Jackson Highway Tiny Homes

Chehalis, WA

Drainage and Erosion Control Report

Fuller Designs Project No. 2039

May 10th, 2021

Prepared by:

FULLER DESIGNS

1101 Kresky Ave., Centralia, WA 98531; 360.269.4104

PRELIMINARY DRAINAGE AND EROSION CONTROL REPORT

Jackson Highway Tiny Homes
Chehalis, Washington
May 10th, 2021

Project Information

Contact: David T. Cosser
282 SW 13th St
Chehalis, WA 98532

Reviewing Agency

Jurisdiction: City of Chehalis
Contact: Trent Lougheed, City Engineer

References

2012 Stormwater Management Manual for Western Washington as Amended in December 2014 (The 2014 SWMMWW)

Project Engineer

Prepared by: Fuller Designs, Inc.
1101 Kresky Ave.
Centralia, WA 98531
(360) 880-4927

Contact: Aaron Fuller, PE

"I hereby certify that this Drainage and Erosion Control Report for the Hubbard Condos project has been prepared by me or under my supervision and meets minimum standards of the City of Chehalis and normal standards of engineering practice. I hereby acknowledge and agree that the jurisdiction does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities designed by me."

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DRAINAGE AND EROSION CONTROL REPORT

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SECTION 1 – PROPOSED PROJECT DESCRIPTION

Site Address: 2945 Jackson Highway, Chehalis, WA 98532

Parcel Number(s): 017808001006

Total Site Area: 8.34 Acres

Zoning: UGA – Residential

Sec, Twn, Rge: Section 14, Township 13N, Range 2W, W.M.

Proposed Improvements
The site is located on Jackson Highway 1,080 feet North-West from its intersection with Bishop and Yates Road. This project will construct a 56-unit condominium and necessary access/parking.

Stormwater runoff from the proposed impervious areas will be collected via filter catch basins, and then conveyed to an enlarged detention pond just in-site. Runoff will then be sent to the adjacent natural drainage paths.

The lot will be served by:

City of Chehalis	Water
Lewis County Sewer District #4	Sewer
Lewis County PUD	Electricity
Centurylink & Comast	Telecommunications
Lemay	Refuse & Recycling

The subject property is completely bordered by residential zoning in the Chehalis UGA

SECTION 2 – EXISTING CONDITONS DESCRIPTION

The lot currently fronts Jackson Highway. The lot is currently an unused area served by an existing driveway from Jackson Highway in the southwest corner of the lot. This gravel driveway serves as the primary access to the residence. The project area is mainly flat yard area that drains to the south-west property line.

Vegetation onsite is consistent with medium to low density residential lots. Grasses and small shrubs are predominant throughout the site.

According to the online USDA Web Soil Survey tool, soils in the area include Reed Silty Clay Loam, Scamman Silty Clay Loam and Salkum Silty Clay Loam. A soil analysis was also conducted. It was determined, the soil onsite consists of SW (well-graded sand, fine to coarse sand), and SP (poorly graded sand). The soils were determined to have a short-term K-value of 47.72-in/hr, and a long-term K-value of 5.67-in/hr. The soil report

generated using the online tool, USDA Web Soil Survey, and soil analysis can be found in APPENDIX A of this report.

The project utilities and improvements will be built in one phase. Asphalt extensions and individual site improvements will be constructed immediately. The proposed construction schedule would start in Winter of 2021 and be complete by spring 2022.

SECTION 3 – OFFSITE ANALYSIS REPORTS

The area immediately adjacent to the proposed project properties is:

- West – Residential UGA
- South – Residential UGA
- East – Residential RDD-5
- North – Residential UGA and Jackson Highway

Properties to the east of the site are higher than the project and shed water too it. A portion of the watershed flows into a culvert which discharges southwest of the project site, the remaining watershed drains sheet flow towards the southwest of the project site converging with the forementioned watershed. Properties on all other sides are lower than this site and do not contribute runoff.

The proposed project plans to maintain the natural drainage paths by releasing stormwater to current drainage location southwest of the project site. This area has not been flagged as a possible stormwater problem area.

SECTION 4 – APPLICABLE MINIMUM REQUIREMENTS

The minimum requirements for stormwater development and redevelopment sites are listed in Volume 1 chapter 2 of the 2014 Washington State Department of Ecology Stormwater Management Manual for Western Washington (SWMMWW). Not all minimum requirements of this section apply to all projects. Determination of applicable minimum requirements is based on section 2.4 of the WSDOE SWMMWW.

Based on the thresholds given in figures 2.4.1 and 2.4.2 of the SWMMWW, the proposed Jackson Highway Tiny Homes project will create more than 5000 square feet of new impervious surface and thus must address all minimum requirements. These requirements as they apply to the project are discussed in more detail below.

Minimum Requirement #1 – Preparation of Drainage Control Plans:

A Stormwater Site Plan has been prepared (see Erosion Control and Drainage Plans).

Minimum Requirement #2 – Construction Stormwater Pollution Prevention Plan

A Construction Stormwater Pollution Prevention Plan (SWPPP) has been prepared. See section 7.

Minimum Requirement #3 – Source Control of Pollution

All known, available, and reasonable source control BMPs shall be applied to the project to limit pollutants from encountering stormwater. Construction specific BMP's will be provided during construction (see Section 7 SWPPP for reference).

Minimum Requirement #4 – Preservation of Natural Drainage Systems and Outfalls

Stormwater leaving the site will be either dispersed toward natural drainages or directed toward the southwestern ditch where runoff currently goes. The same discharge points will be used in both pre and post development. Improvements onsite do not propose to impact natural drainages inside their associated buffers.

Minimum Requirement #5 – On-site Stormwater Management

This project is inside the UGA , therefore, List #2 from Section 2.5.5 in Volume I of the SWMMWW is applicable.

The proposed Best Management Practice's (BMP's) are as follows:

Lawn and Landscape Areas:

- All disturbed areas not being covered with a hard surface and all new lawn and landscape areas will contain soils meeting the Post-Construction Soil Quality and Depth (BMP T5.13) requirements.

Roof Areas:

- Roof area on the project shall use Downspout Dispersion (T5.10B), or Perforated Stubouts (T5.10C).

Other Hard Surface Areas:

- Stormwater runoff from the new paved areas will be routed to the proposed stormwater treatment and attenuation.

Minimum Requirement #6 – Runoff Treatment

This project proposes to create more than 5000 square feet of pollution-generating hard surface (PGHS) and is subject to this minimum requirement.

In the present, existing predeveloped condition of the site, runoff flows downhill from the eastern to the western side of the site, and down to the existing ditches east of the Jackson Hwy. In the proposed, developed condition runoff of basin 1 is proposed to be concentrated to a Contech StormFilter Catch Basin. After collection and treatment, 100-percent of the stormwater runoff will be infiltrated. WWHM2012 (WWHM2012 Report, Section 5) was utilized to determine the facility size necessary for developed condition of basin2. The site was determined to have along K-value of approximately 5.67-in/hr (Soil Analysis, Section 7), as a factor of safety, a K-value of 5-in/hr was utilized. To determine the infiltration volumes that would be routed through the facilities, 618' long channel and a

trapezoidal pond, 5.5' deep, 3 orifice was modeled in WWHM2012 (WWHM2012 Report, Section 5).

Minimum Requirement #7 – Flow Control

The development pre and post runoff rates were compared based on existing and proposed land coverage types using the WWHM2012 continuous inflow model. Stormwater from this site will be routed to a new wet/detention pond.

Minimum Requirement #8 – Wetlands Protection

The thresholds identified in Minimum Requirement #6 – Runoff Treatment, and Minimum Requirement #7 – Flow Control are used to determine the applicability of this requirement to discharges to wetlands. Since Minimum Requirements #6 and #7 are properly mitigated, Minimum Requirement #8 is considered satisfied. Also, wetland impacts on this site were properly mitigated through credit application.

Minimum Requirement #9 – Operation and Maintenance

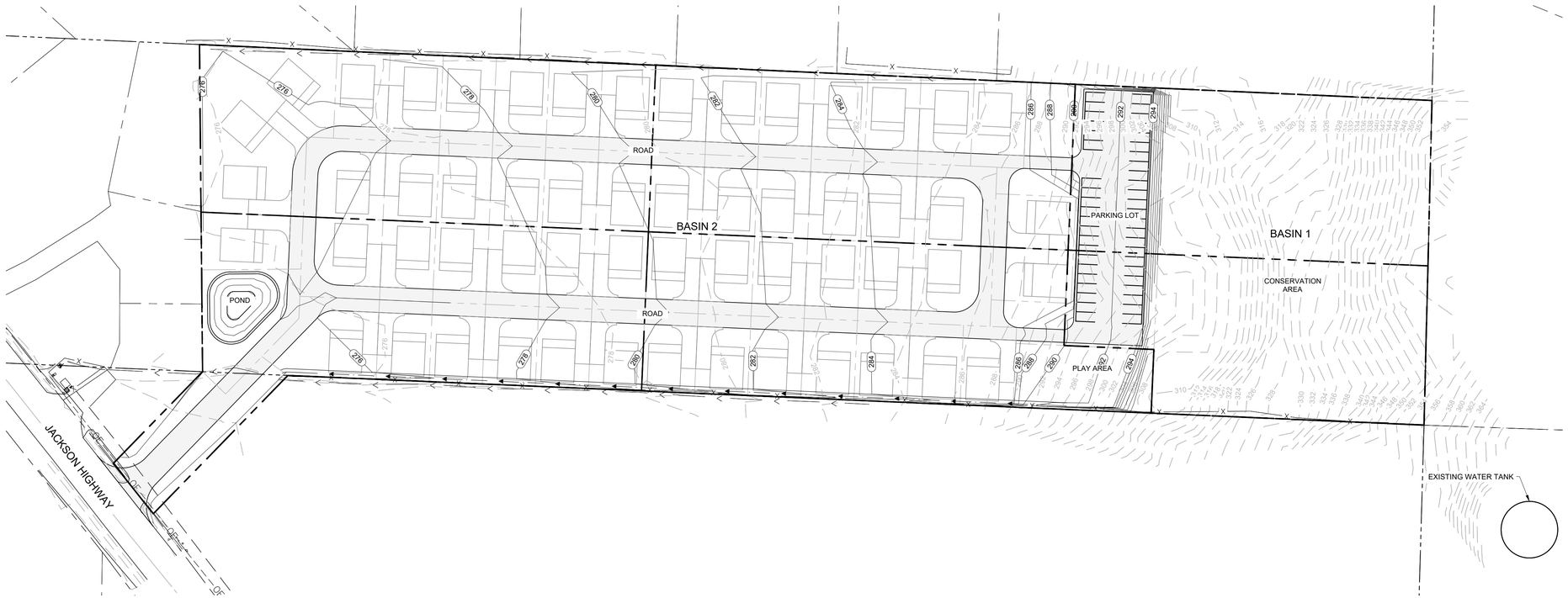
Maintenance of storm drainage facilities (bioswales, catch basins, ponds, etc..) will be the responsibility of the landowner whose property the individual structure is located on. All improvements within Jackson right-of-way (roadside ditches, culverts, etc..) will be maintained by Lewis County. A storm drainage operation and maintenance plan are included in this report. If required by the City of Chehalis, a performance bond or security can be obtained prior to final approval.

SECTION 5 – PERMANENT STORMWATER CONTROL PLAN

This project will utilize Post-Construction Soil Quality and Depth in accordance with BMP T5.13 from Chapter 5 of the SWMMWW. A pre/post basin flow control analysis, basin map, sub basin water quality analysis, and bioswale calculation has been provided in the next few pages.

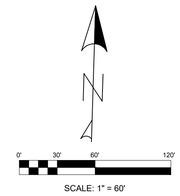
EXISTING CONDITIONS

(SCALE: 1" = 60')



DEVELOPED CONDITIONS

(SCALE: 1" = 60')



SCALE: 1" = 60'

EXISTING CONDITIONS

BASIN 1

EXISTING FOREST	2.16 AC
EXISTING PASTURE	0.10 AC
PERVIOUS TOTAL	2.26 AC
IMPERVIOUS TOTAL	0.00 AC
BASIN 1 TOTAL	2.26 AC

BASIN 2

EXISTING FOREST	0.45 AC
EXISTING PASTURE	5.59 AC
EXISTING GRAVEL	0.04 AC
PERVIOUS TOTAL	6.04 AC
IMPERVIOUS TOTAL	0.04 AC
BASIN 2 TOTAL	6.08 AC

DEVELOPED CONDITIONS

BASIN 1

REMAINING FOREST	1.18 AC
PROPOSED PASTURE	0.67 AC
PROPOSED PARKING	0.41 AC
PERVIOUS TOTAL	1.85 AC
IMPERVIOUS TOTAL	0.41 AC
BASIN 1 TOTAL	2.26 AC

BASIN 2

PROPOSED PASTURE	2.70 AC
PROPOSED ROAD	1.03 AC
PROPOSED DRIVEWAY	0.57 AC
PROPOSED ROOF	1.71 AC
PROPOSED POND	0.07 AC
PERVIOUS TOTAL	2.70 AC
IMPERVIOUS TOTAL	3.38 AC
BASIN 2 TOTAL	6.08 AC

PRELIMINARY
FOR PERMIT ONLY

DRAWING TITLE: BASIN MAP
SCALE: 1" = 60'
DATE: 05/10/21
DRAWN: MM
CHECKED: AF
PROJECT NAME: JACKSON HIGHWAY TINY HOMES

FULLER DESIGNS
1101 KRESKY AVE
CENTRALIA, WA 98531
(360) 807-4420

REV:	DESCRIPTION:	DATE:
0	PRELIMINARY - FOR PERMIT	05/10/21

BASIN

1 OF 1

WWHM2012

PROJECT REPORT

General Model Information

Project Name:	BASIN 1
Site Name:	Cosser
Site Address:	2945 Jackson Hwy
City:	Chehalis
Report Date:	5/10/2021
Gage:	Olympia
Data Start:	1955/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	0.800
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, Steep	2.16
C, Pasture, Steep	0.1
Pervious Total	2.26

Impervious Land Use	acre
Impervious Total	0
Basin Total	2.26

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Forest, Steep	1.18
A B, Lawn, Steep	0.67
Pervious Total	1.85

Impervious Land Use	acre
PARKING FLAT	0.41
Impervious Total	0.41
Basin Total	2.26

Element Flows To:

Surface	Interflow	Groundwater
Tank 1	Tank 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Tank 1

Dimensions
Depth: 4 ft.
Tank Type: Circular
Diameter: 4 ft.
Length: 720 ft.
Infiltration On
Infiltration rate: 5
Infiltration safety factor: 1
Total Volume Infiltrated (ac-ft.): 112.082
Total Volume Through Riser (ac-ft.): 0
Total Volume Through Facility (ac-ft.): 112.082
Percent Infiltrated: 100
Total Precip Applied to Facility: 0
Total Evap From Facility: 0
Discharge Structure
Riser Height: 3.9 ft.
Riser Diameter: 24 in.
Notch Type: Rectangular
Notch Width: 0.028 ft.
Notch Height: 1.558 ft.
Orifice 1 Diameter: 0.5 in. Elevation:3.85833333333333 ft.
Element Flows To:
Outlet 1 Outlet 2

Tank Hydraulic Table

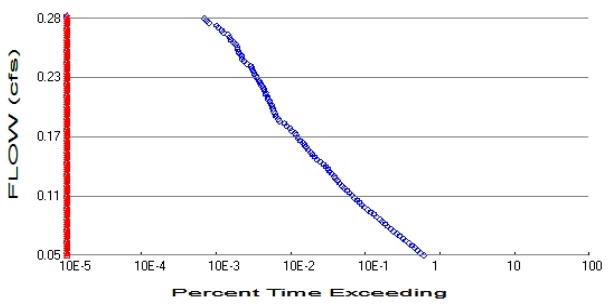
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.000	0.000	0.000	0.000
0.0444	0.013	0.000	0.000	0.069
0.0889	0.019	0.001	0.000	0.098
0.1333	0.023	0.002	0.000	0.119
0.1778	0.027	0.003	0.000	0.137
0.2222	0.030	0.004	0.000	0.152
0.2667	0.033	0.005	0.000	0.166
0.3111	0.035	0.007	0.000	0.178
0.3556	0.037	0.009	0.000	0.189
0.4000	0.039	0.010	0.000	0.200
0.4444	0.041	0.012	0.000	0.209
0.4889	0.043	0.014	0.000	0.218
0.5333	0.045	0.016	0.000	0.226
0.5778	0.046	0.018	0.000	0.234
0.6222	0.047	0.020	0.000	0.241
0.6667	0.049	0.022	0.000	0.248
0.7111	0.050	0.025	0.000	0.254
0.7556	0.051	0.027	0.000	0.260
0.8000	0.052	0.029	0.000	0.266
0.8444	0.054	0.031	0.000	0.272
0.8889	0.055	0.034	0.000	0.277
0.9333	0.055	0.036	0.000	0.282
0.9778	0.056	0.039	0.000	0.286
1.0222	0.057	0.041	0.000	0.290
1.0667	0.058	0.044	0.000	0.294
1.1111	0.059	0.047	0.000	0.298

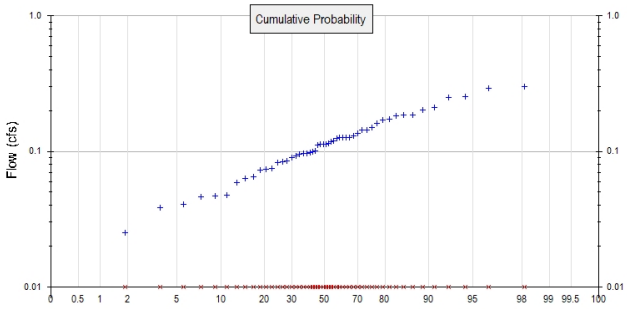
1.1556	0.059	0.049	0.000	0.302
1.2000	0.060	0.052	0.000	0.305
1.2444	0.061	0.055	0.000	0.308
1.2889	0.061	0.057	0.000	0.311
1.3333	0.062	0.060	0.000	0.314
1.3778	0.062	0.063	0.000	0.316
1.4222	0.063	0.066	0.000	0.319
1.4667	0.063	0.069	0.000	0.321
1.5111	0.064	0.071	0.000	0.323
1.5556	0.064	0.074	0.000	0.325
1.6000	0.064	0.077	0.000	0.326
1.6444	0.065	0.080	0.000	0.328
1.6889	0.065	0.083	0.000	0.329
1.7333	0.065	0.086	0.000	0.330
1.7778	0.065	0.089	0.000	0.331
1.8222	0.065	0.092	0.000	0.332
1.8667	0.066	0.095	0.000	0.332
1.9111	0.066	0.098	0.000	0.333
1.9556	0.066	0.100	0.000	0.333
2.0000	0.066	0.103	0.000	0.333
2.0444	0.066	0.106	0.000	0.333
2.0889	0.066	0.109	0.000	0.333
2.1333	0.066	0.112	0.000	0.333
2.1778	0.065	0.115	0.000	0.333
2.2222	0.065	0.118	0.000	0.333
2.2667	0.065	0.121	0.000	0.333
2.3111	0.065	0.124	0.000	0.333
2.3556	0.065	0.127	0.000	0.333
2.4000	0.064	0.130	0.001	0.333
2.4444	0.064	0.133	0.003	0.333
2.4889	0.064	0.135	0.005	0.333
2.5333	0.063	0.138	0.007	0.333
2.5778	0.063	0.141	0.010	0.333
2.6222	0.062	0.144	0.013	0.333
2.6667	0.062	0.147	0.016	0.333
2.7111	0.061	0.149	0.019	0.333
2.7556	0.061	0.152	0.022	0.333
2.8000	0.060	0.155	0.026	0.333
2.8444	0.059	0.158	0.029	0.333
2.8889	0.059	0.160	0.033	0.333
2.9333	0.058	0.163	0.037	0.333
2.9778	0.057	0.165	0.041	0.333
3.0222	0.056	0.168	0.045	0.333
3.0667	0.055	0.170	0.049	0.333
3.1111	0.055	0.173	0.053	0.333
3.1556	0.054	0.175	0.057	0.333
3.2000	0.052	0.178	0.061	0.333
3.2444	0.051	0.180	0.065	0.333
3.2889	0.050	0.182	0.069	0.333
3.3333	0.049	0.185	0.073	0.333
3.3778	0.047	0.187	0.078	0.333
3.4222	0.046	0.189	0.083	0.333
3.4667	0.045	0.191	0.089	0.333
3.5111	0.043	0.193	0.094	0.333
3.5556	0.041	0.195	0.099	0.333
3.6000	0.039	0.196	0.105	0.333
3.6444	0.037	0.198	0.110	0.333
3.6889	0.035	0.200	0.116	0.333

3.7333	0.033	0.201	0.122	0.333
3.7778	0.030	0.203	0.169	0.333
3.8222	0.027	0.204	0.177	0.333
3.8667	0.023	0.205	0.186	0.333
3.9111	0.019	0.206	0.217	0.333
3.9556	0.013	0.207	0.471	0.333
4.0000	0.000	0.207	0.864	0.333
4.0444	0.000	0.000	1.356	0.333

Analysis Results

POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 2.26
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 1.85
Total Impervious Area: 0.41

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.109953
5 year	0.169793
10 year	0.207809
25 year	0.253135
50 year	0.284792
100 year	0.314664

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**
1956	0.118	0.000
1957	0.203	0.000
1958	0.063	0.000
1959	0.085	0.000
1960	0.144	0.000
1961	0.098	0.000
1962	0.039	0.000
1963	0.172	0.000
1964	0.113	0.000
1965	0.097	0.000

1966	0.065	0.000
1967	0.126	0.000
1968	0.093	0.000
1969	0.047	0.000
1970	0.089	0.000
1971	0.119	0.000
1972	0.182	0.000
1973	0.096	0.000
1974	0.074	0.000
1975	0.211	0.000
1976	0.127	0.000
1977	0.024	0.000
1978	0.111	0.000
1979	0.161	0.000
1980	0.100	0.000
1981	0.151	0.000
1982	0.083	0.000
1983	0.171	0.000
1984	0.126	0.000
1985	0.041	0.000
1986	0.185	0.000
1987	0.248	0.000
1988	0.074	0.000
1989	0.082	0.000
1990	0.252	0.000
1991	0.300	0.000
1992	0.073	0.000
1993	0.046	0.000
1994	0.047	0.000
1995	0.115	0.000
1996	0.185	0.000
1997	0.101	0.000
1998	0.113	0.000
1999	0.125	0.000
2000	0.135	0.000
2001	0.025	0.000
2002	0.126	0.000
2003	0.059	0.000
2004	0.113	0.000
2005	0.097	0.000
2006	0.144	0.000
2007	0.130	0.000
2008	0.292	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.3003	0.0000
2	0.2920	0.0000
3	0.2521	0.0000
4	0.2481	0.0000
5	0.2112	0.0000
6	0.2031	0.0000
7	0.1849	0.0000
8	0.1846	0.0000
9	0.1824	0.0000
10	0.1718	0.0000
11	0.1714	0.0000

12	0.1610	0.0000
13	0.1509	0.0000
14	0.1439	0.0000
15	0.1438	0.0000
16	0.1353	0.0000
17	0.1303	0.0000
18	0.1271	0.0000
19	0.1263	0.0000
20	0.1263	0.0000
21	0.1262	0.0000
22	0.1248	0.0000
23	0.1194	0.0000
24	0.1181	0.0000
25	0.1146	0.0000
26	0.1134	0.0000
27	0.1131	0.0000
28	0.1129	0.0000
29	0.1113	0.0000
30	0.1013	0.0000
31	0.0998	0.0000
32	0.0978	0.0000
33	0.0973	0.0000
34	0.0972	0.0000
35	0.0958	0.0000
36	0.0931	0.0000
37	0.0895	0.0000
38	0.0847	0.0000
39	0.0834	0.0000
40	0.0821	0.0000
41	0.0744	0.0000
42	0.0740	0.0000
43	0.0732	0.0000
44	0.0652	0.0000
45	0.0635	0.0000
46	0.0586	0.0000
47	0.0473	0.0000
48	0.0471	0.0000
49	0.0461	0.0000
50	0.0407	0.0000
51	0.0385	0.0000
52	0.0251	0.0000
53	0.0236	0.0000

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0550	11203	0	0	Pass
0.0573	10212	0	0	Pass
0.0596	9313	0	0	Pass
0.0619	8484	0	0	Pass
0.0643	7819	0	0	Pass
0.0666	7179	0	0	Pass
0.0689	6538	0	0	Pass
0.0712	5927	0	0	Pass
0.0735	5354	0	0	Pass
0.0759	4893	0	0	Pass
0.0782	4470	0	0	Pass
0.0805	4083	0	0	Pass
0.0828	3726	0	0	Pass
0.0852	3408	0	0	Pass
0.0875	3137	0	0	Pass
0.0898	2899	0	0	Pass
0.0921	2656	0	0	Pass
0.0944	2409	0	0	Pass
0.0968	2191	0	0	Pass
0.0991	1981	0	0	Pass
0.1014	1815	0	0	Pass
0.1037	1668	0	0	Pass
0.1060	1547	0	0	Pass
0.1084	1435	0	0	Pass
0.1107	1326	0	0	Pass
0.1130	1235	0	0	Pass
0.1153	1151	0	0	Pass
0.1177	1061	0	0	Pass
0.1200	980	0	0	Pass
0.1223	907	0	0	Pass
0.1246	848	0	0	Pass
0.1269	790	0	0	Pass
0.1293	737	0	0	Pass
0.1316	704	0	0	Pass
0.1339	661	0	0	Pass
0.1362	618	0	0	Pass
0.1385	588	0	0	Pass
0.1409	549	0	0	Pass
0.1432	509	0	0	Pass
0.1455	462	0	0	Pass
0.1478	416	0	0	Pass
0.1502	388	0	0	Pass
0.1525	362	0	0	Pass
0.1548	343	0	0	Pass
0.1571	323	0	0	Pass
0.1594	303	0	0	Pass
0.1618	283	0	0	Pass
0.1641	270	0	0	Pass
0.1664	247	0	0	Pass
0.1687	232	0	0	Pass
0.1710	219	0	0	Pass
0.1734	210	0	0	Pass
0.1757	193	0	0	Pass

0.1780	181	0	0	Pass
0.1803	164	0	0	Pass
0.1827	152	0	0	Pass
0.1850	132	0	0	Pass
0.1873	126	0	0	Pass
0.1896	119	0	0	Pass
0.1919	114	0	0	Pass
0.1943	109	0	0	Pass
0.1966	108	0	0	Pass
0.1989	105	0	0	Pass
0.2012	103	0	0	Pass
0.2035	97	0	0	Pass
0.2059	93	0	0	Pass
0.2082	91	0	0	Pass
0.2105	87	0	0	Pass
0.2128	86	0	0	Pass
0.2152	82	0	0	Pass
0.2175	79	0	0	Pass
0.2198	75	0	0	Pass
0.2221	73	0	0	Pass
0.2244	71	0	0	Pass
0.2268	66	0	0	Pass
0.2291	63	0	0	Pass
0.2314	60	0	0	Pass
0.2337	58	0	0	Pass
0.2360	56	0	0	Pass
0.2384	54	0	0	Pass
0.2407	48	0	0	Pass
0.2430	44	0	0	Pass
0.2453	41	0	0	Pass
0.2477	41	0	0	Pass
0.2500	39	0	0	Pass
0.2523	37	0	0	Pass
0.2546	36	0	0	Pass
0.2569	36	0	0	Pass
0.2593	34	0	0	Pass
0.2616	32	0	0	Pass
0.2639	29	0	0	Pass
0.2662	28	0	0	Pass
0.2685	27	0	0	Pass
0.2709	23	0	0	Pass
0.2732	22	0	0	Pass
0.2755	20	0	0	Pass
0.2778	19	0	0	Pass
0.2801	15	0	0	Pass
0.2825	14	0	0	Pass
0.2848	13	0	0	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.0993 acre-feet
On-line facility target flow:	0.0612 cfs.
Adjusted for 15 min:	0.0612 cfs.
Off-line facility target flow:	0.0357 cfs.
Adjusted for 15 min:	0.0357 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
Tank 1 POC	☐	101.99			☐	100.00			
Total Volume Infiltrated		101.99	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.

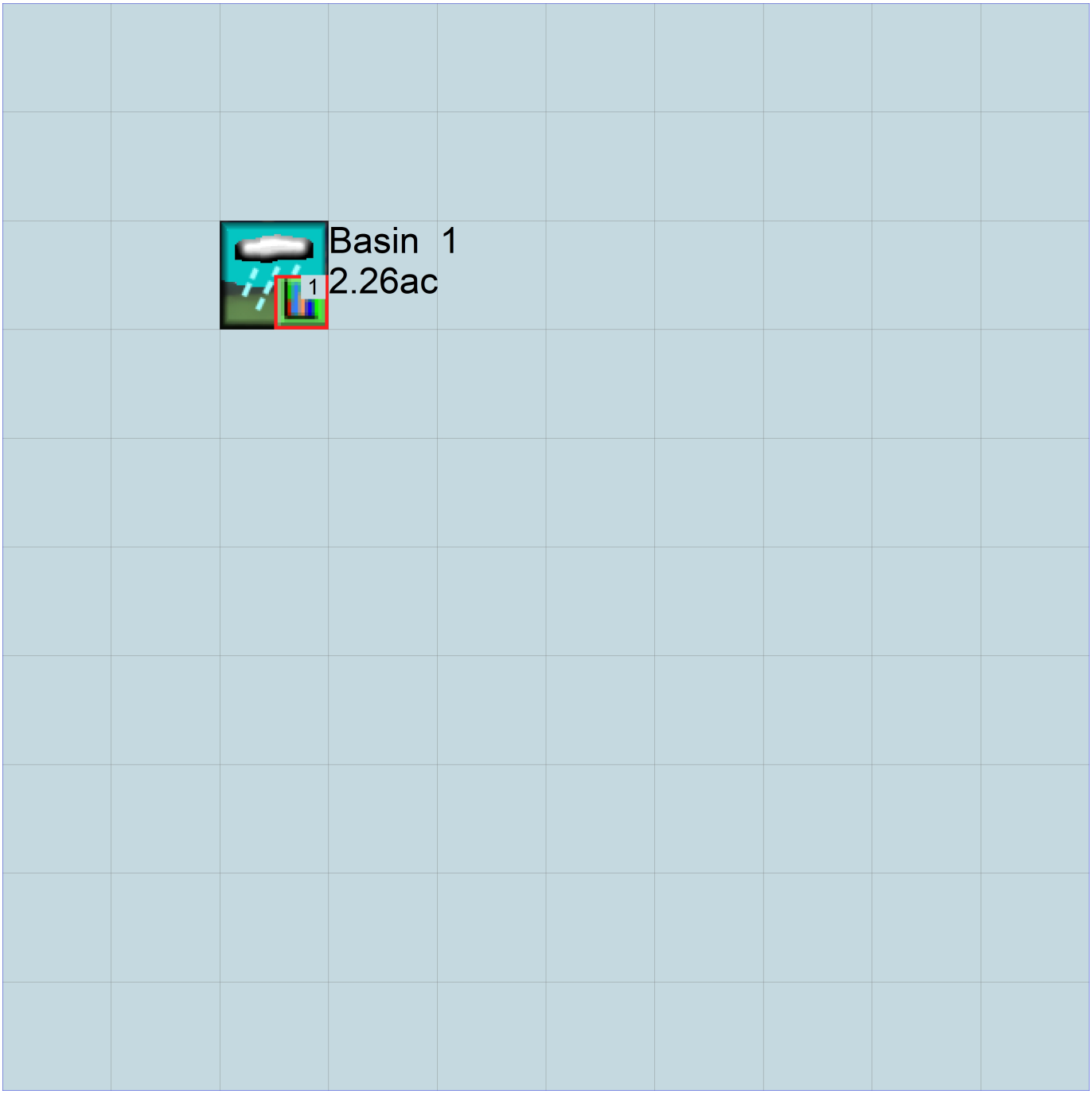
PERLND Changes

No PERLND changes have been made.

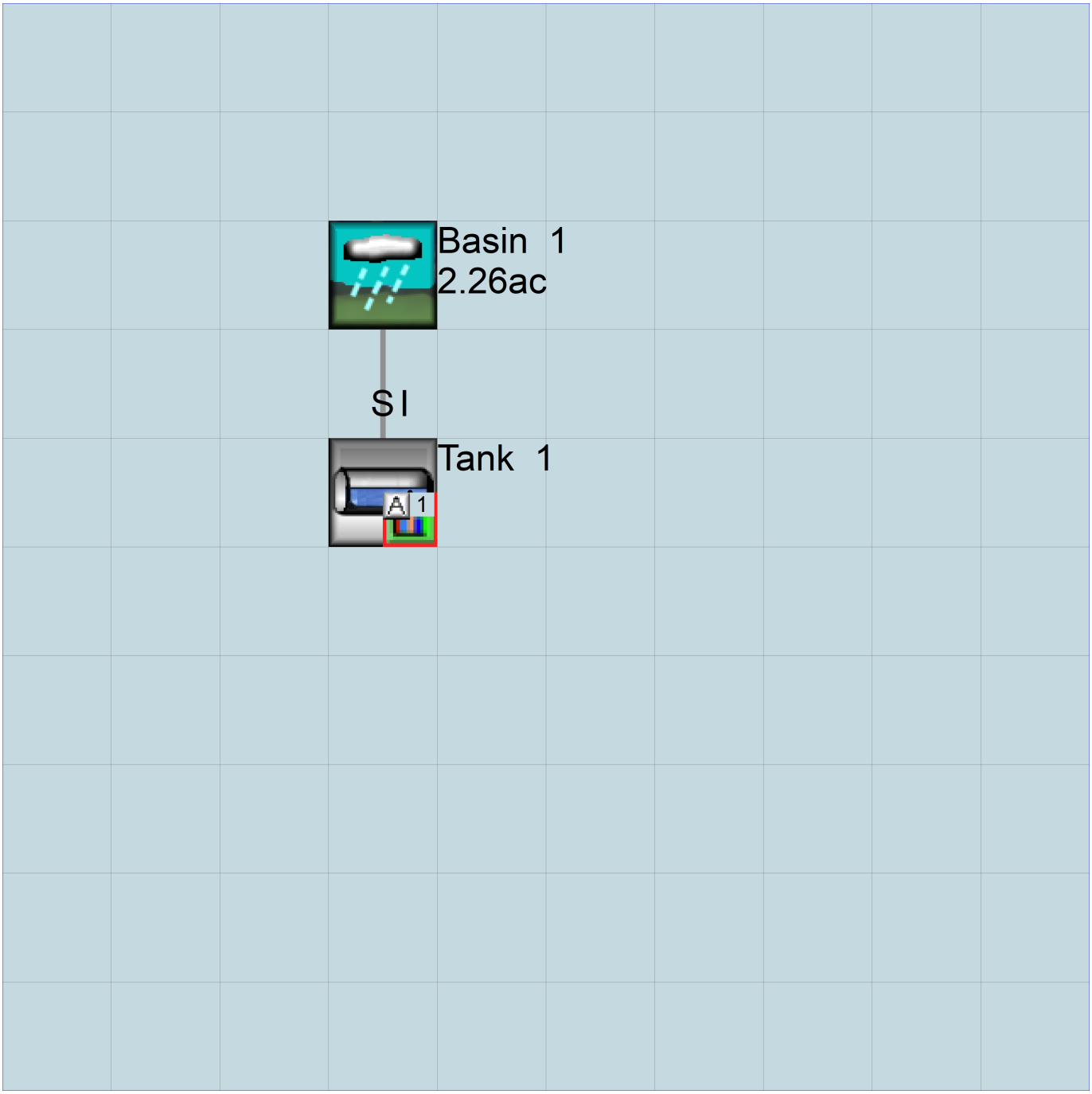
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1955 10 01        END    2008 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 1.wdm
MESSU       25   PreBASIN 1.MES
            27   PreBASIN 1.L61
            28   PreBASIN 1.L62
            30   POCBASIN 11.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      12
      PERLND      15
      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           ***
   12     C, Forest, Steep        1    1    1    1   27    0
   15     C, Pasture, Steep       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 ***
   12         0    0    1    0    0    0    0    0    0    0    0    0
   15         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  *********
```

```
 12         0    0    4    0    0    0    0    0    0    0    0    0    1    9
 15         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 ***
 12         0    0    0    0    0    0    0    0    0    0    0
 15         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
 12              0       4.5      0.08       400      0.15       0.5     0.996
 15              0       4.5      0.06       400      0.15       0.5     0.996
END PWAT-PARM2

PWAT-PARM3
  <PLS >      PWATER input info: Part 3         ***
  # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
 12              0         0         2         2         0         0         0
 15              0         0         2         2         0         0         0
END PWAT-PARM3
PWAT-PARM4
  <PLS >     PWATER input info: Part 4                              ***
  # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
 12            0.2       0.3      0.35         6       0.3       0.7
 15           0.15      0.25       0.3         6       0.3       0.4
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
 12              0         0         0         0       2.5         1         0
 15              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  12                        2.16     COPY   501     12
PERLND  12                        2.16     COPY   501     13
PERLND  15                         0.1     COPY   501     12
PERLND  15                         0.1     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    0.8            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    0.8            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           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       1955 10 01        END    2008 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 1.wdm
MESSU       25   MitBASIN 1.MES
            27   MitBASIN 1.L61
            28   MitBASIN 1.L62
            30   POCBASIN 11.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      12
      PERLND       9
      IMPLND      11
      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        Tank  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            ***
   12     C, Forest, Steep        1    1    1    1   27    0
    9     A/B, Lawn, Steep        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 ***
   12         0    0    1    0    0    0    0    0    0    0    0    0
    9         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  *********
   12         0    0    4    0    0    0    0    0    0    0    0    0    1    9
    9         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 ***
   12         0    0    0    0    0    0    0    0    0    0    0
    9         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
   12              0       4.5      0.08       400      0.15       0.5     0.996
    9              0         5       0.8       400      0.15       0.3     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   12              0         0         2         2         0         0         0
    9              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   12            0.2       0.3      0.35         6       0.3       0.7
    9            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
   12              0         0         0         0       2.5         1         0
    9              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           ***
   11      PARKING/FLAT           1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
   11         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
   11         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     ***
   11         0    0    0    0    0
  END IWAT-PARM1
```

```
  IWAT-PARM2
    <PLS >       IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
   11            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >       IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
   11              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
   11              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  12                       1.18     RCHRES   1      2
PERLND  12                       1.18     RCHRES   1      3
PERLND   9                       0.67     RCHRES   1      2
PERLND   9                       0.67     RCHRES   1      3
IMPLND  11                       0.41     RCHRES   1      5

******Routing******
PERLND  12                       1.18     COPY     1     12
PERLND   9                       0.67     COPY     1     12
IMPLND  11                       0.41     COPY     1     15
PERLND  12                       1.18     COPY     1     13
PERLND   9                       0.67     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     Tank  1                 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      0.14       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  0.000000  0.000000  0.000000  0.000000
  0.044444  0.013861  0.000412  0.000000  0.069881
  0.088889  0.019492  0.001160  0.000000  0.098270
  0.133333  0.023736  0.002124  0.000000  0.119670
  0.177778  0.027250  0.003260  0.000000  0.137387
  0.222222  0.030289  0.004540  0.000000  0.152708
  0.266667  0.032984  0.005947  0.000000  0.166296
  0.311111  0.035414  0.007468  0.000000  0.178548
  0.355556  0.037631  0.009092  0.000000  0.189722
  0.400000  0.039669  0.010810  0.000000  0.200000
  0.444444  0.041556  0.012616  0.000000  0.209513
  0.488889  0.043311  0.014502  0.000000  0.218362
  0.533333  0.044950  0.016464  0.000000  0.226623
  0.577778  0.046485  0.018496  0.000000  0.234360
  0.622222  0.047925  0.020594  0.000000  0.241622
  0.666667  0.049280  0.022755  0.000000  0.248452
  0.711111  0.050555  0.024974  0.000000  0.254884
  0.755556  0.051758  0.027247  0.000000  0.260947
  0.800000  0.052893  0.029573  0.000000  0.266667
  0.844444  0.053963  0.031948  0.000000  0.272065
  0.888889  0.054974  0.034369  0.000000  0.277160
  0.933333  0.055928  0.036834  0.000000  0.281968
  0.977778  0.056827  0.039340  0.000000  0.286505
  1.022222  0.057676  0.041884  0.000000  0.290782
  1.066667  0.058475  0.044466  0.000000  0.294811
  1.111111  0.059227  0.047081  0.000000  0.298602
  1.155556  0.059933  0.049730  0.000000  0.302164
  1.200000  0.060596  0.052408  0.000000  0.305505
  1.244444  0.061216  0.055115  0.000000  0.308632
  1.288889  0.061795  0.057849  0.000000  0.311552
  1.333333  0.062334  0.060608  0.000000  0.314270
  1.377778  0.062835  0.063389  0.000000  0.316791
  1.422222  0.063297  0.066192  0.000000  0.319121
  1.466667  0.063722  0.069015  0.000000  0.321263
  1.511111  0.064110  0.071856  0.000000  0.323221
  1.555556  0.064463  0.074713  0.000000  0.324999
  1.600000  0.064780  0.077585  0.000000  0.326599
  1.644444  0.065063  0.080471  0.000000  0.328024
  1.688889  0.065311  0.083368  0.000000  0.329276
```

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  1.733333  0.065525  0.086276  0.000000  0.330357
  1.777778  0.065706  0.089192  0.000000  0.331269
  1.822222  0.065854  0.092116  0.000000  0.332014
  1.866667  0.065969  0.095045  0.000000  0.332592
  1.911111  0.066050  0.097979  0.000000  0.333004
  1.955556  0.066099  0.100916  0.000000  0.333251
  2.000000  0.066116  0.103854  0.000000  0.333251
  2.044444  0.066099  0.106793  0.000000  0.333251
  2.088889  0.066050  0.109729  0.000000  0.333251
  2.133333  0.065969  0.112663  0.000000  0.333251
  2.177778  0.065854  0.115593  0.000000  0.333251
  2.222222  0.065706  0.118516  0.000000  0.333251
  2.266667  0.065525  0.121433  0.000000  0.333251
  2.311111  0.065311  0.124340  0.000000  0.333251
  2.355556  0.065063  0.127238  0.000146  0.333251
  2.400000  0.064780  0.130123  0.001286  0.333251
  2.444444  0.064463  0.132995  0.002992  0.333251
  2.488889  0.064110  0.135853  0.005092  0.333251
  2.533333  0.063722  0.138694  0.007502  0.333251
  2.577778  0.063297  0.141516  0.010168  0.333251
  2.622222  0.062835  0.144319  0.013053  0.333251
  2.666667  0.062334  0.147101  0.016125  0.333251
  2.711111  0.061795  0.149860  0.019362  0.333251
  2.755556  0.061216  0.152593  0.022742  0.333251
  2.800000  0.060596  0.155300  0.026249  0.333251
  2.844444  0.059933  0.157979  0.029866  0.333251
  2.888889  0.059227  0.160627  0.033581  0.333251
  2.933333  0.058475  0.163243  0.037380  0.333251
  2.977778  0.057676  0.165824  0.041253  0.333251
  3.022222  0.056827  0.168369  0.045188  0.333251
  3.066667  0.055928  0.170875  0.049178  0.333251
  3.111111  0.054974  0.173340  0.053212  0.333251
  3.155556  0.053963  0.175761  0.057283  0.333251
  3.200000  0.052893  0.178135  0.061382  0.333251
  3.244444  0.051758  0.180461  0.065502  0.333251
  3.288889  0.050555  0.182735  0.069637  0.333251
  3.333333  0.049280  0.184954  0.073779  0.333251
  3.377778  0.047925  0.187114  0.078625  0.333251
  3.422222  0.046485  0.189213  0.083740  0.333251
  3.466667  0.044950  0.191245  0.088961  0.333251
  3.511111  0.043311  0.193207  0.094286  0.333251
  3.555556  0.041556  0.195093  0.099714  0.333251
  3.600000  0.039669  0.196899  0.105241  0.333251
  3.644444  0.037631  0.198617  0.110868  0.333251
  3.688889  0.035414  0.200241  0.116591  0.333251
  3.733333  0.032984  0.201762  0.122410  0.333251
  3.777778  0.030289  0.203169  0.169415  0.333251
  3.822222  0.027250  0.204449  0.177342  0.333251
  3.866667  0.023736  0.205584  0.186008  0.333251
  3.911111  0.019492  0.206548  0.217933  0.333251
  3.955556  0.013861  0.207297  0.471413  0.333251
  4.000000  0.001000  0.207709  0.864297  0.333251
  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    0.8            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    0.8            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           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   1002 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1003 FLOW     ENGL      REPL
```

```
RCHRES   1 HYDR   O      2 1        1      WDM   1004 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1005 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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Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

WWHM2012

PROJECT REPORT

General Model Information

Project Name:	BASIN 2
Site Name:	Cosser
Site Address:	2945 Jackson Hwy
City:	Chehalis
Report Date:	5/10/2021
Gage:	Olympia
Data Start:	1955/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	0.800
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 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Forest, Flat	0.36
C, Forest, Steep	0.09
C, Pasture, Flat	5.37
C, Pasture, Steep	0.22
Pervious Total	6.04

Impervious Land Use	acre
ROADS FLAT	0.04
Impervious Total	0.04
Basin Total	6.08

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Lawn, Flat	2.7
Pervious Total	2.7

Impervious Land Use	acre
ROADS FLAT	1.03
DRIVEWAYS FLAT	0.57
POND	0.07
Impervious Total	1.67
Basin Total	4.37

Element Flows To:

Surface	Interflow	Groundwater
Channel 1	Channel 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length:	18.91 ft.		
Bottom Width:	18.91 ft.		
Depth:	5.5 ft.		
Volume at riser head:	0.1159 acre-feet.		
Infiltration On			
Infiltration rate:	5		
Infiltration safety factor:	1		
Total Volume Infiltrated (ac-ft.):		25.174	
Total Volume Through Riser (ac-ft.):		40.891	
Total Volume Through Facility (ac-ft.):		66.066	
Percent Infiltrated:		38.1	
Total Precip Applied to Facility:		0	
Total Evap From Facility:		0.116	
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:	4.5 ft.		
Riser Diameter:	18 in.		
Orifice 1 Diameter:	2.41 in.	Elevation:0 ft.	
Orifice 2 Diameter:	2.53 in.	Elevation:3.0015 ft.	
Orifice 3 Diameter:	1.61 in.	Elevation:3.82375000000003 ft.	
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
0.0611	0.008	0.000	0.039	0.041
0.1222	0.008	0.001	0.055	0.041
0.1833	0.009	0.001	0.067	0.041
0.2444	0.009	0.002	0.077	0.041
0.3056	0.009	0.002	0.087	0.041
0.3667	0.010	0.003	0.095	0.041
0.4278	0.010	0.004	0.103	0.041
0.4889	0.011	0.004	0.110	0.041
0.5500	0.011	0.005	0.116	0.041
0.6111	0.011	0.006	0.123	0.041
0.6722	0.012	0.006	0.129	0.041
0.7333	0.012	0.007	0.135	0.041
0.7944	0.012	0.008	0.140	0.041
0.8556	0.013	0.009	0.145	0.041
0.9167	0.013	0.009	0.150	0.041
0.9778	0.014	0.010	0.155	0.041
1.0389	0.014	0.011	0.160	0.041
1.1000	0.014	0.012	0.165	0.041
1.1611	0.015	0.013	0.169	0.041
1.2222	0.015	0.014	0.174	0.041
1.2833	0.016	0.015	0.178	0.041
1.3444	0.016	0.016	0.182	0.041
1.4056	0.017	0.017	0.186	0.041

1.4667	0.017	0.018	0.190	0.041
1.5278	0.018	0.019	0.194	0.041
1.5889	0.018	0.020	0.198	0.041
1.6500	0.019	0.021	0.202	0.041
1.7111	0.019	0.023	0.206	0.041
1.7722	0.020	0.024	0.209	0.041
1.8333	0.020	0.025	0.213	0.041
1.8944	0.021	0.026	0.216	0.041
1.9556	0.021	0.028	0.220	0.041
2.0167	0.022	0.029	0.223	0.041
2.0778	0.022	0.030	0.227	0.041
2.1389	0.023	0.032	0.230	0.041
2.2000	0.023	0.033	0.233	0.041
2.2611	0.024	0.035	0.237	0.041
2.3222	0.024	0.036	0.240	0.041
2.3833	0.025	0.038	0.243	0.041
2.4444	0.025	0.039	0.246	0.041
2.5056	0.026	0.041	0.249	0.041
2.5667	0.027	0.042	0.252	0.041
2.6278	0.027	0.044	0.255	0.041
2.6889	0.028	0.046	0.258	0.041
2.7500	0.028	0.048	0.261	0.041
2.8111	0.029	0.049	0.264	0.041
2.8722	0.030	0.051	0.267	0.041
2.9333	0.030	0.053	0.269	0.041
2.9944	0.031	0.055	0.272	0.041
3.0556	0.031	0.057	0.315	0.041
3.1167	0.032	0.059	0.337	0.041
3.1778	0.033	0.061	0.353	0.041
3.2389	0.033	0.063	0.368	0.041
3.3000	0.034	0.065	0.381	0.041
3.3611	0.035	0.067	0.393	0.041
3.4222	0.035	0.069	0.404	0.041
3.4833	0.036	0.071	0.414	0.041
3.5444	0.037	0.074	0.424	0.041
3.6056	0.037	0.076	0.434	0.041
3.6667	0.038	0.078	0.443	0.041
3.7278	0.039	0.081	0.452	0.041
3.7889	0.039	0.083	0.460	0.041
3.8500	0.040	0.086	0.480	0.041
3.9111	0.041	0.088	0.498	0.041
3.9722	0.042	0.091	0.512	0.041
4.0333	0.042	0.093	0.525	0.041
4.0944	0.043	0.096	0.537	0.041
4.1556	0.044	0.098	0.548	0.041
4.2167	0.044	0.101	0.559	0.041
4.2778	0.045	0.104	0.569	0.041
4.3389	0.046	0.107	0.579	0.041
4.4000	0.047	0.110	0.589	0.041
4.4611	0.047	0.112	0.598	0.041
4.5222	0.048	0.115	0.660	0.041
4.5833	0.049	0.118	0.999	0.041
4.6444	0.050	0.121	1.495	0.041
4.7056	0.051	0.125	2.096	0.041
4.7667	0.051	0.128	2.767	0.041
4.8278	0.052	0.131	3.470	0.041
4.8889	0.053	0.134	4.169	0.041
4.9500	0.054	0.137	4.827	0.041

5.0111	0.055	0.141	5.413	0.041
5.0722	0.055	0.144	5.901	0.041
5.1333	0.056	0.148	6.283	0.041
5.1944	0.057	0.151	6.569	0.041
5.2556	0.058	0.155	6.866	0.041
5.3167	0.059	0.158	7.117	0.041
5.3778	0.060	0.162	7.360	0.041
5.4389	0.061	0.166	7.594	0.041
5.5000	0.061	0.169	7.821	0.041
5.5611	0.062	0.173	8.042	0.041

Channel 1

Bottom Length: 618.00 ft.
Bottom Width: 1.00 ft.
Manning's n: 0.03
Channel bottom slope 1: 0.01 To 1
Channel Left side slope 0: 3 To 1
Channel right side slope 2: 3 To 1
Infiltration On
Infiltration rate: 5
Infiltration safety factor: 1
Total Volume Infiltrated (ac-ft.): 179.591
Total Volume Through Riser (ac-ft.): 66.205
Total Volume Through Facility (ac-ft.): 245.796
Percent Infiltrated: 73.07
Total Precip Applied to Facility: 0
Total Evap From Facility: 0
Discharge Structure
Riser Height: 0 ft.
Riser Diameter: 0 in.
Element Flows To:
Outlet 1 Outlet 2
Trapezoidal Pond 1

Channel Hydraulic Table

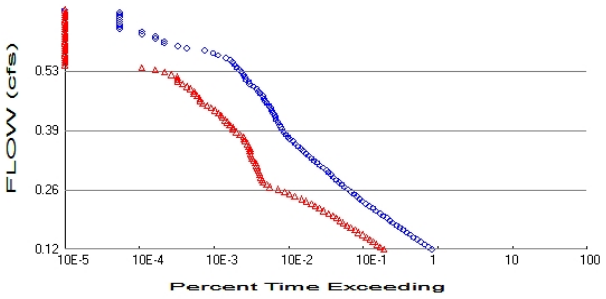
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.014	0.000	0.000	0.000
0.0111	0.015	0.000	0.002	0.071
0.0222	0.016	0.000	0.008	0.071
0.0333	0.017	0.000	0.017	0.071
0.0444	0.018	0.000	0.028	0.071
0.0556	0.018	0.000	0.042	0.071
0.0667	0.019	0.001	0.058	0.071
0.0778	0.020	0.001	0.076	0.071
0.0889	0.021	0.001	0.096	0.071
0.1000	0.022	0.001	0.119	0.071
0.1111	0.023	0.002	0.144	0.071
0.1222	0.024	0.002	0.171	0.071
0.1333	0.025	0.002	0.201	0.071
0.1444	0.026	0.002	0.233	0.071
0.1556	0.027	0.003	0.268	0.071
0.1667	0.028	0.003	0.304	0.071
0.1778	0.029	0.003	0.344	0.071
0.1889	0.030	0.004	0.386	0.071
0.2000	0.031	0.004	0.431	0.071
0.2111	0.032	0.004	0.478	0.071
0.2222	0.033	0.005	0.528	0.071
0.2333	0.034	0.005	0.581	0.071
0.2444	0.035	0.006	0.636	0.071
0.2556	0.035	0.006	0.695	0.071
0.2667	0.036	0.006	0.756	0.071
0.2778	0.037	0.007	0.820	0.071
0.2889	0.038	0.007	0.887	0.071
0.3000	0.039	0.008	0.957	0.071
0.3111	0.040	0.008	1.030	0.071
0.3222	0.041	0.009	1.107	0.071
0.3333	0.042	0.009	1.186	0.071

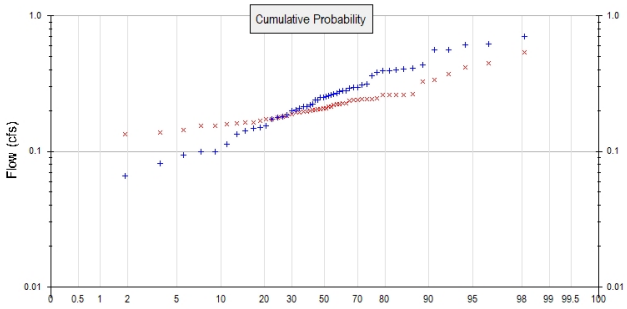
0.3444	0.043	0.009	1.269	0.071
0.3556	0.044	0.010	1.354	0.071
0.3667	0.045	0.010	1.443	0.071
0.3778	0.046	0.011	1.536	0.071
0.3889	0.047	0.012	1.632	0.071
0.4000	0.048	0.012	1.731	0.071
0.4111	0.049	0.013	1.833	0.071
0.4222	0.050	0.013	1.940	0.071
0.4333	0.051	0.014	2.049	0.071
0.4444	0.052	0.014	2.162	0.071
0.4556	0.053	0.015	2.279	0.071
0.4667	0.053	0.015	2.400	0.071
0.4778	0.054	0.016	2.524	0.071
0.4889	0.055	0.017	2.652	0.071
0.5000	0.056	0.017	2.784	0.071
0.5111	0.057	0.018	2.919	0.071
0.5222	0.058	0.019	3.059	0.071
0.5333	0.059	0.019	3.202	0.071
0.5444	0.060	0.020	3.349	0.071
0.5556	0.061	0.021	3.501	0.071
0.5667	0.062	0.021	3.656	0.071
0.5778	0.063	0.022	3.815	0.071
0.5889	0.064	0.023	3.979	0.071
0.6000	0.065	0.023	4.147	0.071
0.6111	0.066	0.024	4.318	0.071
0.6222	0.067	0.025	4.495	0.071
0.6333	0.068	0.026	4.675	0.071
0.6444	0.069	0.026	4.860	0.071
0.6556	0.070	0.027	5.049	0.071
0.6667	0.070	0.028	5.242	0.071
0.6778	0.071	0.029	5.440	0.071
0.6889	0.072	0.030	5.642	0.071
0.7000	0.073	0.030	5.849	0.071
0.7111	0.074	0.031	6.060	0.071
0.7222	0.075	0.032	6.276	0.071
0.7333	0.076	0.033	6.497	0.071
0.7444	0.077	0.034	6.722	0.071
0.7556	0.078	0.035	6.952	0.071
0.7667	0.079	0.035	7.187	0.071
0.7778	0.080	0.036	7.426	0.071
0.7889	0.081	0.037	7.670	0.071
0.8000	0.082	0.038	7.919	0.071
0.8111	0.083	0.039	8.173	0.071
0.8222	0.084	0.040	8.432	0.071
0.8333	0.085	0.041	8.696	0.071
0.8444	0.086	0.042	8.965	0.071
0.8556	0.087	0.043	9.239	0.071
0.8667	0.088	0.044	9.518	0.071
0.8778	0.088	0.045	9.802	0.071
0.8889	0.089	0.046	10.09	0.071
0.9000	0.090	0.047	10.38	0.071
0.9111	0.091	0.048	10.68	0.071
0.9222	0.092	0.049	10.99	0.071
0.9333	0.093	0.050	11.30	0.071
0.9444	0.094	0.051	11.61	0.071
0.9556	0.095	0.052	11.93	0.071
0.9667	0.096	0.053	12.26	0.071
0.9778	0.097	0.054	12.59	0.071

0.9889	0.098	0.055	12.93	0.071
1.0000	0.099	0.056	13.27	0.071
1.0111	0.100	0.057	13.62	0.071

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 6.04
Total Impervious Area: 0.04

Mitigated Landuse Totals for POC #1
Total Pervious Area: 2.7
Total Impervious Area: 1.67

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.243712
5 year	0.380979
10 year	0.471444
25 year	0.582907
50 year	0.663232
100 year	0.741007

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.208025
5 year	0.272199
10 year	0.318861
25 year	0.382736
50 year	0.434011
100 year	0.48856

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1956	0.257	0.203
1957	0.436	0.416
1958	0.147	0.178
1959	0.202	0.204
1960	0.313	0.243
1961	0.222	0.164
1962	0.081	0.159
1963	0.404	0.338
1964	0.260	0.226
1965	0.239	0.243

1966	0.150	0.154
1967	0.238	0.205
1968	0.179	0.173
1969	0.112	0.143
1970	0.200	0.163
1971	0.251	0.195
1972	0.399	0.240
1973	0.215	0.196
1974	0.173	0.209
1975	0.564	0.183
1976	0.309	0.207
1977	0.066	0.213
1978	0.266	0.227
1979	0.391	0.220
1980	0.215	0.194
1981	0.409	0.237
1982	0.186	0.223
1983	0.362	0.263
1984	0.266	0.179
1985	0.099	0.196
1986	0.383	0.260
1987	0.610	0.373
1988	0.155	0.137
1989	0.178	0.167
1990	0.559	0.448
1991	0.700	0.329
1992	0.141	0.198
1993	0.099	0.134
1994	0.094	0.155
1995	0.249	0.261
1996	0.395	0.225
1997	0.220	0.187
1998	0.282	0.239
1999	0.275	0.215
2000	0.296	0.242
2001	0.052	0.173
2002	0.293	0.261
2003	0.134	0.115
2004	0.253	0.245
2005	0.208	0.160
2006	0.296	0.203
2007	0.281	0.259
2008	0.624	0.539

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.7002	0.5390
2	0.6236	0.4479
3	0.6104	0.4155
4	0.5638	0.3730
5	0.5593	0.3379
6	0.4365	0.3285
7	0.4092	0.2628
8	0.4040	0.2612
9	0.3990	0.2611
10	0.3950	0.2604
11	0.3909	0.2593

12	0.3833	0.2447
13	0.3621	0.2429
14	0.3132	0.2426
15	0.3089	0.2423
16	0.2964	0.2404
17	0.2956	0.2385
18	0.2931	0.2365
19	0.2816	0.2270
20	0.2812	0.2258
21	0.2748	0.2245
22	0.2664	0.2226
23	0.2662	0.2199
24	0.2598	0.2146
25	0.2567	0.2125
26	0.2525	0.2089
27	0.2512	0.2068
28	0.2487	0.2050
29	0.2392	0.2040
30	0.2385	0.2029
31	0.2217	0.2029
32	0.2200	0.1984
33	0.2148	0.1962
34	0.2145	0.1958
35	0.2075	0.1946
36	0.2016	0.1939
37	0.2003	0.1875
38	0.1861	0.1828
39	0.1791	0.1794
40	0.1783	0.1775
41	0.1733	0.1728
42	0.1546	0.1726
43	0.1501	0.1668
44	0.1470	0.1639
45	0.1407	0.1634
46	0.1342	0.1605
47	0.1123	0.1585
48	0.0990	0.1550
49	0.0988	0.1536
50	0.0943	0.1431
51	0.0815	0.1373
52	0.0661	0.1344
53	0.0522	0.1152

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1219	15527	3481	22	Pass
0.1273	13719	3109	22	Pass
0.1328	12288	2825	22	Pass
0.1383	10796	2518	23	Pass
0.1437	9798	2295	23	Pass
0.1492	8714	2041	23	Pass
0.1547	7926	1833	23	Pass
0.1601	7073	1584	22	Pass
0.1656	6406	1437	22	Pass
0.1711	5735	1254	21	Pass
0.1765	5189	1119	21	Pass
0.1820	4626	995	21	Pass
0.1875	4221	903	21	Pass
0.1929	3819	811	21	Pass
0.1984	3408	729	21	Pass
0.2039	3109	639	20	Pass
0.2094	2758	543	19	Pass
0.2148	2501	477	19	Pass
0.2203	2215	420	18	Pass
0.2258	2015	375	18	Pass
0.2312	1808	320	17	Pass
0.2367	1660	277	16	Pass
0.2422	1517	224	14	Pass
0.2476	1398	190	13	Pass
0.2531	1275	163	12	Pass
0.2586	1161	135	11	Pass
0.2640	1043	103	9	Pass
0.2695	952	94	9	Pass
0.2750	882	84	9	Pass
0.2804	805	81	10	Pass
0.2859	737	79	10	Pass
0.2914	679	76	11	Pass
0.2968	633	75	11	Pass
0.3023	592	72	12	Pass
0.3078	542	71	13	Pass
0.3133	482	69	14	Pass
0.3187	445	67	15	Pass
0.3242	402	63	15	Pass
0.3297	373	60	16	Pass
0.3351	344	59	17	Pass
0.3406	315	57	18	Pass
0.3461	287	56	19	Pass
0.3515	271	56	20	Pass
0.3570	247	54	21	Pass
0.3625	225	52	23	Pass
0.3679	214	48	22	Pass
0.3734	190	47	24	Pass
0.3789	181	46	25	Pass
0.3843	169	41	24	Pass
0.3898	159	37	23	Pass
0.3953	151	33	21	Pass
0.4007	146	33	22	Pass
0.4062	139	30	21	Pass

0.4117	133	28	21	Pass
0.4172	127	26	20	Pass
0.4226	124	24	19	Pass
0.4281	120	23	19	Pass
0.4336	114	21	18	Pass
0.4390	110	19	17	Pass
0.4445	107	17	15	Pass
0.4500	101	15	14	Pass
0.4554	94	13	13	Pass
0.4609	90	12	13	Pass
0.4664	86	12	13	Pass
0.4718	83	11	13	Pass
0.4773	77	10	12	Pass
0.4828	73	10	13	Pass
0.4882	69	9	13	Pass
0.4937	64	8	12	Pass
0.4992	55	7	12	Pass
0.5046	54	6	11	Pass
0.5101	49	6	12	Pass
0.5156	48	6	12	Pass
0.5211	46	5	10	Pass
0.5265	43	4	9	Pass
0.5320	40	3	7	Pass
0.5375	37	2	5	Pass
0.5429	35	0	0	Pass
0.5484	33	0	0	Pass
0.5539	31	0	0	Pass
0.5593	27	0	0	Pass
0.5648	21	0	0	Pass
0.5703	18	0	0	Pass
0.5757	14	0	0	Pass
0.5812	8	0	0	Pass
0.5867	6	0	0	Pass
0.5921	4	0	0	Pass
0.5976	4	0	0	Pass
0.6031	3	0	0	Pass
0.6085	3	0	0	Pass
0.6140	2	0	0	Pass
0.6195	2	0	0	Pass
0.6250	1	0	0	Pass
0.6304	1	0	0	Pass
0.6359	1	0	0	Pass
0.6414	1	0	0	Pass
0.6468	1	0	0	Pass
0.6523	1	0	0	Pass
0.6578	1	0	0	Pass
0.6632	1	0	0	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.0747 acre-feet
On-line facility target flow:	0.0377 cfs.
Adjusted for 15 min:	0.0377 cfs.
Off-line facility target flow:	0.0247 cfs.
Adjusted for 15 min:	0.0247 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	☐	60.12			☐	38.10			
Channel 1	☐	223.67			☐	73.07			
Total Volume Infiltrated		283.79	0.00	0.00		65.66	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.

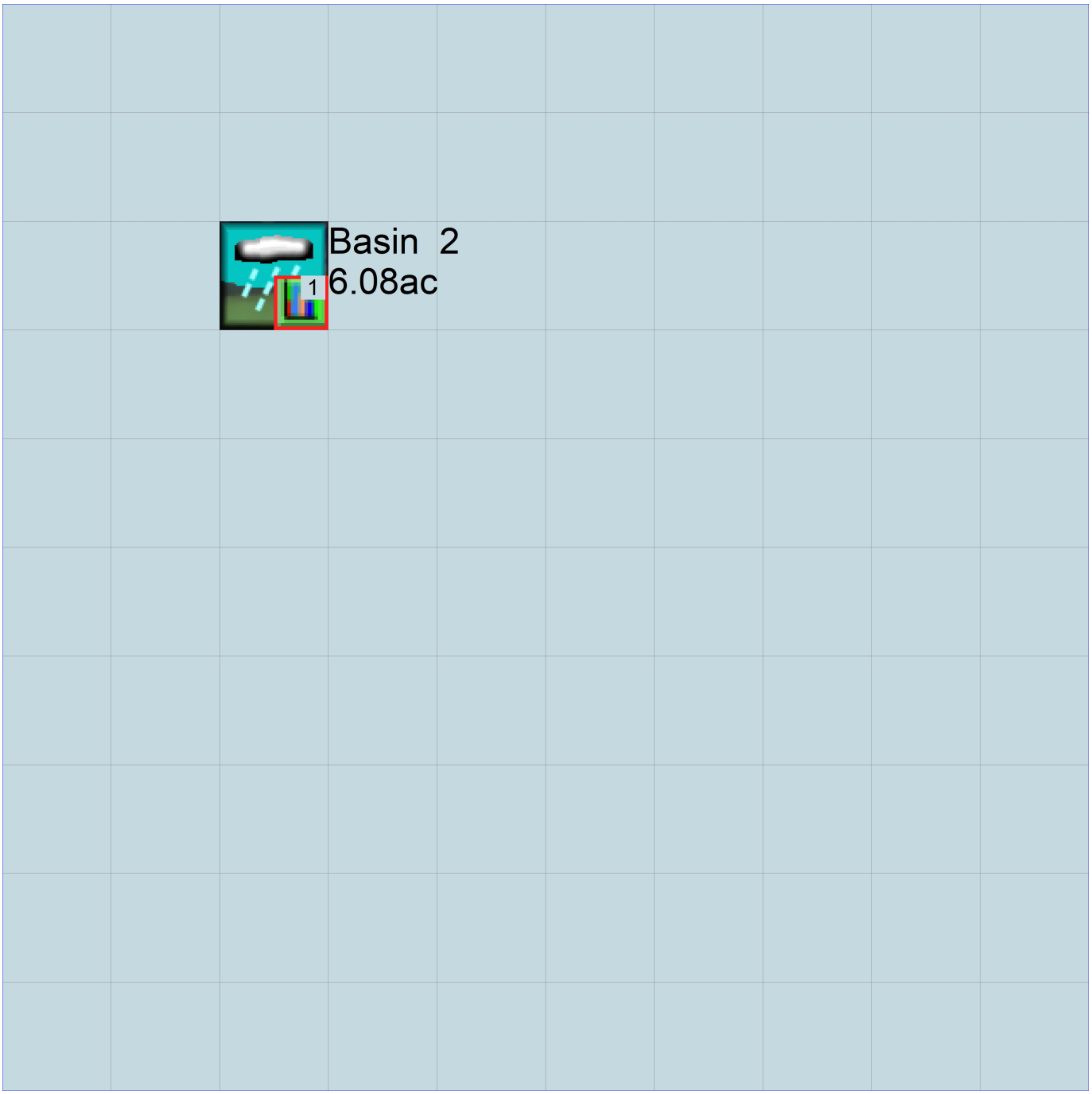
PERLND Changes

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       1955 10 01        END    2008 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 2.wdm
MESSU       25   PreBASIN 2.MES
            27   PreBASIN 2.L61
            28   PreBASIN 2.L62
            30   POCBASIN 21.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      10
      PERLND      12
      PERLND      13
      PERLND      15
      IMPLND       1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  2                   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
   12     C, Forest, Steep        1    1    1    1   27    0
   13     C, Pasture, Flat        1    1    1    1   27    0
   15     C, Pasture, Steep       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
   12         0    0    1    0    0    0    0    0    0    0    0    0
```

```
   13         0    0    1    0    0    0    0    0    0    0    0    0
   15         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
   12         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   13         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   15         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
   12         0    0    0    0    0    0    0    0    0    0    0
   13         0    0    0    0    0    0    0    0    0    0    0
   15         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
   12              0       4.5      0.08       400      0.15        0.5      0.996
   13              0       4.5      0.06       400      0.05        0.5      0.996
   15              0       4.5      0.06       400      0.15        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
   12              0         0         2         2         0         0         0
   13              0         0         2         2         0         0         0
   15              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
   12           0.2       0.3      0.35         6       0.3       0.7
   13          0.15       0.4       0.3         6       0.5       0.4
   15          0.15      0.25       0.3         6       0.3       0.4
  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
   12              0         0         0         0       2.5          1         0
   13              0         0         0         0       2.5          1         0
   15              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
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
```

```
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         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
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         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
  END IWAT-PARM2

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

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

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  2***
PERLND  10                        0.36     COPY   501     12
PERLND  10                        0.36     COPY   501     13
PERLND  12                        0.09     COPY   501     12
PERLND  12                        0.09     COPY   501     13
PERLND  13                        5.37     COPY   501     12
PERLND  13                        5.37     COPY   501     13
PERLND  15                        0.22     COPY   501     12
PERLND  15                        0.22     COPY   501     13
IMPLND   1                        0.04     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    0.8            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    0.8            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           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

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


END MASS-LINK
```

```
END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1955 10 01        END    2008 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 2.wdm
MESSU       25   MitBASIN 2.MES
            27   MitBASIN 2.L61
            28   MitBASIN 2.L62
            30   POCBASIN 21.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND       7
      IMPLND       1
      IMPLND       5
      IMPLND      14
      RCHRES       1
      RCHRES       2
      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
    5      DRIVEWAYS/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
    5         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
    5         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
    5         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
    5            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
    5              0         0
   14              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    5              0         0
   14              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  2***
PERLND   7                        2.7     RCHRES   1      2
PERLND   7                        2.7     RCHRES   1      3
IMPLND   1                       1.03     RCHRES   1      5
IMPLND   5                       0.57     RCHRES   1      5
IMPLND  14                       0.07     RCHRES   1      5

******Routing******
RCHRES   1                           1     RCHRES   2      7
RCHRES   1                                 COPY     1     17
RCHRES   2                           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     Channel  1              2    1    1    1   28    0    1
    2     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
```

```
    2         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
  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
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1              1      0.12       0.0       0.0       0.5       0.0
    2              2      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
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      2
   91    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)     (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.008213  0.000000  0.000000  0.000000
  0.061111  0.008534  0.000512  0.038963  0.041407
  0.122222  0.008862  0.001043  0.055102  0.041407
  0.183333  0.009196  0.001595  0.067486  0.041407
  0.244444  0.009536  0.002167  0.077926  0.041407
  0.305556  0.009882  0.002761  0.087124  0.041407
  0.366667  0.010235  0.003375  0.095440  0.041407
  0.427778  0.010593  0.004012  0.103087  0.041407
  0.488889  0.010958  0.004670  0.110204  0.041407
  0.550000  0.011329  0.005351  0.116889  0.041407
  0.611111  0.011706  0.006055  0.123212  0.041407
  0.672222  0.012089  0.006782  0.129226  0.041407
  0.733333  0.012478  0.007533  0.134972  0.041407
  0.794444  0.012874  0.008308  0.140483  0.041407
  0.855556  0.013276  0.009107  0.145786  0.041407
  0.916667  0.013684  0.009930  0.150903  0.041407
  0.977778  0.014098  0.010779  0.155852  0.041407
  1.038889  0.014518  0.011654  0.160649  0.041407
  1.100000  0.014944  0.012554  0.165306  0.041407
  1.161111  0.015377  0.013480  0.169836  0.041407
  1.222222  0.015816  0.014433  0.174248  0.041407
  1.283333  0.016261  0.015414  0.178551  0.041407
  1.344444  0.016712  0.016421  0.182753  0.041407
  1.405556  0.017169  0.017456  0.186860  0.041407
  1.466667  0.017633  0.018520  0.190879  0.041407
  1.527778  0.018102  0.019612  0.194815  0.041407
  1.588889  0.018578  0.020732  0.198673  0.041407
  1.650000  0.019060  0.021882  0.202458  0.041407
```

```
1.711111  0.019548  0.023062  0.206173  0.041407
1.772222  0.020043  0.024272  0.209822  0.041407
1.833333  0.020543  0.025512  0.213409  0.041407
1.894444  0.021050  0.026783  0.216937  0.041407
1.955556  0.021563  0.028085  0.220408  0.041407
2.016667  0.022082  0.029419  0.223826  0.041407
2.077778  0.022607  0.030784  0.227192  0.041407
2.138889  0.023139  0.032182  0.230508  0.041407
2.200000  0.023676  0.033612  0.233778  0.041407
2.261111  0.024220  0.035076  0.237003  0.041407
2.322222  0.024770  0.036573  0.240184  0.041407
2.383333  0.025326  0.038103  0.243324  0.041407
2.444444  0.025888  0.039668  0.246424  0.041407
2.505556  0.026456  0.041268  0.249485  0.041407
2.566667  0.027031  0.042902  0.252509  0.041407
2.627778  0.027612  0.044572  0.255498  0.041407
2.688889  0.028199  0.046277  0.258452  0.041407
2.750000  0.028792  0.048018  0.261372  0.041407
2.811111  0.029391  0.049796  0.264260  0.041407
2.872222  0.029997  0.051611  0.267117  0.041407
2.933333  0.030608  0.053463  0.269944  0.041407
2.994444  0.031226  0.055352  0.272741  0.041407
3.055556  0.031850  0.057279  0.315895  0.041407
3.116667  0.032480  0.059245  0.337199  0.041407
3.177778  0.033117  0.061249  0.353895  0.041407
3.238889  0.033759  0.063293  0.368286  0.041407
3.300000  0.034408  0.065376  0.381220  0.041407
3.361111  0.035063  0.067498  0.393121  0.041407
3.422222  0.035724  0.069661  0.404240  0.041407
3.483333  0.036391  0.071865  0.414737  0.041407
3.544444  0.037064  0.074109  0.424724  0.041407
3.605556  0.037744  0.076395  0.434282  0.041407
3.666667  0.038429  0.078723  0.443472  0.041407
3.727778  0.039121  0.081092  0.452342  0.041407
3.788889  0.039819  0.083504  0.460928  0.041407
3.850000  0.040524  0.085959  0.480658  0.041407
3.911111  0.041234  0.088457  0.498159  0.041407
3.972222  0.041950  0.090999  0.512372  0.041407
4.033333  0.042673  0.093585  0.525183  0.041407
4.094444  0.043402  0.096215  0.537117  0.041407
4.155556  0.044137  0.098890  0.548417  0.041407
4.216667  0.044879  0.101610  0.559221  0.041407
4.277778  0.045626  0.104375  0.569618  0.041407
4.338889  0.046380  0.107186  0.579671  0.041407
4.400000  0.047139  0.110044  0.589424  0.041407
4.461111  0.047905  0.112948  0.598912  0.041407
4.522222  0.048677  0.115899  0.660900  0.041407
4.583333  0.049456  0.118898  0.999491  0.041407
4.644444  0.050240  0.121944  1.495031  0.041407
4.705556  0.051031  0.125038  2.096451  0.041407
4.766667  0.051828  0.128181  2.767017  0.041407
4.827778  0.052631  0.131373  3.470502  0.041407
4.888889  0.053440  0.134614  4.169646  0.041407
4.950000  0.054255  0.137905  4.827949  0.041407
5.011111  0.055077  0.141245  5.413104  0.041407
5.072222  0.055904  0.144636  5.901500  0.041407
5.133333  0.056738  0.148078  6.283551  0.041407
5.194444  0.057578  0.151571  6.569718  0.041407
5.255556  0.058424  0.155116  6.866205  0.041407
5.316667  0.059277  0.158712  7.117860  0.041407
5.377778  0.060135  0.162361  7.360440  0.041407
5.438889  0.061000  0.166062  7.594872  0.041407
5.500000  0.061871  0.169817  7.821936  0.041407
END FTABLE  2
FTABLE      1
 91    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
0.000000  0.014187  0.000000  0.000000  0.000000
0.011111  0.015133  0.000163  0.002774  0.071528
```

0.022222	0.016079	0.000336	0.008899	0.071528
0.033333	0.017025	0.000520	0.017693	0.071528
0.044444	0.017971	0.000715	0.028927	0.071528
0.055556	0.018916	0.000920	0.042495	0.071528
0.066667	0.019862	0.001135	0.058348	0.071528
0.077778	0.020808	0.001361	0.076465	0.071528
0.088889	0.021754	0.001597	0.096849	0.071528
0.100000	0.022700	0.001844	0.119511	0.071528
0.111111	0.023646	0.002102	0.144476	0.071528
0.122222	0.024591	0.002370	0.171770	0.071528
0.133333	0.025537	0.002648	0.201426	0.071528
0.144444	0.026483	0.002937	0.233481	0.071528
0.155556	0.027429	0.003237	0.267973	0.071528
0.166667	0.028375	0.003547	0.304943	0.071528
0.177778	0.029321	0.003867	0.344431	0.071528
0.188889	0.030266	0.004198	0.386481	0.071528
0.200000	0.031212	0.004540	0.431136	0.071528
0.211111	0.032158	0.004892	0.478440	0.071528
0.222222	0.033104	0.005255	0.528438	0.071528
0.233333	0.034050	0.005628	0.581173	0.071528
0.244444	0.034996	0.006011	0.636692	0.071528
0.255556	0.035942	0.006405	0.695039	0.071528
0.266667	0.036887	0.006810	0.756259	0.071528
0.277778	0.037833	0.007225	0.820397	0.071528
0.288889	0.038779	0.007651	0.887498	0.071528
0.300000	0.039725	0.008087	0.957607	0.071528
0.311111	0.040671	0.008533	1.030769	0.071528
0.322222	0.041617	0.008991	1.107028	0.071528
0.333333	0.042562	0.009458	1.186429	0.071528
0.344444	0.043508	0.009936	1.269016	0.071528
0.355556	0.044454	0.010425	1.354833	0.071528
0.366667	0.045400	0.010924	1.443924	0.071528
0.377778	0.046346	0.011434	1.536334	0.071528
0.388889	0.047292	0.011954	1.632105	0.071528
0.400000	0.048238	0.012485	1.731281	0.071528
0.411111	0.049183	0.013026	1.833906	0.071528
0.422222	0.050129	0.013578	1.940021	0.071528
0.433333	0.051075	0.014140	2.049671	0.071528
0.444444	0.052021	0.014713	2.162898	0.071528
0.455556	0.052967	0.015296	2.279744	0.071528
0.466667	0.053913	0.015890	2.400251	0.071528
0.477778	0.054859	0.016494	2.524462	0.071528
0.488889	0.055804	0.017109	2.652418	0.071528
0.500000	0.056750	0.017734	2.784161	0.071528
0.511111	0.057696	0.018370	2.919732	0.071528
0.522222	0.058642	0.019016	3.059173	0.071528
0.533333	0.059588	0.019673	3.202524	0.071528
0.544444	0.060534	0.020341	3.349827	0.071528
0.555556	0.061480	0.021018	3.501123	0.071528
0.566667	0.062425	0.021707	3.656451	0.071528
0.577778	0.063371	0.022406	3.815852	0.071528
0.588889	0.064317	0.023115	3.979366	0.071528
0.600000	0.065263	0.023835	4.147033	0.071528
0.611111	0.066209	0.024565	4.318894	0.071528
0.622222	0.067155	0.025306	4.494987	0.071528
0.633333	0.068101	0.026058	4.675352	0.071528
0.644444	0.069046	0.026820	4.860028	0.071528
0.655556	0.069992	0.027592	5.049055	0.071528
0.666667	0.070938	0.028375	5.242471	0.071528
0.677778	0.071884	0.029168	5.440316	0.071528
0.688889	0.072830	0.029972	5.642628	0.071528
0.700000	0.073776	0.030787	5.849444	0.071528
0.711111	0.074722	0.031612	6.060805	0.071528
0.722222	0.075668	0.032447	6.276748	0.071528
0.733333	0.076613	0.033293	6.497310	0.071528
0.744444	0.077559	0.034150	6.722531	0.071528
0.755556	0.078505	0.035017	6.952447	0.071528
0.766667	0.079451	0.035894	7.187096	0.071528
0.777778	0.080397	0.036783	7.426515	0.071528
0.788889	0.081343	0.037681	7.670743	0.071528

```
  0.800000  0.082289  0.038590  7.919816  0.071528
  0.811111  0.083235  0.039510  8.173771  0.071528
  0.822222  0.084180  0.040440  8.432645  0.071528
  0.833333  0.085126  0.041380  8.696476  0.071528
  0.844444  0.086072  0.042331  8.965298  0.071528
  0.855556  0.087018  0.043293  9.239150  0.071528
  0.866667  0.087964  0.044265  9.518067  0.071528
  0.877778  0.088910  0.045248  9.802086  0.071528
  0.888889  0.089856  0.046241  10.09124  0.071528
  0.900000  0.090802  0.047245  10.38557  0.071528
  0.911111  0.091747  0.048259  10.68511  0.071528
  0.922222  0.092693  0.049283  10.98990  0.071528
  0.933333  0.093639  0.050319  11.29997  0.071528
  0.944444  0.094585  0.051364  11.61535  0.071528
  0.955556  0.095531  0.052421  11.93609  0.071528
  0.966667  0.096477  0.053487  12.26221  0.071528
  0.977778  0.097423  0.054564  12.59376  0.071528
  0.988889  0.098369  0.055652  12.93076  0.071528
  1.000000  0.099315  0.056750  13.27326  0.071528
  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    0.8             PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    0.8             IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76            IMPLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76            RCHRES   2     EXTNL  POTEV

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   2 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   2 HYDR   O      1 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   2 HYDR   O      2 1        1      WDM   1003 FLOW     ENGL      REPL
RCHRES   2 HYDR   STAGE  1 1        1      WDM   1001 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        7
RCHRES     OFLOW  OVOL   1                 RCHRES         INFLOW IVOL
  END MASS-LINK    7

  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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Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

SECTION 6 – CONSTRUCTION SWPPP

This project is required to prepare a construction Storm Water Pollution Prevention Plan in accordance with Minimum Requirement #2 and must be prepared in accordance with Volume II chapter 3 of the SWMMWW.

This drainage and erosion control report is intended to supplement the construction SWPPP by utilizing other sections in this report to cover required narrative elements. Also, the construction and erosion control plans supplied for the project are to act as the required drawing component of the construction SWPPP.

Intended BMPs which should be used during construction include but are not limited to:

- BMP C101: Preserving Natural Vegetation
- BMP C102: Buffer Zones
- BMP C103: High Visibility Fence
- BMP C105: Stabilized Construction Entrance / Exit
- BMP C120: Temporary and Permanent Seeding
- BMP C123: Plastic Covering
- BMP C125: Topsoiling / Composting
- BMP C140: Dust Control
- BMP C153: Material Delivery, Storage and Containment
- BMP C160: Certified Erosion and Sediment Control Lead
- BMP C162: Scheduling
- BMP C233: Silt Fence

CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

FOR

Jackson Highway Tiny Homes

2945 Jackson Highway

Chehalis, WA 98532

Prepared by:

FULLER DESIGNS

1101 Kresky Ave.
Centralia, WA 98531
(360) 269-4104

General Requirements

Clearing and grading activities for this project shall be permitted only to the approved site development plan. These clearing and grading areas were established to preserve sensitive areas, buffers, native growth protection easements, and tree retention areas. These areas are delineated on the site plans and shall be marked on the development site.

The SWPPP shall be implemented beginning with initial land disturbance and until final stabilization. Sediment and Erosion control BMPs shall be consistent with the BMPs contained in chapters 3 and 4 of Volume II of the SWMMWW.

Seasonal Work Limitations - From October 15 through April 1, clearing, grading, and other soil disturbing activities shall only be permitted if shown to the satisfaction of the local permitting authority that silt-laden runoff will be prevented from leaving the site through a combination of the following:

1. Site conditions including existing vegetative coverage, slope, soil type and proximity to receiving waters.
2. Limitations on activities and the extent of disturbed areas.
3. Proposed erosion and sediment control measures.

Project Requirements - Construction SWPPP Elements

In most cases, all the following elements shall apply and be implemented throughout construction. Self-contained sites (discharges only to groundwater) must comply with all elements except for Element 3: Control Flow Rates.

Element 1: Preserve Vegetation/Mark Clearing Limits

- Before beginning land disturbing activities, including clearing and grading, clearly mark all clearing limits, sensitive areas and their buffers, and trees that are to be preserved within the construction area.
- Retain the duff layer, native topsoil, and natural vegetation in an undisturbed state to the maximum degree practicable.

Element 2: Establish Construction Access

- Limit construction vehicle access and exit to one route, if possible.
- Stabilize access points with a pad of quarry spalls, crushed rock, or other equivalent BMPs, to minimize tracking of sediment onto public roads.
- Locate wheel wash or tire baths on site. If the stabilized construction entrance is not effective in preventing tracking sediment onto roads.
- If sediment is tracked off site, clean the affected roadway thoroughly at the end of each day, or more frequently as necessary (for example, during wet weather). Remove sediment from roads by shoveling, sweeping, or pick up and transport the sediment to a controlled sediment disposal area.
- Conduct street washing only after sediment is removed in accordance with the above bullet.

- Control street wash wastewater by pumping back on-site, or otherwise prevent it from discharging into systems tributary to waters of the State.

Element 3: Control Flow Rates

- Protect properties and waterways downstream of development sites from erosion and the associated discharge of turbid waters due to increases in the velocity and peak volumetric flow rate of stormwater runoff from the project site.
- Where necessary to comply with the bullet above, construct stormwater retention or detention facilities as one of the first steps in grading. Assure that detention facilities function properly before constructing site improvements (e.g. impervious surfaces).
- If permanent infiltration ponds are used for flow control during construction, protect these facilities from siltation during the construction phase.

Element 4: Install Sediment Controls

- Design, install, and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants.
- Construct sediment control BMPs (sediment ponds, traps, filters, etc.) as one of the first steps in grading. These BMPs shall be functional before other land disturbing activities take place.
- Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site.
- Direct stormwater runoff from disturbed areas through a sediment pond or other appropriate sediment removal BMP, before the runoff leaves a construction site or before discharge to an infiltration facility. Runoff from fully stabilized areas may be discharged without a sediment removal BMP but must meet the flow control performance standard in Element #3, bullet #1.
- Locate BMPs intended to trap sediment on-site in a manner to avoid interference with the movement of juvenile salmonids attempting to enter off-channel areas or drainages.
- Where feasible, design outlet structures that withdraw impounded stormwater from the surface to avoid discharging sediment that is still suspended lower in the water column.

Element 5: Stabilize Soils

- Stabilize exposed and unworked soils by application of effective BMPs that prevent erosion. Applicable BMPs include but are not limited to: temporary and permanent seeding, sodding, mulching, plastic covering, erosion control fabrics and matting, soil application of polyacrylamide (PAM), the early application of gravel base early on areas to be paved, and dust control.
- Control stormwater volume and velocity within the site to minimize soil erosion.
- Control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion.
- Soils must not remain exposed and unworked for more than the time periods set forth below to prevent erosion:
    - During the dry season (April 2 – October 14): 7 days

    - During the wet season (October 15 - April 1): 2 days
    - Note that projects performing work under a NPDES Construction Stormwater General Permit issued by Ecology will have more restrictive time periods.
- Stabilize soils at the end of the shift before a holiday or weekend if needed based on the weather forecast.
- Stabilize soil stockpiles from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways and drainage channels.
- Minimize the amount of soil exposed during construction activity.
- Minimize the disturbance of steep slopes.
- Minimize soil compaction and, unless infeasible, preserve topsoil.

Element 6: Protect Slopes

- Design and construct cut-and-fill slopes in a manner to minimize erosion. Applicable practices include, but are not limited to, reducing continuous length of slope with terracing and diversions, reducing slope steepness, and roughening slope surfaces (for example, track walking).
- Divert off-site stormwater (run-on) or ground water away from slopes and disturbed areas with interceptor dikes, pipes and/or swales. Off-site stormwater should be managed separately from stormwater generated on the site.
- At the top of slopes, collect drainage in pipe slope drains or protected channels to prevent erosion.
- Place excavated material on the uphill side of trenches, consistent with safety and space considerations.
- Place check dams at regular intervals within constructed channels that are cut down a slope.

Element 7: Protect Drain Inlets

- Protect all storm drain inlets made operable during construction so that stormwater runoff shall not enter the conveyance system without first being filtered or treated to remove sediment.
- Clean or remove and replace inlet protection devices when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

Element 8: Stabilize Channels and Outlets

- Design, construct, and stabilize all on-site conveyance channels.
- Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes and downstream reaches at the outlets of all conveyance systems.

Element 9: Control Pollutants

- Design, install, implement and maintain effective pollution prevention measures to minimize the discharge of pollutants.

- Handle and dispose of all pollutants, including waste materials and demolition debris that occur on-site in a manner that does not cause contamination of stormwater.
- Provide cover, containment, and protection from vandalism for all chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health or the environment. On-site fueling tanks must include secondary containment. Secondary containment means placing tanks or containers within an impervious structure capable of containing 110% of the volume contained in the largest take within the containment structure. Double-walled tanks do not require additional secondary containment.
- Conduct maintenance, fueling, and repair of heavy equipment and vehicles using spill prevention and control measures. Clean contaminated surfaces immediately following any spill incident.
- Discharge wheel wash or tire bath wastewater to a separate on-site treatment system that prevents discharge to surface water, such as closed-loop recirculation or upland application, or to the sanitary sewer, with local sewer district approval.
- Apply fertilizers and pesticides in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Follow manufacturers' label requirements for application rates and procedures.
- Use BMPs to prevent contamination of stormwater runoff by pH modifying sources. The sources for this contamination include, but are not limited to: bulk cement, cement kiln dust, fly ash, new concrete washing and curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, dewatering concrete vaults, concrete pumping and mixer washout waters.
- Adjust the pH of stormwater if necessary to prevent violations of water quality standards.
- Assure that washout of concrete trucks is performed off-site 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 dump excess concrete on-site, except in designated concrete washout areas. Concrete spillage or concrete discharge to surface waters of the State is prohibited.
- Obtain written approval from Ecology before using chemical treatment other than CO2 or dry ice to adjust pH.

Element 10: Control De-Watering

- Discharge foundation, vault, and trench de-watering water, which has similar characteristics to stormwater runoff at the site, into a controlled conveyance system before discharge to a sediment trap or sediment pond.
- Discharge clean, non-turbid de-watering water, such as well-point ground water, to systems tributary to, or directly into surface waters of the State, as specified in Element #8, provided the de-watering flow does not cause erosion or flooding of receiving waters. Do not route clean dewatering water through stormwater sediment ponds. Note that "surface waters of the State" may exist on a construction site as well as off site; for example, a creek running through a site.
- Handle highly turbid or otherwise contaminated dewatering water separately from stormwater.
- Other treatment or disposal options may include:
    1. Infiltration.

2. Transport off-site in a vehicle, such as a vacuum flush truck, for legal disposal in a manner that does not pollute state waters.
3. Ecology-approved on-site chemical treatment or other suitable treatment technologies.
4. Sanitary or combined sewer discharge with local sewer district approval, if there is no other option.
5. Use of a sedimentation bag that discharges to a ditch or swale for small volumes of localized dewatering.

Element 11: Maintain BMPs

- Maintain and repair all temporary and permanent erosion and sediment control BMPs as needed to assure continued performance of their intended function in accordance with BMP specifications.
- Remove all temporary erosion and sediment control BMPs within 30 days after achieving final site stabilization or after the temporary BMPs are no longer needed.

Element 12: Manage the Project

- Phase development projects to the maximum degree practicable and consider seasonal work limitations.
- Inspection and monitoring – Inspect, maintain and repair all BMPs as needed to assure continued performance of their intended function. Projects regulated under the Construction Stormwater General Permit must conduct site inspections and monitoring in accordance with Special Condition S4 of the Construction Stormwater General Permit.
- Maintaining an updated construction SWPPP – Maintain, update, and implement the SWPPP.
- Projects that disturb one or more acres must have site inspections conducted by a Certified Erosion and Sediment Control Lead (CESCL). Project sites disturbing less than one acre may have a CESCL or a person without CESCL certification conduct inspections. By the initiation of construction, the SWPPP must identify the CESCL or inspector, who must be present onsite or on-call at all times.
- The CESCL or inspector (project sites less than one acre) must have the skills to assess the:
    - Site conditions and construction activities that could impact the quality of stormwater.
    - Effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.
- The CESCL or inspector must examine stormwater visually for the presence of suspended sediment, turbidity, discoloration, and oil sheen. They must evaluate the effectiveness of BMPs and determine if it is necessary to install, maintain, or repair BMPs to improve the quality of stormwater discharges.
- Based on the results of the inspection, construction site operators must correct the problems identified by:
    - Reviewing the SWPPP for compliance with the 13 construction SWPPP elements and making appropriate revisions within seven (7) calendar days of the inspection.
- Immediately beginning the process of fully implementing and maintaining appropriate source control and/or treatment BMPs as soon as possible, addressing the problems not

later than within 10 days of the inspection. If installation of necessary treatment BMPs is not feasible within 10 days, the construction site operator may request an extension within the initial 10day response period.

- Documenting BMP implementation and maintenance in the site log book (sites larger than 1 acre).
- The CESCL or inspector must inspect all areas disturbed by construction activities, all BMPs, and all stormwater discharge points at least once every calendar week and within 24 hours of any discharge from the site. (For purposes of this condition, individual discharge events that last more than one day do not require daily inspections. For example, if a stormwater pond discharges continuously over the course of a week, only one inspection is required that week.) The CESCL or inspector may reduce the inspection frequency for temporary stabilized, inactive sites to once every calendar month.

Element 13: Protect Low Impact Development BMPs

- Protect all Bioretention and Rain Garden BMPs from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the Bioretention and/or Rain Garden BMPs. Restore the BMPs to their fully functioning condition if they accumulate sediment during construction. Restoring the BMP must include removal of sediment and any sediment-laden Bioretention/rain garden soils, and replacing the removed soils with soils meeting the design specification.
- Prevent compacting Bioretention and rain garden BMPs by excluding construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction due to construction equipment.
- Control erosion and avoid introducing sediment from surrounding land uses onto permeable pavements. Do not allow muddy construction equipment on the base material or pavement. Do not allow sediment-laden runoff onto permeable pavements or base materials.
- Pavement fouled with sediments or no longer passing an initial infiltration test must be cleaned using procedures in accordance with this manual or the manufacturer's procedures.
- Keep all heavy equipment off existing soils under LID facilities that have been excavated to final grade to retain the infiltration rate of the soils.

SECTION 7 – SPECIAL REPORTS AND STUDIES

A soils report from the NRCS USDA web soil survey website is included on the next pages. The information from this soil report was used to approximate subsurface site conditions and runoff potential.

Soil Map—Lewis County Area, Washington
(2039 soil)

Map Scale: 1:1,670 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 20 40 80 120

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Lewis County Area, Washington
Survey Area Data: Version 20, Jun 4, 2020

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

Date(s) aerial images were photographed: Mar 30, 2019—May 10, 2019

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
172	Reed silty clay loam	5.8	73.5%
189	Salkum silty clay loam, 15 to 30 percent slopes	0.5	7.0%
194	Scamman silty clay loam, 5 to 15 percent slopes	1.5	19.6%
Totals for Area of Interest		**7.9**	**100.0%**

Sieve Analysis Data Sheet

ASTM D422-63(2007)

Project Name:	Cosser Jackson Highway	**Tested By:**	AF	**Date:**	5/3/2021
Location:	Chehalis, WA	**Checked By:**	AF	**Date:**	5/3/2021
Boring No:	1	**Test Number:**	1		
Sample Depth:	10	**Gnd Elev.:**	n/a		

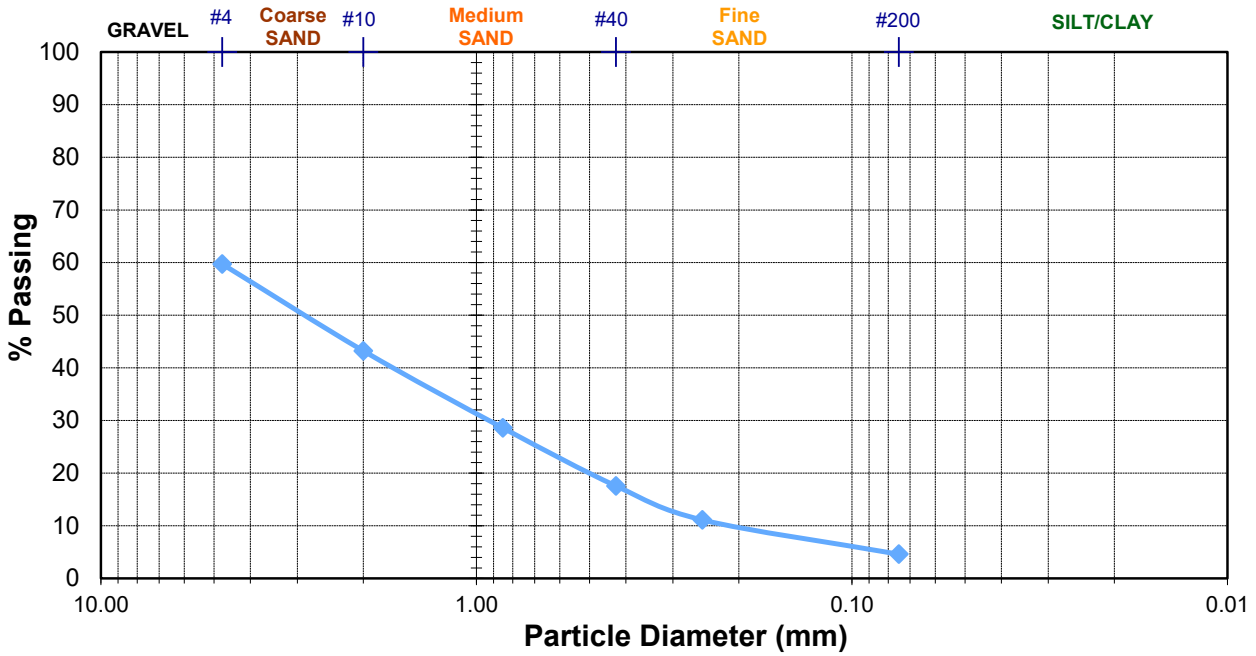
USCS Soil Classification: SW or SP

Notes: Sample taken 4/27/21

Weight of Container (g): 414.8 **Weight of Container & Soil (g):** 1359.2

Weight of Dry Sample (g): 944.4

Sieve Number	Diameter (mm)	Mass of Sieve (g)	Mass of Sieve & Soil (g)	Soil Retained (g)	Soil Retained (%)	Soil Passing (%)
#4	4.75	485.9	866.4	380.5	40.3	59.7
#10	2.00	452.8	608.5	155.7	16.5	43.2
#20	0.85	382.9	521.2	138.3	14.6	28.6
#40	0.43	346.5	450.6	104.1	11.0	17.6
#60	0.25	329.1	390	60.9	6.4	11.1
#200	0.075	314.9	376.4	61.5	6.5	4.6
Pan		348	391.7	43.7	4.6	0.0
			TOTAL:	**944.7**	**100.0**	



Grain Size Distribution Curve Results:

% Gravel:	40.3	**D_{10}:**	0.2	**Short-K_{sat}:**	47.72
% Sand:	55.1	**D_{30}:**	0.9	**Long-K_{sat}:**	5.67
% Fines:	4.6	**D_{60}:**	4.9		
		D_{90}:	20		
		fines	4.627%		

Saturation Correction Factors

CF_v:	0.3
CF_t:	0.4
CF_m:	0.9
CF_T:	0.12

SECTION 8 – OPERATION AND MAINTENANCE MANUAL

The Following pages contain maintenance needs for most of the components that are part of your drainage system, as well as components that you may not have. Let us know if there are any components that are missing from these pages. Ignore the requirements that do not apply to your system. You should plan to complete a checklist for all system components on the following schedule

1. Monthly from November through April
2. Once in late summer (preferably September).
3. After any major storm (use 1" of precipitation in 24 hours) for any items marked "S".

Using photocopies of these pages, check off the items you looked for after each inspection. Add comments on issues found and actions taken. Keep these records in your files. These files will be needed to write your annual report if required. Some items may not need to be looked at every time an inspection is done. Use the suggest frequency at the left of each item as a guideline for your inspection.

You may call the jurisdiction for technical assistance. Please do not hesitate to call, especially if you are unsure whether a situation you have discovered may be a developing issue.

No. 1 – Detention Ponds

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
General	Trash & Debris	Any trash and debris which exceed 1 cubic feet per 1,000 square feet. In general, there should be no visual evidence of dumping. If less than threshold all trash and debris will be removed as part of next scheduled maintenance.	Trash and debris cleared from site.
	Poisonous Vegetation and noxious weeds	Any poisonous or nuisance vegetation which may constitute a hazard to maintenance personnel or the public. Any evidence of noxious weeds as defined by State or local regulations. (Apply requirements of adopted IPM policies for the use of herbicides).	No danger of poisonous vegetation where maintenance personnel or the public might normally be. (Coordinate with local health department) Complete eradication of noxious weeds may not be possible. Compliance with State or local eradication policies required
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants (Coordinate removal/cleanup with local water quality response agency).	~~No contaminants or pollutants present.~~
	Rodent Holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes.	Rodents destroyed and dam or berm repaired. (Coordinate with local health department; coordinate with Ecology Dam Safety Office if pond exceeds 10 acre-feet.)

No. 1 – Detention Ponds

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Emergency Overflow/ Spillway and Berms over 4 feet in height.	Tree Growth	Tree growth on emergency spillways creates blockage problems and may cause failure of the berm due to uncontrolled overtopping. Tree growth on berms over 4 feet in height may lead to piping through the berm which could lead to failure of the berm.	Trees should be removed. If root system is small (base less than 4 inches) the root system may be left in place. Otherwise the roots should be removed and the berm restored. A licensed civil engineer should be consulted for proper berm/spillway restoration.
	Piping	Discernable water flow through pond berm. Ongoing erosion with potential for erosion to continue. (Recommend a Goethechnical engineer be called in to inspect and evaluate condition and recommend repair of condition.	Piping eliminated. Erosion potential resolved.
Emergency Overflow/ Spillway	Emergency Overflow/ Spillway	Only one layer of rock exists above native soil in area five square feet or larger, or any exposure of native soil at the top of out flow path of spillway. (Rip-rap on inside slopes need not be replaced.)	Rocks and pad depth are restored to design standards.
	Erosion	See “Side Slopes of Pond”	

No. 1 – Detention Ponds

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
	Beaver Dams	Dam results in change or function of the facility.	Facility is returned to design function. (Coordinate trapping of beavers and removal of dams with appropriate permitting agencies)
	Insects	When insects such as wasps and hornets interfere with maintenance activities.	Insects destroyed or removed from site. Apply insecticides in compliance with adopted IPM policies
	Tree Growth and Hazard Trees	Tree growth does not allow maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). If trees are not interfering with access or maintenance, do not remove If dead, diseased, or dying trees are identified (Use a certified Arborist to determine health of tree or removal requirements)	Trees do not hinder maintenance activities. Harvested trees should be recycled into mulch or other beneficial uses (e.g., alders for firewood). Remove hazard Trees
Side Slopes of Pond	Erosion	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion. Any erosion observed on a compacted berm embankment.	Slopes should be stabilized using appropriate erosion control measure(s); e.g., rock reinforcement, planting of grass, compaction. If erosion is occurring on compacted berms a licensed civil engineer should be consulted to resolve source of erosion.
Storage Area	Sediment	Accumulated sediment that exceeds 10% of the designed pond depth unless otherwise specified or affects inletting or outletting condition of the facility.	Sediment cleaned out to designed pond shape and depth; pond reseeded if necessary to control erosion.
	Liner (If Applicable)	Liner is visible and has more than three 1/4-inch holes in it.	Liner repaired or replaced. Liner is fully covered.
Pond Berms (Dikes)	Settlements	Any part of berm which has settled 4 inches lower than the design elevation. If settlement is apparent, measure berm to determine amount of settlement. Settling can be an indication of more severe problems with the berm or outlet works. A licensed civil engineer should be consulted to determine the source of the settlement.	Dike is built back to the design elevation.
	Piping	Discernable water flow through pond berm. Ongoing erosion with potential for erosion to continue. (Recommend a Goethechnical engineer be called in to inspect and evaluate condition and recommend repair of condition.	Piping eliminated. Erosion potential resolved.

No. 3 – Closed Detention Systems (Tanks/Vaults)

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Storage Area	Plugged Air Vents	One-half of the cross section of a vent is blocked at any point or the vent is damaged.	Vents open and functioning.
	Debris and Sediment	Accumulated sediment depth exceeds 10% of the diameter of the storage area for 1/2 length of storage vault or any point depth exceeds 15% of diameter. (Example: 72-inch storage tank would require cleaning when sediment reaches depth of 7 inches for more than 1/2 length of tank.)	All sediment and debris removed from storage area.
	Joints Between Tank/Pipe Section	Any openings or voids allowing material to be transported into facility. (Will require engineering analysis to determine structural stability).	All joint between tank/pipe sections are sealed.
	Tank Pipe Bent Out of Shape	Any part of tank/pipe is bent out of shape more than 10% of its design shape. (Review required by engineer to determine structural stability).	Tank/pipe repaired or replaced to design.
	Vault Structure Includes Cracks in Wall, Bottom, Damage to Frame and/or Top Slab	Cracks wider than 1/2-inch and any evidence of soil particles entering the structure through the cracks, or maintenance/inspection personnel determines that the vault is not structurally sound. Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or any evidence of soil particles entering the vault through the walls.	Vault replaced or repaired to design specifications and is structurally sound. No cracks more than 1/4-inch wide at the joint of the inlet/outlet pipe.
Manhole	Cover Not in Place	Cover is missing or only partially in place. Any open manhole requires maintenance.	Manhole is closed.
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread (may not apply to self-locking lids).	Mechanism opens with proper tools.
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure. Intent is to keep cover from sealing off access to maintenance.	Cover can be removed and reinstalled by one maintenance person.
	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, misalignment, not securely attached to structure wall, rust, or cracks.	Ladder meets design standards. Allows maintenance person safe access.
Catch Basins	See “Catch Basins” (No. 5)	See “Catch Basins” (No. 5).	See “Catch Basins” (No. 5).

No. 4 – Control Structure/Flow Restrictor

Maintenance Component	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Trash and Debris (Includes Sediment)	Material exceeds 25% of sump depth or 1 foot below orifice plate.	Control structure orifice is not blocked. All trash and debris removed.
	Structural Damage	Structure is not securely attached to manhole wall.	Structure securely attached to wall and outlet pipe.
		Structure is not in upright position (allow up to 10% from plumb).	Structure in correct position.
		Connections to outlet pipe are not watertight and show signs of rust.	Connections to outlet pipe are water tight; structure repaired or replaced and works as designed.
		Any holes--other than designed holes--in the structure.	Structure has no holes other than designed holes.
Cleanout Gate	Damaged or Missing	Cleanout gate is not watertight or is missing.	Gate is watertight and works as designed.
		Gate cannot be moved up and down by one maintenance person.	Gate moves up and down easily and is watertight.
		Chain/rod leading to gate is missing or damaged.	Chain is in place and works as designed.
		Gate is rusted over 50% of its surface area.	Gate is repaired or replaced to meet design standards.
Orifice Plate	Damaged or Missing	Control device is not working properly due to missing, out of place, or bent orifice plate.	Plate is in place and works as designed.
	Obstructions	Any trash, debris, sediment, or vegetation blocking the plate.	Plate is free of all obstructions and works as designed.
Overflow Pipe	Obstructions	Any trash or debris blocking (or having the potential of blocking) the overflow pipe.	Pipe is free of all obstructions and works as designed.
Manhole	See “Closed Detention Systems” (No. 3).	See “Closed Detention Systems” (No. 3).	See “Closed Detention Systems” (No. 3).
Catch Basin	See “Catch Basins” (No. 5).	See “Catch Basins” (No. 5).	See “Catch Basins” (No. 5).

No. 5 – Catch Basins

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
General	Trash & Debris	Trash or debris which is located immediately in front of the catch basin opening or is blocking inletting capacity of the basin by more than 10%.	No Trash or debris located immediately in front of catch basin or on grate opening.
		Trash or debris (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of six inches clearance from the debris surface to the invert of the lowest pipe.	No trash or debris in the catch basin.
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.	Inlet and outlet pipes free of trash or debris.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No dead animals or vegetation present within the catch basin.
	Sediment	Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the sediment surface to the invert of the lowest pipe.	No sediment in the catch basin
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch (Intent is to make sure no material is running into basin).	Top slab is free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Frame is sitting flush on the riser rings or top slab and firmly attached.
	Fractures or Cracks in Basin Walls/ Bottom	Maintenance person judges that structure is unsound.	Basin replaced or repaired to design standards.
		Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	Pipe is regrouted and secure at basin wall.
	Settlement/ Misalignment	If failure of basin has created a safety, function, or design problem.	Basin replaced or repaired to design standards.
	Vegetation	Vegetation growing across and blocking more than 10% of the basin opening.	No vegetation blocking opening to basin.
		Vegetation growing in inlet/outlet pipe joints that is more than six inches tall and less than six inches apart.	No vegetation or root growth present.
	Contamination and Pollution	See "Detention Ponds" (No. 1).	No pollution present.

No. 5 – Catch Basins

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
Catch Basin Cover	Cover Not in Place	Cover is missing or only partially in place. Any open catch basin requires maintenance.	Catch basin cover is closed
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	Mechanism opens with proper tools.
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure. (Intent is keep cover from sealing off access to maintenance.)	Cover can be removed by one maintenance person.
Ladder	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.	Ladder meets design standards and allows maintenance person safe access.
Metal Grates (If Applicable)	Grate opening Unsafe	Grate with opening wider than 7/8 inch.	Grate opening meets design standards.
	Trash and Debris	Trash and debris that is blocking more than 20% of grate surface inletting capacity.	Grate free of trash and debris.
	Damaged or Missing.	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.

No. 6 – Debris Barriers (e.g., Trash Racks)

Maintenance Components	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Trash and Debris	Trash or debris that is plugging more than 20% of the openings in the barrier.	Barrier cleared to design flow capacity.
Metal	Damaged/ Missing Bars.	Bars are bent out of shape more than 3 inches.	Bars in place with no bends more than 3/4 inch.
		Bars are missing or entire barrier missing.	Bars in place according to design.
		Bars are loose and rust is causing 50% deterioration to any part of barrier.	Barrier replaced or repaired to design standards.
	Inlet/Outlet Pipe	Debris barrier missing or not attached to pipe	Barrier firmly attached to pipe

No. 10 – Filter Strips

Maintenance Component	Defect or Problem	Condition When Maintenance is Needed	Recommended Maintenance to Correct Problem
General	Sediment Accumulation on Grass	Sediment depth exceeds 2 inches.	Remove sediment deposits, re-level so slope is even and flows pass evenly through strip.
	Vegetation	When the grass becomes excessively tall (greater than 10-inches); when nuisance weeds and other vegetation starts to take over.	Mow grass, control nuisance vegetation, such that flow not impeded. Grass should be mowed to a height between 3-4 inches.
	Trash and Debris Accumulation	Trash and debris accumulated on the filter strip.	Remove trash and Debris from filter.
	Erosion/Scouring	Eroded or scoured areas due to flow channelization, or higher flows.	For ruts or bare areas less than 12 inches wide, repair the damaged area by filling with crushed gravel. The grass will creep in over the rock in time. If bare areas are large, generally greater than 12 inches wide, the filter strip should be re-graded and re-seeded. For smaller bare areas, overseed when bare spots are evident.
	Flow spreader	Flow spreader uneven or clogged so that flows are not uniformly distributed through entire filter width.	Level the spreader and clean so that flows are spread evenly over entire filter width.

No. 15 – Manufactured Media Filters)

Maintenance Component	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
Below Ground Vault	Sediment Accumulation on Media.	Sediment depth exceeds 0.25-inches.	No sediment deposits which would impede permeability of the compost media.
	Sediment Accumulation in Vault	Sediment depth exceeds 6-inches in first chamber.	No sediment deposits in vault bottom of first chamber.
	Trash/Debris Accumulation	Trash and debris accumulated on compost filter bed.	Trash and debris removed from the compost filter bed.
	Sediment in Drain Pipes/Clean-Outs	When drain pipes, clean-outs, become full with sediment and/or debris.	Sediment and debris removed.
	Damaged Pipes	Any part of the pipes that are crushed or damaged due to corrosion and/or settlement.	Pipe repaired and/or replaced.
	Access Cover Damaged/Not Working	Cover cannot be opened; one person cannot open the cover using normal lifting pressure, corrosion/deformation of cover.	Cover repaired to proper working specifications or replaced.
	Vault Structure Includes Cracks in Wall, Bottom, Damage to Frame and/or Top Slab	Cracks wider than 1/2-inch or evidence of soil particles entering the structure through the cracks, or maintenance/inspection personnel determine that the vault is not structurally sound.	Vault replaced or repairs made so that vault meets design specifications and is structurally sound.
		Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or evidence of soil particles entering through the cracks.	Vault repaired so that no cracks exist wider than 1/4-inch at the joint of the inlet/outlet pipe.
	Baffles	Baffles corroding, cracking warping, and/or showing signs of failure as determined by maintenance/inspection person.	Baffles repaired or replaced to specifications.
	Access Ladder Damaged	Ladder is corroded or deteriorated, not functioning properly, not securely attached to structure wall, missing rungs, cracks, and misaligned.	Ladder replaced or repaired and meets specifications, and is safe to use as determined by inspection personnel.
Below Ground Cartridge Type	Media	Drawdown of water through the media takes longer than 1 hour, and/or overflow occurs frequently.	Media cartridges replaced.
	Short Circuiting	Flows do not properly enter filter cartridges.	Filter cartridges replaced.

No. 18 – Catchbasin Inserts

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Sediment Accumulation	When sediment forms a cap over the insert media of the insert and/or unit.	No sediment cap on the insert media and its unit.
	Trash and Debris Accumulation	Trash and debris accumulates on insert unit creating a blockage/restriction.	Trash and debris removed from insert unit. Runoff freely flows into catch basin.
	Media Insert Not Removing Oil	Effluent water from media insert has a visible sheen.	Effluent water from media insert is free of oils and has no visible sheen.
	Media Insert Water Saturated	Catch basin insert is saturated with water and no longer has the capacity to absorb.	Remove and replace media insert
	Media Insert-Oil Saturated	Media oil saturated due to petroleum spill that drains into catch basin.	Remove and replace media insert.
	Media Insert Use Beyond Normal Product Life	Media has been used beyond the typical average life of media insert product.	Remove and replace media at regular intervals, depending on insert product.

SECTION 9 – DRAFT STORMWATER MAINTENANCE AGREEMENT

The following pages contain a draft maintenance agreement to be completed prior to final approval. Upon completion of road construction and stormwater facilities; a signed agreement will be executed, and a copy provided to the City of Chehalis.