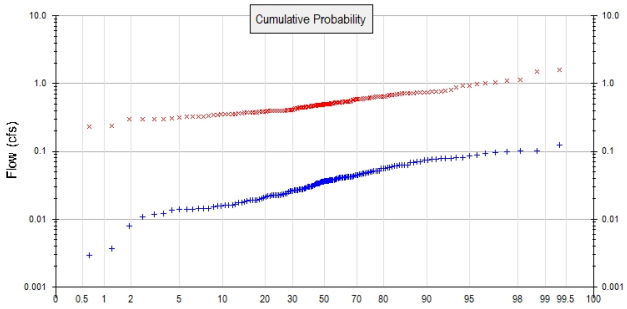
Routing Elements
Predeveloped Routing

Mitigated Routing

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 1.742
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.344
Total Impervious Area: 1.398

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.036709
5 year	0.057108
10 year	0.068192
25 year	0.079474
50 year	0.08618
100 year	0.091693

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.49044
5 year	0.658665
10 year	0.78098
25 year	0.948437
50 year	1.08287
100 year	1.225872

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.027	0.579
1903	0.022	0.642
1904	0.037	0.727
1905	0.018	0.326
1906	0.008	0.365
1907	0.056	0.487
1908	0.042	0.401
1909	0.041	0.495
1910	0.057	0.473
1911	0.037	0.530

1912	0.122	0.929
1913	0.059	0.383
1914	0.014	1.608
1915	0.024	0.330
1916	0.037	0.617
1917	0.012	0.233
1918	0.039	0.494
1919	0.029	0.302
1920	0.037	0.402
1921	0.042	0.345
1922	0.042	0.542
1923	0.034	0.378
1924	0.015	0.713
1925	0.019	0.298
1926	0.036	0.581
1927	0.023	0.473
1928	0.028	0.351
1929	0.058	0.701
1930	0.037	0.734
1931	0.035	0.354
1932	0.027	0.382
1933	0.026	0.378
1934	0.077	0.615
1935	0.036	0.326
1936	0.031	0.456
1937	0.050	0.678
1938	0.030	0.332
1939	0.002	0.417
1940	0.033	0.736
1941	0.016	0.727
1942	0.050	0.547
1943	0.026	0.541
1944	0.047	0.778
1945	0.042	0.590
1946	0.023	0.458
1947	0.014	0.357
1948	0.079	0.491
1949	0.068	0.758
1950	0.019	0.429
1951	0.024	0.649
1952	0.103	0.732
1953	0.093	0.675
1954	0.034	0.399
1955	0.027	0.371
1956	0.013	0.366
1957	0.048	0.396
1958	0.099	0.495
1959	0.061	0.500
1960	0.016	0.390
1961	0.062	1.113
1962	0.033	0.479
1963	0.016	0.356
1964	0.017	1.031
1965	0.069	0.463
1966	0.019	0.387
1967	0.030	0.542
1968	0.030	0.457
1969	0.030	0.412

1970	0.047	0.468
1971	0.075	0.454
1972	0.048	1.501
1973	0.062	0.872
1974	0.033	0.631
1975	0.078	0.652
1976	0.041	0.694
1977	0.014	0.298
1978	0.070	0.513
1979	0.019	0.529
1980	0.039	0.521
1981	0.038	0.490
1982	0.015	0.400
1983	0.062	0.542
1984	0.025	0.539
1985	0.041	0.613
1986	0.037	0.311
1987	0.070	0.547
1988	0.044	0.326
1989	0.040	0.298
1990	0.045	0.394
1991	0.035	0.589
1992	0.051	0.560
1993	0.049	0.640
1994	0.074	0.438
1995	0.014	0.340
1996	0.081	0.457
1997	0.031	0.409
1998	0.037	0.486
1999	0.003	0.528
2000	0.028	0.464
2001	0.014	0.372
2002	0.051	0.676
2003	0.045	0.394
2004	0.041	0.591
2005	0.075	1.130
2006	0.023	0.530
2007	0.023	0.593
2008	0.039	0.489
2009	0.027	0.373
2010	0.023	0.479
2011	0.018	0.504
2012	0.027	0.467
2013	0.021	0.441
2014	0.016	0.426
2015	0.030	0.717
2016	0.012	0.448
2017	0.057	0.719
2018	0.103	0.443
2019	0.096	0.638
2020	0.031	0.522
2021	0.051	0.440
2022	0.021	0.748
2023	0.043	0.924
2024	0.081	0.991
2025	0.038	0.481
2026	0.062	0.528
2027	0.022	0.589

2028	0.019	0.231
2029	0.042	0.379
2030	0.078	0.759
2031	0.026	0.239
2032	0.014	0.404
2033	0.022	0.508
2034	0.022	0.397
2035	0.088	0.489
2036	0.045	0.397
2037	0.011	0.534
2038	0.036	0.506
2039	0.004	1.018
2040	0.020	0.398
2041	0.027	0.505
2042	0.085	0.583
2043	0.041	0.645
2044	0.056	0.443
2045	0.038	0.359
2046	0.044	0.398
2047	0.033	0.491
2048	0.042	0.405
2049	0.038	0.601
2050	0.027	0.447
2051	0.039	0.630
2052	0.023	0.482
2053	0.040	0.409
2054	0.051	0.812
2055	0.016	0.497
2056	0.018	0.642
2057	0.028	0.316
2058	0.035	0.604
2059	0.062	0.753

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.1222	1.6077
2	0.1030	1.5009
3	0.1029	1.1300
4	0.0994	1.1132
5	0.0959	1.0309
6	0.0929	1.0177
7	0.0876	0.9914
8	0.0852	0.9294
9	0.0807	0.9241
10	0.0806	0.8717
11	0.0790	0.8122
12	0.0782	0.7782
13	0.0776	0.7591
14	0.0769	0.7584
15	0.0755	0.7531
16	0.0745	0.7479
17	0.0736	0.7356
18	0.0701	0.7335
19	0.0697	0.7322
20	0.0691	0.7269
21	0.0677	0.7268
22	0.0621	0.7188

23	0.0618	0.7168
24	0.0618	0.7133
25	0.0618	0.7007
26	0.0616	0.6944
27	0.0614	0.6782
28	0.0586	0.6758
29	0.0583	0.6749
30	0.0569	0.6519
31	0.0566	0.6492
32	0.0563	0.6449
33	0.0555	0.6421
34	0.0514	0.6416
35	0.0512	0.6397
36	0.0509	0.6376
37	0.0506	0.6308
38	0.0504	0.6303
39	0.0495	0.6168
40	0.0491	0.6147
41	0.0483	0.6129
42	0.0476	0.6039
43	0.0475	0.6005
44	0.0473	0.5930
45	0.0455	0.5913
46	0.0452	0.5898
47	0.0446	0.5893
48	0.0444	0.5887
49	0.0443	0.5832
50	0.0428	0.5811
51	0.0422	0.5793
52	0.0420	0.5598
53	0.0419	0.5467
54	0.0419	0.5466
55	0.0418	0.5421
56	0.0417	0.5419
57	0.0414	0.5419
58	0.0413	0.5413
59	0.0411	0.5388
60	0.0410	0.5337
61	0.0410	0.5303
62	0.0404	0.5300
63	0.0399	0.5286
64	0.0394	0.5283
65	0.0393	0.5279
66	0.0392	0.5219
67	0.0390	0.5212
68	0.0378	0.5132
69	0.0378	0.5077
70	0.0378	0.5064
71	0.0377	0.5054
72	0.0375	0.5038
73	0.0373	0.5001
74	0.0370	0.4973
75	0.0368	0.4949
76	0.0367	0.4947
77	0.0366	0.4941
78	0.0366	0.4911
79	0.0363	0.4910
80	0.0357	0.4905

81	0.0356	0.4891
82	0.0354	0.4886
83	0.0352	0.4875
84	0.0347	0.4856
85	0.0337	0.4817
86	0.0335	0.4812
87	0.0334	0.4789
88	0.0333	0.4786
89	0.0332	0.4734
90	0.0326	0.4726
91	0.0313	0.4685
92	0.0310	0.4675
93	0.0309	0.4639
94	0.0303	0.4628
95	0.0302	0.4577
96	0.0302	0.4569
97	0.0297	0.4568
98	0.0297	0.4560
99	0.0290	0.4542
100	0.0285	0.4479
101	0.0280	0.4473
102	0.0278	0.4432
103	0.0274	0.4431
104	0.0272	0.4409
105	0.0271	0.4399
106	0.0271	0.4376
107	0.0269	0.4291
108	0.0268	0.4264
109	0.0267	0.4171
110	0.0262	0.4120
111	0.0259	0.4092
112	0.0257	0.4087
113	0.0252	0.4048
114	0.0236	0.4040
115	0.0236	0.4020
116	0.0231	0.4008
117	0.0229	0.3997
118	0.0228	0.3988
119	0.0228	0.3983
120	0.0227	0.3977
121	0.0226	0.3975
122	0.0225	0.3968
123	0.0224	0.3955
124	0.0222	0.3942
125	0.0221	0.3939
126	0.0211	0.3901
127	0.0208	0.3868
128	0.0202	0.3830
129	0.0194	0.3816
130	0.0192	0.3792
131	0.0192	0.3784
132	0.0191	0.3776
133	0.0191	0.3730
134	0.0184	0.3720
135	0.0179	0.3709
136	0.0176	0.3657
137	0.0175	0.3647
138	0.0163	0.3587

139	0.0159	0.3571
140	0.0159	0.3556
141	0.0159	0.3537
142	0.0155	0.3511
143	0.0154	0.3448
144	0.0154	0.3401
145	0.0143	0.3315
146	0.0143	0.3297
147	0.0143	0.3260
148	0.0141	0.3260
149	0.0140	0.3260
150	0.0139	0.3155
151	0.0134	0.3113
152	0.0122	0.3021
153	0.0118	0.2983
154	0.0109	0.2982
155	0.0079	0.2980
156	0.0036	0.2387
157	0.0030	0.2330
158	0.0019	0.2308

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0184	54315	365035	672	Fail
0.0190	50210	357777	712	Fail
0.0197	46597	350520	752	Fail
0.0204	43357	343650	792	Fail
0.0211	40276	337002	836	Fail
0.0218	37451	330686	882	Fail
0.0225	34925	324592	929	Fail
0.0232	32553	318498	978	Fail
0.0238	30332	312626	1030	Fail
0.0245	28265	306864	1085	Fail
0.0252	26432	301490	1140	Fail
0.0259	24786	296116	1194	Fail
0.0266	23296	291186	1249	Fail
0.0273	21922	286089	1305	Fail
0.0279	20642	281269	1362	Fail
0.0286	19412	276505	1424	Fail
0.0293	18288	271906	1486	Fail
0.0300	17219	267363	1552	Fail
0.0307	16160	262987	1627	Fail
0.0314	15141	258666	1708	Fail
0.0321	14277	254566	1783	Fail
0.0327	13446	250466	1862	Fail
0.0334	12665	246533	1946	Fail
0.0341	11933	242544	2032	Fail
0.0348	11246	238777	2123	Fail
0.0355	10559	235010	2225	Fail
0.0362	9978	231298	2318	Fail
0.0369	9374	227586	2427	Fail
0.0375	8847	224151	2533	Fail
0.0382	8332	220605	2647	Fail
0.0389	7861	217226	2763	Fail
0.0396	7457	213902	2868	Fail
0.0403	7030	210689	2996	Fail
0.0410	6609	207475	3139	Fail
0.0416	6277	204428	3256	Fail
0.0423	5978	201326	3367	Fail
0.0430	5701	198390	3479	Fail
0.0437	5437	195453	3594	Fail
0.0444	5198	192462	3702	Fail
0.0451	4942	189636	3837	Fail
0.0458	4706	186866	3970	Fail
0.0464	4511	184041	4079	Fail
0.0471	4338	181382	4181	Fail
0.0478	4155	178722	4301	Fail
0.0485	3958	176174	4451	Fail
0.0492	3764	173570	4611	Fail
0.0499	3581	170966	4774	Fail
0.0506	3412	168584	4940	Fail
0.0512	3265	166091	5087	Fail
0.0519	3134	163764	5225	Fail
0.0526	3027	161327	5329	Fail
0.0533	2926	159000	5434	Fail
0.0540	2813	156728	5571	Fail
0.0547	2682	154512	5761	Fail

0.0554	2555	152296	5960	Fail
0.0560	2451	150136	6125	Fail
0.0567	2358	147920	6273	Fail
0.0574	2256	145870	6465	Fail
0.0581	2139	143709	6718	Fail
0.0588	2038	141715	6953	Fail
0.0595	1952	139610	7152	Fail
0.0601	1860	137671	7401	Fail
0.0608	1777	135676	7635	Fail
0.0615	1689	133793	7921	Fail
0.0622	1618	131798	8145	Fail
0.0629	1561	129970	8326	Fail
0.0636	1482	128142	8646	Fail
0.0643	1407	126369	8981	Fail
0.0649	1338	124485	9303	Fail
0.0656	1270	122768	9666	Fail
0.0663	1217	120940	9937	Fail
0.0670	1163	119278	10256	Fail
0.0677	1103	117560	10658	Fail
0.0684	1055	115898	10985	Fail
0.0691	1005	114236	11366	Fail
0.0697	964	112685	11689	Fail
0.0704	919	111134	12092	Fail
0.0711	872	109582	12566	Fail
0.0718	814	108087	13278	Fail
0.0725	774	106646	13778	Fail
0.0732	737	105150	14267	Fail
0.0738	694	103655	14935	Fail
0.0745	636	102214	16071	Fail
0.0752	601	100774	16767	Fail
0.0759	553	99389	17972	Fail
0.0766	517	98004	18956	Fail
0.0773	478	96674	20224	Fail
0.0780	434	95289	21955	Fail
0.0786	394	93959	23847	Fail
0.0793	363	92741	25548	Fail
0.0800	339	91411	26964	Fail
0.0807	310	90248	29112	Fail
0.0814	295	88973	30160	Fail
0.0821	273	87699	32124	Fail
0.0828	252	86536	34339	Fail
0.0834	237	85317	35998	Fail
0.0841	223	84209	37761	Fail
0.0848	206	83101	40340	Fail
0.0855	194	81938	42236	Fail
0.0862	179	80830	45156	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.1501 acre-feet
On-line facility target flow:	0.2071 cfs.
Adjusted for 15 min:	0.2071 cfs.
Off-line facility target flow:	0.1193 cfs.
Adjusted for 15 min:	0.1193 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

Model Default Modifications

Total of 0 changes have been made.

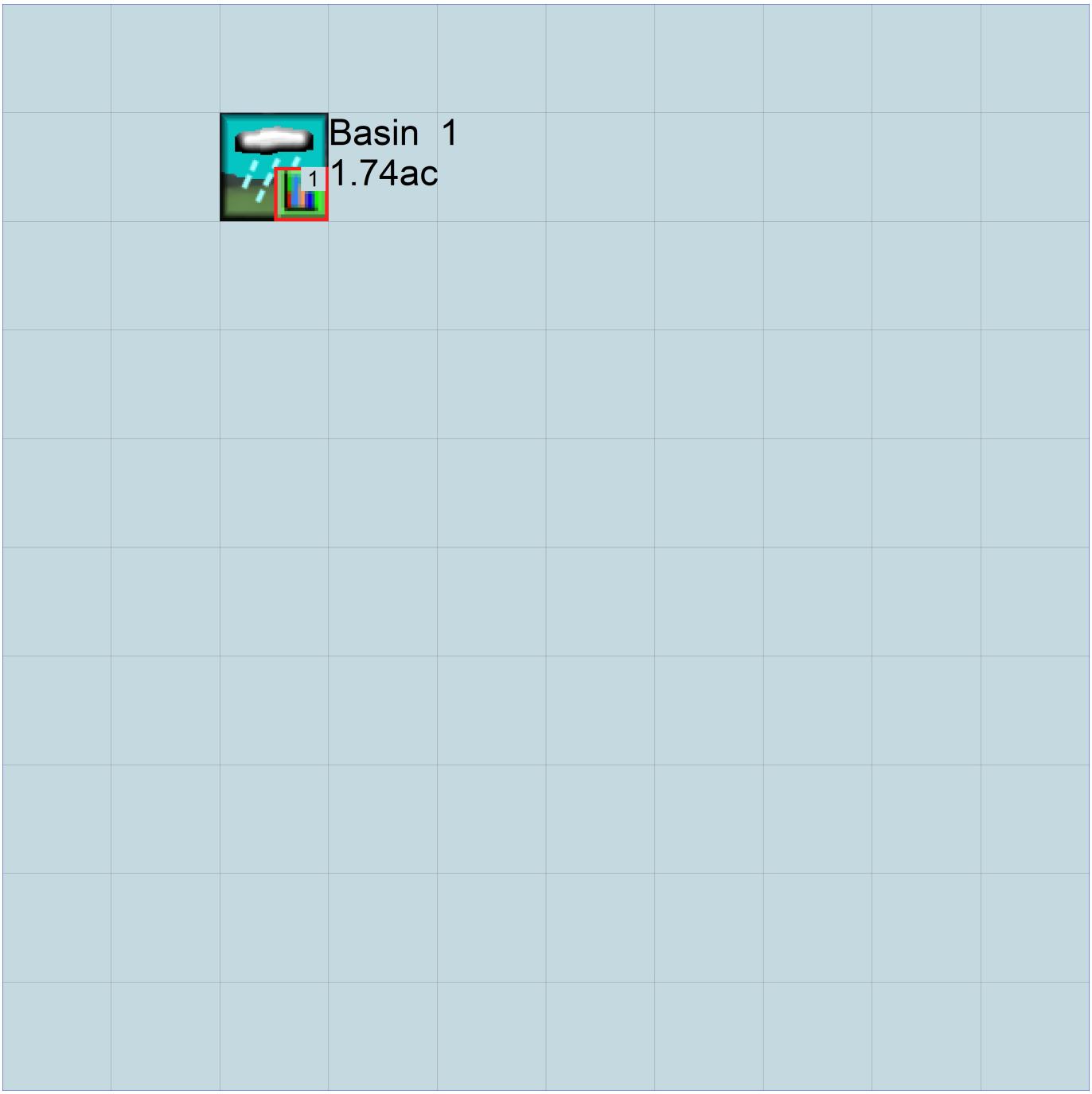
PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   P-3-WQ.wdm
MESSU       25   PreP-3-WQ.MES
            27   PreP-3-WQ.L61
            28   PreP-3-WQ.L62
            30   POCP-3-WQ1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                     1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                       1.742     COPY   501     12
PERLND  10                       1.742     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><--->
```

```
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

Predeveloped HSPF Message File

Mitigated HSPF Message File

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WWHM2012

PROJECT REPORT

General Model Information

Project Name:	P-4-WQ
Site Name:	
Site Address:	
City:	
Report Date:	8/10/2022
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	0.806
Pervious Total	0.806
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.806

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	0.159
Pervious Total	0.159

Impervious Land Use	acre
ROADS FLAT	0.44
SIDEWALKS FLAT	0.181
POND	0.026
Impervious Total	0.647
Basin Total	0.806

Element Flows To:

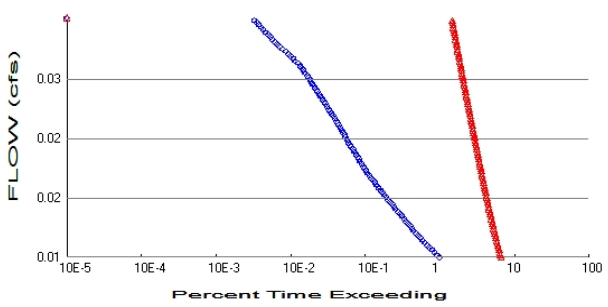
Surface	Interflow	Groundwater

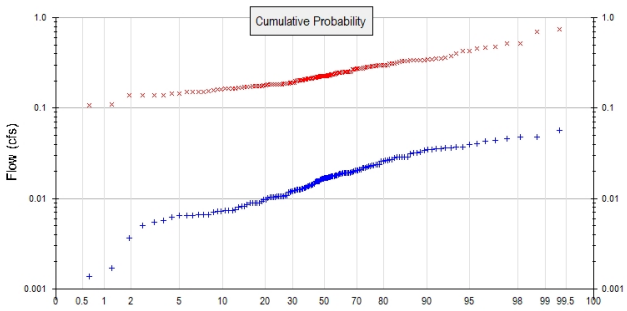
Routing Elements
Predeveloped Routing

Mitigated Routing

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.806
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.159
Total Impervious Area: 0.647

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.016985
5 year	0.026423
10 year	0.031552
25 year	0.036772
50 year	0.039874
100 year	0.042425

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.226977
5 year	0.304832
10 year	0.36144
25 year	0.438939
50 year	0.501155
100 year	0.567336

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.012	0.268
1903	0.010	0.297
1904	0.017	0.336
1905	0.008	0.151
1906	0.004	0.169
1907	0.026	0.226
1908	0.019	0.185
1909	0.019	0.229
1910	0.026	0.219
1911	0.017	0.245

1912	0.057	0.430
1913	0.027	0.177
1914	0.007	0.744
1915	0.011	0.153
1916	0.017	0.285
1917	0.006	0.108
1918	0.018	0.229
1919	0.013	0.140
1920	0.017	0.186
1921	0.019	0.160
1922	0.019	0.251
1923	0.016	0.175
1924	0.007	0.330
1925	0.009	0.138
1926	0.016	0.269
1927	0.011	0.219
1928	0.013	0.162
1929	0.027	0.324
1930	0.017	0.339
1931	0.016	0.164
1932	0.013	0.177
1933	0.012	0.175
1934	0.036	0.284
1935	0.017	0.151
1936	0.014	0.211
1937	0.023	0.314
1938	0.014	0.153
1939	0.001	0.193
1940	0.015	0.340
1941	0.007	0.336
1942	0.023	0.253
1943	0.012	0.251
1944	0.022	0.360
1945	0.019	0.273
1946	0.010	0.212
1947	0.007	0.165
1948	0.037	0.227
1949	0.031	0.351
1950	0.009	0.199
1951	0.011	0.300
1952	0.048	0.339
1953	0.043	0.312
1954	0.016	0.185
1955	0.013	0.172
1956	0.006	0.169
1957	0.022	0.183
1958	0.046	0.229
1959	0.028	0.231
1960	0.008	0.181
1961	0.029	0.515
1962	0.015	0.222
1963	0.007	0.165
1964	0.008	0.477
1965	0.032	0.214
1966	0.009	0.179
1967	0.014	0.251
1968	0.014	0.211
1969	0.014	0.191

1970	0.022	0.217
1971	0.034	0.210
1972	0.022	0.695
1973	0.029	0.403
1974	0.015	0.292
1975	0.036	0.302
1976	0.019	0.321
1977	0.006	0.138
1978	0.032	0.238
1979	0.009	0.245
1980	0.018	0.241
1981	0.017	0.227
1982	0.007	0.185
1983	0.029	0.251
1984	0.012	0.249
1985	0.019	0.284
1986	0.017	0.144
1987	0.032	0.253
1988	0.021	0.151
1989	0.018	0.138
1990	0.021	0.182
1991	0.016	0.272
1992	0.023	0.259
1993	0.023	0.296
1994	0.034	0.203
1995	0.007	0.157
1996	0.037	0.211
1997	0.014	0.189
1998	0.017	0.225
1999	0.001	0.244
2000	0.013	0.215
2001	0.007	0.172
2002	0.024	0.313
2003	0.021	0.182
2004	0.019	0.274
2005	0.035	0.523
2006	0.011	0.245
2007	0.011	0.274
2008	0.018	0.226
2009	0.012	0.173
2010	0.011	0.222
2011	0.009	0.233
2012	0.012	0.216
2013	0.010	0.204
2014	0.007	0.197
2015	0.014	0.332
2016	0.005	0.207
2017	0.026	0.333
2018	0.048	0.205
2019	0.044	0.295
2020	0.014	0.242
2021	0.024	0.204
2022	0.010	0.346
2023	0.020	0.428
2024	0.037	0.459
2025	0.018	0.223
2026	0.029	0.245
2027	0.010	0.273

2028	0.009	0.107
2029	0.019	0.176
2030	0.036	0.351
2031	0.012	0.110
2032	0.006	0.187
2033	0.010	0.235
2034	0.010	0.184
2035	0.041	0.226
2036	0.021	0.184
2037	0.005	0.247
2038	0.017	0.234
2039	0.002	0.471
2040	0.009	0.184
2041	0.013	0.234
2042	0.039	0.270
2043	0.019	0.298
2044	0.026	0.205
2045	0.017	0.166
2046	0.020	0.184
2047	0.015	0.227
2048	0.020	0.187
2049	0.017	0.278
2050	0.013	0.207
2051	0.018	0.292
2052	0.010	0.223
2053	0.019	0.189
2054	0.024	0.376
2055	0.007	0.230
2056	0.008	0.297
2057	0.013	0.146
2058	0.016	0.280
2059	0.029	0.349

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	**Predeveloped**	**Mitigated**
1	0.0565	0.7440
2	0.0476	0.6946
3	0.0476	0.5230
4	0.0460	0.5152
5	0.0444	0.4771
6	0.0430	0.4710
7	0.0405	0.4588
8	0.0394	0.4301
9	0.0373	0.4277
10	0.0373	0.4034
11	0.0365	0.3759
12	0.0362	0.3602
13	0.0359	0.3513
14	0.0356	0.3510
15	0.0349	0.3485
16	0.0345	0.3462
17	0.0341	0.3404
18	0.0324	0.3395
19	0.0322	0.3389
20	0.0320	0.3364
21	0.0313	0.3364
22	0.0287	0.3327

23	0.0286	0.3317
24	0.0286	0.3301
25	0.0286	0.3243
26	0.0285	0.3213
27	0.0284	0.3139
28	0.0271	0.3127
29	0.0270	0.3124
30	0.0263	0.3017
31	0.0262	0.3004
32	0.0261	0.2985
33	0.0257	0.2972
34	0.0238	0.2969
35	0.0237	0.2960
36	0.0236	0.2951
37	0.0234	0.2919
38	0.0233	0.2917
39	0.0229	0.2855
40	0.0227	0.2845
41	0.0224	0.2837
42	0.0220	0.2795
43	0.0220	0.2779
44	0.0219	0.2744
45	0.0210	0.2737
46	0.0209	0.2730
47	0.0206	0.2727
48	0.0206	0.2725
49	0.0205	0.2699
50	0.0198	0.2689
51	0.0195	0.2681
52	0.0194	0.2591
53	0.0194	0.2530
54	0.0194	0.2530
55	0.0193	0.2509
56	0.0193	0.2508
57	0.0192	0.2508
58	0.0191	0.2505
59	0.0190	0.2493
60	0.0190	0.2470
61	0.0190	0.2454
62	0.0187	0.2453
63	0.0185	0.2446
64	0.0183	0.2445
65	0.0182	0.2443
66	0.0181	0.2415
67	0.0180	0.2412
68	0.0175	0.2375
69	0.0175	0.2350
70	0.0175	0.2344
71	0.0174	0.2339
72	0.0173	0.2332
73	0.0173	0.2314
74	0.0171	0.2301
75	0.0170	0.2290
76	0.0170	0.2289
77	0.0170	0.2287
78	0.0169	0.2273
79	0.0168	0.2273
80	0.0165	0.2270

81	0.0164	0.2263
82	0.0164	0.2261
83	0.0163	0.2256
84	0.0160	0.2247
85	0.0156	0.2229
86	0.0155	0.2227
87	0.0155	0.2216
88	0.0154	0.2215
89	0.0153	0.2191
90	0.0151	0.2187
91	0.0145	0.2168
92	0.0144	0.2163
93	0.0143	0.2147
94	0.0140	0.2142
95	0.0140	0.2118
96	0.0140	0.2114
97	0.0138	0.2114
98	0.0137	0.2110
99	0.0134	0.2102
100	0.0132	0.2073
101	0.0130	0.2070
102	0.0129	0.2051
103	0.0127	0.2051
104	0.0126	0.2040
105	0.0126	0.2036
106	0.0125	0.2025
107	0.0125	0.1986
108	0.0124	0.1974
109	0.0123	0.1930
110	0.0121	0.1907
111	0.0120	0.1894
112	0.0119	0.1891
113	0.0116	0.1874
114	0.0109	0.1870
115	0.0109	0.1861
116	0.0107	0.1855
117	0.0106	0.1850
118	0.0106	0.1846
119	0.0105	0.1843
120	0.0105	0.1841
121	0.0105	0.1840
122	0.0104	0.1837
123	0.0104	0.1830
124	0.0103	0.1824
125	0.0102	0.1823
126	0.0098	0.1806
127	0.0096	0.1790
128	0.0093	0.1773
129	0.0090	0.1766
130	0.0089	0.1755
131	0.0089	0.1751
132	0.0088	0.1747
133	0.0088	0.1726
134	0.0085	0.1722
135	0.0083	0.1717
136	0.0082	0.1692
137	0.0081	0.1688
138	0.0076	0.1660

139	0.0074	0.1653
140	0.0074	0.1646
141	0.0074	0.1637
142	0.0072	0.1625
143	0.0071	0.1596
144	0.0071	0.1574
145	0.0066	0.1534
146	0.0066	0.1526
147	0.0066	0.1509
148	0.0065	0.1509
149	0.0065	0.1509
150	0.0065	0.1460
151	0.0062	0.1441
152	0.0057	0.1398
153	0.0055	0.1380
154	0.0050	0.1380
155	0.0036	0.1379
156	0.0017	0.1105
157	0.0014	0.1078
158	0.0009	0.1068

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0085	54282	365035	672	Fail
0.0088	50160	357722	713	Fail
0.0091	46564	350520	752	Fail
0.0094	43312	343650	793	Fail
0.0098	40260	337002	837	Fail
0.0101	37517	330908	882	Fail
0.0104	34941	324703	929	Fail
0.0107	32564	318554	978	Fail
0.0110	30371	312792	1029	Fail
0.0113	28299	306975	1084	Fail
0.0117	26432	301490	1140	Fail
0.0120	24825	296338	1193	Fail
0.0123	23313	291297	1249	Fail
0.0126	21933	286200	1304	Fail
0.0129	20626	281324	1363	Fail
0.0132	19440	276671	1423	Fail
0.0136	18293	271962	1486	Fail
0.0139	17219	267419	1553	Fail
0.0142	16177	263098	1626	Fail
0.0145	15152	258776	1707	Fail
0.0148	14271	254621	1784	Fail
0.0151	13462	250632	1861	Fail
0.0155	12676	246588	1945	Fail
0.0158	11944	242599	2031	Fail
0.0161	11235	238777	2125	Fail
0.0164	10582	235120	2221	Fail
0.0167	9978	231353	2318	Fail
0.0171	9374	227641	2428	Fail
0.0174	8859	224206	2530	Fail
0.0177	8332	220661	2648	Fail
0.0180	7856	217281	2765	Fail
0.0183	7468	214013	2865	Fail
0.0186	7036	210744	2995	Fail
0.0190	6615	207531	3137	Fail
0.0193	6277	204539	3258	Fail
0.0196	5983	201437	3366	Fail
0.0199	5701	198445	3480	Fail
0.0202	5437	195453	3594	Fail
0.0205	5200	192517	3702	Fail
0.0209	4945	189692	3836	Fail
0.0212	4703	186866	3973	Fail
0.0215	4515	184152	4078	Fail
0.0218	4339	181437	4181	Fail
0.0221	4158	178778	4299	Fail
0.0224	3958	176285	4453	Fail
0.0228	3770	173626	4605	Fail
0.0231	3581	171022	4775	Fail
0.0234	3411	168584	4942	Fail
0.0237	3267	166147	5085	Fail
0.0240	3134	163820	5227	Fail
0.0243	3026	161382	5333	Fail
0.0247	2931	159111	5428	Fail
0.0250	2815	156784	5569	Fail
0.0253	2682	154568	5763	Fail

0.0256	2559	152407	5955	Fail
0.0259	2454	150191	6120	Fail
0.0262	2359	148031	6275	Fail
0.0266	2255	145925	6471	Fail
0.0269	2143	143820	6711	Fail
0.0272	2039	141770	6952	Fail
0.0275	1952	139665	7154	Fail
0.0278	1862	137726	7396	Fail
0.0281	1778	135732	7633	Fail
0.0285	1689	133793	7921	Fail
0.0288	1619	131909	8147	Fail
0.0291	1561	130025	8329	Fail
0.0294	1482	128252	8653	Fail
0.0297	1407	126369	8981	Fail
0.0300	1340	124596	9298	Fail
0.0304	1270	122823	9671	Fail
0.0307	1217	120995	9942	Fail
0.0310	1164	119333	10251	Fail
0.0313	1103	117616	10663	Fail
0.0316	1055	115898	10985	Fail
0.0319	1007	114347	11355	Fail
0.0323	964	112740	11695	Fail
0.0326	919	111134	12092	Fail
0.0329	872	109582	12566	Fail
0.0332	815	108142	13268	Fail
0.0335	774	106702	13785	Fail
0.0339	737	105150	14267	Fail
0.0342	695	103765	14930	Fail
0.0345	637	102270	16054	Fail
0.0348	601	100829	16776	Fail
0.0351	556	99444	17885	Fail
0.0354	517	98059	18966	Fail
0.0358	478	96674	20224	Fail
0.0361	433	95289	22006	Fail
0.0364	394	94015	23861	Fail
0.0367	363	92741	25548	Fail
0.0370	339	91466	26981	Fail
0.0373	310	90248	29112	Fail
0.0377	296	89029	30077	Fail
0.0380	273	87755	32144	Fail
0.0383	252	86591	34361	Fail
0.0386	237	85317	35998	Fail
0.0389	223	84264	37786	Fail
0.0392	206	83101	40340	Fail
0.0396	195	81993	42047	Fail
0.0399	180	80885	44936	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.0694 acre-feet
On-line facility target flow:	0.0958 cfs.
Adjusted for 15 min:	0.0958 cfs.
Off-line facility target flow:	0.0552 cfs.
Adjusted for 15 min:	0.0552 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

Model Default Modifications

Total of 0 changes have been made.

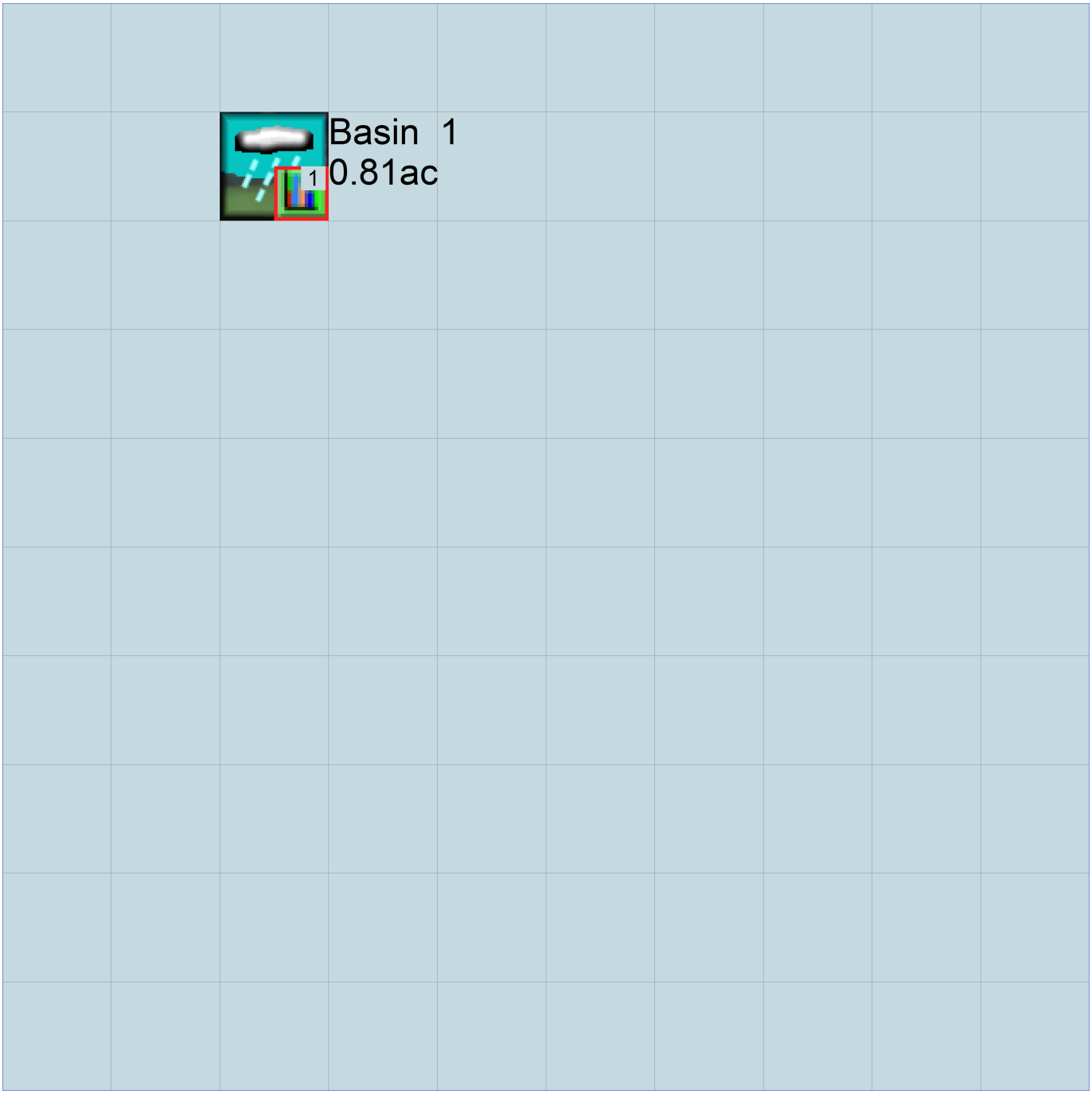
PERLND Changes

No PERLND changes have been made.

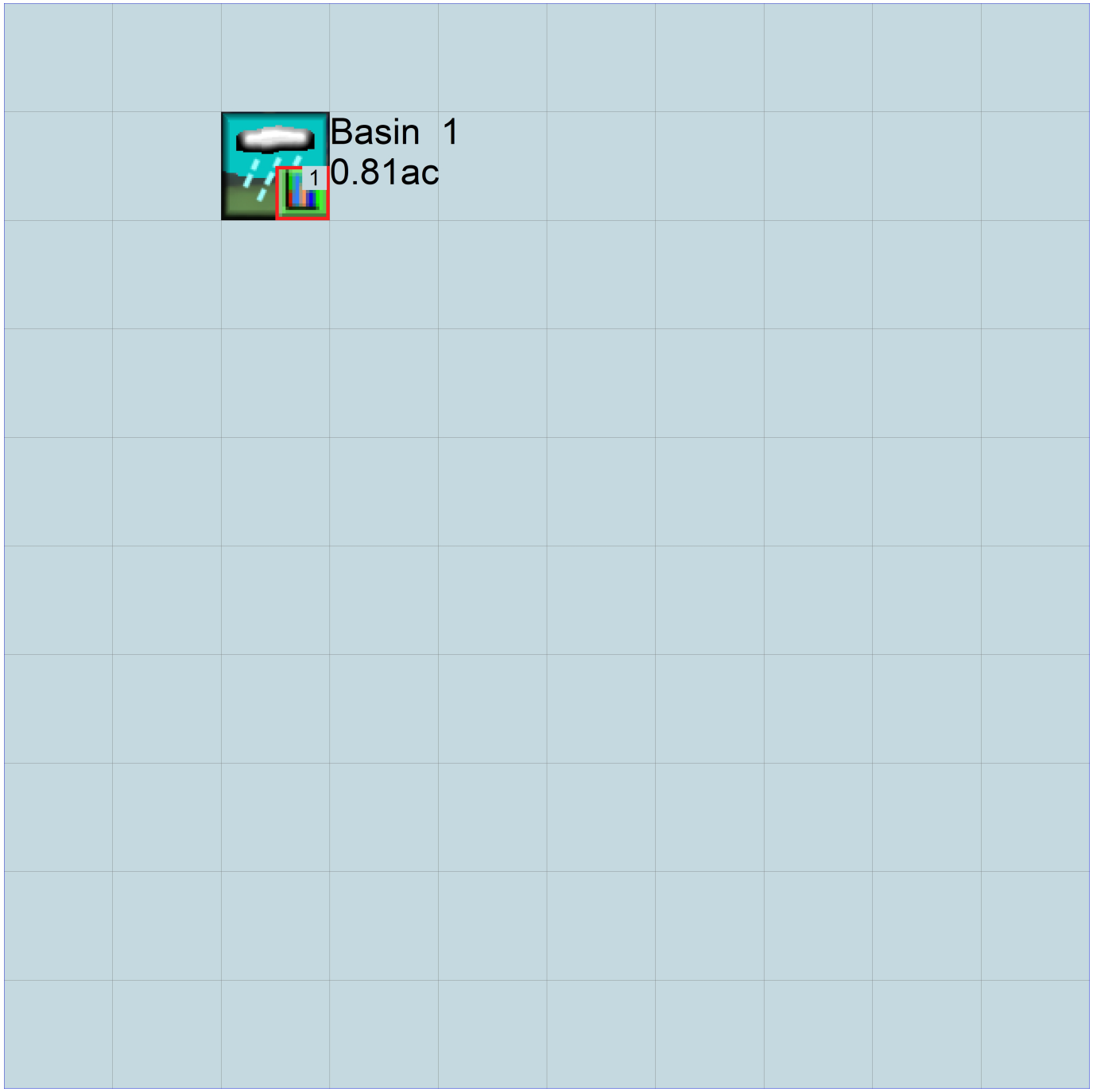
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   P-4-WQ.wdm
MESSU       25   PreP-4-WQ.MES
            27   PreP-4-WQ.L61
            28   PreP-4-WQ.L62
            30   POCP-4-WQ1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                     1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                       0.806     COPY   501     12
PERLND  10                       0.806     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><--->
```

```
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM        26   P-4-WQ.wdm
MESSU      25   MitP-4-WQ.MES
           27   MitP-4-WQ.L61
           28   MitP-4-WQ.L62
           30   POCP-4-WQ1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       7
      IMPLND       1
      IMPLND       8
      IMPLND      14
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                      in  out           ***
    7     A/B, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    7         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
```

```
    7         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    7         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    7             0         5       0.8       400      0.05       0.3     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    7             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    7          0.1       0.5      0.25         0       0.7      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS       GWVS
    7             0         0         0         0         3         1          0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
   14      POND                   1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    8         0    0    1    0    0    0
   14         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
   14         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    8         0    0    0    0    0
   14         0    0    0    0    0
  END IWAT-PARM1
```

```
  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
   14            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    8              0         0
   14              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    8              0         0
   14              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND   7                      0.159     COPY   501     12
PERLND   7                      0.159     COPY   501     13
IMPLND   1                       0.44     COPY   501     15
IMPLND   8                      0.181     COPY   501     15
IMPLND  14                      0.026     COPY   501     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
```

```
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
             FG FG FG FG  possible  exit  *** possible  exit      possible  exit
              *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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WWHM2012

PROJECT REPORT

General Model Information

Project Name:	P-5-WQ
Site Name:	
Site Address:	
City:	
Report Date:	8/10/2022
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	4.471
Pervious Total	4.471
Impervious Land Use	acre
Impervious Total	0
Basin Total	4.471

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	0.882
Pervious Total	0.882

Impervious Land Use	acre
ROADS FLAT	2.499
SIDEWALKS FLAT	0.948
POND	0.142
Impervious Total	3.589
Basin Total	4.471

Element Flows To:

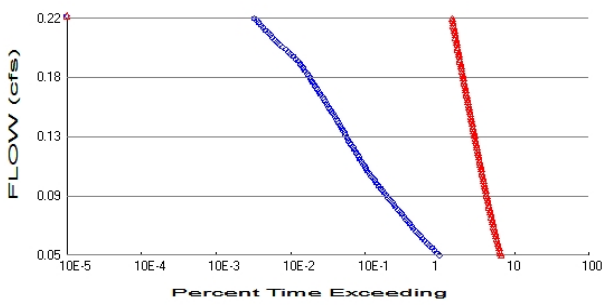
Surface	Interflow	Groundwater

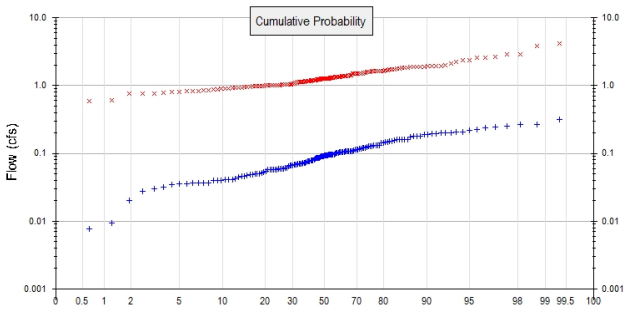
Routing Elements
Predeveloped Routing

Mitigated Routing

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 4.471
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.882
Total Impervious Area: 3.589

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.094216
5 year	0.146573
10 year	0.175022
25 year	0.203977
50 year	0.221187
100 year	0.235339

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	1.259076
5 year	1.690947
10 year	2.004956
25 year	2.434857
50 year	2.779976
100 year	3.147096

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.069	1.487
1903	0.057	1.649
1904	0.094	1.866
1905	0.045	0.837
1906	0.020	0.936
1907	0.145	1.251
1908	0.107	1.029
1909	0.106	1.270
1910	0.146	1.213
1911	0.095	1.361

1912	0.314	2.386
1913	0.150	0.983
1914	0.037	4.127
1915	0.061	0.846
1916	0.094	1.583
1917	0.031	0.598
1918	0.101	1.268
1919	0.074	0.776
1920	0.096	1.032
1921	0.107	0.885
1922	0.107	1.391
1923	0.086	0.969
1924	0.039	1.831
1925	0.049	0.765
1926	0.091	1.492
1927	0.059	1.215
1928	0.073	0.901
1929	0.150	1.799
1930	0.096	1.883
1931	0.089	0.908
1932	0.070	0.980
1933	0.067	0.971
1934	0.197	1.578
1935	0.092	0.837
1936	0.080	1.171
1937	0.127	1.741
1938	0.077	0.851
1939	0.005	1.071
1940	0.086	1.888
1941	0.041	1.866
1942	0.129	1.403
1943	0.067	1.390
1944	0.122	1.998
1945	0.108	1.514
1946	0.058	1.175
1947	0.037	0.917
1948	0.203	1.261
1949	0.174	1.947
1950	0.049	1.102
1951	0.061	1.667
1952	0.264	1.880
1953	0.238	1.733
1954	0.086	1.024
1955	0.070	0.952
1956	0.034	0.939
1957	0.122	1.015
1958	0.255	1.270
1959	0.158	1.284
1960	0.042	1.002
1961	0.159	2.858
1962	0.085	1.229
1963	0.041	0.913
1964	0.045	2.646
1965	0.177	1.188
1966	0.050	0.993
1967	0.076	1.392
1968	0.078	1.173
1969	0.078	1.058

1970	0.122	1.203
1971	0.191	1.166
1972	0.124	3.853
1973	0.158	2.238
1974	0.086	1.619
1975	0.201	1.674
1976	0.106	1.783
1977	0.036	0.766
1978	0.179	1.317
1979	0.049	1.357
1980	0.101	1.338
1981	0.097	1.259
1982	0.040	1.026
1983	0.159	1.391
1984	0.065	1.383
1985	0.105	1.574
1986	0.094	0.799
1987	0.180	1.403
1988	0.114	0.837
1989	0.103	0.766
1990	0.116	1.011
1991	0.091	1.511
1992	0.130	1.437
1993	0.126	1.642
1994	0.189	1.124
1995	0.036	0.873
1996	0.207	1.173
1997	0.079	1.049
1998	0.094	1.247
1999	0.008	1.355
2000	0.072	1.191
2001	0.037	0.955
2002	0.131	1.735
2003	0.114	1.012
2004	0.105	1.518
2005	0.194	2.901
2006	0.059	1.361
2007	0.059	1.522
2008	0.100	1.254
2009	0.069	0.958
2010	0.058	1.230
2011	0.047	1.293
2012	0.069	1.200
2013	0.053	1.132
2014	0.040	1.095
2015	0.076	1.840
2016	0.030	1.150
2017	0.145	1.845
2018	0.264	1.138
2019	0.246	1.637
2020	0.080	1.340
2021	0.131	1.129
2022	0.054	1.920
2023	0.110	2.372
2024	0.207	2.545
2025	0.097	1.235
2026	0.158	1.356
2027	0.057	1.513

2028	0.049	0.592
2029	0.107	0.974
2030	0.199	1.949
2031	0.066	0.613
2032	0.036	1.037
2033	0.058	1.303
2034	0.057	1.020
2035	0.225	1.256
2036	0.117	1.019
2037	0.028	1.370
2038	0.093	1.300
2039	0.009	2.613
2040	0.052	1.023
2041	0.070	1.298
2042	0.219	1.497
2043	0.106	1.656
2044	0.142	1.137
2045	0.097	0.921
2046	0.114	1.021
2047	0.084	1.261
2048	0.108	1.039
2049	0.097	1.542
2050	0.069	1.148
2051	0.101	1.618
2052	0.058	1.237
2053	0.104	1.050
2054	0.132	2.085
2055	0.041	1.277
2056	0.046	1.647
2057	0.071	0.810
2058	0.090	1.550
2059	0.159	1.933

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.3136	4.1273
2	0.2643	3.8530
3	0.2640	2.9010
4	0.2550	2.8577
5	0.2463	2.6465
6	0.2384	2.6127
7	0.2248	2.5453
8	0.2186	2.3859
9	0.2071	2.3723
10	0.2068	2.2378
11	0.2027	2.0851
12	0.2008	1.9979
13	0.1992	1.9487
14	0.1973	1.9470
15	0.1937	1.9334
16	0.1913	1.9201
17	0.1889	1.8883
18	0.1799	1.8831
19	0.1788	1.8798
20	0.1774	1.8661
21	0.1737	1.8658
22	0.1594	1.8453

23	0.1586	1.8402
24	0.1585	1.8312
25	0.1585	1.7990
26	0.1581	1.7826
27	0.1577	1.7410
28	0.1503	1.7348
29	0.1496	1.7327
30	0.1460	1.6737
31	0.1452	1.6666
32	0.1446	1.6557
33	0.1425	1.6486
34	0.1320	1.6471
35	0.1314	1.6422
36	0.1307	1.6368
37	0.1299	1.6195
38	0.1293	1.6182
39	0.1271	1.5834
40	0.1260	1.5780
41	0.1241	1.5735
42	0.1221	1.5505
43	0.1218	1.5417
44	0.1215	1.5223
45	0.1167	1.5180
46	0.1160	1.5142
47	0.1144	1.5129
48	0.1140	1.5113
49	0.1136	1.4972
50	0.1100	1.4918
51	0.1083	1.4872
52	0.1077	1.4371
53	0.1075	1.4034
54	0.1074	1.4033
55	0.1072	1.3916
56	0.1071	1.3913
57	0.1063	1.3911
58	0.1059	1.3897
59	0.1056	1.3832
60	0.1052	1.3703
61	0.1051	1.3615
62	0.1038	1.3607
63	0.1025	1.3570
64	0.1012	1.3563
65	0.1009	1.3553
66	0.1007	1.3398
67	0.1001	1.3380
68	0.0971	1.3175
69	0.0970	1.3033
70	0.0969	1.3001
71	0.0968	1.2976
72	0.0962	1.2934
73	0.0958	1.2839
74	0.0951	1.2766
75	0.0945	1.2705
76	0.0943	1.2700
77	0.0941	1.2685
78	0.0940	1.2607
79	0.0931	1.2606
80	0.0916	1.2592

81	0.0912	1.2556
82	0.0909	1.2545
83	0.0903	1.2515
84	0.0890	1.2466
85	0.0864	1.2367
86	0.0860	1.2354
87	0.0858	1.2295
88	0.0856	1.2287
89	0.0851	1.2154
90	0.0837	1.2132
91	0.0803	1.2026
92	0.0796	1.2001
93	0.0794	1.1909
94	0.0778	1.1881
95	0.0776	1.1751
96	0.0775	1.1729
97	0.0763	1.1727
98	0.0762	1.1707
99	0.0744	1.1660
100	0.0730	1.1498
101	0.0719	1.1484
102	0.0713	1.1379
103	0.0703	1.1375
104	0.0698	1.1319
105	0.0696	1.1294
106	0.0695	1.1235
107	0.0691	1.1016
108	0.0687	1.0948
109	0.0685	1.0708
110	0.0672	1.0577
111	0.0665	1.0505
112	0.0658	1.0491
113	0.0646	1.0393
114	0.0606	1.0372
115	0.0605	1.0321
116	0.0592	1.0290
117	0.0588	1.0260
118	0.0586	1.0238
119	0.0585	1.0226
120	0.0582	1.0210
121	0.0580	1.0204
122	0.0576	1.0188
123	0.0575	1.0154
124	0.0570	1.0119
125	0.0567	1.0113
126	0.0541	1.0015
127	0.0535	0.9931
128	0.0517	0.9833
129	0.0497	0.9796
130	0.0494	0.9736
131	0.0492	0.9713
132	0.0490	0.9693
133	0.0490	0.9575
134	0.0472	0.9551
135	0.0459	0.9523
136	0.0452	0.9388
137	0.0449	0.9362
138	0.0419	0.9208

139	0.0409	0.9168
140	0.0409	0.9129
141	0.0408	0.9079
142	0.0398	0.9014
143	0.0396	0.8853
144	0.0395	0.8731
145	0.0368	0.8510
146	0.0368	0.8464
147	0.0367	0.8370
148	0.0363	0.8370
149	0.0358	0.8368
150	0.0358	0.8100
151	0.0345	0.7991
152	0.0314	0.7757
153	0.0304	0.7657
154	0.0279	0.7656
155	0.0202	0.7650
156	0.0093	0.6127
157	0.0076	0.5981
158	0.0048	0.5924

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0471	54298	365090	672	Fail
0.0489	50165	357722	713	Fail
0.0506	46575	350520	752	Fail
0.0524	43312	343650	793	Fail
0.0541	40260	337002	837	Fail
0.0559	37462	330797	883	Fail
0.0577	34925	324648	929	Fail
0.0594	32564	318554	978	Fail
0.0612	30321	312681	1031	Fail
0.0629	28265	306920	1085	Fail
0.0647	26426	301490	1140	Fail
0.0665	24786	296172	1194	Fail
0.0682	23290	291186	1250	Fail
0.0700	21928	286144	1304	Fail
0.0717	20637	281324	1363	Fail
0.0735	19412	276560	1424	Fail
0.0752	18282	271906	1487	Fail
0.0770	17213	267419	1553	Fail
0.0788	16155	262987	1627	Fail
0.0805	15141	258721	1708	Fail
0.0823	14266	254566	1784	Fail
0.0840	13446	250522	1863	Fail
0.0858	12659	246533	1947	Fail
0.0876	11933	242599	2033	Fail
0.0893	11241	238832	2124	Fail
0.0911	10559	235065	2226	Fail
0.0928	9972	231298	2319	Fail
0.0946	9374	227641	2428	Fail
0.0963	8842	224151	2535	Fail
0.0981	8332	220605	2647	Fail
0.0999	7856	217281	2765	Fail
0.1016	7462	213957	2867	Fail
0.1034	7047	210799	2991	Fail
0.1051	6620	207586	3135	Fail
0.1069	6282	204595	3256	Fail
0.1087	5983	201492	3367	Fail
0.1104	5701	198445	3480	Fail
0.1122	5447	195564	3590	Fail
0.1139	5198	192517	3703	Fail
0.1157	4950	189803	3834	Fail
0.1174	4707	186922	3971	Fail
0.1192	4510	184096	4081	Fail
0.1210	4342	181492	4179	Fail
0.1227	4159	178778	4298	Fail
0.1245	3964	176285	4447	Fail
0.1262	3770	173626	4605	Fail
0.1280	3587	171133	4770	Fail
0.1298	3417	168695	4936	Fail
0.1315	3260	166091	5094	Fail
0.1333	3136	163875	5225	Fail
0.1350	3027	161382	5331	Fail
0.1368	2934	159166	5424	Fail
0.1385	2815	156784	5569	Fail
0.1403	2681	154568	5765	Fail

0.1421	2559	152407	5955	Fail
0.1438	2451	150191	6127	Fail
0.1456	2363	148086	6266	Fail
0.1473	2256	145925	6468	Fail
0.1491	2148	143875	6698	Fail
0.1509	2041	141770	6946	Fail
0.1526	1952	139665	7154	Fail
0.1544	1862	137781	7399	Fail
0.1561	1778	135732	7633	Fail
0.1579	1696	133903	7895	Fail
0.1596	1619	131909	8147	Fail
0.1614	1561	130025	8329	Fail
0.1632	1484	128252	8642	Fail
0.1649	1407	126424	8985	Fail
0.1667	1341	124651	9295	Fail
0.1684	1270	122823	9671	Fail
0.1702	1219	121106	9934	Fail
0.1720	1164	119333	10251	Fail
0.1737	1103	117616	10663	Fail
0.1755	1057	115954	10970	Fail
0.1772	1006	114292	11361	Fail
0.1790	965	112796	11688	Fail
0.1807	920	111189	12085	Fail
0.1825	872	109582	12566	Fail
0.1843	815	108197	13275	Fail
0.1860	774	106702	13785	Fail
0.1878	738	105261	14263	Fail
0.1895	695	103710	14922	Fail
0.1913	640	102325	15988	Fail
0.1931	601	100829	16776	Fail
0.1948	553	99444	17982	Fail
0.1966	517	98059	18966	Fail
0.1983	478	96730	20236	Fail
0.2001	434	95400	21981	Fail
0.2018	394	94015	23861	Fail
0.2036	363	92741	25548	Fail
0.2054	340	91522	26918	Fail
0.2071	310	90248	29112	Fail
0.2089	297	89084	29994	Fail
0.2106	273	87755	32144	Fail
0.2124	253	86647	34247	Fail
0.2142	237	85372	36021	Fail
0.2159	223	84264	37786	Fail
0.2177	206	83156	40366	Fail
0.2194	194	81993	42264	Fail
0.2212	180	80885	44936	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.3855 acre-feet
On-line facility target flow:	0.5317 cfs.
Adjusted for 15 min:	0.5317 cfs.
Off-line facility target flow:	0.3064 cfs.
Adjusted for 15 min:	0.3064 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   P-5-WQ.wdm
MESSU       25   PreP-5-WQ.MES
            27   PreP-5-WQ.L61
            28   PreP-5-WQ.L62
            30   POCP-5-WQ1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                     1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10             0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                       4.471     COPY   501     12
PERLND  10                       4.471     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><--->
```

```
WDM      1 EVAP     ENGL    1             PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1             IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   P-5-WQ.wdm
MESSU       25   MitP-5-WQ.MES
            27   MitP-5-WQ.L61
            28   MitP-5-WQ.L62
            30   POCP-5-WQ1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       7
      IMPLND       1
      IMPLND       8
      IMPLND      14
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                      in  out           ***
    7     A/B, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    7         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
```

```
    7         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    7         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    7             0         5       0.8       400      0.05       0.3     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    7             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    7          0.1       0.5      0.25         0       0.7      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS       GWVS
    7             0         0         0         0         3         1          0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
   14      POND                   1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    8         0    0    1    0    0    0
   14         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
   14         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    8         0    0    0    0    0
   14         0    0    0    0    0
  END IWAT-PARM1
```

```
  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
   14            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    8              0         0
   14              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    8              0         0
   14              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND   7                      0.882     COPY   501     12
PERLND   7                      0.882     COPY   501     13
IMPLND   1                      2.499     COPY   501     15
IMPLND   8                      0.948     COPY   501     15
IMPLND  14                      0.142     COPY   501     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
```

```
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
             FG FG FG FG  possible  exit  *** possible  exit      possible  exit
              *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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WWHM2012

PROJECT REPORT

General Model Information

Project Name:	P-6-WQ
Site Name:	
Site Address:	
City:	
Report Date:	8/10/2022
Gage:	38 IN CENTRAL
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2019/09/13
Version:	4.2.17

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	0.979
Pervious Total	0.979
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.979

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	0.519
Pervious Total	0.519

Impervious Land Use	acre
ROADS FLAT	0.429
POND	0.031
Impervious Total	0.46
Basin Total	0.979

Element Flows To:

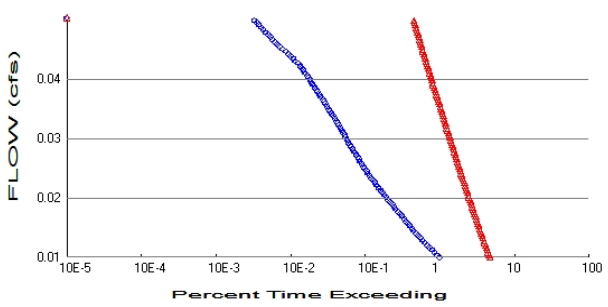
Surface	Interflow	Groundwater

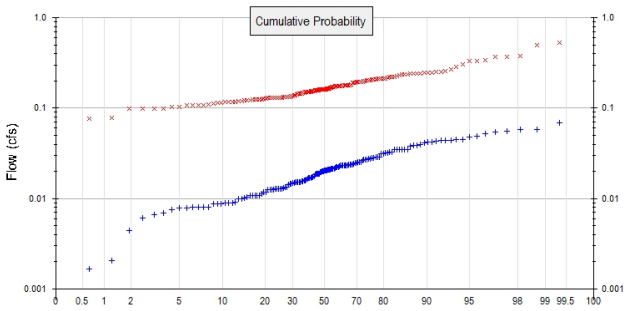
Routing Elements
Predeveloped Routing

Mitigated Routing

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.979
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.519
Total Impervious Area: 0.46

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.02063
5 year	0.032095
10 year	0.038324
25 year	0.044664
50 year	0.048433
100 year	0.051531

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.162031
5 year	0.218189
10 year	0.259104
25 year	0.315213
50 year	0.360322
100 year	0.408363

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1902	0.015	0.191
1903	0.013	0.211
1904	0.021	0.239
1905	0.010	0.107
1906	0.004	0.120
1907	0.032	0.160
1908	0.023	0.132
1909	0.023	0.163
1910	0.032	0.156
1911	0.021	0.175

1912	0.069	0.380
1913	0.033	0.126
1914	0.008	0.529
1915	0.013	0.108
1916	0.021	0.203
1917	0.007	0.077
1918	0.022	0.163
1919	0.016	0.099
1920	0.021	0.132
1921	0.023	0.114
1922	0.024	0.179
1923	0.019	0.125
1924	0.009	0.235
1925	0.011	0.098
1926	0.020	0.191
1927	0.013	0.156
1928	0.016	0.116
1929	0.033	0.231
1930	0.021	0.241
1931	0.019	0.117
1932	0.015	0.126
1933	0.015	0.124
1934	0.043	0.202
1935	0.020	0.108
1936	0.017	0.150
1937	0.028	0.223
1938	0.017	0.109
1939	0.001	0.138
1940	0.019	0.242
1941	0.009	0.239
1942	0.028	0.180
1943	0.015	0.178
1944	0.027	0.256
1945	0.024	0.194
1946	0.013	0.151
1947	0.008	0.118
1948	0.044	0.162
1949	0.038	0.250
1950	0.011	0.141
1951	0.013	0.214
1952	0.058	0.246
1953	0.052	0.224
1954	0.019	0.131
1955	0.015	0.122
1956	0.008	0.120
1957	0.027	0.130
1958	0.056	0.171
1959	0.035	0.176
1960	0.009	0.128
1961	0.035	0.366
1962	0.019	0.157
1963	0.009	0.117
1964	0.010	0.339
1965	0.039	0.158
1966	0.011	0.127
1967	0.017	0.178
1968	0.017	0.150
1969	0.017	0.136

1970	0.027	0.154
1971	0.042	0.150
1972	0.027	0.494
1973	0.035	0.287
1974	0.019	0.208
1975	0.044	0.216
1976	0.023	0.228
1977	0.008	0.098
1978	0.039	0.181
1979	0.011	0.174
1980	0.022	0.171
1981	0.021	0.161
1982	0.009	0.132
1983	0.035	0.178
1984	0.014	0.177
1985	0.023	0.202
1986	0.021	0.102
1987	0.039	0.180
1988	0.025	0.107
1989	0.022	0.098
1990	0.025	0.130
1991	0.020	0.194
1992	0.028	0.184
1993	0.028	0.210
1994	0.041	0.144
1995	0.008	0.112
1996	0.045	0.151
1997	0.017	0.134
1998	0.021	0.160
1999	0.002	0.174
2000	0.016	0.153
2001	0.008	0.122
2002	0.029	0.223
2003	0.025	0.130
2004	0.023	0.195
2005	0.042	0.372
2006	0.013	0.174
2007	0.013	0.195
2008	0.022	0.161
2009	0.015	0.123
2010	0.013	0.158
2011	0.010	0.166
2012	0.015	0.154
2013	0.012	0.145
2014	0.009	0.140
2015	0.017	0.236
2016	0.007	0.147
2017	0.032	0.237
2018	0.058	0.161
2019	0.054	0.210
2020	0.018	0.172
2021	0.029	0.145
2022	0.012	0.246
2023	0.024	0.304
2024	0.045	0.330
2025	0.021	0.159
2026	0.035	0.174
2027	0.012	0.194

2028	0.011	0.076
2029	0.024	0.125
2030	0.044	0.250
2031	0.014	0.079
2032	0.008	0.133
2033	0.013	0.167
2034	0.012	0.131
2035	0.049	0.161
2036	0.026	0.131
2037	0.006	0.176
2038	0.020	0.167
2039	0.002	0.335
2040	0.011	0.131
2041	0.015	0.166
2042	0.048	0.192
2043	0.023	0.212
2044	0.031	0.146
2045	0.021	0.118
2046	0.025	0.131
2047	0.018	0.162
2048	0.024	0.133
2049	0.021	0.198
2050	0.015	0.147
2051	0.022	0.207
2052	0.013	0.159
2053	0.023	0.135
2054	0.029	0.267
2055	0.009	0.164
2056	0.010	0.211
2057	0.016	0.104
2058	0.020	0.199
2059	0.035	0.248

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.0687	0.5291
2	0.0579	0.4940
3	0.0578	0.3799
4	0.0558	0.3721
5	0.0539	0.3663
6	0.0522	0.3395
7	0.0492	0.3349
8	0.0479	0.3302
9	0.0453	0.3041
10	0.0453	0.2868
11	0.0444	0.2673
12	0.0440	0.2561
13	0.0436	0.2498
14	0.0432	0.2496
15	0.0424	0.2478
16	0.0419	0.2464
17	0.0414	0.2461
18	0.0394	0.2420
19	0.0391	0.2414
20	0.0388	0.2392
21	0.0380	0.2391
22	0.0349	0.2365

23	0.0347	0.2359
24	0.0347	0.2347
25	0.0347	0.2306
26	0.0346	0.2285
27	0.0345	0.2239
28	0.0329	0.2231
29	0.0328	0.2228
30	0.0320	0.2156
31	0.0318	0.2136
32	0.0317	0.2122
33	0.0312	0.2113
34	0.0289	0.2111
35	0.0288	0.2105
36	0.0286	0.2101
37	0.0285	0.2076
38	0.0283	0.2074
39	0.0278	0.2029
40	0.0276	0.2023
41	0.0272	0.2017
42	0.0267	0.1987
43	0.0267	0.1976
44	0.0266	0.1951
45	0.0256	0.1946
46	0.0254	0.1941
47	0.0250	0.1939
48	0.0250	0.1937
49	0.0249	0.1919
50	0.0241	0.1912
51	0.0237	0.1906
52	0.0236	0.1842
53	0.0235	0.1812
54	0.0235	0.1799
55	0.0235	0.1799
56	0.0235	0.1794
57	0.0233	0.1784
58	0.0232	0.1783
59	0.0231	0.1781
60	0.0230	0.1773
61	0.0230	0.1762
62	0.0227	0.1757
63	0.0225	0.1745
64	0.0222	0.1744
65	0.0221	0.1740
66	0.0220	0.1739
67	0.0219	0.1739
68	0.0213	0.1719
69	0.0212	0.1715
70	0.0212	0.1712
71	0.0212	0.1672
72	0.0211	0.1667
73	0.0210	0.1663
74	0.0208	0.1660
75	0.0207	0.1636
76	0.0206	0.1630
77	0.0206	0.1628
78	0.0206	0.1618
79	0.0204	0.1616
80	0.0201	0.1614

81	0.0200	0.1610
82	0.0199	0.1608
83	0.0198	0.1607
84	0.0195	0.1604
85	0.0189	0.1598
86	0.0188	0.1587
87	0.0188	0.1585
88	0.0187	0.1582
89	0.0186	0.1579
90	0.0183	0.1575
91	0.0176	0.1558
92	0.0174	0.1555
93	0.0174	0.1543
94	0.0170	0.1538
95	0.0170	0.1526
96	0.0170	0.1515
97	0.0167	0.1506
98	0.0167	0.1503
99	0.0163	0.1501
100	0.0160	0.1499
101	0.0157	0.1474
102	0.0156	0.1472
103	0.0154	0.1458
104	0.0153	0.1451
105	0.0153	0.1448
106	0.0152	0.1441
107	0.0151	0.1412
108	0.0150	0.1403
109	0.0150	0.1375
110	0.0147	0.1356
111	0.0146	0.1346
112	0.0144	0.1345
113	0.0141	0.1333
114	0.0133	0.1329
115	0.0133	0.1323
116	0.0130	0.1319
117	0.0129	0.1315
118	0.0128	0.1312
119	0.0128	0.1311
120	0.0128	0.1310
121	0.0127	0.1309
122	0.0126	0.1307
123	0.0126	0.1304
124	0.0125	0.1297
125	0.0124	0.1296
126	0.0119	0.1284
127	0.0117	0.1273
128	0.0113	0.1261
129	0.0109	0.1256
130	0.0108	0.1255
131	0.0108	0.1250
132	0.0107	0.1245
133	0.0107	0.1229
134	0.0103	0.1224
135	0.0100	0.1222
136	0.0099	0.1203
137	0.0098	0.1203
138	0.0092	0.1181

139	0.0090	0.1178
140	0.0090	0.1171
141	0.0089	0.1166
142	0.0087	0.1155
143	0.0087	0.1135
144	0.0086	0.1119
145	0.0081	0.1091
146	0.0081	0.1085
147	0.0080	0.1076
148	0.0079	0.1074
149	0.0078	0.1073
150	0.0078	0.1039
151	0.0075	0.1024
152	0.0069	0.0994
153	0.0067	0.0983
154	0.0061	0.0982
155	0.0044	0.0981
156	0.0020	0.0788
157	0.0017	0.0767
158	0.0011	0.0760

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0103	54354	259220	476	Fail
0.0107	50160	252128	502	Fail
0.0111	46609	245369	526	Fail
0.0115	43312	238721	551	Fail
0.0119	40293	232461	576	Fail
0.0122	37451	226145	603	Fail
0.0126	34941	220273	630	Fail
0.0130	32553	214456	658	Fail
0.0134	30348	209027	688	Fail
0.0138	28265	203653	720	Fail
0.0142	26443	198611	751	Fail
0.0146	24786	193459	780	Fail
0.0149	23302	188639	809	Fail
0.0153	21928	183875	838	Fail
0.0157	20648	179443	869	Fail
0.0161	19412	174900	900	Fail
0.0165	18293	170634	932	Fail
0.0169	17219	166368	966	Fail
0.0172	16166	162435	1004	Fail
0.0176	15141	158390	1046	Fail
0.0180	14282	154568	1082	Fail
0.0184	13446	150801	1121	Fail
0.0188	12676	147144	1160	Fail
0.0192	11933	143543	1202	Fail
0.0196	11246	140053	1245	Fail
0.0199	10559	136618	1293	Fail
0.0203	9978	133405	1336	Fail
0.0207	9374	130081	1387	Fail
0.0211	8853	127034	1434	Fail
0.0215	8332	123931	1487	Fail
0.0219	7861	120940	1538	Fail
0.0223	7457	118003	1582	Fail
0.0226	7036	115123	1636	Fail
0.0230	6609	112408	1700	Fail
0.0234	6277	109804	1749	Fail
0.0238	5978	107256	1794	Fail
0.0242	5706	104763	1836	Fail
0.0246	5437	102214	1879	Fail
0.0249	5199	99832	1920	Fail
0.0253	4942	97450	1971	Fail
0.0257	4706	95178	2022	Fail
0.0261	4511	92907	2059	Fail
0.0265	4339	90857	2093	Fail
0.0269	4154	88696	2135	Fail
0.0273	3958	86647	2189	Fail
0.0276	3764	84597	2247	Fail
0.0280	3582	82713	2309	Fail
0.0284	3412	80774	2367	Fail
0.0288	3265	78891	2416	Fail
0.0292	3134	76951	2455	Fail
0.0296	3027	75179	2483	Fail
0.0300	2926	73461	2510	Fail
0.0303	2815	71855	2552	Fail
0.0307	2682	70193	2617	Fail

0.0311	2556	68531	2681	Fail
0.0315	2451	66979	2732	Fail
0.0319	2361	65539	2775	Fail
0.0323	2256	63988	2836	Fail
0.0326	2143	62658	2923	Fail
0.0330	2038	61162	3001	Fail
0.0334	1952	59777	3062	Fail
0.0338	1860	58448	3142	Fail
0.0342	1778	57173	3215	Fail
0.0346	1688	55844	3308	Fail
0.0350	1619	54625	3373	Fail
0.0353	1561	53351	3417	Fail
0.0357	1483	52126	3514	Fail
0.0361	1407	50913	3618	Fail
0.0365	1340	49766	3713	Fail
0.0369	1270	48570	3824	Fail
0.0373	1218	47456	3896	Fail
0.0377	1163	46315	3982	Fail
0.0380	1103	45229	4100	Fail
0.0384	1055	44254	4194	Fail
0.0388	1006	43285	4302	Fail
0.0392	963	42287	4391	Fail
0.0396	920	41379	4497	Fail
0.0400	872	40442	4637	Fail
0.0403	815	39545	4852	Fail
0.0407	773	38659	5001	Fail
0.0411	738	37772	5118	Fail
0.0415	694	36925	5320	Fail
0.0419	637	36116	5669	Fail
0.0423	601	35285	5871	Fail
0.0427	555	34531	6221	Fail
0.0430	517	33800	6537	Fail
0.0434	478	33052	6914	Fail
0.0438	434	32299	7442	Fail
0.0442	394	31601	8020	Fail
0.0446	363	30930	8520	Fail
0.0450	339	30265	8927	Fail
0.0454	310	29617	9553	Fail
0.0457	296	28963	9784	Fail
0.0461	273	28310	10369	Fail
0.0465	252	27767	11018	Fail
0.0469	237	27146	11454	Fail
0.0473	223	26526	11895	Fail
0.0477	206	25961	12602	Fail
0.0480	195	25373	13011	Fail
0.0484	180	24808	13782	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.0494 acre-feet
On-line facility target flow:	0.0683 cfs.
Adjusted for 15 min:	0.0683 cfs.
Off-line facility target flow:	0.0393 cfs.
Adjusted for 15 min:	0.0393 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

Model Default Modifications

Total of 0 changes have been made.

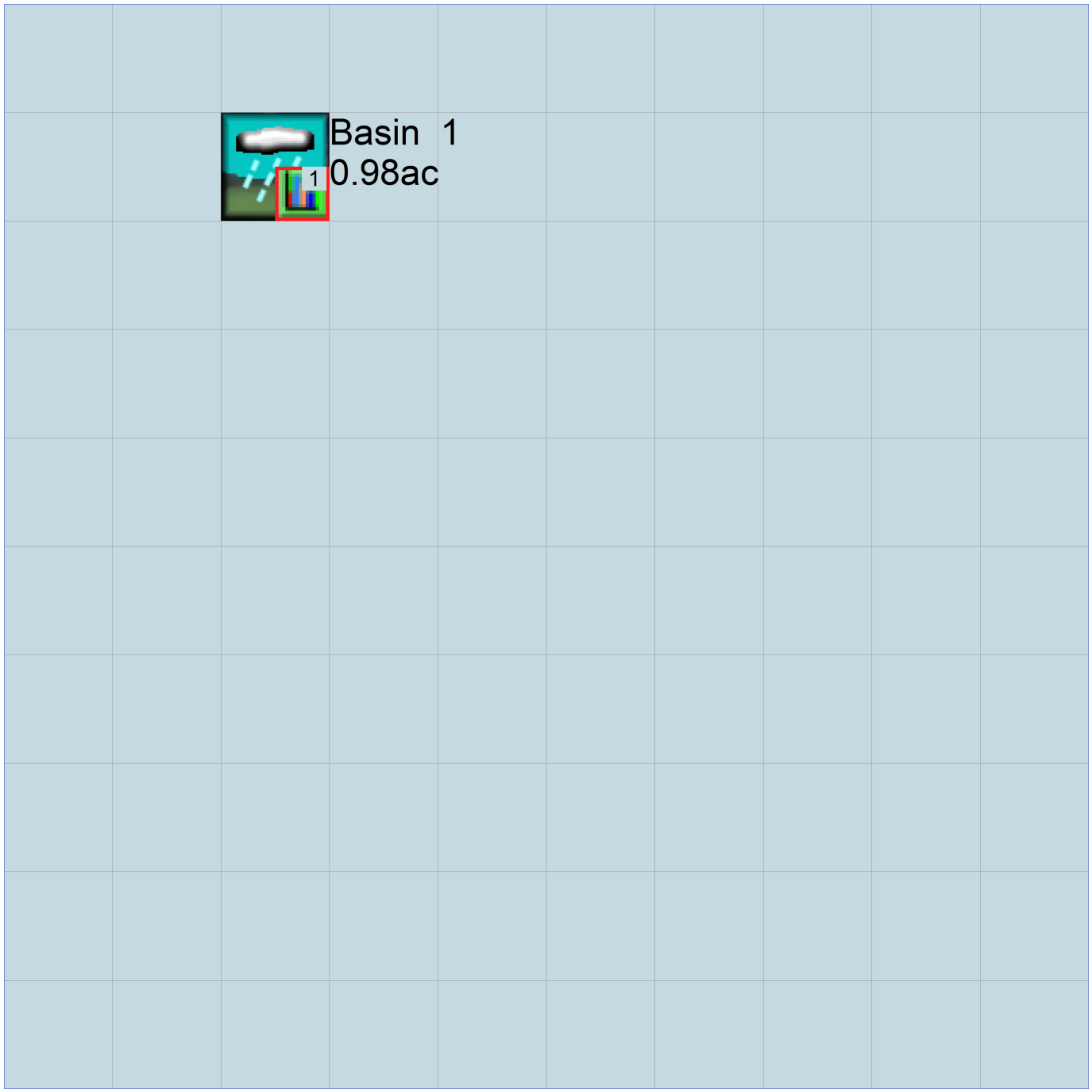
PERLND Changes

No PERLND changes have been made.

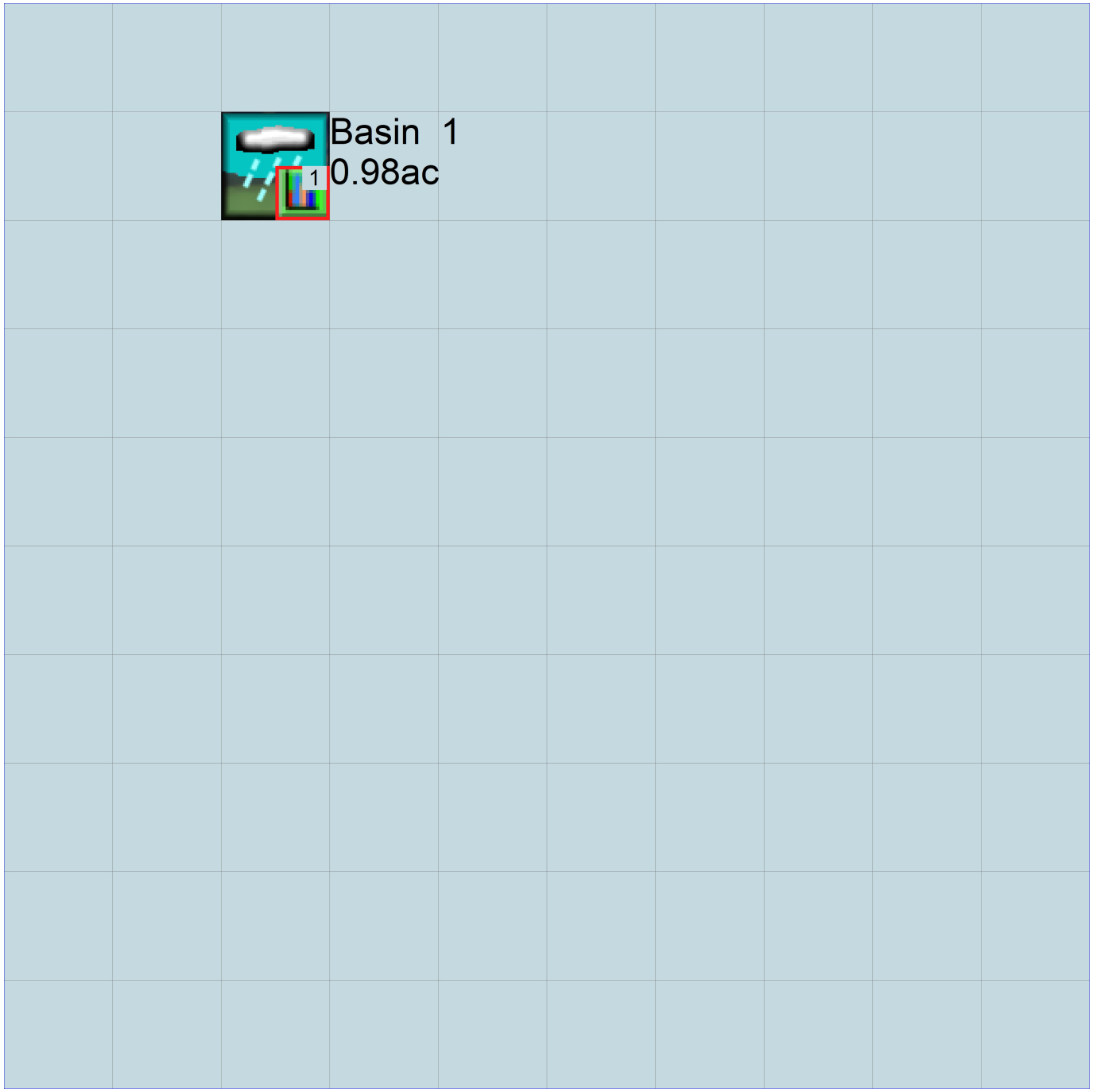
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   P-6-WQ.wdm
MESSU       25   PreP-6-WQ.MES
            27   PreP-6-WQ.L61
            28   PreP-6-WQ.L62
            30   POCP-6-WQ1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                     1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                       in  out           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10           0.2       0.5      0.35         6       0.5       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   10             0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                       0.979     COPY   501     12
PERLND  10                       0.979     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><--->
```

```
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   P-6-WQ.wdm
MESSU       25   MitP-6-WQ.MES
            27   MitP-6-WQ.L61
            28   MitP-6-WQ.L62
            30   POCP-6-WQ1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       7
      IMPLND       1
      IMPLND      14
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                        in  out           ***
    7     A/B, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
    7         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
    7         0    0    4    0    0    0    0    0    0    0    0    0    1    9
```

```
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
    7         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
    7             0         5       0.8       400      0.05       0.3     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
    7             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
    7          0.1       0.5      0.25         0       0.7      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
    7             0         0         0         0         3         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
   14      POND                   1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
   14         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
   14         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
   14         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
   14            400      0.01       0.1       0.1
```

```
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
   14              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
   14              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND   7                      0.519     COPY   501     12
PERLND   7                      0.519     COPY   501     13
IMPLND   1                      0.429     COPY   501     15
IMPLND  14                      0.031     COPY   501     15

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
```

```
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                        ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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APPENDIX G:
Infiltration Memo