

**Puyallup School District
Ferrucci Junior High Addition**

**Preliminary
Stormwater Site Plan**

Prepared for:

**NAC Architecture
2025 1st Avenue Suite 300
Seattle, WA 98121**

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1.0 PROJECT OVERVIEW AND CONDITIONS

1.1 Scope

The project proposes, on behalf of the Puyallup School District, the construction of additions to the existing Ferrucci Junior High building as well as site improvements to facilitate better traffic circulation. The site is located at 3213 Wildwood Park Drive, Puyallup, WA 98374. See the Vicinity map included in Figure 1. In addition, the project proposes storm drainage, sanitary sewer, and water utility improvements together with surfacing and restoration that includes paving, curb and sidewalk, and vegetative improvements.

This report addresses the City of Puyallup storm drainage design and preliminary stormwater site plan requirements of PMC Chapter 21.10 and the Washington State Department of Ecology Stormwater Management Manual for Western Washington, as Amended in December 2014 (the Manual). Please note that the stormwater management strategies discussed in this report are preliminary and may change.

1.2 Existing Conditions Summary

This project proposes improvements to parcels 0419023002 (19.85 acres) and 5481611380 (1.51 acres). These parcels contain the existing Ferrucci Junior High School site. The site currently contains the main junior high building as well as 15 portable classroom buildings. All but four of the portable classrooms will be removed from the project site. The main school building was built in the early 1980s. See Figure 2 for the preliminary site plan, which includes existing conditions.

The west side of the existing site is at a higher elevation than the east side. A slope of approximately 3H:1V separates the two sides of the site. A large mound is located in the northwest portion of the site. Aside from the mound and the slope the defines the elevation difference between the west and east sides of the site, grades are mostly gentle. The majority of the site has previously been cleared of forested vegetation and developed in some manner. The site surfacing consists of the buildings previously mentioned, impervious pavements and gravels, and vegetative surfaces (which include both landscaping and play fields).

The site is currently served by a drainage system that conveys water to the two onsite stormwater ponds. Both of these ponds are located on the south end of the site. These ponds discharge to the existing storm line in 36th Place East (the cul-de-sac southeast of the project site). The plans for this existing storm drainage system are included with this report as Figure 9.

Existing site soils are described in detail in the Geotechnical Engineering Report prepared by Associated Earth Sciences for the project. A copy of this report has been included with the preliminary site plan submittal. The findings of this report indicate that the existing pond on the southwest portion of the project site is the only viable location for onsite infiltration, with a design infiltration rate of 1.3 inches per hour. Infiltration using deep injection wells on the east side of the site was also found to be technically feasible, but not practicable (see Section 1.4).

1.3 Critical Areas

1.3.1 Flood Zone

The project site is located within an area of minimal flood hazard (0.2% annual change flood hazard), Zone X. Please see Figure 5.

1.3.2 Wetlands

There are no wetlands that will be impacted by the proposed project.

1.3.3 Aquifer Recharge and Wellhead Protection Zone

The project lies within an aquifer recharge area, as defined by the City of Puyallup's Aquifer Recharge and Wellhead Protection Areas, see Figure 6. This project does not negatively impact the Aquifer Recharge or Wellhead protection area.

1.3.4 Other Critical Areas

The potential for landslide and seismic hazards has been addressed in the Geotechnical Engineering Report prepared by Associated Earth Sciences.

1.4 Proposed Conditions

One new side sewer service is proposed. No new water services are proposed, since all water service to the proposed additions will be provided from the existing building. The only water system improvements proposed are the relocation of existing lines that conflict with proposed improvements and the installation of fire hydrants.

Stormwater runoff from new and replaced hard surfaces will be captured and treated prior to discharge into the southwest stormwater pond, which will be enlarged to allow for infiltration of new hard surface area. Treatment of runoff from the new bus parking area will be accomplished using a compost-amended vegetated filter strip. The remaining new and replaced surfaces will be treated using cartridge-based filtration units. Some of the area that discharges to the southeast pond in the existing condition will be redirected to the proposed treatment facilities and enlarged southwest pond. Therefore, no analysis of the existing southeast pond is provided as the discharge to this pond will be reduced.

Per the Geotechnical Report prepared by Associated Earth Sciences, infiltration on the east end of the site using deep underground injection wells is feasible. However, this approach was considered, and ultimately scrapped, by the Puyallup School District in favor of infiltration at the existing southwest pond. The cost, maintenance, and permitting impacts of an underground injection well system was found to be far less favorable than the chosen strategy.

Also per the Geotechnical Report, groundwater in the vicinity of the enlarged southwest pond is measured to be 35 feet below the existing pond bottom. A detailed discussion of site groundwater can be found in the Geotechnical Report.

New and replaced hard surfaces include the new bus parking and turnaround area, the new site access, and the new student drop-off/pick-up area. Please see the proposed site plan in Figure 2.

2.0 DISCUSSION OF MINIMUM REQUIREMENTS

According to the Washington State Department of Ecology's Stormwater Management Manual for Western Washington, the development threshold minimum requirement flow charts (presented as Figure 7 of this report) necessitate that Minimum Requirements 1-10 apply to the new hard surfaces, converted pervious surfaces and the land disturbed. Below is a summary of the Minimum Requirements applicable to this project.

2.1 Minimum Requirement #1 - Prepare a Stormwater Site Plan

According to the City of Puyallup Land Use & Development Requirements, a Preliminary and Final Stormwater Site Plan shall be provided. This Preliminary Stormwater Site Plan has been provided pursuant to submittal of a Final Stormwater Site Plan. A final Stormwater Site Plan will be provided upon preliminary site plan approval and during the Final Site Plan permitting process per City requirements to fully satisfy this requirement.

2.2 Minimum Requirement #2 - Construction Stormwater Pollution Prevention

This minimum requirement will be satisfied by the preparation of Construction Stormwater Pollution Prevention Plan and a Temporary Erosion and Sediment Control Plan – to be included with the Final Site Plan Review submittal.

2.3 Minimum Requirement #3 - Source Control for Pollution

Operational and Structural Source Control BMPs will be included in the Operations and Maintenance Manual – to be included with the Final Site Plan Review submittal.

2.4 Minimum Requirement #4 - Preservation of Natural Drainage Systems and Outfalls

The project site has already been developed and is served by an existing man-made drainage system. Elements of the existing system will continue to be used, with some modifications being made to fit the drainage strategy for the project.

2.5 Minimum Requirement #5 - On-site Stormwater Management

Stormwater will be managed onsite in accordance with City of Puyallup and DOE requirements. Per the flow chart for LID requirements included in Figure 7 of this report, the project will elect to satisfy the LID performance standard through the use of infiltration. Additionally, lawn and landscape areas will be subject to BMP T5.13: Post-Construction Soil Quality and Depth.

2.6 Minimum Requirement #6 - Runoff Treatment

The project proposes the use of a compost amended vegetated filter strip and cartridge-based filtration units to treat runoff from project surfaces. Preliminary calculations for the proposed facilities are provided in Appendices B and C.

2.7 Minimum Requirement #7 - Flow Control

The project proposes full infiltration of project surfaces through an infiltration pond. Preliminary calculations for the proposed pond are provided in Appendix A.

2.8 Minimum Requirement #8 - Wetland Protection

No wetlands will be impacted by the proposed project.

2.9 Minimum Requirement #9 - Operation and Maintenance

An Operations and Maintenance Plan will be provided to the City of Puyallup as a part of the Final Site Plan Review.

2.10 Optional Guidance #1 – Financial Liability

Financial liability will be waived as a part of the Final Site Plan Review.

2.11 Optional Guidance #2 – Off Site Analysis and Mitigation

An offsite analysis is provided in Section 3.0 of this report.

3.0 OFFSITE ANALYSIS

The project proposes the retention and infiltration of runoff from project surfaces in the expanded infiltration pond. An emergency overflow will be provided that discharges to the existing drainage system in 36th Place SE as discussed in Section 1.2 of this report. According to Puyallup GIS information (see Figure X), this system discharges to a regional stormwater pond located in Manorwood Park approximately ¼ mile from the project site. Discharge to this system will only take place during extreme storm events.

4.0 PERMANENT STORMWATER CONTROL PLAN

Conveyance calculations will be provided, as required, as a part of the Permanent Stormwater Site Plan.

5.0 CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN

A CSWPP Plan will be provided as a part of the Permanent Stormwater Site Plan.

6.0 SPECIAL REPORTS AND STUDIES

A geotechnical investigation of the project area has been completed by Associated Earth Sciences, Inc. (AESI) and summarized in their geotechnical report dated July 2, 2020 (bound separate from this Preliminary Stormwater Site Plan).

7.0 OTHER PERMITS

This project also requires the approval of the SEPA permit. This project proposes to disturb more than 1 acre of land, which means a Construction Stormwater General Permit is required.

8.0 OPERATION AND MAINTENANCE MANUAL

An O&M Manual will be submitted as a part of the Permanent Stormwater Control Plan.

9.0 DECLARATION OF COVENANT FOR PRIVATELY MAINTAINED FLOW CONTROL AND TREATMENT FACILITIES

The project will provide a declaration of covenant for privately maintained flow control and treatment facilities.

10.0 DECLARATION OF COVENANT FOR PRIVATELY MAINTAINED ON-SITE STORMWATER MANAGEMENT BMPs

The project will provide a declaration of covenant for privately maintained on-site stormwater management BMPs.

11.0 BOND QUANTITIES WORKSHEET

The bond quantities worksheet shall be provided as a part of the Permanent Stormwater Control Plan.

FIGURES

Figure 1 – Vicinity Map



Figure 2 – Preliminary Site Plan

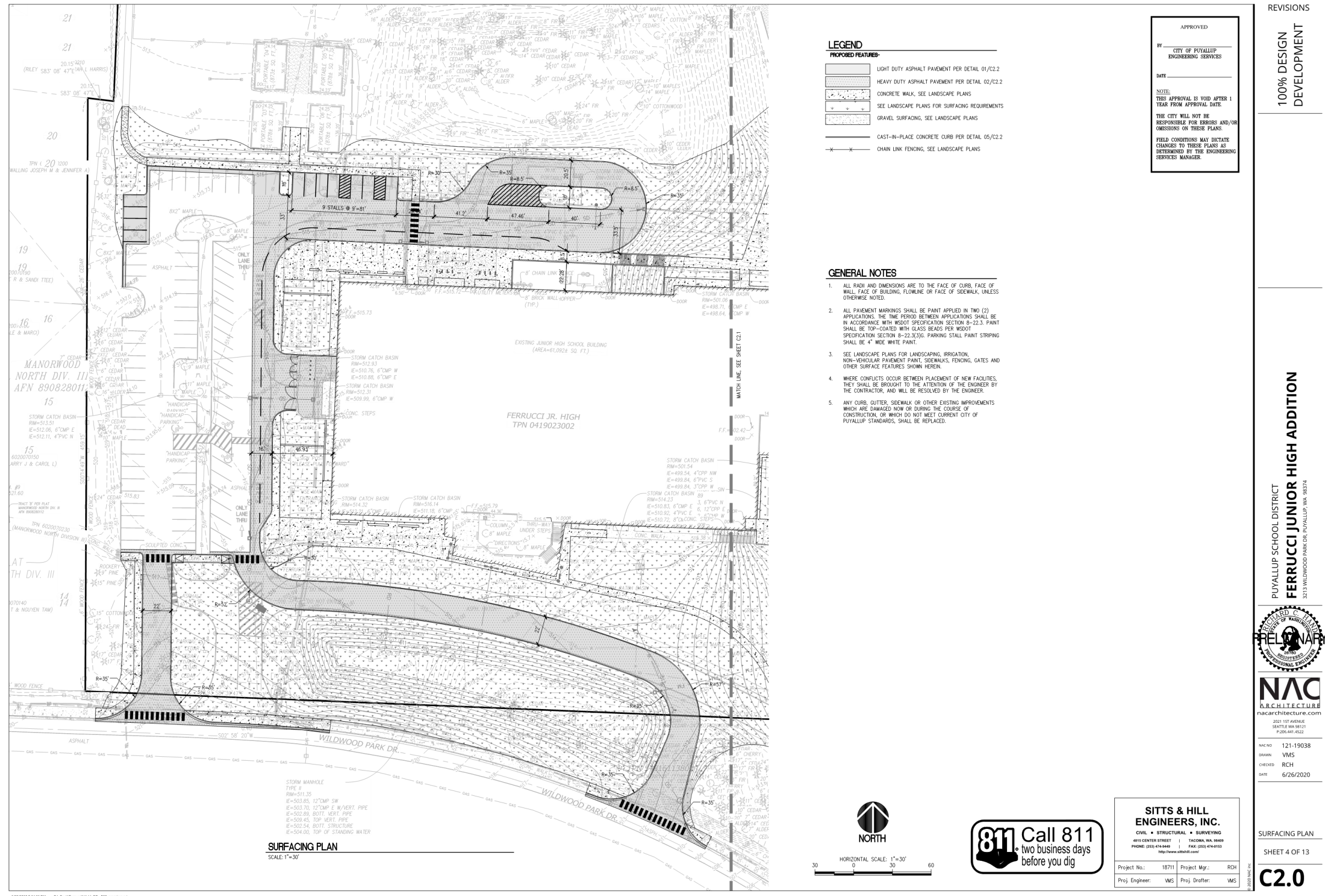




Figure 3 – Infiltration Pond Tributary Area

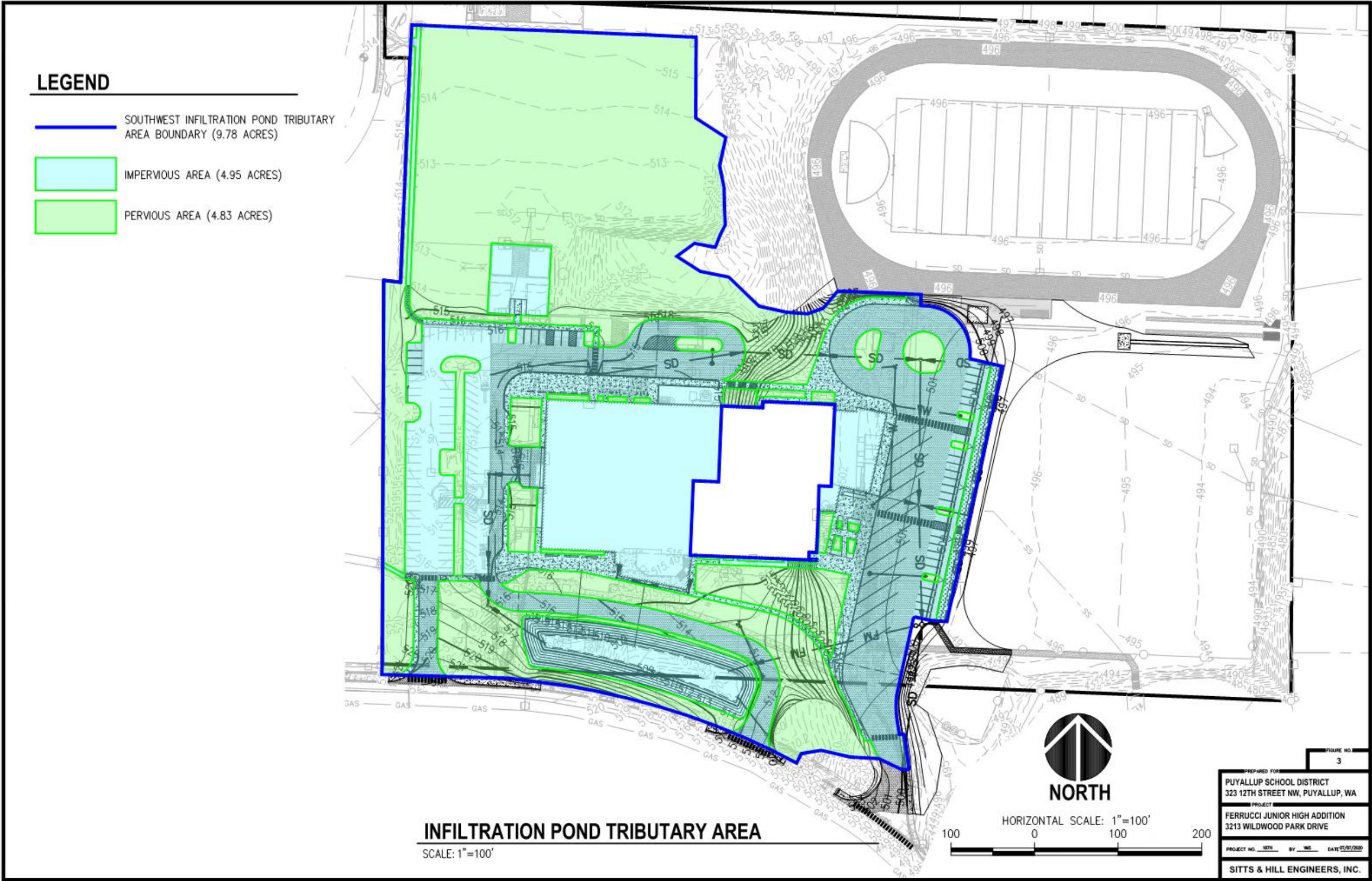


Figure 4 – Water Quality Facility Tributary Areas

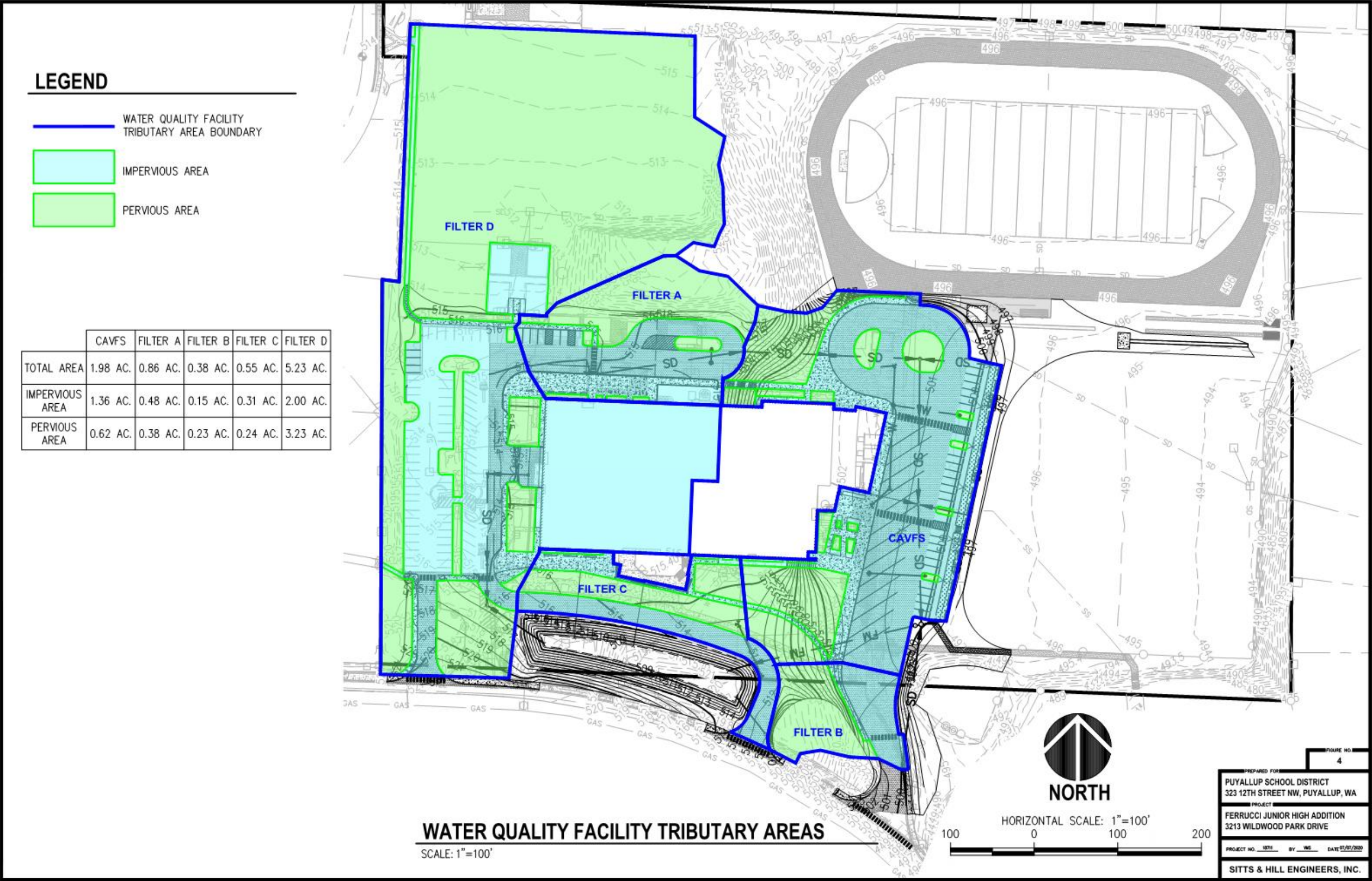


Figure 5 – FEMA Map

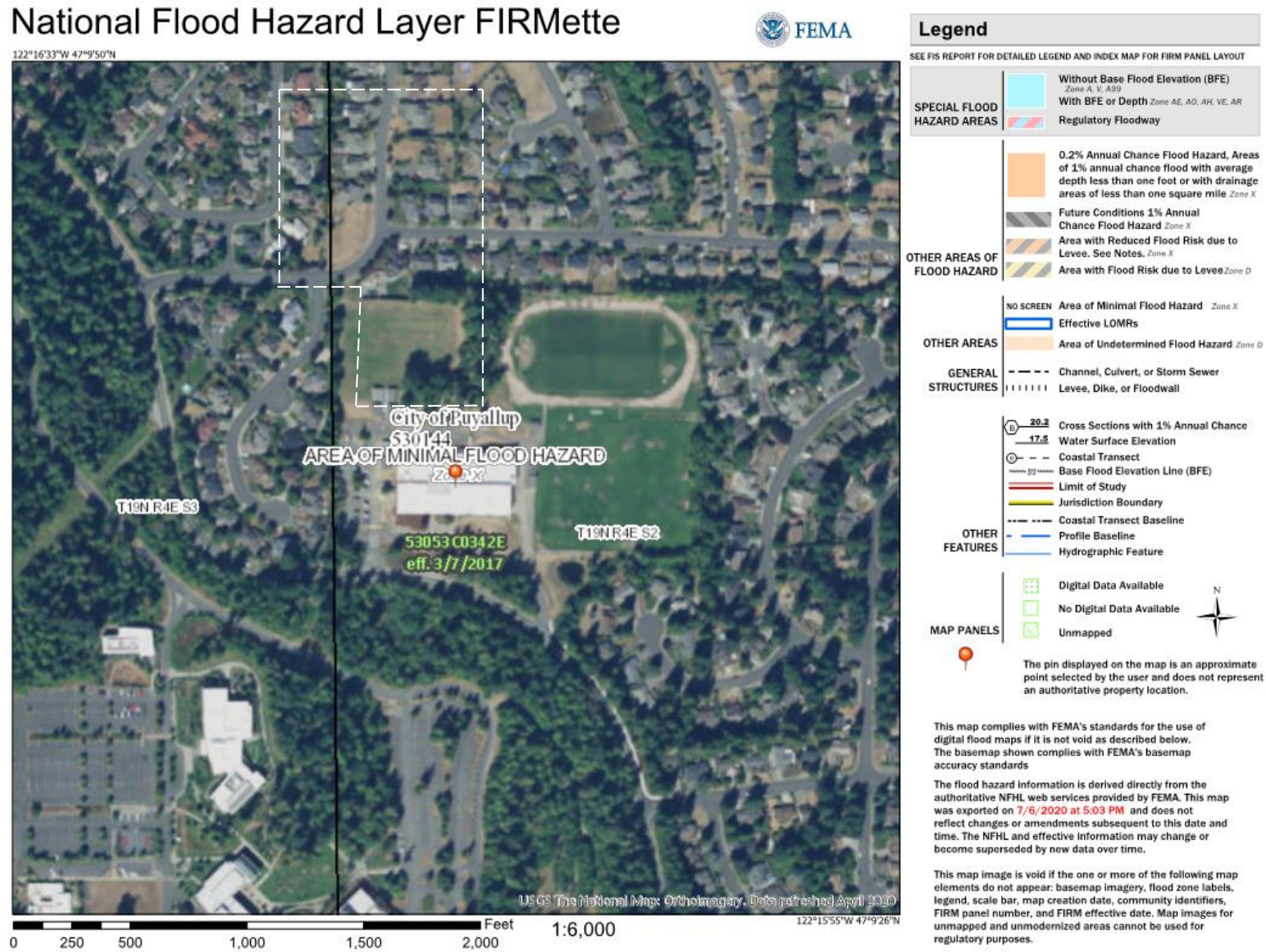


Figure 6 – Aquifer Recharge & Wetland Map

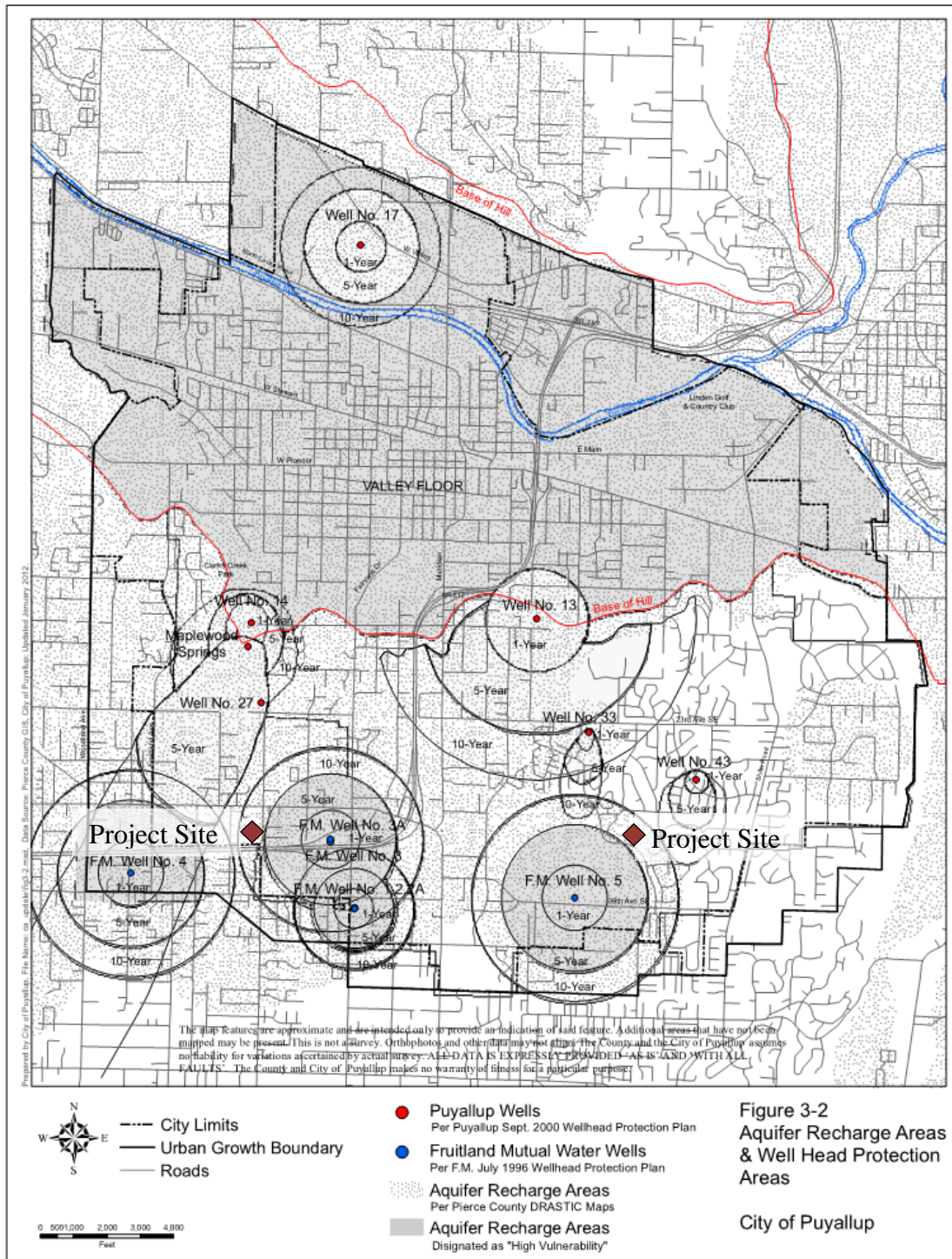
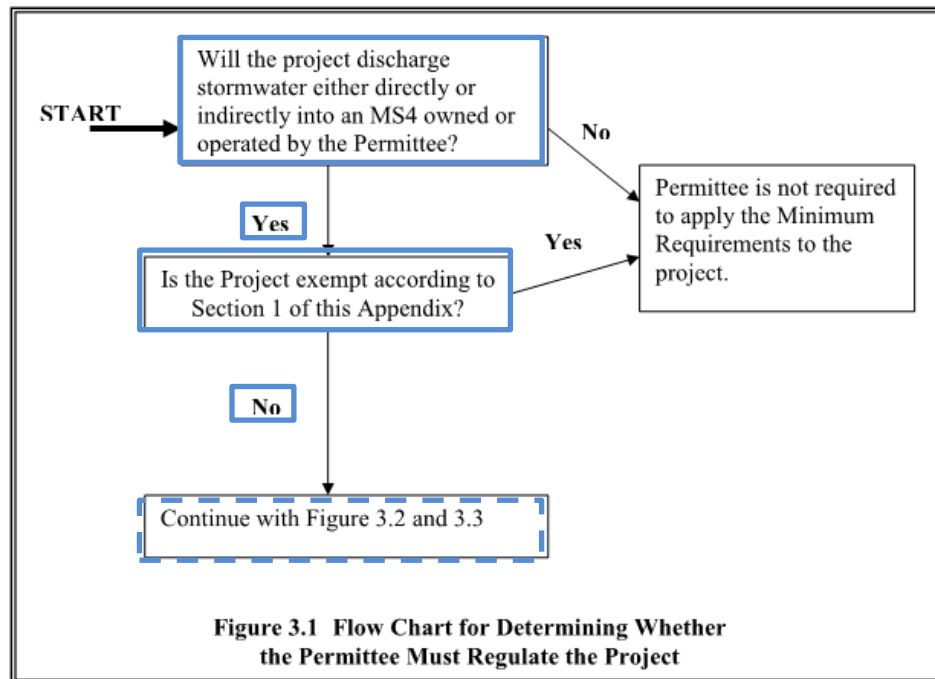
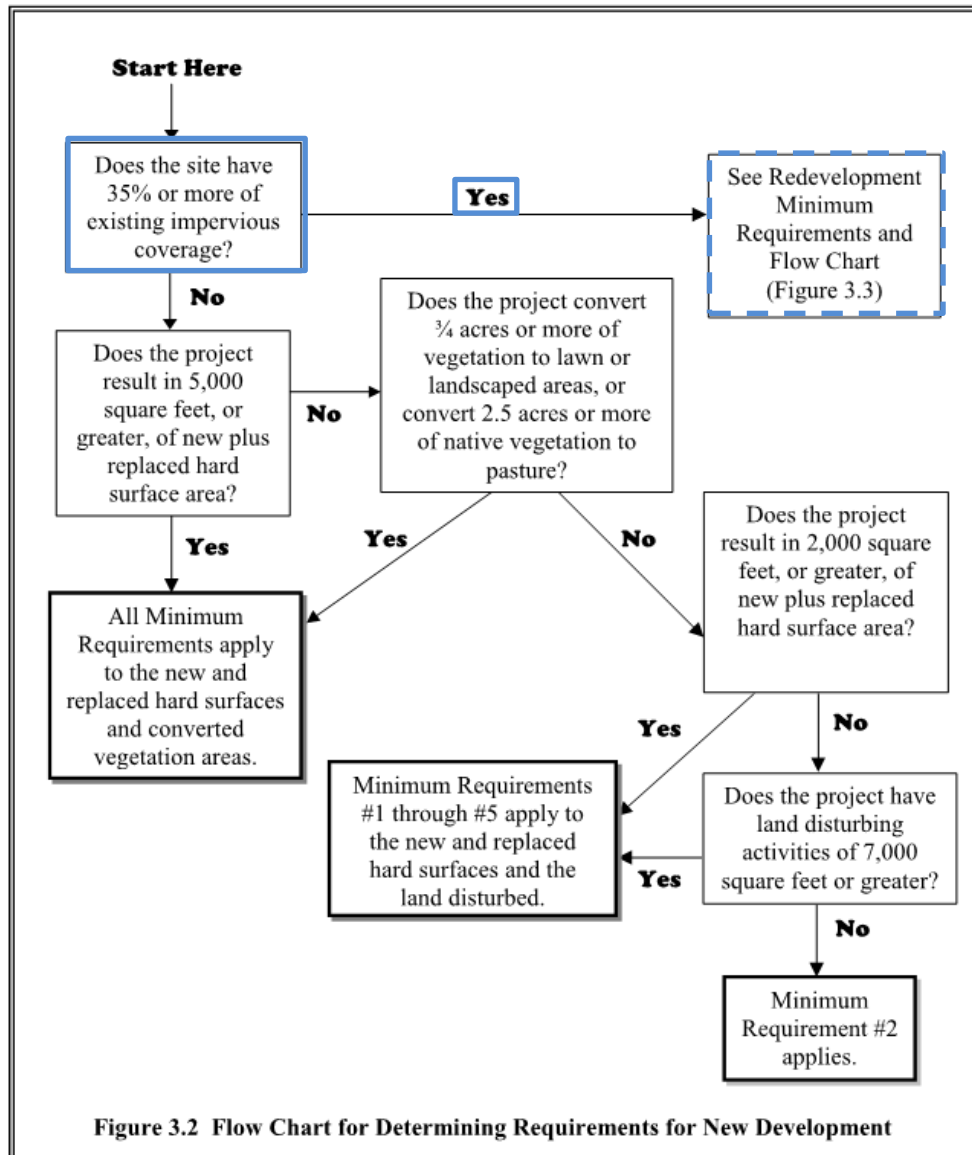


Figure 7 – Flow Charts for Determining Minimum Requirements





Western Washington Phase II Municipal Stormwater Permit

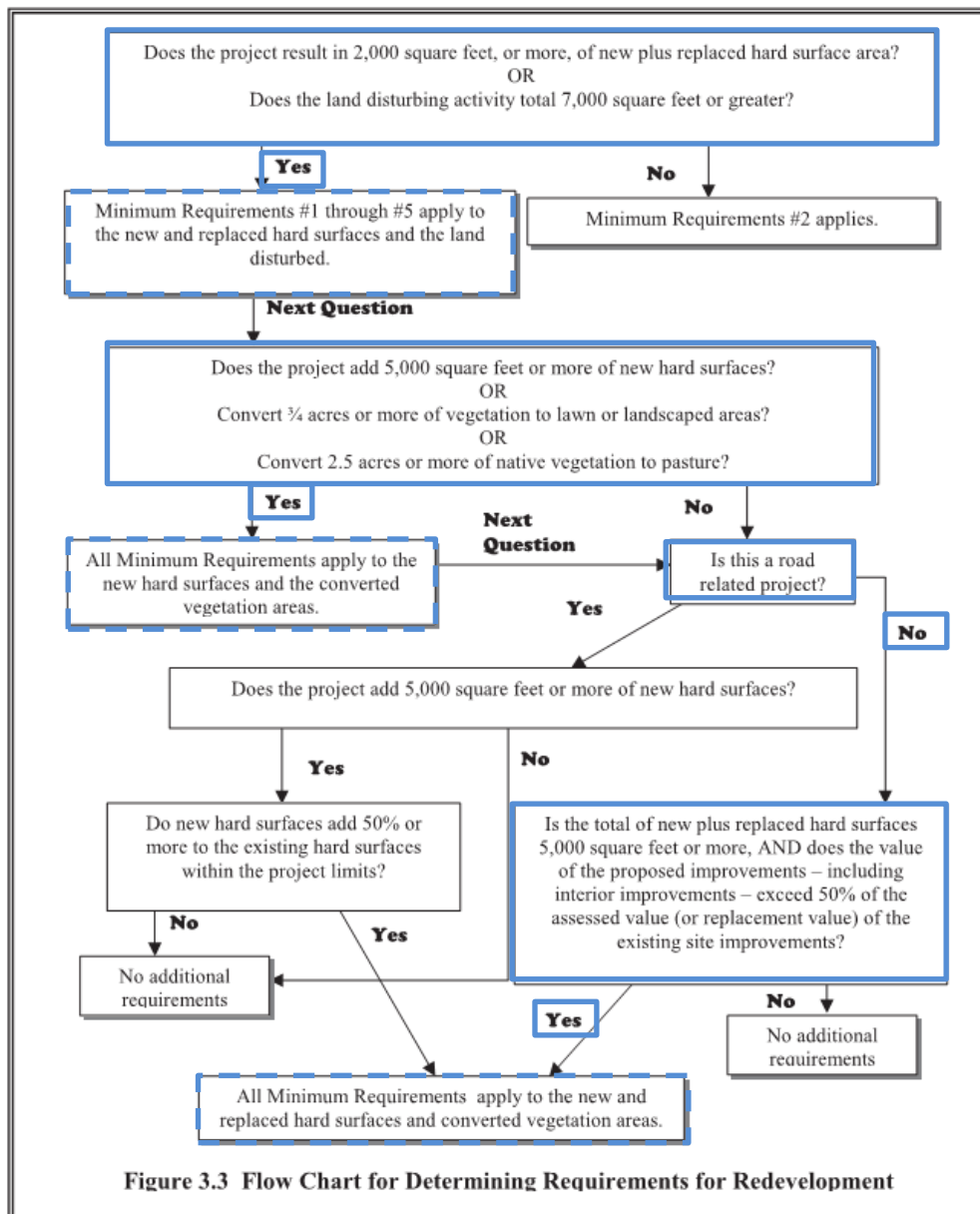
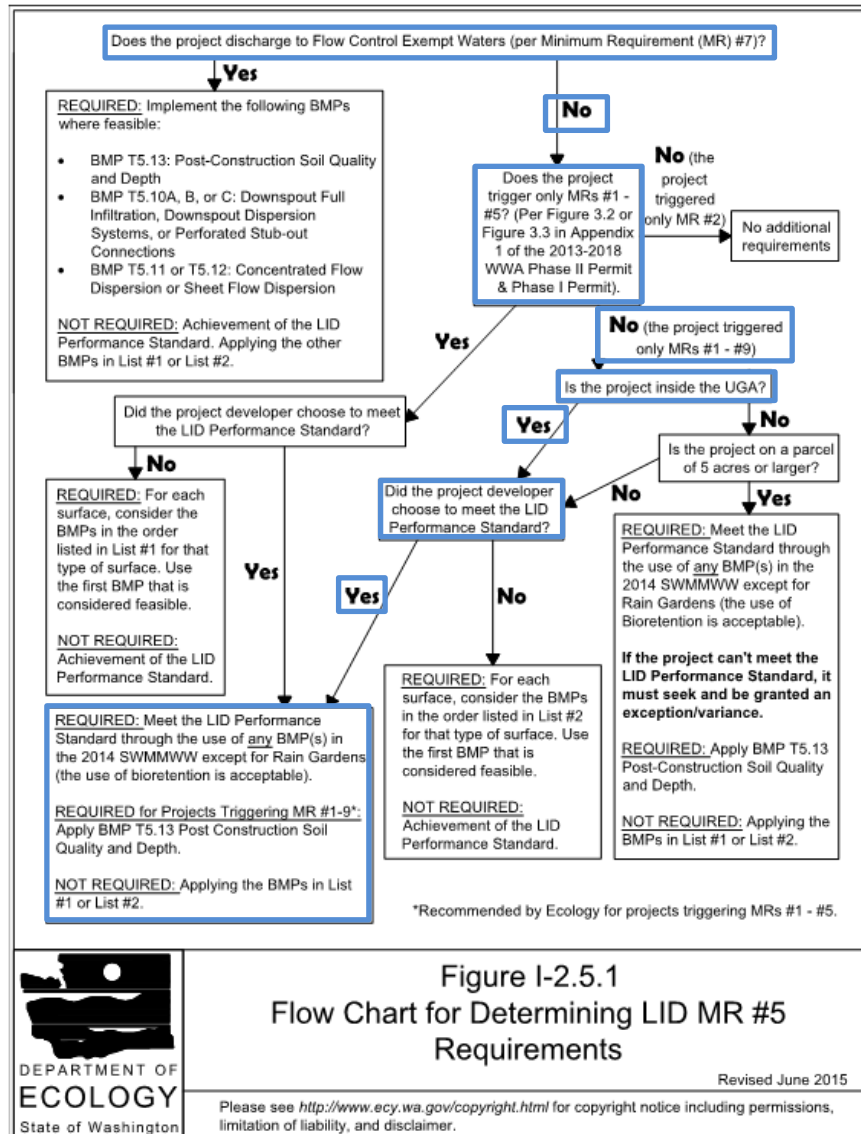


Figure I-2.5.1 Flow Chart for Determining LID MR #5 Requirements



**Figure I-2.5.1
Flow Chart for Determining LID MR #5
Requirements**

Revised June 2015

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Figure 8 – City of Puyallup Drainage Basins

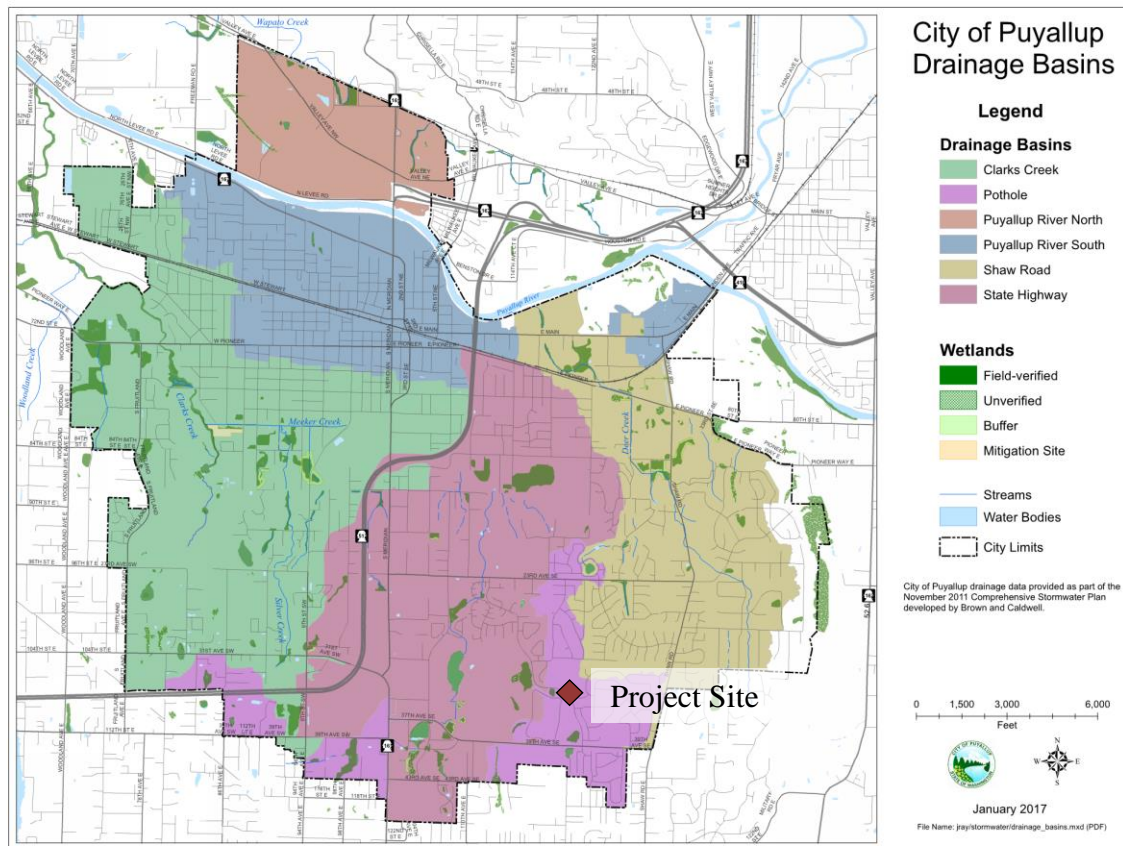
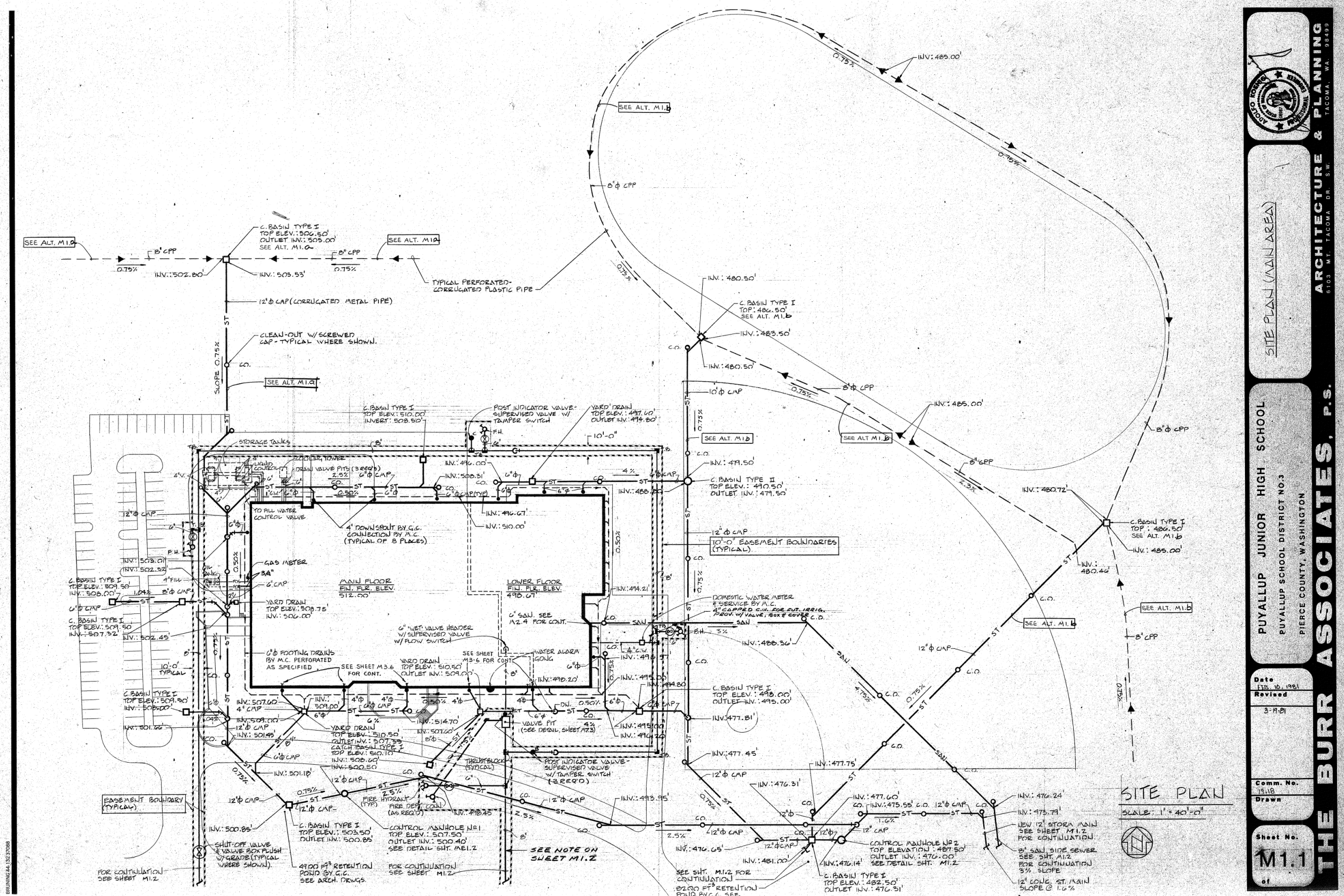
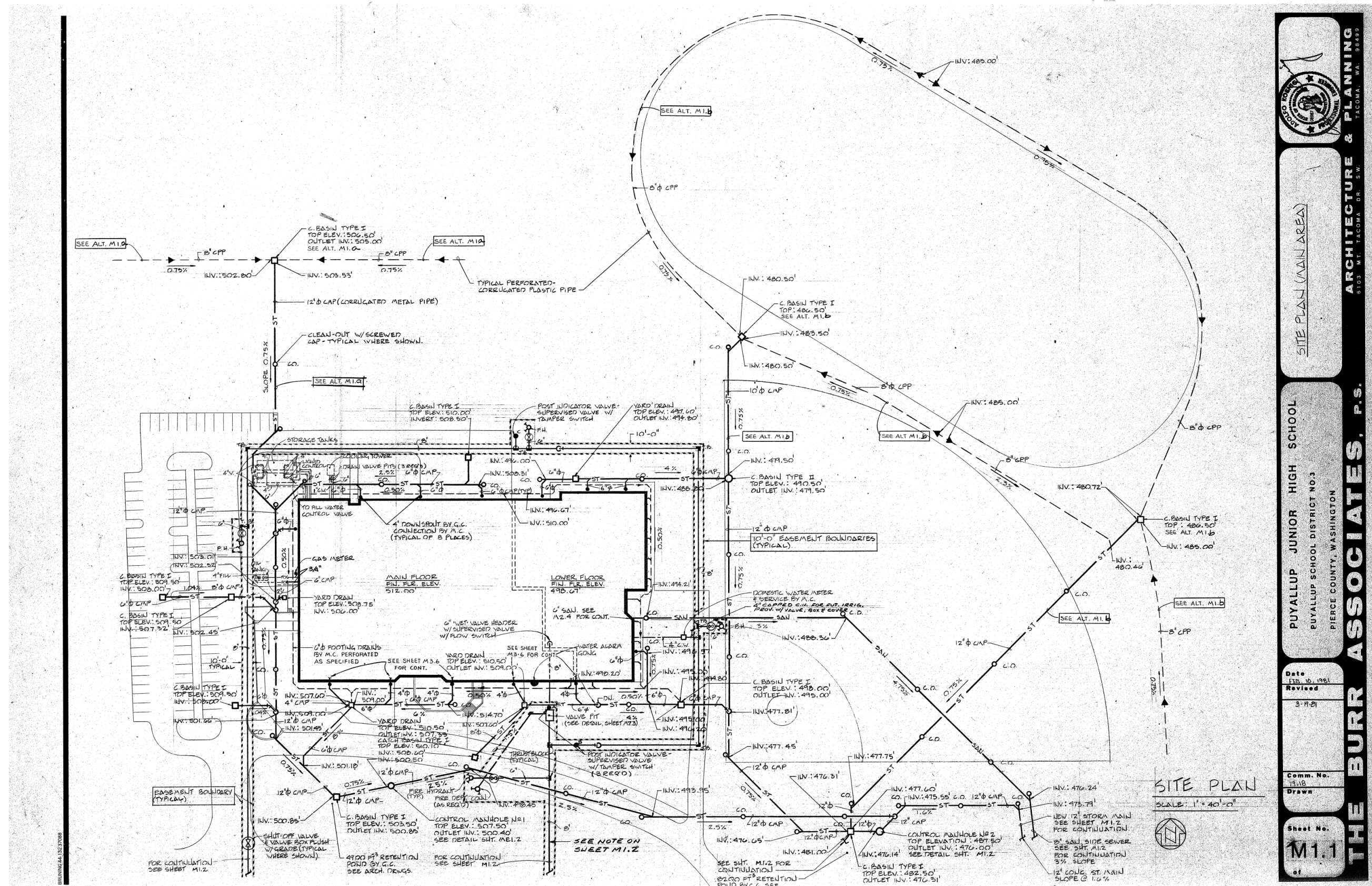


Figure 9 – Existing Storm Drainage System





APPENDIX A – Infiltration Pond Calculations

Flow control basin areas can be seen in Figure 3.

Predeveloped Conditions:

Basin 1 Predeveloped

Subbasin Name: Basin 1

Flows To : Surface Interflow Groundwater

Area in Basin ☒ Show Only Selected

Available Pervious	Acres	Available Impervious	Acres
<input checked="" type="checkbox"/> C, Forest, Flat	9.78		

Mitigated Conditions:

Basin 1 Mitigated

Subbasin Name: Basin 1 ☐ Designate as Bypass for POC

Flows To : Surface Interflow Groundwater

Trapezoidal Pond 1 Trapezoidal Pond 1

Area in Basin ☒ Show Only Selected

Available Pervious	Acres	Available Impervious	Acres
<input checked="" type="checkbox"/> C, Pasture, Flat	1.13	<input checked="" type="checkbox"/> ROADS/FLAT	4.52
<input checked="" type="checkbox"/> C, Pasture, Steep	1.23	<input checked="" type="checkbox"/> POND	.42
<input checked="" type="checkbox"/> C, Lawn, Flat	2.48		

Infiltration Pond:

Trapezoidal Pond 1 Mitigated

Facility Name

Trapezoidal Pond 1

Facility Type

Outlet 1

Outlet 2

Outlet 3

Downstream Connections

0

0

0

☐ Precipitation Applied to Facility

Auto Pond

Quick Pond

☐ Evaporation Applied to Facility

Facility Dimension Diagram

Facility Dimensions

Facility Bottom Elevation (ft)

0

Bottom Length (ft)

260

Bottom Width (ft)

23

Effective Depth (ft)

6

Left Side Slope (H/V)

3

Bottom Side Slope (H/V)

3

Right Side Slope (H/V)

3

Top Side Slope (H/V)

3

Outlet Structure Data

Riser Height (ft)

5

Riser Diameter (in)

12

Riser Type

Flat

Notch Type

Infiltration

Yes

Measured Infiltration Rate (in/hr)

1.3

Reduction Factor(infilt*factor)

1

Use Wetted Surface Area (sidewalls)

Yes

Total Volume Infiltrated (ac-ft)

3065.287

Total Volume Through Riser (ac-ft)

2.408

Total Volume Through Facility (ac-ft)

3067.70

Percent Infiltrated

99.92

Orifice

Diameter

Height

Number

(in)

(ft)

1

0

0

2

0

0

3

0

0

Pond Volume at Riser Head (ac-ft)

1.208

Show Pond Table

Open Table

Initial

0

Size Infiltration Pond

Target %: 100

Tide Gate

Time Series

Demand

Determine Outlet With Tide Gate

☐ Use Tide Gate

Tide Gate Elevation (ft)

0

Downstream Connection

Overflow Elevation (ft)

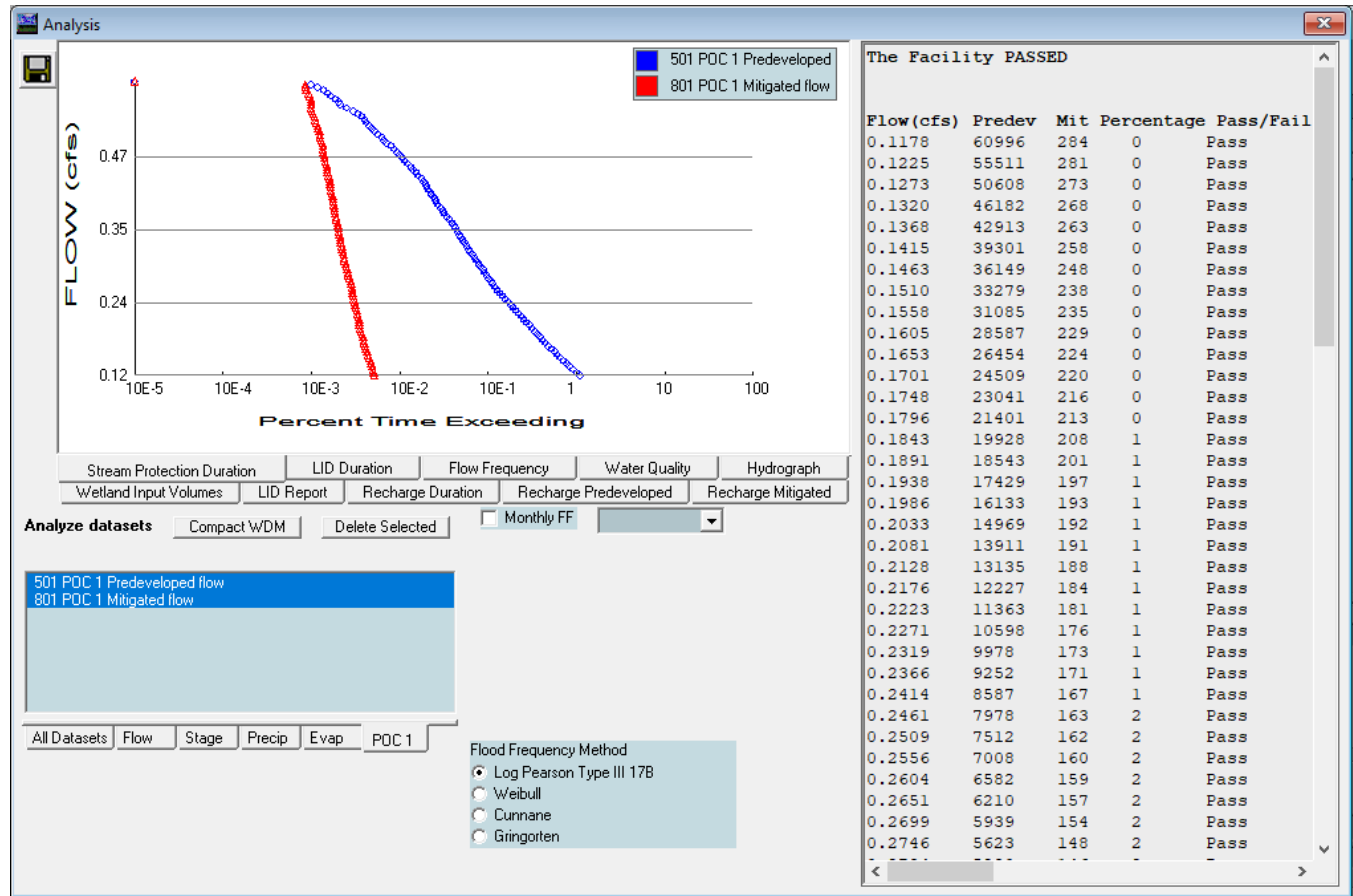
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Iterations

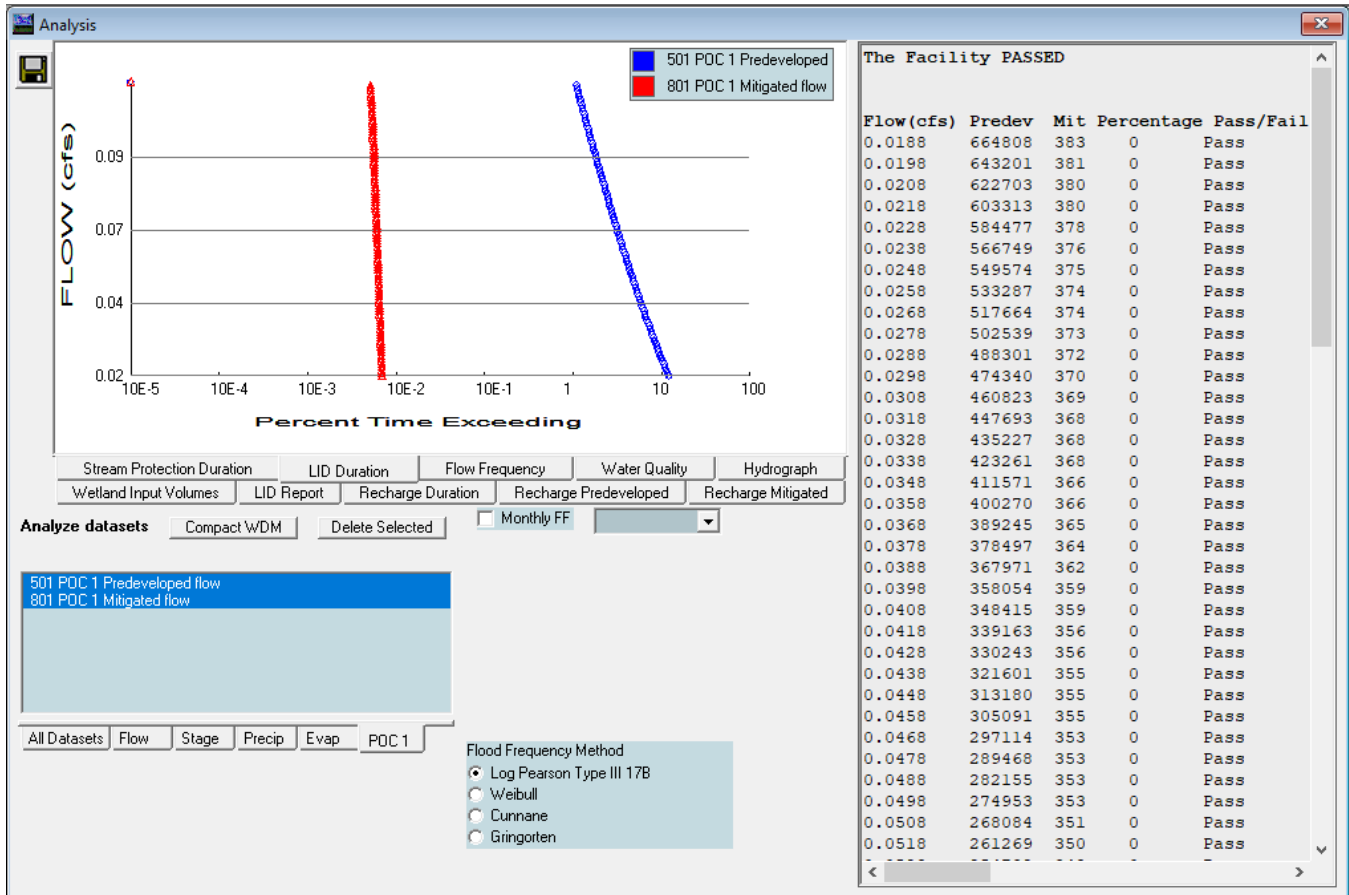
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PSD FERRUCCI JUNIOR HIGH ADDITION
PRELIMINARY STORMWATER SITE PLAN

Results:



PSD FERRUCCI JUNIOR HIGH ADDITION
PRELIMINARY STORMWATER SITE PLAN



APPENDIX B – CAVFS Treatment Calculations

Treatment facility basins can be seen in Figure 4.

Predeveloped Conditions:

Basin 1 Predeveloped

Subbasin Name: Basin 1

Flows To : Surface Interflow Groundwater

Area in Basin ☒ Show Only Selected

Available Pervious	Acres	Available Impervious	Acres
<input checked="" type="checkbox"/> C, Forest, Flat	1.98		

Mitigated Conditions:

Basin 1 Mitigated

Subbasin Name: Basin 1 ☐ Designate as Bypass for POC

Flows To : Surface Interflow Groundwater

Area in Basin ☒ Show Only Selected

Available Pervious	Acres	Available Impervious	Acres
<input checked="" type="checkbox"/> C, Pasture, Flat	.19	<input checked="" type="checkbox"/> ROADS/FLAT	1.36
<input checked="" type="checkbox"/> C, Pasture, Steep	.43		

CAVFS:

CAVFS 1 Mitigated

Facility Name

CAVFS 1

Outlet 1

0

Outlet 2

0

Outlet 3

0

Downstream Connection

0

Facility Type

CAVFS

☒ Use Simple Swale

Default CAVFS

CAVFS Bottom Elevation (ft)

0

CAVFS Dimensions

CAVFS width (ft)

15.000

CAVFS Length (ft)

313.000

Surface Ponding (ft)

0.250

Flow Through CAVFS (ac-ft)

638.165

Total Outflow (ac-ft)

699.522

Percent Through CAVFS

91.23

Total Volume Filtered

638.165

Facility Dimension Diagram

Material Layer for CAVFS

Gravel

CAVFS

Depth (ft)

0.250

0.500

Gravel Spreader

GRAVEL

CAVFS

SMMwW 12 in/hr

Edit Soil Types

Embankment Height (ft)

5.000

KSat Safety Factor

☐ None
☐ 2
☒ 4

Show CAVFS

Open Table

Native Infiltration

NO

CAVFS Volume at overflow (ac-ft)

.028

APPENDIX C – Water Quality Filter Calculations

Treatment facility basins can be seen in Figure 4. Treatment units proposed are Stormfilters, manufactured by Contech. This product has been granted a General Use Level Designation by the Department of Ecology.

Facility	Filter A	Filter B	Filter C	Filter D
Flow per 18" Cartridge Filter	7.5 gpm = 0.0167 cfs	7.5 gpm = 0.0167 cfs	7.5 gpm = 0.0167 cfs	7.5 gpm = 0.0167 cfs
WWHM WQ Flow	0.0439 cfs	0.0144 cfs	0.0276 cfs	0.1805 cfs
Cartridges needed	3	1	2	11

FILTER A

Predeveloped Conditions:

Basin 1 Predeveloped

Subbasin Name: Basin 1

Flows To : Surface Interflow Groundwater

Area in Basin ☒ Show Only Selected

Available Pervious Acres Available Impervious Acres

☒ C, Forest, Flat .86

Mitigated Conditions:

Basin 1 Mitigated

Subbasin Name: Basin 1 ☐ Designate as Bypass for POC

Flows To : Surface Interflow Groundwater

Area in Basin ☒ Show Only Selected

Available Pervious Acres Available Impervious Acres

☒ C, Pasture, Flat .11 ☒ ROADS/FLAT .48

☒ C, Pasture, Steep .27

Water Quality Flowrate:

Water Quality

On-Line BMP	Off-Line BMP
24 hour Volume (ac-ft) 0.0652	
Standard Flow Rate (cfs) 0.0761	Standard Flow Rate (cfs) 0.0439

FILTER B

Predeveloped Conditions:

Basin 1 Predeveloped

Subbasin Name: Basin 1

Flows To : Surface Interflow Groundwater

Area in Basin ☒ Show Only Selected

Available Pervious	Acres	Available Impervious	Acres
<input checked="" type="checkbox"/> C, Forest, Flat	.38		

Mitigated Conditions:

Basin 1 Mitigated

Subbasin Name: Basin 1 ☐ Designate as Bypass for POC:

Flows To : Surface Interflow Groundwater

Area in Basin ☒ Show Only Selected

Available Pervious	Acres	Available Impervious	Acres
<input checked="" type="checkbox"/> C, Pasture, Steep	.23	<input checked="" type="checkbox"/> ROADS/FLAT	.15

Water Quality Flowrate:

Water Quality

On-Line BMP	Off-Line BMP
24 hour Volume (ac-ft) 0.0255	
Standard Flow Rate (cfs) 0.0251	Standard Flow Rate (cfs) 0.0144

FILTER C

Predeveloped Conditions:

Basin 1 Predeveloped

Subbasin Name: Basin 1

Flows To : Surface Interflow Groundwater

Area in Basin

Available Pervious Acres

☒ C, Forest, Flat .55

Available Impervious Acres

☒ Show Only Selected

Mitigated Conditions:

Basin 1 Mitigated

Subbasin Name: Basin 1 ☐ Designate as Bypass for POC:

Flows To : Surface Interflow Groundwater

Area in Basin

Available Pervious Acres

☒ C, Pasture, Flat .24

Available Impervious Acres

☒ ROADS/FLAT .31

☒ Show Only Selected

Water Quality Flowrate:

Water Quality

Run Analysis

On-Line BMP

24 hour Volume (ac-ft) 0.0396

Standard Flow Rate (cfs) 0.0479

Off-Line BMP

Standard Flow Rate (cfs) 0.0276

FILTER C

Predeveloped Conditions:

Basin 1 Predeveloped

Subbasin Name:

Flows To :

Area in Basin ☒ Show Only Selected

Available Pervious	Acres	Available Impervious	Acres
<input checked="" type="checkbox"/> C, Forest, Flat	5.23		

Mitigated Conditions:

Basin 1 Mitigated

Subbasin Name: ☐ Designate as Bypass for POC

Flows To :

Area in Basin ☒ Show Only Selected

Available Pervious	Acres	Available Impervious	Acres
<input checked="" type="checkbox"/> C, Pasture, Flat	.43	<input checked="" type="checkbox"/> ROADS/FLAT	2
<input checked="" type="checkbox"/> C, Pasture, Steep	.31		
<input checked="" type="checkbox"/> C, Lawn, Flat	2.49		

Water Quality Flowrate:

Water Quality

On-Line BMP	Off-Line BMP
24 hour Volume (ac-ft) <input type="text" value="0.3245"/>	
Standard Flow Rate (cfs) <input type="text" value="0.3166"/>	Standard Flow Rate (cfs) <input type="text" value="0.1805"/>