Cascade Business Park

Preliminary Binding Site Plan
Macro Analysis Drainage Report

Prepared for

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~~Strike through~~ = N/A at this time

SECTION 1.0: PROJECT OVERVIEW

The Cascade Business Park project proposes the development of a light industrial building park. The project property ownership covers approximately 431 acres and is located within both City of Arlington and City of Marysville city limits. Approximately 99 acres of the project is within City of Arlington limits and the remaining 332 acres of the project is within City of Marysville limits. Development will include nine warehouse-style buildings, two public roads, private drives, parking and loading areas, and utility improvements. The nine proposed building footprint areas range from approximately 137,000 square feet (sf) to 952,000 sf. Majority of open space across the site will be dedicated to stormwater detention ponds. The project will be accessed off 172nd St NE, 152nd St NE, 51st Ave NE and 59th Ave NE. The project site is comprised of parcels #31052700100100 and 31052700100900 in Arlington and parcels #31052700100300, 31052700400300, 31052700300400, 31052700300200, 31052700300500, 31052700300900, 31052700300800, 31052700300700, 31053400200600, 31053400200500, 31053400200400, 31053400300300, 31053400200100, 31053400200700, 31053400300300, 31053400200800, 31053400201300 and 31053400200900 in Marysville. See Vicinity Map in Appendix A for relative location.

1.1 EXISTING SITE

The site is approximately 431-acre collection of 20 parcels and is currently zoned as light industrial. Two parcels (~99 acres) are located within the City of Arlington bounds and the remaining 18 parcels (~332 acres) within the City of Marysville. Several parcels under the common ownership are located on the east side of the BNSF railroad and are not included in the development construction limits. Residential farms occupy the site with surrounding land being farmed agricultural fields.

A site soil survey by Terra Associates, Inc. determined that the existing topography of the project site descends from northeast to southwest at slopes ranging from 0% to 5% with an overall relief of about 25 feet. Soils were observed as primarily native glacial outwash deposits. Test pits revealed groundwater below depths of four to six feet however static groundwater levels of one to two feet below grade.

Soundview Consultants has noted 36 wetlands located throughout the site and four wetlands offsite whose buffers enter the site ranging from Category III to IV, six ditches (one Type F and five non-typed), and a Type F creek – Edgecomb creek. Edgecomb Creek flows northeast to southwest across the site within a shallow manmade ditch. Refer to Appendix B for a critical area map per Sound View and City of Marysville.

1.2 DOWNSTREAM ANALYSIS

On the existing site, flows generally convey south/west through Edgecomb Creek. From here, flows continue through the creek before eventually discharging into slough areas tributary to the Puget Sound. As the site is developed for agricultural use, it is assumed that flows generally infiltrate onsite. Groundwater flows ultimately migrate to Edgecomb Creek.

1.3 PROPOSED DEVELOPMENT

Within the ±431 acres, project development will be contained within +327.5 acres and remaining acreage is attributed to the Edgecomb Creek relocation and buffer enhancement/mitigation and parcels located to the east of the BNSF railroad. The Cascade Business Park project proposed to develop nine warehouse-style buildings with footprints ranging from 137,000 sf to 952,000 sf. Paved parking, loading dock, and access drive areas are proposed adjacent to the building perimeters in addition to two public roads. Remaining open space will primarily be dedicated to stormwater detention ponds. Based on the elevation of the ground water table, the site proposes approximately 6-15 feet of fill across the site for separation from bottom of stormwater detention pond. Development will disturb approximately 320 acres and will generate 192.7 acres of onsite impervious area, 98.7 acres being pollution generating impervious surfaces (PGIS). Project areas are listed below.

Estimated Proposed Impervious Area:	±192.7 AC (±98.7 AC being PGIS)
Estimated Proposed Pervious Area (including stormwater ponds):	±116.5 AC
Estimated Undisturbed Area:	±18.3 AC
Onsite Industrial Development Limits	±327.5 AC
Proposed Impervious %*:	±58.8%

*Light Industrial Zone impervious max 85%

All existing vegetation will be cleared, and conflicting structures will be removed or demolished as part of the development. Main access to the proposed site will be provided via new public and private roads off 172nd St NE, 152nd St NE, 51st Ave NE and 59th Ave NE.

1.4 PROPOSED FLOW CONTROL DESIGN

The proposed project is vested to the requirements of the 2014 Department of Ecology (DOE) Stormwater Management Manual for Western Washington. Flow control mitigation of onsite stormwater runoff will be achieved by routing collected flow through a network of catch basins and closed pipes to one of 17 detention ponds located sporadically throughout the project site. Multiple ponds are proposed to subsurface connect via conveyance pipe creating pond networks. Nine hydrologic basins have been delineated according to area tributary to each pond network. Mitigated stormwater flows of all pond networks will ultimately outfall to the relocated Edgecomb Creek. Basins names have been assigned per the portion of Building areas within each basin. Site basins are as follows: B1/2/4/5, B3N, B3S/8N, B6S, B6N/7S, B7N, B8S, B9N, B9S. Refer to Figure X for site basin delineation.

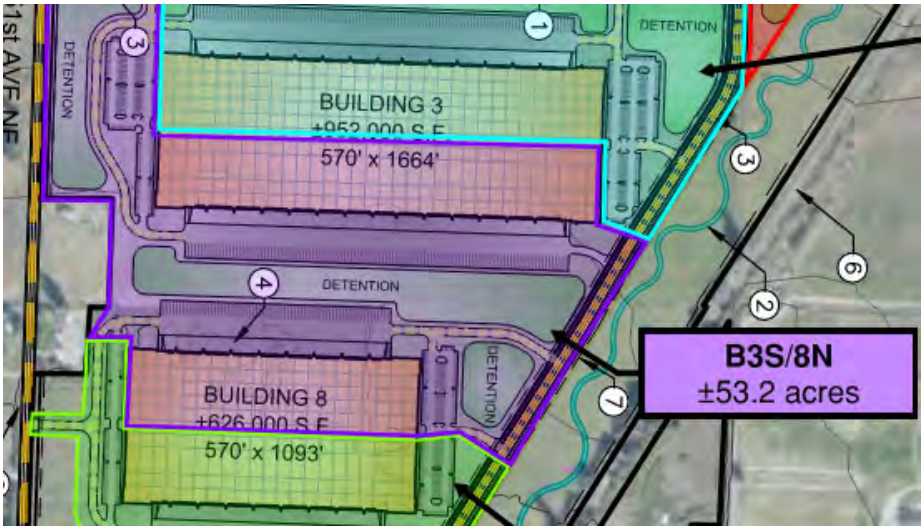
Where:

B = Building

= Assigned Building Number per NorthPoint numbering convention

N/S = North or South portion of the building within the Basin (as necessary)

Example: B3S/8N = Site basin contains South half of Building 3 and North half of Building 8 roofs



The Arlington Airport and FAA require that there is minimal exposure along the existing and future flight paths with permanent standing water. This is to reduce the presence of waterfowl from congregating in the permanent water surfaces along the flight paths and potentially flying into and colliding with aircraft. The proposed ponds are within the north-south flight path of the airport and will require that the ponds not have a permanent water surface. The proposed design is to maintain the existing soil characteristics in the bottom of the pond and not provide a liner to prevent stormwater infiltration. Although there would be some inherent infiltration within the pond, as a conservative design approach, it is not factored in the pond sizing calculations. This will allow the ponds to fill with water during storm events, draw down through the provided flow control structures at the design release rates, and when the storm event has ended and the drawdown period is over the pond would continue to infiltrate the water remaining below the outfall elevation into the native soils. And thus, the bottom of the pond would have no standing water remaining. This will also require enhanced maintenance of the pond bottom to maintain native soil infiltration characteristics as noted in the O&M portion of this report.

A French Drain system is proposed along portions of the northern/western property lines to collect and promote infiltration of pond embankment runoff that drains towards the property line. French drains are expected to be located along the property line edge of the ponds associated with Pond networks 1, 4, and 5. These ponds northwest of Building 7, north of Building 6, and north of Building 2 cannot convey embankment slopes to the on-site detention systems.

Frontage improvement and onsite frontage tributary area flow control will be fully designed at a later time. Frontage improvements associated to 51st Ave NE and 152nd St NE will route to a linear roadside bioretention swale. Tributary flows will infiltrate into native soils, any remaining flows will discard to Edgecomb Creek. Frontage improvements along 172nd are to be built by WSDOT. Ultimately the drainage along 172nd will be discharged to Edgecomb Creek prior to entering the Cascade Business Park Site.

Hydrologic calculations associated to detention pond design have been completed using WWHM2012. See Section 4.1 for additional description and calculations concerning the proposed stormwater flow control measures.

1.5 PROPOSED WATER QUALITY TREATMENT DESIGN

The industrial nature of the development requires "enhanced" water quality treatment level. A modular wetland will provide Enhanced treatment of site PGIS surfaces downstream of the onsite storm detention pond network. Frontage improvement water quality design associated to 51st Ave NE and 152nd St NE will route to a linear roadside bioretention swale. The proposed soil media will provide water quality treatment. Water quality devices have been designed to performed in accordance with Volume 5 of the 2014 DOE Manual. Please see Section 4.2 for additional discussion.

1.6 EROSION/SEDIMENTATION CONTROL

Erosion control measures that will be utilized during construction will be provided in the SWPPP and TESC plan sheets in future construction submittals.

1.7 MINIMUM REQUIREMENTS

Per 2014 DOE Manual, Minimum Requirements 1-9 apply to the proposed development.

Minimum Requirement #1: Preparation of Stormwater Site Plans: This report along with the construction plans satisfies this minimum requirement.

Minimum Requirement #2: Construction Stormwater Pollution Prevention (SWPP): A Stormwater Pollution Prevention Plan (SWPPP) will be provided as a separate document in a forthcoming construction submittal.

Minimum Requirement #3: Source Control of Pollution: Source control BMPs are not applicable for the subject site as trash/recycle enclosures will be located within warehouse buildings.

Minimum Requirement #4: Preservation of Natural Drainage Systems and Outfalls: The site contains two onsite discharge location that lies within a single threshold discharge basin. The site historically flowed from north to south towards Edgecomb Creek along with portions of

the site draining south west towards 51st Ave NE. In the developed condition, onsite runoff will be collected and conveyed to one of nine detention pond networks (totaling 17 ponds). Onsite flows will be treated, detained, and released at historic rates via a proposed stormwater network that releases mitigated flows into the relocated Edgecomb Creek. Frontage improvement flows along 51st Ave NE are expected to infiltrate and discharge to the south along the existing roadside ditch. Frontage improvement flows along 172nd St. NE will be mitigated with the WSDOT improvement project and will ultimately be collected and discharged into Edgecomb creek prior to entering the development site.

Minimum Requirement #5: Onsite Stormwater Management: BMP T5.13 soils management practices and detention are the best means of available onsite stormwater management strategies. See Section 4.3 for further discussion on the feasibility of LID BMPs.

Minimum Requirement #6: Runoff Treatment: All water quality treatment designs have been performed in accordance with Volume 5 of the 2014 DOE Manual. Nine modular wetlands have been proposed to provide Enhanced water treatment Basins A-I mitigated detention flows. Frontage flows along 51st Ave NE and 152nd St NE will receive treatment via roadside linear biofiltration swales. Please see Section 4.2 for additional discussion.

Minimum Requirement #7: Flow Control: This site will use nine detention pond networks (totaling 17 ponds) and associated control structures to provide flow control for developed condition flows. The site has been broken down into various hydrology basins for areas tributary to each pond network. Frontage flows along 51st Ave NE and 152nd St NE will drain into a linear roadside biofiltration swale. A level of flows will infiltrate into native soils. Stormwater unable to infiltrate will discharge into Edgecomb Creek. See Onsite Stormwater Management in Section 4.1 of this report for further discussion and sizing calculations.

Minimum Requirement #8: Wetlands Protection: According to Soundview Consultants, 36 onsite wetlands and four offsite wetlands whose buffers enter the site have been identified throughout the site. Wetlands range from Category II to IV. All wetlands within site boundaries will be filled as part of development. Wetland mitigation/creation will be performed along the

buffer of the relocated Edgecomb Creek between the stormwater discharge points and the creek corridor.

Minimum Requirement #9: Operation and Maintenance: See Operations and Maintenance in Section 6.0 of this report.

SECTION 2.0: RISK ASSESSMENT ANALYSIS AND TEMPORARY EROSION AND SEDIMENT CONTROL DESIGN

2.1 TEMPORARY EROSION AND SEDIMENT CONTROL

This section will be addressed in the construction level submittal.

SECTION 3.0: DOWNSTREAM ANALYSIS REPORT

3.1 TASK 1. STUDY AREA DEFINITION AND MAPS

Snohomish County Bare Earth LiDAR, survey, and 2012 aerial photography were the best topographical references available for the area containing the site. The limits of the downstream analysis extend roughly 0.25 miles beyond the subject property's natural discharge location (See Figure 4.0, Downstream Analysis Map).

3.2 TASK 2. RESOURCE REVIEW

All the resources below have been reviewed for existing and potential issues near the project site:

- **Adopted Basin Plans**

  No Adopted Basin Plans were located that include the project site.

- **Drainage Basin**

  This site is located within the Quilceda Creek basin.

- **Floodplain / Floodway (FEMA) maps**

  According to FEMA floodplain mapping, the subject property is not within a floodplain. Reference the FEMA FIS study in Appendix B as necessary.

- **Critical Areas Map**

  Soundview Consultants has documented 36 onsite and four offsite wetlands whose buffers enter the site located throughout the site ranging from Category III to IV, six ditches (one Type F and five non-typed), and a Type F creek – Edgecomb creek- which flows northeast to southwest across the site within a shallow manmade ditch. Refer to Soundview Consultants Wetland Report.

- **Drainage Complaints**

  No drainage complaints were identified.

- **Road Drainage Problems**

  No issues were identified near the proposed site.

- **Soil Survey**

  A site soil survey by Terra Associates, Inc. determined that the existing topography of the project site descends from northeast to southwest at slopes ranging from 0% to 5% with an overall relief of about 2 feet. Soils were observed as primarily native glacial outwash deposits. Test pits revealed groundwater below depths of 4 to 6 feet however static groundwater levels of one to two feet below grade. A design infiltration rate of ¾ in/hr is assigned to the site. Infiltration is feasible on this site with shallow infiltration design, however, is not recommended due to the need for additional fill to provide separation between infiltration device and groundwater elevation. Appendix B for USDA Soil Map, Snohomish County Area, Washington, and soil classification description.

- **Wetland Inventory Maps**

  Soundview Consultants has documented 36 onsite wetlands and four offsite wetlands whose buffers enter the site located throughout the site ranging from Category III to IV. All wetlands onsite will be filled for development. See Appendix B for City of Marysville Inventory map and the Wetland and Fish and Wildlife Habitat Assessment Report.

- **Migrating River Studies**

  Migrating River Studies are considered to be not applicable to the proposed site development.

- **Section 303d List of Polluted Waters**

  Washington State Department of Ecology's Water Quality Assessment for Washington does contain one listing downstream of the project site within the typical 0.25 analysis distance for bacteria.

- **Water Quality Problems**

  No known water quality problems are present onsite or downstream of the site.

- **Stormwater Compliance Plans**

  Not applicable to the proposed project.

3.3 TASK 3. FIELD INSPECTION/DOWNSTREAM ANALYSIS

On February 6th, 2020 and December 4th, 2020, two site visits were performed to observe exiting site conditions and perform Upstream and Downstream Analysis'. The weather consisted of 50-55ºF and cloudy skies both field visits. The following observations were verified during the visits.

The subject property contains single-family residences, barns, and associated outbuilding structures associated with farming operations. The remaining site contains remnants of agricultural vegetation.

Upstream:

Multiple upstream flows paths existing around the perimeter of the site.

Upstream Flow Path 1:

The ditch along the western property line along 51st Ave NE flows North to South. Approximately +2,000 LF of northern offsite ditch flows south along project frontage. Per infield conditions the ditch appears near flat with vegetative growth along the bottom of ditch. As the existing water table exists ~2 feet below existing grade, it is likely that the water table perches the roadside ditch. These flows converge with Downstream Flow Path 2. Tributary parcels are agricultural sites that infiltrate prior to entering the ditch, however, it has been estimated that ~150 acres may be tributary to the ditch. Refer to the Figure 4.0 Downstream Map for basin delineation. In the developed condition the ditch along project frontage will be channelized into a 24" diameter perforated culvert and will discharge into the existing ditch south of the site continuing the existing flow path. See Appendix B images 1-3.

Upstream Flow Path 2:

Upstream flows from 172nd ROW enter a roadside ditch adjacent to the projects northern property line and are direct towards the onsite Ditch X and continue south through the site until converging with Edge Comb Creek and Downstream Flow Path 2. Tributary area has not been determined as

72nd ROW will receive improvements from WSDOT and will eventually directly discharge into relocated Ditch X or Edge Comb Creek. See Appendix B images 4-5.

Upstream Flow Path 3:

A manmade stream travels through the site identified as Edgecomb Creek. The stream begins offsite and enters the site through the northwest property line and continues through the site and continues as Downstream Flow Path 1. Tributary area for the creek has been identified by Southview who is designing the relocation of the creek onsite. See Appendix B images 6-7.

Upstream Flow Path 4:

Mitigated stormwater flows from an adjacent offsite parcel 31052700100200 discharges stormwater onto the project site via a drainage easement (AF NO. 200404070088) in the north western corner of the project site. It has been estimated that ~7 acres may be tributary to the flowpath. In the developed conditions the discharge line that currently releases onsite will be channelized and routed and discharge to the relocated Edgecomb Creek. Refer to the Figure 4.0 Downstream Map for basin delineation. See Appendix B images 8-10.

Onsite:

Flow in the existing condition is considered to convey southward. Flows generally are seen to infiltrate into agricultural pasture surfaces. Flows that do not infiltrate discharge into Edgecomb Creek or enter the roadside ditch along 51st Ave NE and travel south through a residential development where flow paths converge before a quarter mile. See Figure 4.0, "Downstream Analysis Map" for map exhibits of the discharge location. The drainage flow path from the site is described below.

Downstream Flow Path 1:

Flows are generally expected to infiltrate or pool onsite due to the agricultural flat nature of the site. Surface flows enter Edge Comb Creek located centrally on the site and travel south leaving the site. The Creek continues south for 2,200 LF before exiting the quarter mile boundary of analysis. Refer to Appendix B images 11-12.

Downstream Flow Path 2:

Flows are generally expected to infiltrate or pool onsite due to the agricultural flat nature of the site. Surface flows enter the existing ditch along 51st Ave NE. Flows travel south past the edge of the property line and continue an additional 650 LF south before rerouting east and passing under the Railroad via culvert and continuing east for 1,400 LF before converging with Flow Path 1. Refer to Appendix B images 13-15.

3.4 TASK 4. DRAINAGE SYSTEM DESCRIPTION AND PROBLEM DESCRIPTIONS

Based on the information and all the resources available including visual inspection of the downstream flow path, there is no evidence of existing or anticipated downstream drainage problems. All flows are adequately carried into/through existing drainage structures/conveyances.

3.5 TASK 5. MITIGATION OF EXISTING OR POTENTIAL DRAINAGE PROBLEMS

No evidence of existing or potential problems with upstream or downstream drainage conveyances/infrastructure was found. Mitigation is not required.

SECTION 4.0: FLOW CONTROL AND WATER QUALITY FACILITY ANALYSIS AND DESIGN

4.1 FLOW CONTROL

Flow control for onsite development will be provided for onsite hard surfaces and converted land covers via nine detention pond networks (totaling 17 ponds) that will collect, store, and mitigate runoff associated with onsite development. Due to the presence of high ground water table one to two feet below existing grade, the site will fill 6 to +12 feet throughout the project to provide adequate separation from the high groundwater table and bottom of flow control facilities. Frontage flow control and onsite bypass flow control have not been addressed at this time.

The nine detention pond networks create nine hydrologic basins internal to the site. Names have been named in accordance to portions of proposed Buildings Tributary to each basin. Example: B3S/8N = Site basin include the South portion of Building 3 and North part of Building 8. Refer to the nomenclature breakdown below. The basin assigned to the site are: B1/2/4/5, B3N, B3S/8N, B6S, B6N/7S, B7N, B8S, B9N, and B9S. Where **B** =Building, **#**= Assigned Building Number per NorthPoint numbering convention, **N/S** = North or South portion of the building within the Basin (as necessary). Refer to Figure 5 for site basin delineation. Predeveloped and developed areas associated with each basin used in WWHM modeling are listed in Section 4.1.1. As the design is based on a macro site analysis, proposed basin totals, including impervious/pervious totals, may change or alter in the future when detailed site design is performed.

4.1.1 ONSITE HYDROLOGY

The predeveloped and developed conditions were modeled in WWHM2012, a continuous hydrologic modeling for the purpose of flow control sizing and flow-duration control. Based on the site location, WWHM2012 used a Precipitation Scale factor of 1.2. Pervious land cover in each developed basin has been modeled as pasture. In Section 7.1 of the Low Impact Development Technical Guidance Manual for Puget Sound (LID Manual), referenced in Appendix C of the 2014 DOE manual, it is prescribed that if landscaped areas are underlain with BMP T5.13 soils, the area may be modeled as pasture. These landscaped areas will be underlain with BMP T5.13 soil mixtures in the developed condition and thus have been modeled as pastureland cover in WWHM. As the existing onsite structures do not surpass 30% of the site area, the project is considered

new development. The pre-developed condition (forested) is applied to all onsite landcover to be converted for development. Site soils will be modeled as till (soil type C) within WWHM as the observed ground water table is within 5-ft of the existing ground surface. Refer to the Geotechnical Report for ground water information. For visual representation of the following predeveloped and developed conditions see Figure 4.0, "Predeveloped Hydrology Map" and Figure 5.0 "Developed Hydrology Map".

Basin B1/2/4/5:

Basin B1/2/4/5 includes areas of Building 1, 2, 4, and 5 footprints along with pavement, pasture, and pond surface. The Basin has been shown for the predeveloped and developed conditions in WWHM for pond network 1 as:

Table 4-1.1.1 – Predeveloped and Developed Areas: Pond Network 1

Predeveloped Areas	
Land Cover	**Area**
Forest	±60.5 AC
Total	**±60.9 AC**

Developed Areas	
Land Cover	**Area**
Pasture	±10.3 AC
Roof	±20.5 AC
Pavement/Parking/Sidewalk	±19.0 AC
Pond	±11.1 AC
Total	**±60.9 AC**

Basin B3N:

Basin B3N includes areas associated to the north half of Building 3 footprint along with pavement, pasture, and pond surface. The Basin has been shown for the predeveloped and developed conditions in WWHM for pond network 2 as:

Table 4-1.1.2 – Predeveloped and Developed Areas: Pond Network 2

Predeveloped Areas	
Land Cover	**Area**
Forest	±43.6 AC
Total	**±43.6 AC**

Developed Areas	
Land Cover	**Area**
Pasture	±9.8 AC
Roof	±10.9 AC
Pavement/Parking/Sidewalk	±15.6 AC
Pond	±7.3 AC
Total	**±43.6 AC**

Basin B3S/8N:

Basin B3S/8N includes areas associated to the southern half of Building 3 and northern half of Building 8 footprints along with pavement, pasture, and pond surface. The Basin has been shown for the predeveloped and developed conditions in WWHM for pond network 3 as:

Table 4-1.1.3 – Predeveloped and Developed Areas: Pond Network 3

Predeveloped Areas	
Land Cover	**Area**
Forest	±52.2 AC
Total	**±52.2 AC**

Developed Areas	
Land Cover	**Area**
Pasture	±6.8 AC
Roof	±18.1 AC
Pavement/Parking/Sidewalk	±16.2 AC
Pond	±11.1 AC
Total	**±52.2 AC**

Basin B6S:

Basin B6S includes areas of the southern half of Building 6 footprint along with pavement, pasture, and pond surface. The Basin has been shown for the predeveloped and developed conditions in WWHM for pond network 4 as:

Table 4-1.1.4 – Predeveloped and Developed Areas: Pond Network 4

Predeveloped Areas	
Land Cover	**Area**
Forest	±22.2 AC
Total	**±22.2 AC**

Developed Areas	
Land Cover	**Area**
Pasture	±3.1 AC
Roof	±7.8 AC
Pavement/Parking/Sidewalk	±7.8 AC
Pond	±3.5 AC
Total	**±22.2 AC**

Basin B6N/7S:

Basin B6N/7S includes areas of the northern half of Building 6 and southern half of Building 7 footprints along with pavement, pasture, and pond surface. The Basin has been shown for the predeveloped and developed conditions in WWHM for pond network 5 as:

Table 4-1.1.5 – Predeveloped and Developed Areas: Pond Network 5

Predeveloped Areas	
Land Cover	**Area**
Forest	±45.0 AC
Total	**±45.0 AC**

Developed Areas	
Land Cover	**Area**
Pasture	±8.5 AC
Roof	±14.4 AC
Pavement/Parking/Sidewalk	±14.7 AC
Pond	±7.4 AC
Total	**±45.0 AC**

Basin B7N:

Basin B7N includes areas of the northern half of Building 7 footprint along with pavement, pasture, and pond surface. The Basin has been shown for the predeveloped and developed conditions in WWHM for pond network 6 as:

Table 4-1.1.6 – Predeveloped and Developed Areas: Pond Network 6

Predeveloped Areas	
Land Cover	**Area**
Forest	±17.4 AC
Total	**±17.4 AC**

Developed Areas	
Land Cover	**Area**
Pasture	±2.6 AC
Roof	±6.9 AC
Pavement/Parking/Sidewalk	±5.2 AC
Pond	±2.7 AC
Total	**±17.4 AC**

Basin B8S:

Basin B8S includes areas of the southern half of Building 8 footprint along with pavement, pasture, and pond surface. The Basin has been shown for the predeveloped and developed conditions in WWHM for pond network 7 as:

Table 4-1.1.7 – Predeveloped and Developed Areas: Pond Network 7

Predeveloped Areas	
Land Cover	**Area**
Forest	±25.7 AC
Total	**±25.7 AC**

Developed Areas	
Land Cover	**Area**
Pasture	±3.9 AC
Roof	±7.2 AC
Pavement/Parking/Sidewalk	±7.5 AC
Pond	±7.2 AC
Total	**±25.7 AC**

Basin B9N:

Basin B9N includes areas of Building 6 footprint along with pavement, pasture, and pond surface. The Basin has been shown for the predeveloped and developed conditions in WWHM for pond network 8 as:

Table 4-1.1.8 – Predeveloped and Developed Areas: Pond Network 8

Predeveloped Areas	
Land Cover	**Area**
Forest	±25.3 AC
Total	**±25.3 AC**

Developed Areas	
Land Cover	**Area**
Pasture	±2.8 AC
Roof	±9.9 AC
Pavement/Parking/Sidewalk	±7.1 AC
Pond	±5.5 AC
Total	**±25.3 AC**

Basin B9S:

Basin B9N includes areas of pavement, pasture, and pond surface around Building 9. The Basin has been shown for the predeveloped and developed conditions in WWHM for pond network 9 as:

Table 4-1.1.9 – Predeveloped and Developed Areas: Pond Network 9

Predeveloped Areas	
Land Cover	**Area**
Forest	±7.0 AC
Total	**±7.0 AC**

Developed Areas	
Land Cover	**Area**
Pasture	±2.0 AC
Roof	0 AC
Pavement/Parking/Sidewalk	±3.2 AC
Pond	±1.8 AC
Total	**±7.0 AC**

4.1.2 ARLINGTON AIRPORT AND FAA

The Arlington Airport and FAA require that there is minimal exposure along the existing and future flight paths with permanent standing water. This is to reduce the presence of waterfowl from congregating in the permanent water surfaces along the flight paths and potentially flying into and colliding with aircraft. The proposed ponds are within the north-south flight path of the airport and will require that the ponds not have a permanent water surface. The proposed design is to maintain the existing soil characteristics in the bottom of the pond and not provide a liner to prevent stormwater infiltration. Although there would be some inherent infiltration within the pond, as a conservative design approach, it is not factored in the pond sizing calculations. This will allow the ponds to fill with water during storm events, draw down through the provided flow control structures at the design release rates, and when the storm event has ended and the drawdown period is over the pond would continue to infiltrate the water remaining below the outfall elevation into the native soils. And thus, the bottom of the pond would have no standing water remaining. This will also require enhanced maintenance of the pond bottom to maintain native soil infiltration characteristics as noted in the O&M portion of this report.

4.1.3 ONSITE DETENTION POND DESIGN

All detention ponds have been designed to detain, mitigate, and release site development flows to Edgecomb Creek, refer to Appendix C for the typical discharge line proposed onsite. Collection of site runoff will be provided by means of catch basin and conveyance pipe discharge to the pond along with sheet flow of adjacent pavement around the pond perimeter into ponds. The project proposes 17 detention ponds located sporadically throughout the site. Various ponds are subsurface connected via conveyance pipe creating nine onsite detention pond networks. Pond networks have been assigned tributary hydrologic basins as listed in 4.1.1. All ponds have been designed with a three-foot riser, 3:1 internal side slope, 0.5’ dead storage, 0.5’ overflow storage and 0.5’ emergency overflow storage. The predeveloped and developed conditions on each basin were modeled in WWHM2012. As the project stormwater design has been performed on a macro preliminary level, required pond volume and flow rates are subject to alteration based on future detailed design that accounts for refined areas, site bypass, and frontage design. Design summaries and peak flows for each pond network is listed in Tables 4.1.3.1 and 4.1.3.2.

Table 4.1.3.1 – Project Pond Network: Design Summary

Pond Network	1	2	3	4	5	6	7	8	9
Tributary Basin:	B1/2/ 4/5	B3N	B3S/8N	B6S	B6N/7S	B7N	B8S	B9N	B9S
Number Ponds in Network:	3	2	3	2	2	1	1	2	1
Provided Live Pond Area (AC):	8.7	5.8	9.1	2.6	4.8	2.1	6.5	4.6	1.5
Volume Modeled (AC-FT):	26.1	17.4	27.3	7.8	14.4	6.3	19.5	13.8	4.5
Bottom Pond El:	116.0	114.0	111.5	121.0	123.5	126.5	107.0	104.0	101.0
Begin Live Storage El:	116.5	114.5	112.0	121.5	124.0	127.0	107.5	104.5	101.5
Top Riser El (+3'):	119.5	117.5	115.0	124.5	127.0	130.0	110.5	107.5	104.5
Top of Pond El:	120.5	118.5	116.0	125.5	128.0	131.0	111.5	108.5	105.5
Internal Side Slopes:	3:1								

Table 4.1.3.2 – Project Pond Network: Flow Rates by Peak Storm Event

Pond Network	1	2	3	4	5	6	7	8	9
Tributary Basin:	B1/2/4/5	B3N	B3S/8N	B6S	B6N/7S	B7N	B8S	B9N	B9S
Number Ponds in Network:	3	2	3	2	2	1	1	2	1
Predeveloped Flows (cfs)									
2-YEAR	2.0	1.5	1.8	0.7	1.5	0.6	0.9	0.9	0.2
50-YEAR	6.2	4.4	5.3	2.3	4.6	1.8	2.6	2.6	0.7
100-YEAR	7.3	5.2	6.2	2.7	5.4	2.1	3.1	3.0	0.8
Unmitigated Rates (cfs)									
2-YEAR	27.3	18.3	24.4	10.3	19.7	7.9	11.7	12.1	2.7
50-YEAR	61.8	41.6	55.0	23.2	44.7	17.9	26.5	27.2	6.3
100-YEAR	70.2	47.5	62.5	26.3	50.9	20.3	30.2	30.9	7.1

Pond Network (cont.)	1	2	3	4	5	6	7	8	9
Mitigated Flow Rates (cfs)									
2-YEAR	1.1	0.8	0.8	0.5	0.9	0.4	0.3	0.4	0.1
50-YEAR	2.8	2.2	1.8	1.5	2.4	1.0	0.7	0.9	0.2
100-YEAR	3.2	2.6	2.1	1.8	2.9	1.2	0.8	1.1	0.2

4.1.3 FRONTAGE (OFFSITE) HYDROLOGY

To be completed at a later date.

4.1.4 FRONTAGE (OFFSITE) FLOW CONTROL

Frontage improvement and onsite frontage tributary area flow control will be fully designed at a later time. Frontage improvements associated to 51st Ave NE and 152nd St NE will route to a linear roadside bioretention swale. Tributary flows will infiltrate into native soils, any remaining flows will discard to Edgecomb Creek. Frontage improvements along 172nd are to be built by WSDOT. Ultimately the drainage along 172nd will be discharged to Edgecomb Creek prior to entering the Cascade Business Park Site.

4.2 WATER QUALITY TREATMENT

All water quality treatment designs have been performed in accordance with Volume 5 of the 2014 DOE Manual. Various sized Modular Wetlands by Forterra have been proposed to provide enhanced stormwater treatment and will be located downstream of the detention ponds. The modular wetland system is sized to treat the 2-year peak flow for units downstream of detention. An external bypass system is provided at each pond networks discharge to route excess flows around the Modular Wetland.

Table 4.2.1 – Project Pond Network: Water Quality Sizing

Pond Network	1	2	3	4	5	6	7	8
2-YEAR *(mitigated)*	2.0	1.5	1.8	0.7	1.5	0.6	0.9	0.9
Internal Drop	0.5′	0.5′	0.5′	0.5′	0.5′	0.5′	0.5′	0.5′

Water quality for frontage improvements along 51st Ave NE and 152nd St NE will be provided by the roadside biofiltration swales per BMP T7.30.

4.3 LOW IMPACT DESIGN FEASIBILITY

The project design has accounted for Low Impact Design as much as is feasible, given site conditions. Section 1-2.5.5 Minimum Requirement #5: On-site Stormwater Management and Section 5-5.3.1 On-site Stormwater Management BMPS of the 2014 DOE Stormwater Management Manual for Western Washington was applied to the site in order to determine LID feasibility. This section of the 2014 DOE Manual directs projects within the Urban Growth Area to adhere to the Low Impact Development Performance Standard and BMP T5.13: Post-Construction Soil Quality and Depth or choose to implement List #2 BMPs. LID features will be reviewed at each lot development when soils are brough to site to determine what LID features can safely be implemented on each lot. A review at the BSP level is listed below.

Lawn and Landscaped Areas:

1. Post-Construction Soil Quality and Depth will be applied and in accordance with BMP T5.13.

Roofs:

1. Site constraints are not suitable for BMP T5.30 Full Dispersion as the required flow paths are not attainable. Downspout full infiltration system BMP T5.10A is infeasible at the sites current condition due to the separation of the ground water table and existing grade. However, due to the height of fill varying from 6-12 feet proposed at each building pad, BMP T5.10A is feasible, but will not be proposed for this project as the makeup of the structural fill compacted onsite cannot be guaranteed to produce adequate infiltration rates. However, will be re-evaluated at each lots development when soils are brought onsite to determine if BMP is feasible.
2. Bioretention BMP7.30 is infeasible due to the depth the high ground water table onsite varying on average 1.5' below existing grade. However, due to the height of fill varying from 6-12 feet proposed at each building pad, BMP T7.30 is feasible, but will not be proposed for this project as the makeup of the structural fill compacted onsite cannot be guaranteed to produce adequate infiltration rates. However, will be re-evaluated at each lots development when soils are brought onsite to determine if BMP is feasible.
3. Downspout Dispersion Systems BMP T5.10B are infeasible due to the dense nature of the site to meet required flow path.
4. BMP T5.10C Perforated Stub-out Connections are not feasible for this site. Due to the industrial nature of the site. Flat roof area is required to be provided stormwater treatment.

Other Hard Surfaces:

1. Full Dispersion BMP T5.30 is not feasible due to site size and geometry. Adequate vegetative flow paths are available.
2. Permeable Pavement T5.15 is not feasible due to the industrial nature of the site.
3. Sheet Flow Dispersion T5.12 is feasible for the project. Vegetated flow paths of 10-25-feet are provided to mitigate impervious surface flow associated with multimodal pedestrian trails along the edge of Edgecomb Creek that cannot be collected for detention.
4. Bioretention BMP7.30 is infeasible due to the depth the high ground water table onsite varying on average 1.5' below existing grade. However, a variance has been submitted for a modified bioswale along 51st Ave NE for Building 1 submittal. However will be re-evaluated at each lots development when soils are brought onsite to determine if BMP is feasible

SECTION 5.0: CONVEYANCE ANALYSIS AND DESIGN

5.1 CONVEYANCE CAPACITY ANALYSIS

To be completed at a later time.

5.2 DOWNSTREAM DISCHARGE LINE

To be completed at a later time.

SECTION 6.0: OPERATIONS AND MAINTENANCE MANUAL

Table V-4.5.2(1) Maintenance Standards - 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.)
	Beaver Dams	Dam results in change or function of the facility.	Facility is returned to design function.

Table V-4.5.2(1) Maintenance Standards - Detention Ponds

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
			(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.

Table V-4.5.2(1) Maintenance Standards - Detention Ponds

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
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.~~ 3".	Sediment cleaned out to designed pond shape and depth; pond reseeded if necessary to control erosion.
6" Dead Storage Area	Facility filled with sediment and/or debris	3" depth of sediment and/or reduced infiltration after storm events	Sediment is removed to designed pond shape and depth.
Grass	Maintenance	Mowing of pond will be included with the Business Park landscape maintenance. Grass planted in the bottom and on the berms of the pond to be regularly mowed, once a month in the growing season to provide visual appeal and to minimize overgrowth	Visually appealing area that does not resemble a detention pond and more like an open space
Ponds 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.
Emergency Overflow/ Spillway and Berms over 4 feet in height	Tree Growth	Tree growth on emergency spillways creates blockage problems and may	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

Table V-4.5.2(1) Maintenance Standards - Detention Ponds

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
		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.	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"	

Table V-4.5.2(2) Maintenance Standards - Infiltration

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
General	Trash & Debris	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
	Poisonous/Noxious Vegetation	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
	Contaminants and Pollution	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
	Rodent Holes	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1)
Storage Area	Sediment	Water ponding in infiltration pond after rainfall ceases and appropriate time allowed for infiltration. Treatment basins should infiltrate Water Quality Design Storm Volume within 48 hours, and empty within 24 hours after cessation of most rain events. (A percolation test pit or test of facility indicates facility is only working at 90% of its designed capabilities. Test every 2 to 5 years. If two inches or more sediment is present, remove).	Sediment is removed and/or facility is cleaned so that infiltration system works according to design.
Filter Bags (if applicable)	Filled with Sediment and Debris	Sediment and debris fill bag more than 1/2 full.	Filter bag is replaced or system is redesigned.
Rock Filters	Sediment and Debris	By visual inspection, little or no water flows through filter during heavy rain storms.	Gravel in rock filter is replaced.

Table V-4.5.2(2) Maintenance Standards - Infiltration

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Side Slopes of Pond	Erosion	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
Emergency Overflow Spillway and Berms over 4 feet in height.	Tree Growth	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
	Piping	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
Emergency Overflow Spillway	Rock Missing	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
	Erosion	See "Detention Ponds" (No. 1).	See "Detention Ponds" (No. 1).
Pre-settling Ponds and Vaults	Facility or sump filled with Sediment and/or debris	6" or designed sediment trap depth of sediment.	Sediment is removed.

Table V-4.5.2(4) Maintenance Standards - 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.

Table V-4.5.2(4) Maintenance Standards - Control Structure/Flow Restrictor

Maintenance Component	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
		Structure is not in upright position (allow up to 10% from plumb). Connections to outlet pipe are not watertight and show signs of rust. Any holes - other than designed holes - in the structure.	Structure in correct position. Connections to outlet pipe are water tight; structure repaired or replaced and works as designed. Structure has no holes other than designed holes.
Cleanout Gate	Damaged or Missing	Cleanout gate is not watertight or is missing. Gate cannot be moved up and down by one maintenance person. Chain/rod leading to gate is missing or damaged. Gate is rusted over 50% of its surface area.	Gate is watertight and works as designed. Gate moves up and down easily and is watertight. Chain is in place and works as designed. 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.

Table V-4.5.2(4) Maintenance Standards - Control Structure/Flow Restrictor

Maintenance Component	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
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).

Table V-4.5.2(5) Maintenance Standards - 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%. 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. Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height. Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No Trash or debris located immediately in front of catch basin or on grate opening. No trash or debris in the catch basin. Inlet and outlet pipes free of trash or debris. No dead animals or vegetation present within the catch basin.

Table V-4.5.2(5) Maintenance Standards - Catch Basins

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
	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). 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	Top slab is free of holes and cracks. 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. 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.	Basin replaced or repaired to design standards. 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.

Table V-4.5.2(5) Maintenance Standards - Catch Basins

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
		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.
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.

Table V-4.5.2(5) Maintenance Standards - Catch Basins

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
	Damaged or Missing.	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.

Table V-4.5.2(6) Maintenance Standards - 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 are missing or entire barrier missing. Bars are loose and rust is causing 50% deterioration to any part of barrier.	Bars in place with no bends more than 3/4 inch. Bars in place according to design. Barrier replaced or repaired to design standards.
	Inlet/Outlet Pipe	Debris barrier missing or not attached to pipe	Barrier firmly attached to pipe

Table V-4.5.2(7) Maintenance Standards - Energy Dissipaters

Maintenance Components	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
External:			

Table V-4.5.2(7) Maintenance Standards - Energy Dissipaters

Maintenance Components	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Rock Pad	Missing or Moved Rock	Only one layer of rock exists above native soil in area five square feet or larger, or any exposure of native soil.	Rock pad replaced to design standards.
	Erosion	Soil erosion in or adjacent to rock pad.	Rock pad replaced to design standards.
Dispersion Trench	Pipe Plugged with Sediment	Accumulated sediment that exceeds 20% of the design depth.	Pipe cleaned/flushed so that it matches design.
	Not Discharging Water Properly	Visual evidence of water discharging at concentrated points along trench (normal condition is a "sheet flow" of water along trench). Intent is to prevent erosion damage.	Trench redesigned or rebuilt to standards.
	Perforations Plugged.	Over 1/2 of perforations in pipe are plugged with debris and sediment.	Perforated pipe cleaned or replaced.
	Water Flows Out Top of "Distributor" Catch Basin.	Maintenance person observes or receives credible report of water flowing out during any storm less than the design storm or its causing or appears likely to cause damage.	Facility rebuilt or redesigned to standards.
	Receiving Area Over-Saturated	Water in receiving area is causing or has potential of causing landslide problems.	No danger of landslides.
Internal:			
Manhole/Chamber	Worn or Damaged Post, Baffles, Side of Chamber	Structure dissipating flow deteriorates to 1/2 of original size or any concentrated worn	Structure replaced to design standards.

Table V-4.5.2(7) Maintenance Standards - Energy Dissipaters

Maintenance Components	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
		spot exceeding one square foot which would make structure unsound.	
	Other Defects	See "Catch Basins" (No. 5).	See "Catch Basins" (No. 5).

Table V-4.5.2(15) Maintenance Standards - 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.

Table V-4.5.2(7) Maintenance Standards - Energy Dissipaters

Maintenance Components	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
	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. Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or evidence of soil particles entering through the cracks.	Vault replaced or repairs made so that vault meets design specifications and is structurally sound. 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

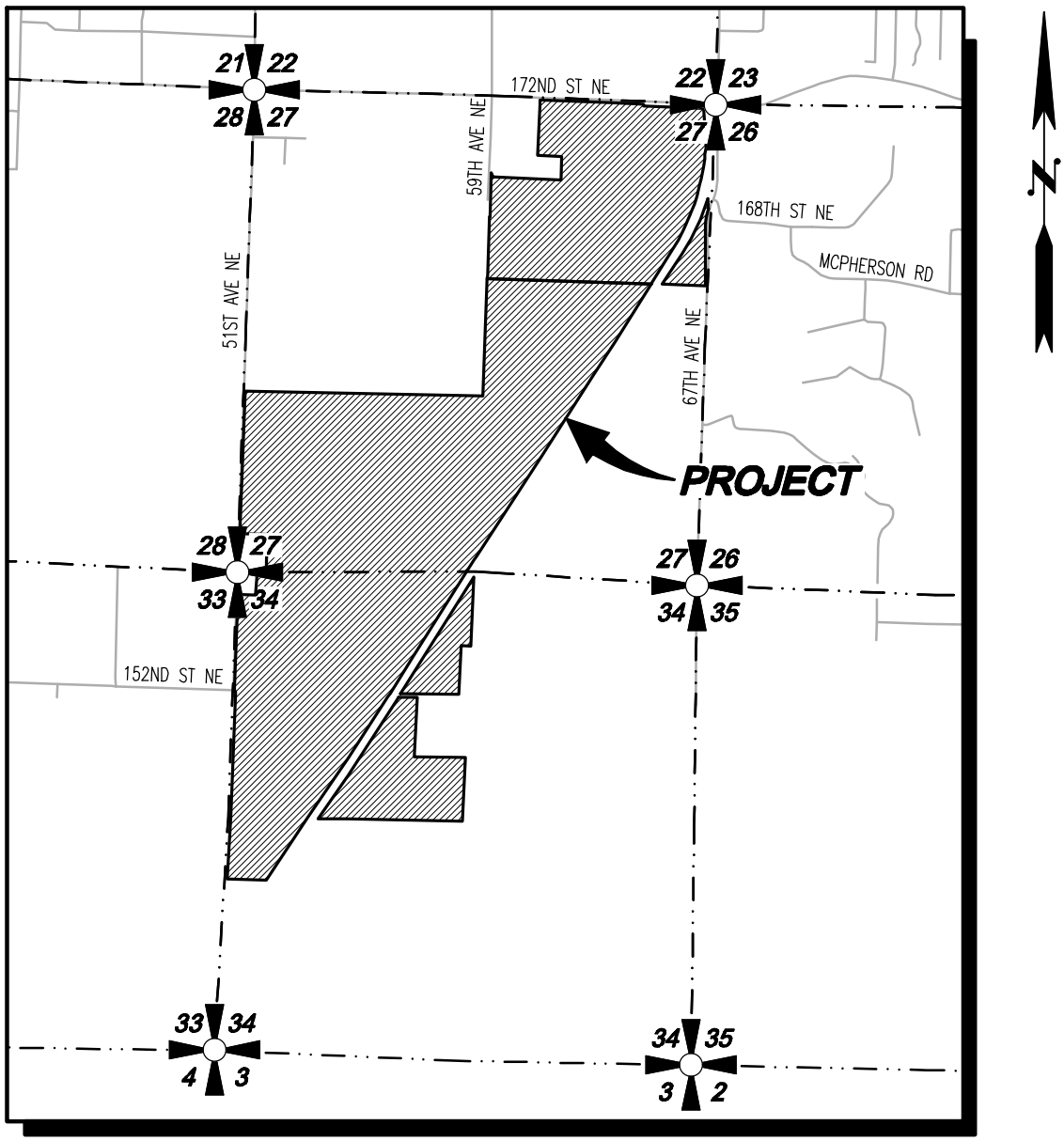
SECTION 7.0: SPECIAL REPORTS AND STUDIES

The following reports have been conducted with past submittals or with reference to this project:

- Geotechnical Report, prepared by Terra Associates, Inc., January, 2020
- Wetland and Fish and Wildlife Habitat Assessment Report and Conceptual Mitigation Plan, prepared by Soundview Consulting, December 2020
- Traffic Impact Analysis, prepared by Gibson Traffic Consultants, Inc., December 2020
- Cultural Resources Assessment by Cultural Resource Consultants, December 2020

Appendix A: Project Overview

1. Figure 1.0 – Vicinity Map
2. Figure 2.0 – Existing Conditions Map
3. Figure 3.0 – Developed Conditions Map



VICINITY MAP

SCALE: 1"=2000'

Drawing: P:\Civil\2020\C20-133 Cascade Industrial Center\Drawings\Exhibits\C20133E-EX-VM-COMBINED.dwg Plotted: Jan 15, 2021 - 1:14pm

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NORTHPOINT

CASCADE INDUSTRIAL CENTER

VICINITY MAP

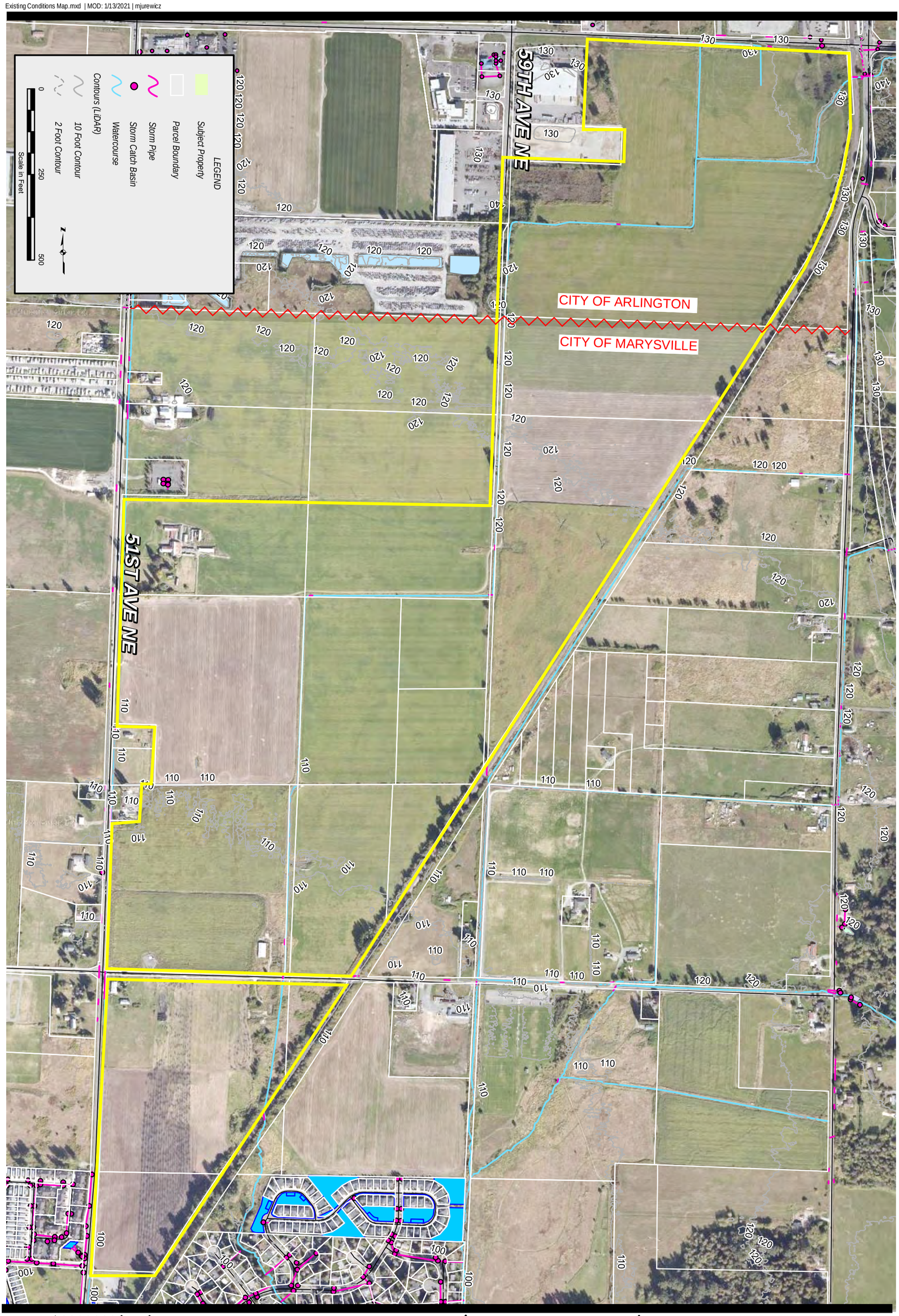

FIGURE: 2.0

CASCADE INDUSTRIAL CENTER

EXISTING CONDITIONS MAP

NAD 1983 HARN STATEPLANE WASHINGTON NORTH FIPS 4601 FEET

REVISION:
JOB NUMBER: 20-133
DRAWING NAME: 20-133-20
DESIGNED BY: DMB
DRAWN BY: MJUREWICZ
DATE: 1/13/2021
SCALE: AS SHOWN
JURISDICTION: GRANITE FALLS

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SOURCE INFORMATION

SOURCE AGENCY	DESCRIPTION
SNOHOMISH COUNTY GIS	PARCEL BOUNDARY
SNOHOMISH COUNTY GIS	CONTOURS GENERATED FROM BARE EARTH LIDAR (KING COUNTY). THIS DATA HAS A STATED VERTICAL ACCURACY OF APPROXIMATELY 1 FOOT.

CITY OF ARLINGTON

CITY OF MARYSVILLE

59TH AVE NE

51ST AVE NE

LEGEND

- Subject Property
- Parcel Boundary
- Storm Pipe
- Storm Catch Basin
- Watercourse

Contours (LiDAR)

- 10 Foot Contour
- 2 Foot Contour

0 250 500

Scale in Feet

Proposed Conditions Map.mxd | MOD: 1/13/2021 | mjurewicz

SOURCE INFORMATION

SOURCE AGENCY	DESCRIPTION
SNOHOMISH COUNTY GIS	PARCEL BOUNDARY
SNOHOMISH COUNTY GIS	CONTOURS GENERATED FROM BARE EARTH LIDAR (KING COUNTY). THIS DATA HAS A STATED VERTICAL ACCURACY OF APPROXIMATELY 1 FOOT.

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Kent, WA 98030
F 425.482.2893

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CASCADE INDUSTRIAL CENTER

PROPOSED CONDITIONS MAP

NAD 1983 HARN
STATEPLANE WASHINGTON
NORTH FIPS 4601 FEET

REVISION:	
JOB NUMBER:	20-133
DRAWING NAME:	20-133-3.0
DESIGNER:	MJUREWICZ
DRAWING BY:	MJUREWICZ
DATE:	1/13/2021
SCALE:	AS SHOWN
JURISDICTION:	GRANITE FALLS

FIGURE:

3.0

Appendix B: Resource Review

1. Figure 4.0 - Downstream Analysis Map
2. City of Marysville Critical Areas Map
3. Soundview Critical Areas Map
4. Downstream Site Visit Pictures
5. FEMA Floodplain Map – Panel #53061C0709E
6. USGS Soils Map
7. USGS Soils Description
8. 303d Listings

Upstream Flowpath 3

Upstream Flowpath 2

Upstream Flowpath 4

Upstream Flowpath 4 Basin
~ 7 AC

Upstream Flowpath 1 Basin
~ 150 AC

Upstream Flowpath 1

Downstream Flowpath 1

Downstream Flowpath 2

VICINITY MAP

CITY OF ARLINGTON

CITY OF MARYSVILLE

17TH ST NE

51ST AVE NE

LEGEND

Subject Property
Parcel Boundary
Quarter Mile Boundary of Analysis
Storm Pipe
Storm Catch Basin
Watercourse
Contours (LiDAR)
10 Foot Contour
2 Foot Contour
Image Number
Downstream Flowpath
Upstream Flowpath
Onsite Flow Direction
Upstream Flow Direction

0 850 1700
Scale in Feet

SOURCE INFORMATION

SOURCE AGENCY	DESCRIPTION
SNOHOMISH COUNTY GIS	PARCEL BOUNDARY
SNOHOMISH COUNTY GIS	CONTOURS GENERATED FROM BARE EARTH LIDAR (KING COUNTY). THIS DATA HAS A STATED VERTICAL ACCURACY OF APPROXIMATELY 1 FOOT.

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CASCADE INDUSTRIAL CENTER

DOWNSTREAM ANALYSIS MAP

NAD 1983 HARN
STATEPLANE WASHINGTON
NORTH FIPS 4601 FEET

REVISION:	
JOB NUMBER:	20-133
DRAWING NAME:	20-133-4.0
DESIGNER:	CDANBY
DRAWING BY:	CDANBY
DATE:	12/3/2020
SCALE:	AS SHOWN
JURISDICTION:	

FIGURE:

4.0

Downstream Map.mxd | MOD: 12/3/2020 | cdanby

CITY OF Marysville WASHINGTON

Critical Areas

2012

1:18,000

0 500 1,000 2,000 3,000 Feet

Project Site

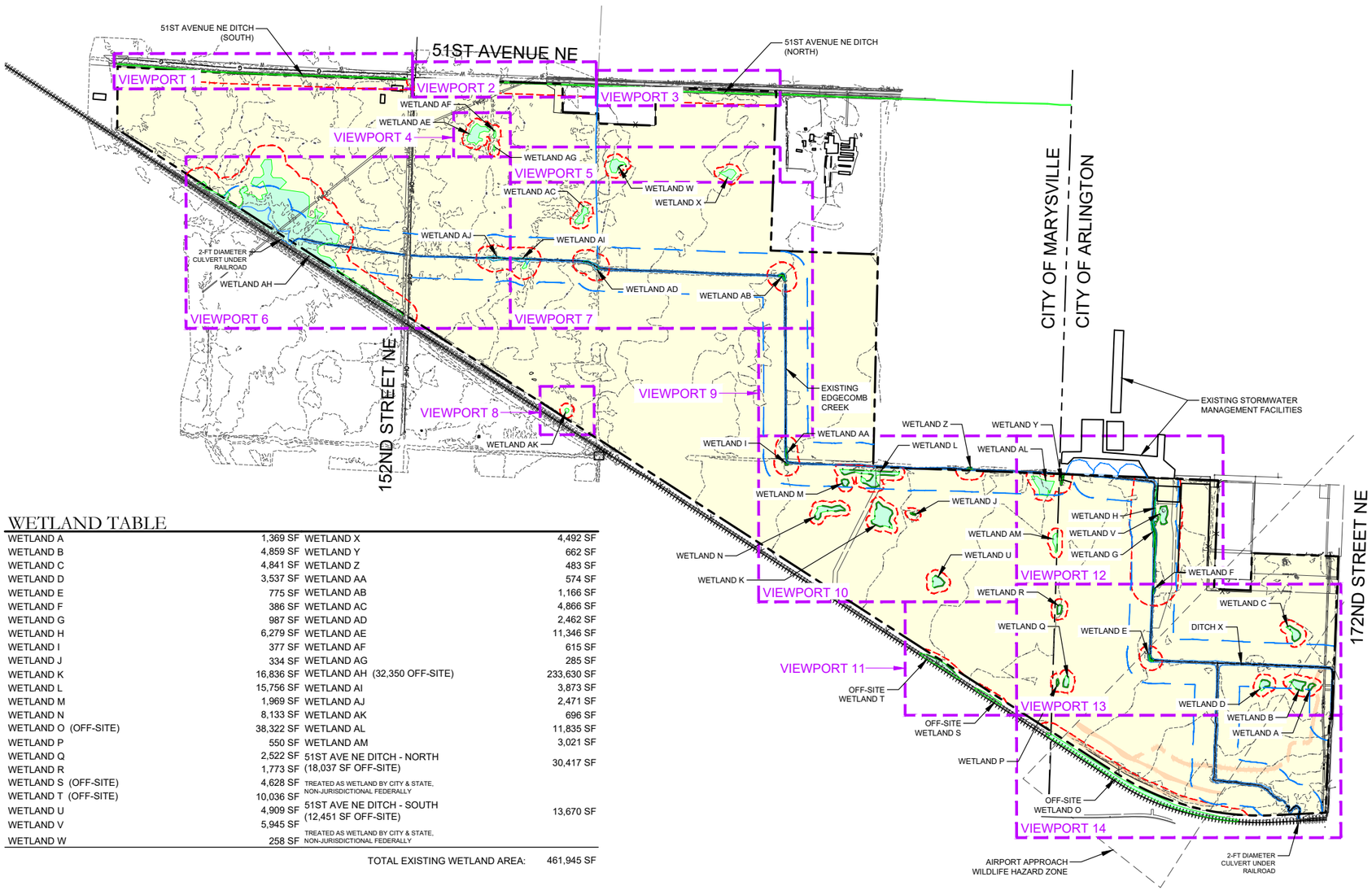
Data shown on this map represents known critical areas however, other critical areas may exist This map is meant for general information purposes only and is not meant to replace critical areas surveys by qualified consultants.

Printed: December 2019

Legend

Marysville stream classes
- S - 200' buffer
- F - 150' buffer
- NS - 50' buffer
- Unknown
- Not regulated
- Outside area

Delineated wetlands
- category 1 - 125' buffer
- category 2 - 100' buffer
- category 3 - 75' buffer
- category 4 - 35' buffer
- 25 percent top-of-bank
- Stream buffers
- Wetland buffers
- Assumed stream wetlands
- Stream wetland buffers
- Lake & slough buffers
- 13' LIDAR floodplain contour
- Top-of-bank 25' buffer
- Marysville city limits
- Urban growth area



WETLAND TABLE

WETLAND A	1,369 SF	WETLAND X	4,492 SF
WETLAND B	4,859 SF	WETLAND Y	662 SF
WETLAND C	4,841 SF	WETLAND Z	483 SF
WETLAND D	3,537 SF	WETLAND AA	574 SF
WETLAND E	775 SF	WETLAND AB	1,166 SF
WETLAND F	386 SF	WETLAND AC	4,866 SF
WETLAND G	987 SF	WETLAND AD	2,462 SF
WETLAND H	6,279 SF	WETLAND AE	11,346 SF
WETLAND I	377 SF	WETLAND AF	615 SF
WETLAND J	334 SF	WETLAND AG	285 SF
WETLAND K	16,836 SF	WETLAND AH (32,350 OFF-SITE)	233,630 SF
WETLAND L	15,756 SF	WETLAND AI	3,873 SF
WETLAND M	1,969 SF	WETLAND AJ	2,471 SF
WETLAND N	8,133 SF	WETLAND AK	696 SF
WETLAND O (OFF-SITE)	38,322 SF	WETLAND AL	11,835 SF
WETLAND P	550 SF	WETLAND AM	3,021 SF
WETLAND Q	2,522 SF	51ST AVE NE DITCH - NORTH (18,037 SF OFF-SITE)	30,417 SF
WETLAND R	1,773 SF		
WETLAND S (OFF-SITE)	4,628 SF	TREATED AS WETLAND BY CITY & STATE, NON-JURISDICTIONAL FEDERALLY	
WETLAND T (OFF-SITE)	10,036 SF		
WETLAND U	4,909 SF	51ST AVE NE DITCH - SOUTH (12,451 SF OFF-SITE)	13,670 SF
WETLAND V	5,945 SF		
WETLAND W	258 SF	TREATED AS WETLAND BY CITY & STATE, NON-JURISDICTIONAL FEDERALLY	
		TOTAL EXISTING WETLAND AREA:	461,945 SF

STREAM/DITCH TABLE

EDGECOMB CREEK	10,723 LF	
	(157,317 SF)	
DITCH X	1,167 LF	
	(18,074 SF)	
TOTAL EXISTING TYPE F STREAMS:	12,340 LF	
(OPEN CHANNEL)	(175,391 SF)	
DITCH U	1,223 LF	
	(4,891 SF)	

PLAN LEGEND

- PROJECT AREA
- EXISTING WETLANDS
- APPROXIMATED WETLAND BOUNDARY (NOT SURVEYED)
- WETLAND BUFFER
- STREAM ORDINARY HIGH WATER LINE (OHW)
- STREAM BUFFER
- DITCH CENTERLINE
- EXISTING CONTOUR

0 200 400 800

GRAPHIC SCALE
1"= 400'

VICINITY MAP

SOURCE: GOOGLE MAPS; WWW.MAPS.GOOGLE.COM (ACCESSED 11/4/2020)

APPLICANT

NORTHPOINT HOLDINGS, LLC
4825 NORTHWEST 41ST STREET, SUITE 500
RIVERSIDE, MISSOURI 6415

SITE ADDRESS/PARCEL #

6600 172ND STREET NORTHEAST
ARLINGTON, WASHINGTON 98223
15223 & 16015 51ST AVENUE NORTHEAST
5415 152ND STREET EAST
MARYSVILLE, WASHINGTON 98271

SNOHOMISH COUNTY TAX PARCELS:
31052700100100, 31052700100300, 31052700300200, 31052700300500, 31052700300700, 31052700300800, 31052700300900, 31052700400300, 31053400200300, 31053400200400, 31053400200500, 31053400200600, 31053400200700, 31053400300300
SNOHOMISH COUNTY TAX PARCELS (NOT ASSESSED): 31052700100900, 31053400200100, 31053400200900, 31053400201300

ENVIRONMENTAL CONSULTANT

SOUNDVIEW CONSULTANTS LLC
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GIG HARBOR, WASHINGTON 98355
(253) 514-8952

SHEET INDEX

SHEET NUMBER	SHEET TITLE
1	EXISTING CONDITIONS OVERVIEW PLAN
2	EXISTING CONDITIONS VIEWPORTS 1-5
3	EXISTING CONDITIONS VIEWPORT 6
4	EXISTING CONDITIONS VIEWPORT 7
5	EXISTING CONDITIONS VIEWPORTS 8-10
6	EXISTING CONDITIONS VIEWPORTS 11-12
7	EXISTING CONDITIONS VIEWPORT 13
8	EXISTING CONDITIONS VIEWPORT 14

PRELIMINARY INFORMATION ONLY

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Kent 1851 Central Pl S, #101 Kent, WA 98032
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WWW.SOUNDVIEWCONSULTANTS.COM

CASCADE BUSINESS PARK
THE NE & SE ¼ OF SECTION 27
NW & SW ¼ OF SECTION 34
TOWNSHIP 31N, RANGE 5E, W.M.

DATE: 3-12/2021
JOB: 1703.0004
BY: MW
SCALE: AS SHOWN
SHEET: 1

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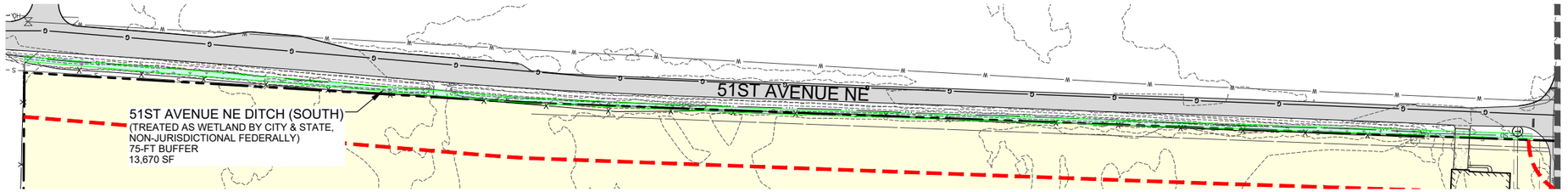
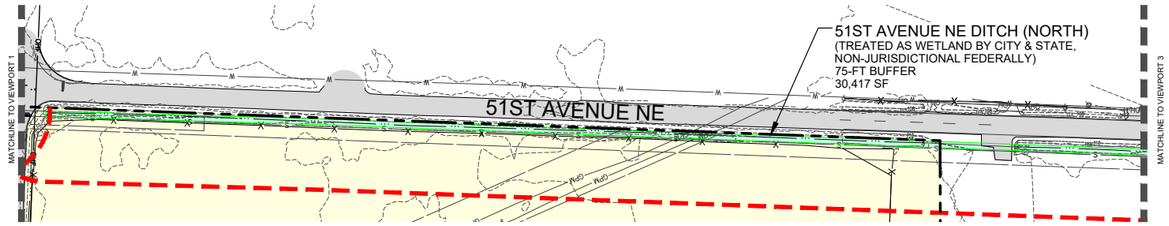
Plotted: March 10, 2021



VIEWPORT 1
SCALE: 1"=80'



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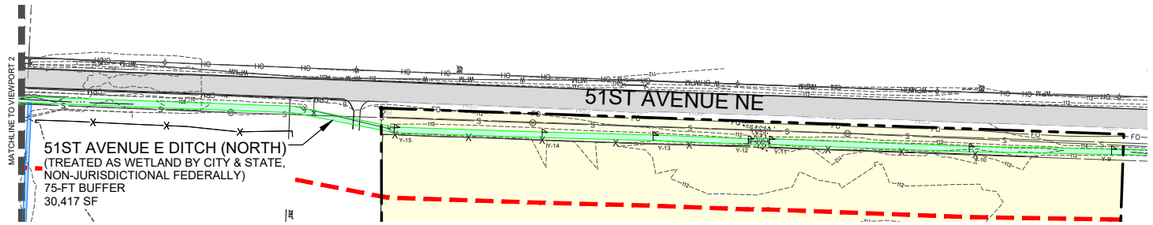

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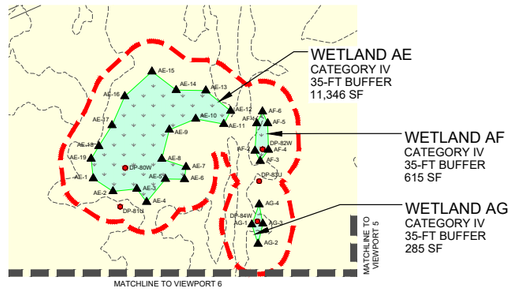

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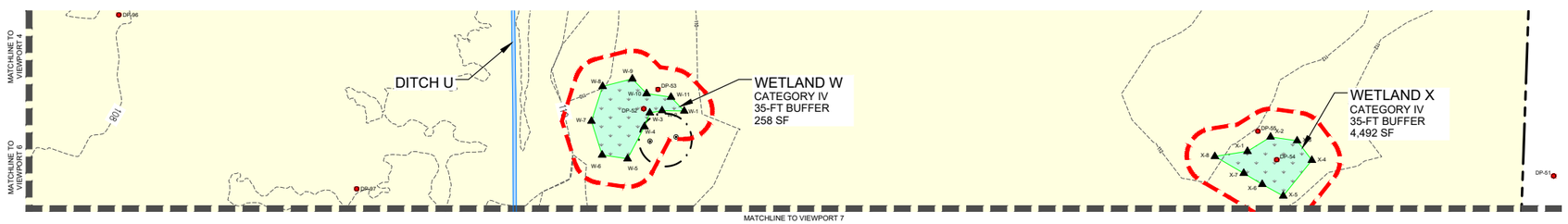

VIEWPORT 5

0 80 160 320

GRAPHIC SCALE
1"=80'

PLAN LEGEND

- PROJECT AREA
- EXISTING WETLAND
- APPROXIMATED WETLAND BOUNDARY (NOT SURVEYED)
- WETLAND BUFFER
- WETLAND FLAG LOCATION
- SOIL TEST PIT LOCATION
- STREAM ORDINARY HIGH WATER LINE (OHW)
- STREAM BUFFER
- STREAM OHW (ORDINARY HIGH WATER) FLAG LOCATION
- DITCH CENTERLINE
- EXISTING CONTOUR

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CASCADE BUSINESS PARK
THE NE & SE¼ OF SECTION 27
NW & SW¼ OF SECTION 34
TOWNSHIP 31N, RANGE 5E, W.M.

DATE: 3-12/2021
JOB: 1703.0004
BY: MW
SCALE: AS SHOWN
SHEET: 2

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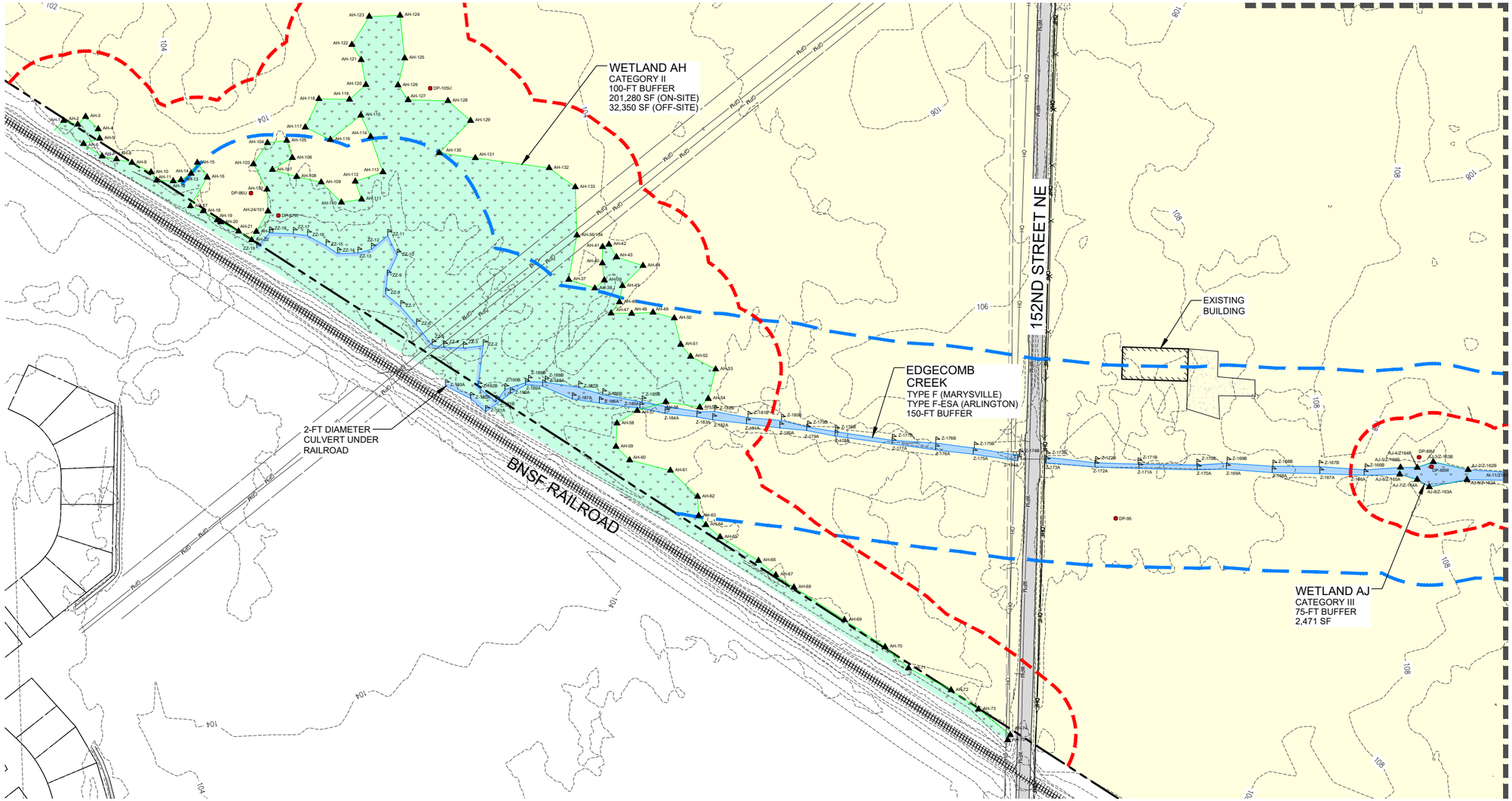
Plotted March 10, 2021



VIEWPORT 6

0 80 160 320

GRAPHIC SCALE
1"= 80'

PLAN LEGEND

- PROJECT AREA
- EXISTING WETLAND
- APPROXIMATED WETLAND BOUNDARY (NOT SURVEYED)
- WETLAND BUFFER
- WETLAND FLAG LOCATION
- SOIL TEST PIT LOCATION
- STREAM ORDINARY HIGH WATER LINE (OHW)
- STREAM BUFFER
- STREAM OHW (ORDINARY HIGH WATER) FLAG LOCATION
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NW & SW ¼ OF SECTION 34
TOWNSHIP 31N, RANGE 5E, W.M.

DATE: 3-12/2021
JOB: 1703.0004
BY: MW
SCALE: AS SHOWN
SHEET: 3

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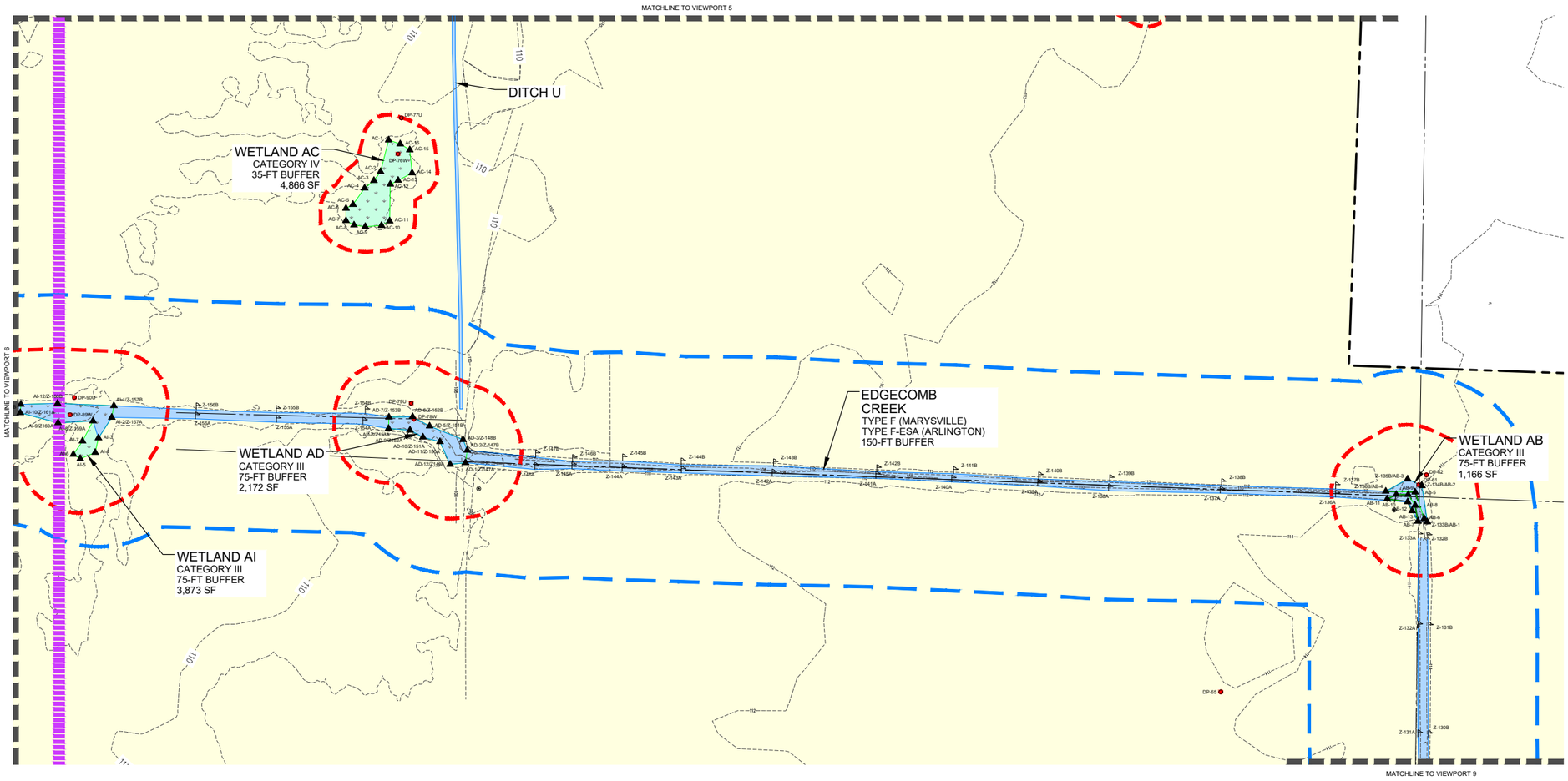
Layout: 3 - Current Base Xref: R:\CURRENT\1703.0004 (2021-03) base.dwg
Plotted: March 15, 2021



VIEWPORT 7

0 80 160 320

GRAPHIC SCALE
1"= 80'

PLAN LEGEND

- PROJECT AREA
- EXISTING WETLAND
- APPROXIMATED WETLAND BOUNDARY (NOT SURVEYED)
- WETLAND BUFFER
- WETLAND FLAG LOCATION
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- STREAM OHW (ORDINARY HIGH WATER) FLAG LOCATION
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TOWNSHIP 31N, RANGE 5E, W.M.

DATE: 3-12/2021
JOB: 1703.0004
BY: MW
SCALE: AS SHOWN
SHEET: 4

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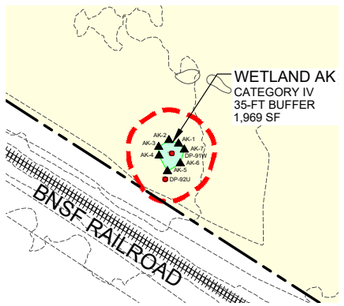
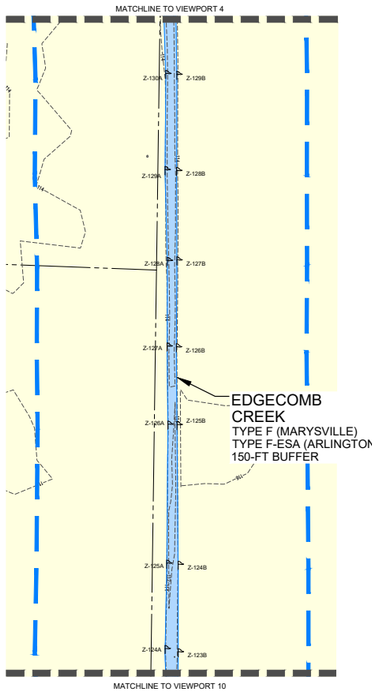
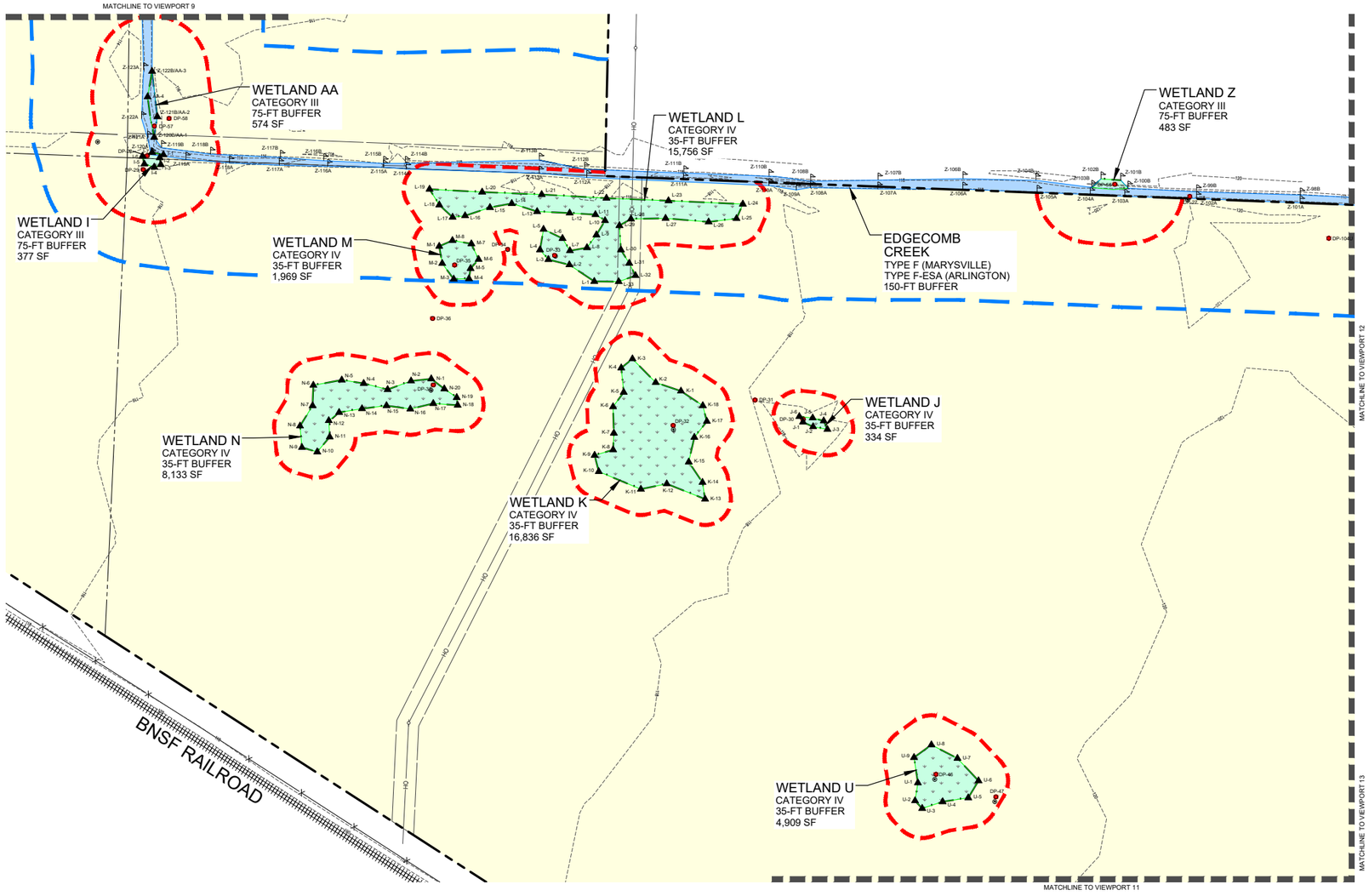
Base.dwg, 7, Current Base SPACE\(1703.0004 (EXIST-SP) Base.dwg
Plotted: March 15, 2021



VIEWPORT 8
SCALE: 1"=80'



VIEWPORT 9



VIEWPORT 10
SCALE: 1"=80'

0 200 400 800

GRAPHIC SCALE
1"= 400'

PLAN LEGEND

- PROJECT AREA
- EXISTING WETLAND
- APPROXIMATED WETLAND BOUNDARY (NOT SURVEYED)
- WETLAND BUFFER
- WETLAND FLAG LOCATION
- SOIL TEST PIT LOCATION
- STREAM ORDINARY HIGH WATER LINE (OHW)
- STREAM BUFFER
- STREAM OHW (ORDINARY HIGH WATER) FLAG LOCATION
- DITCH CENTERLINE
- EXISTING CONTOUR

PRELIMINARY
INFORMATION ONLY

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THE NE & SE ¼ OF SECTION 27
NW & SW ¼ OF SECTION 34
TOWNSHIP 31N, RANGE 5E, W.M.

DATE:	3-12/2021
JOB:	1703.0004
BY:	MW
SCALE:	AS SHOWN
SHEET:	5

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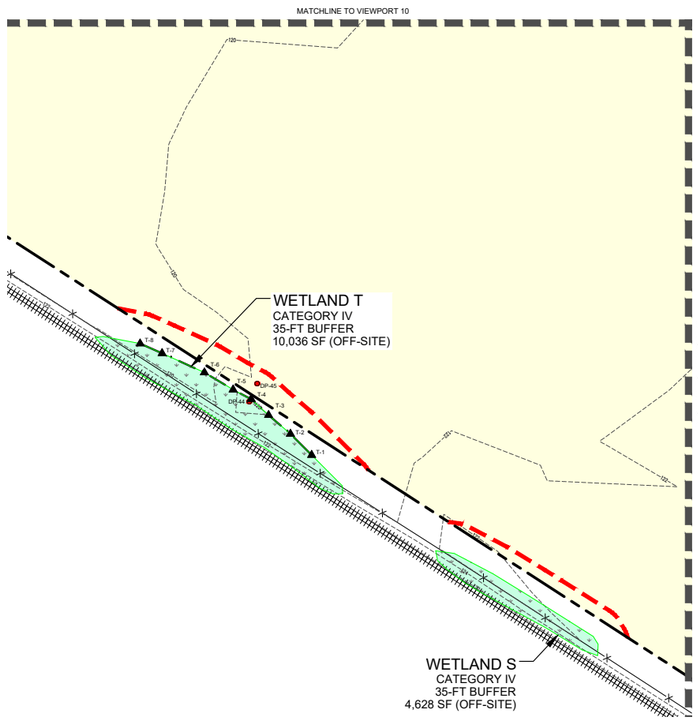
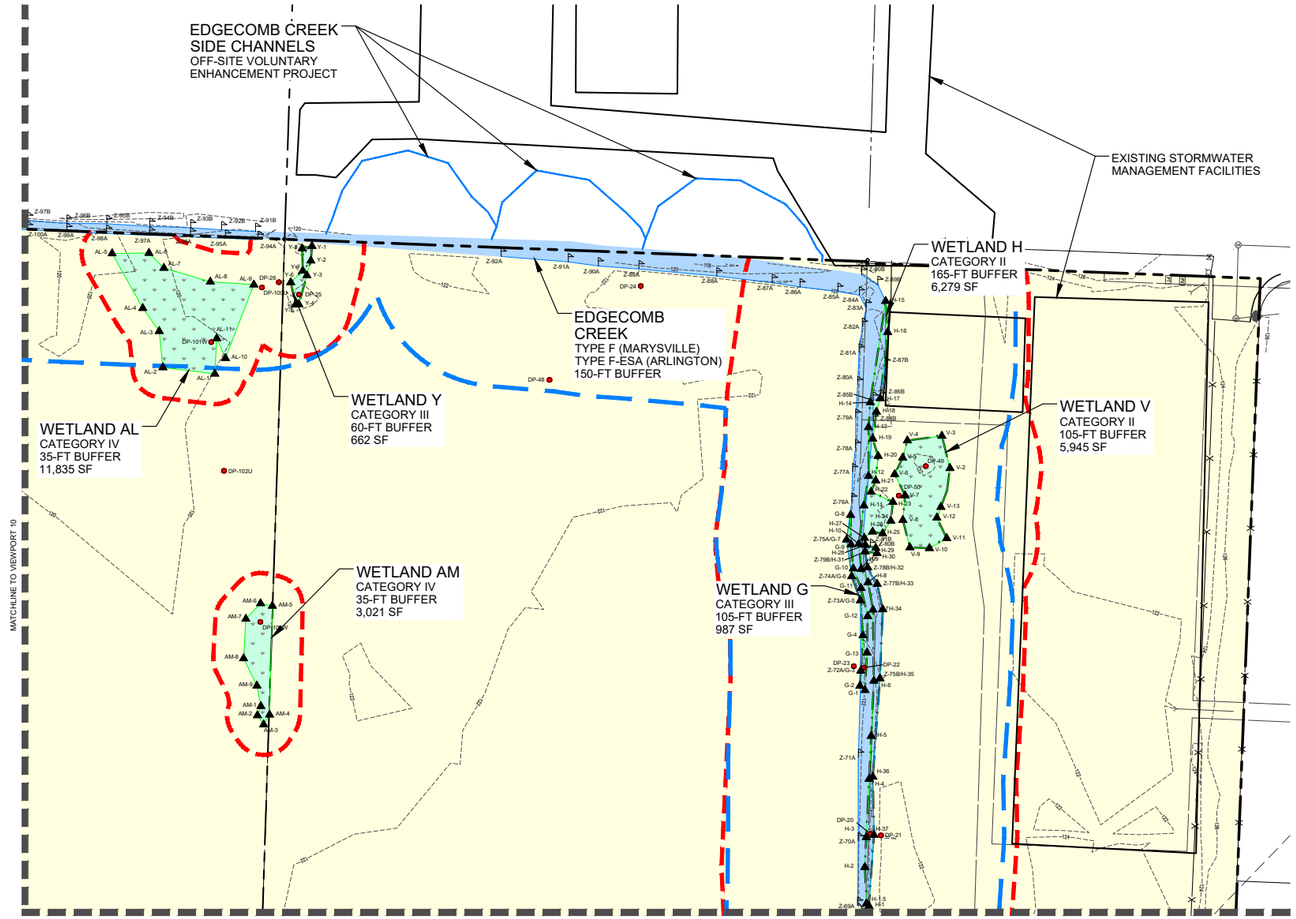
Plotted: March 15, 2021 By: MWebb(1703.0004 (2021-03)) base.dwg



VIEWPORT 11



VIEWPORT 12

SCALE: 1"=80'

0 200 400 800

GRAPHIC SCALE
1"= 400'

PLAN LEGEND

- PROJECT AREA
- EXISTING WETLAND
- APPROXIMATED WETLAND BOUNDARY (NOT SURVEYED)
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SOURCES:
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NW & SW ¼ OF SECTION 34
TOWNSHIP 31N, RANGE 5E, W.M.

DATE: 3-12/2021
JOB: 1703.0004
BY: MW
SCALE: AS SHOWN
SHEET: 6

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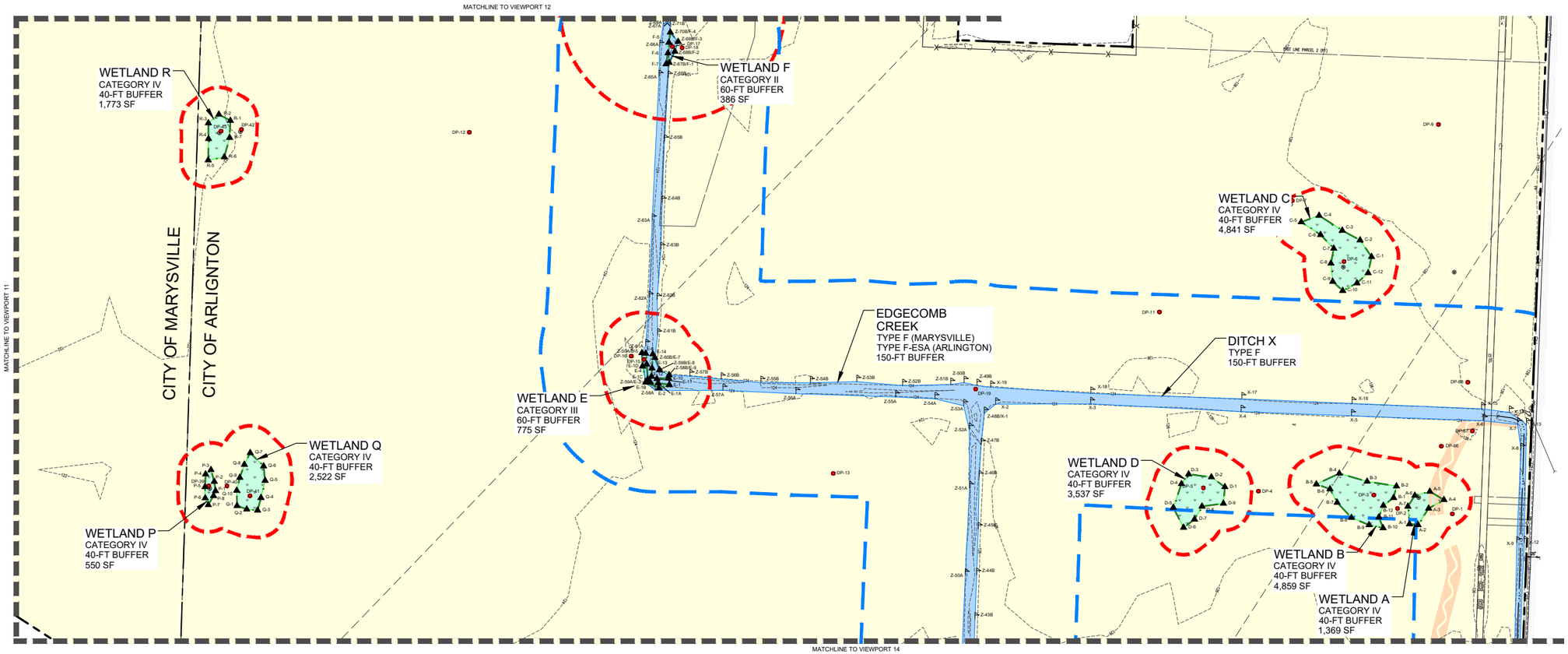
Plotted: March 15, 2021



VIEWPORT 13

0 200 400 800

GRAPHIC SCALE
1"=400'

PLAN LEGEND

- PROJECT AREA
- EXISTING WETLAND
- APPROXIMATED WETLAND BOUNDARY (NOT SURVEYED)
- WETLAND BUFFER
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- STREAM ORDINARY HIGH WATER LINE (OHW)
- STREAM BUFFER
- STREAM OHW (ORDINARY HIGH WATER) FLAG LOCATION
- DITCH CENTERLINE
- EXISTING CONTOUR

PRELIMINARY
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SOURCES:

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20210 142nd Avenue NE
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1851 Central Pl. S. #101
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CASCADE BUSINESS PARK
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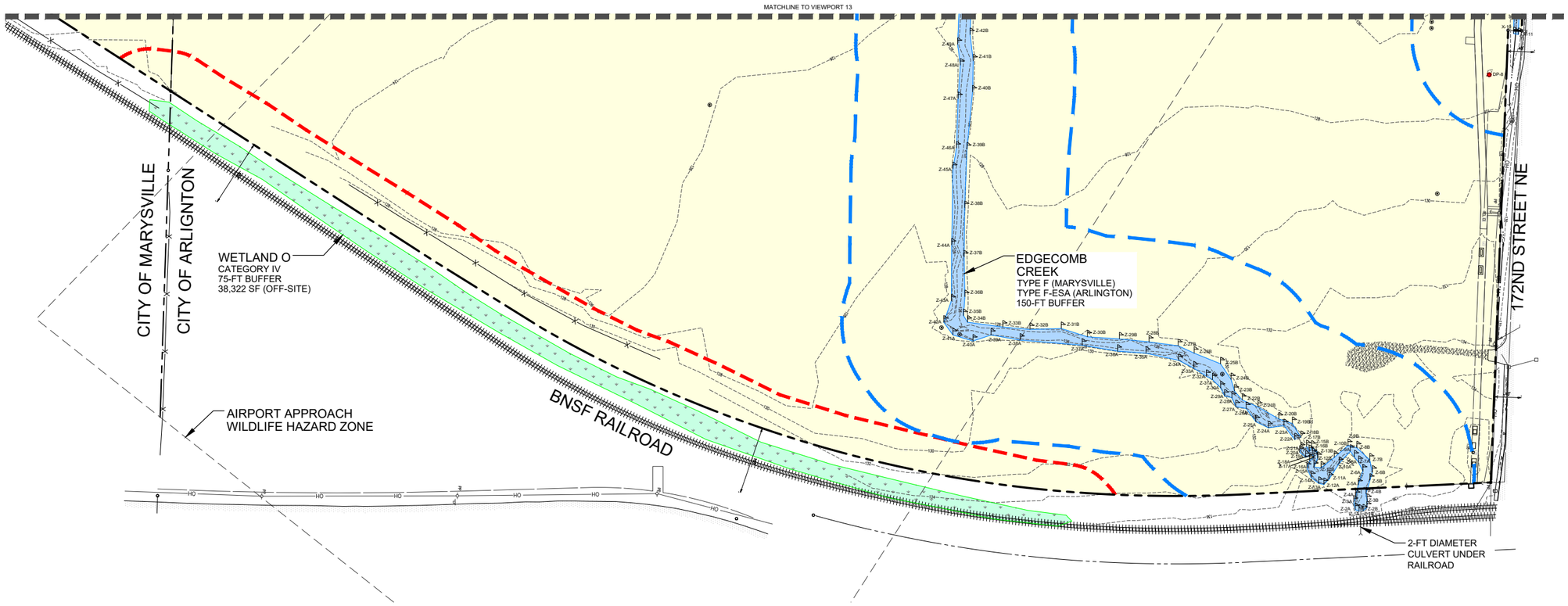
TOWNSHIP 31N, RANGE 5E, W.M.

DATE: 3-12/2021
JOB: 1703.0004
BY: MW
SCALE: AS SHOWN
SHEET: 7

S:\CURRENT\1703 NorthPoint Holdings LLC\1703.0004 Cascade Logistics Park\Graphics & Maps\CAD\A - CURRENT SVC
BASE\1703.0004 Current Base SHEET(1703.0004 (2021-03) Viewing
Plotted March 15, 2021



VIEWPORT 14

0 200 400 800

GRAPHIC SCALE
1"= 400'

PLAN LEGEND

- PROJECT AREA
- EXISTING WETLAND
- APPROXIMATED WETLAND BOUNDARY (NOT SURVEYED)
- WETLAND BUFFER
- WETLAND FLAG LOCATION
- SOIL TEST PIT LOCATION
- STREAM ORDINARY HIGH WATER LINE (OHW)
- STREAM BUFFER
- STREAM OHW (ORDINARY HIGH WATER) FLAG LOCATION
- DITCH CENTERLINE
- EXISTING CONTOUR

PRELIMINARY
INFORMATION ONLY

NOT FOR CONSTRUCTION

SOUNDVIEW CONSULTANTS LLC ASSUMES NO LIABILITY OR RESPONSIBILITY FOR CONSTRUCTION, IMPROVEMENTS, OR ESTIMATES BASED ON THIS PLAN SET

SOURCES:

LDC | Surveying Engineering Planning
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Soundview Consultants LLC
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GIG HARBOR, WASHINGTON 98335
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F. 253.514.8954
WWW.SOUNDVIEWCONSULTANTS.COM

CASCADE BUSINESS PARK
THE NE & SE ¼ OF SECTION 27
NW & SW ¼ OF SECTION 34
TOWNSHIP 31N, RANGE 5E, W.M.

DATE: 3-12/2021
JOB: 1703.0004
BY: MW
SCALE: AS SHOWN
SHEET: 8

S:\CURRENT\1703 NorthPoint Holdings LLC\1703.0004 Cascade Logistics Park\Graphics & Maps\CAD\A - CURRENT.DWG
Last Saved By: Matt Wilson
Plotted: March 15, 2021 11:56:46 AM

(1) Upstream Flow Path 1: Ditch along 51st Ave NE

(2) Upstream Flow Path 1: Ditch along 51st Ave NE

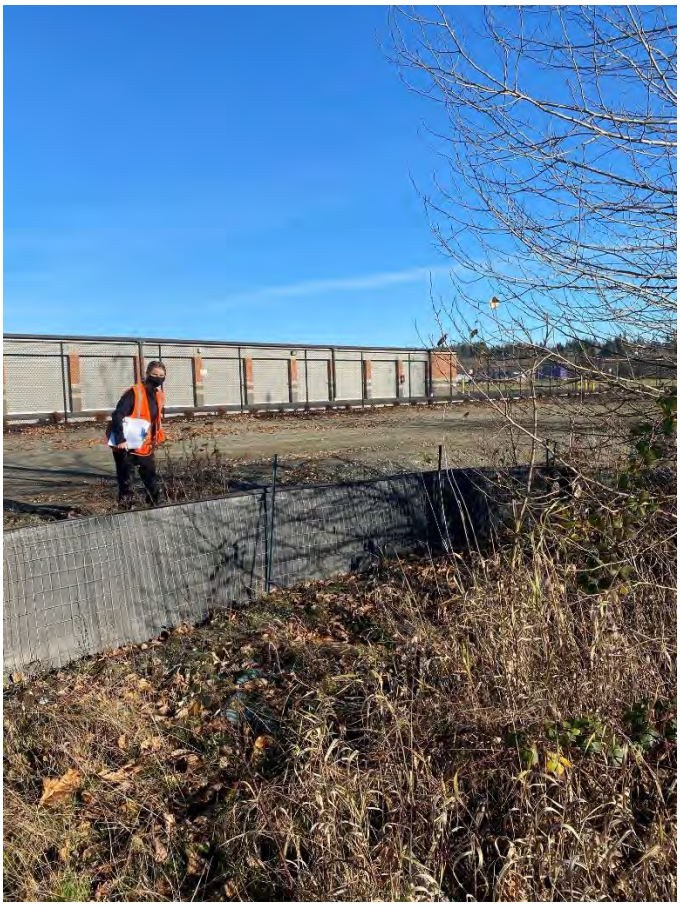
(3) Upstream Flow Path 1: Ditch along 51st Ave SE

(4) Upstream Flow Path 2: Ditch X

(5) Upstream Flow Path 2: Ditch X 172nd Ave Facing South

(6) Upstream Flow Path 3: Edgecomb Creek entering onsite

(7) Upstream Flow Path 3: Edgecomb Creek offsite



(8) Upstream Flow Path 4: Facing north onsite to development that directs discharge onsite

(9) Upstream Flow Path 4: Onsite discharge location

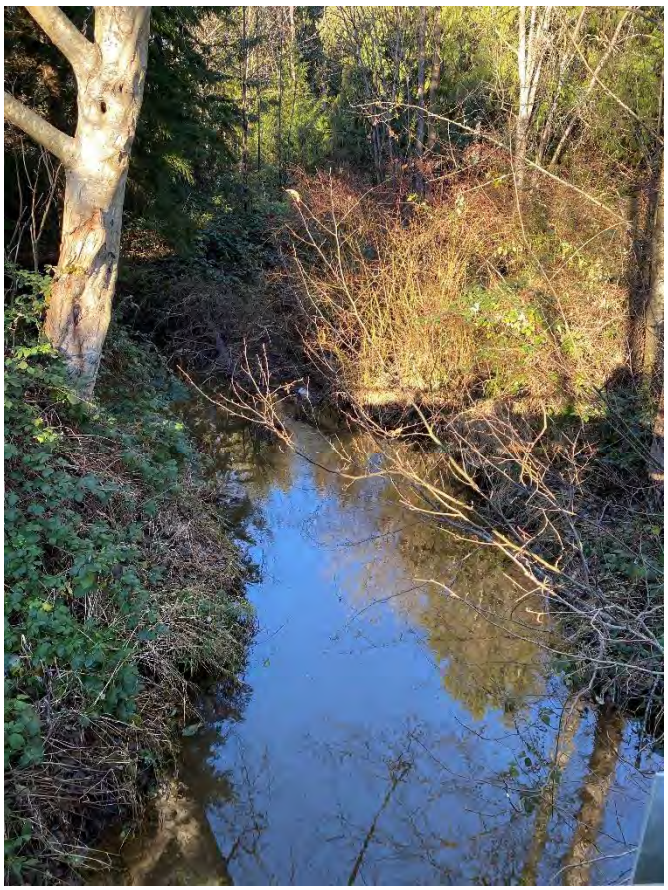
(10) Upstream Flow Path 4: Offsite discharge pipe that discharges onsite. Damage to pipe due to surfaced pipe

(11) Downstream Flow Path 1:Edge Comb Creek crossing rail road

(12) Downstream Flow Path 1: Edge Comb Creek existing the quarter mile boundary of analysis

(13) Downstream Flow Path 2: Ditch along 51st at edge of property line in the SW corner of the project.

(14) Downstream Flow Path 2: Ditch along 51st Ave NE redirects east



(15) Downstream Flow Path 2: Flows converge with Downstream Flow Path 1 within a residential neighborhood

122°11'15.91"W 48°10'31.95"N

USGS The National Map: Orthoimagery. Data refreshed April 2020

122°7'29.2"W 48°6'20.6"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- 8 Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAIP, dated April 11, 2018.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **7/2/2020 4:50 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards. This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: No elevation features on this FIRM

For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

N

1 inch = 1,000 feet 1:12,000

0 500 1,000 2,000 3,000 4,000 Feet

0 105 210 420 630 840 Meters

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

SNOHOMISH COUNTY, WASHINGTON AND INCORPORATED AREAS

PANEL 395 OF 1550

Panel Contains:

COMMUNITY	NUMBER	PANEL
CITY OF MARYSVILLE	530168	0395
CITY OF ARLINGTON	530271	0395
SNOHOMISH COUNTY	535534	0395

MAP NUMBER
53061C0395E
EFFECTIVE DATE
November 08, 1999

Soil Map—Snohomish County Area, Washington

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: Snohomish County Area, Washington
Survey Area Data: Version 22, 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: Sep 26, 2018—Oct 16, 2018

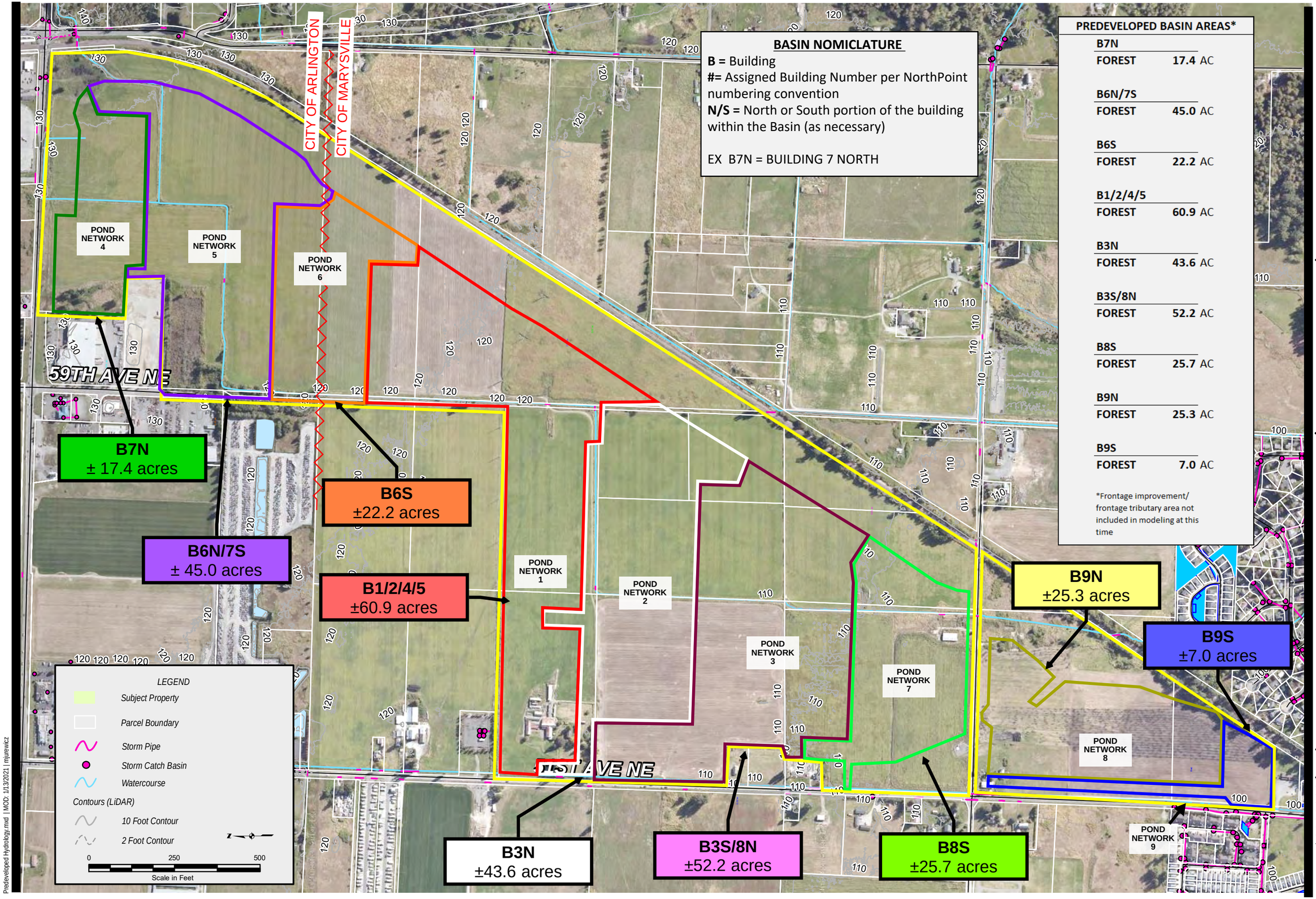
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
13	Custer fine sandy loam	127.4	31.8%
39	Norma loam	273.3	68.2%
Totals for Area of Interest		**400.7**	**100.0%**

Appendix C: Detention and Water Quality Analysis Data

1. Figure 5.0 – Predeveloped Hydrology Map
2. Figure 6.0 – Developed Hydrology Map
3. Typical Pond Discharge
4. WWHM Output: Pond Network 1
5. WWHM Output: Pond Network 2
6. WWHM Output: Pond Network 3
7. WWHM Output: Pond Network 4
8. WWHM Output: Pond Network 5
9. WWHM Output: Pond Network 6
10. WWHM Output: Pond Network 7
11. WWHM Output: Pond Network 8
12. WWHM Output: Pond Network 9



BASIN NOMICLATURE

B = Building
#= Assigned Building Number per NorthPoint numbering convention
N/S = North or South portion of the building within the Basin (as necessary)

EX B7N = BUILDING 7 NORTH

PREDEVELOPED BASIN AREAS*

B7N		
FOREST	**17.4**	AC
B6N/7S		
FOREST	**45.0**	AC
B6S		
FOREST	**22.2**	AC
B1/2/4/5		
FOREST	**60.9**	AC
B3N		
FOREST	**43.6**	AC
B3S/8N		
FOREST	**52.2**	AC
B8S		
FOREST	**25.7**	AC
B9N		
FOREST	**25.3**	AC
B9S		
FOREST	**7.0**	AC

*Frontage improvement/ frontage tributary area not included in modeling at this time

SOURCE INFORMATION

SOURCE AGENCY	DESCRIPTION
SNOHOMISH COUNTY GIS	PARCEL BOUNDARY
SNOHOMISH COUNTY GIS	CONTOURS GENERATED FROM BARE EARTH LIDAR (KING COUNTY). THIS DATA HAS A STATED VERTICAL ACCURACY OF APPROXIMATELY 1 FOOT.

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CASCADE INDUSTRIAL CENTER

PREDEVELOPED HYDROLOGY MAP

NAD 1983 HARN
STATEPLANE WASHINGTON
NORTH FIPS 4601 FEET

REVISION:	
JOB NUMBER:	20-133
DRAWING NAME:	20-133-5.0
DESIGNER:	CDANBY
DRAWING BY:	MJUREWICZ
DATE:	1/13/2021
SCALE:	AS SHOWN
JURISDICTION:	GRANITE FALLS

FIGURE:
5.0

Predeveloped Hydrology.mxd | MOD: 1/13/2021 | mjurewicz

DEVELOPED BASIN AREAS*

B1/2/4/5		B3N		B3S/8N		B6S		B6N/7S	
IMPERVIOUS	39.5 AC	IMPERVIOUS	26.5 AC	IMPERVIOUS	34.3 AC	IMPERVIOUS	15.5 AC	IMPERVIOUS	29.1 AC
PERVIOUS	10.3 AC	PERVIOUS	9.8 AC	PERVIOUS	6.8 AC	PERVIOUS	3.1 AC	PERVIOUS	9.9 AC
POND	11.1 AC	POND	7.3 AC	POND	11.1 AC	POND	3.5 AC	POND	6.0 AC
TOTAL	**60.9 AC**	**TOTAL**	**43.6 AC**	**TOTAL**	**52.2 AC**	**TOTAL**	**22.2 AC**	**TOTAL**	**45.0 AC**

B7N		B8S		B9N		B9S	
IMPERVIOUS	12.0 AC	IMPERVIOUS	14.6 AC	IMPERVIOUS	17.1 AC	IMPERVIOUS	3.2 AC
PERVIOUS	2.5 AC	PERVIOUS	3.9 AC	PERVIOUS	2.8 AC	PERVIOUS	2.0 AC
POND	2.9 AC	POND	7.2 AC	POND	5.5 AC	POND	1.8 AC
TOTAL	**17.4 AC**	**TOTAL**	**25.7 AC**	**TOTAL**	**25.3 AC**	**TOTAL**	**7.0 AC**

*Frontage improvement/frontage tributary area not included in modeling at this time

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N/S = North or South portion of the building within the Basin (as necessary)

EX B7N = BUILDING 7 NORTH

CITY OF ARLINGTON
CITY OF MARYSVILLE

POND NETWORK 1
POND NETWORK 2
POND NETWORK 3
POND NETWORK 4
POND NETWORK 5
POND NETWORK 6
POND NETWORK 7
POND NETWORK 8
POND NETWORK 9

59TH AVE NE

B7N
± 17.4 acres

B6S
±22.2 acres

B6N/7S
± 45.0 acres

B1/2/4/5
±60.9 acres

B9N
±25.3 acres

B9S
±7.0 acres

B3N
±43.6 acres

B3S/8N
±52.2 acres

B8S
±25.7 acres

LEGEND
- Subject Property
- Parcel Boundary
- Storm Pipe
- Storm Catch Basin
- Watercourse
- Stormwater Pond

Contours (LiDAR)
- 10 Foot Contour
- 2 Foot Contour

0 250 500
Scale in Feet

Developed Hydrology Map.mxd | MOD: 1/13/2021 | mjurewicz

SOURCE INFORMATION

SOURCE AGENCY	DESCRIPTION
SNOHOMISH COUNTY GIS	PARCEL BOUNDARY
SNOHOMISH COUNTY GIS	CONTOURS GENERATED FROM BARE EARTH LIDAR (KING COUNTY). THIS DATA HAS A STATED VERTICAL ACCURACY OF APPROXIMATELY 1 FOOT.

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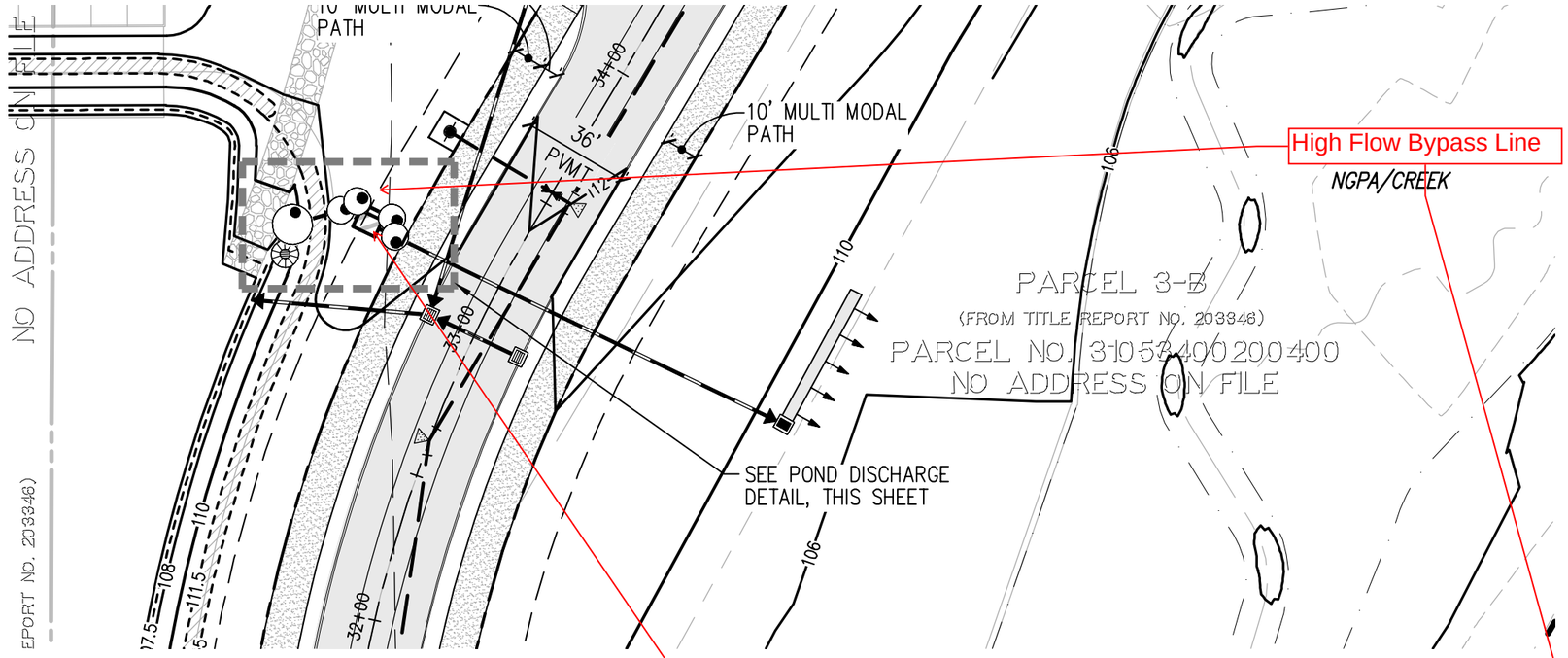
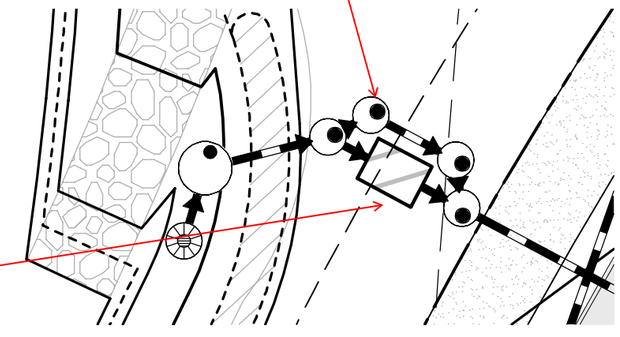
CASCADE INDUSTRIAL CENTER
DEVELOPED HYDROLOGY MAP

NAD 1983 HARN
STATEPLANE WASHINGTON
NORTH FIPS 4601 FEET

REVISION:	
JOB NUMBER:	20-133
DRAWING NAME:	20-133-6.0
DESIGNER:	MJUREWICZ
DRAWING BY:	MJUREWICZ
DATE:	1/13/2021
SCALE:	AS SHOWN
JURISDICTION:	GRANITE FALLS

FIGURE:
6.0





POND DISCHARGE DETAIL

SCALE: 1"=20'

Typical Pond Discharge

EX-01

WWHM2012
PROJECT REPORT

Project Name: Pond Network 1
Site Name:
Site Address:
City :
Report Date: 1/12/2021
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 1.20
Version Date: 2019/09/13
Version : 4.2.17

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 1 2 4 5
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Forest, Flat	60.9
Pervious Total	60.9

Impervious Land Use	acre
Impervious Total	0
Basin Total	60.9

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 1 2 4 5
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Pasture, Flat	10.3
Pervious Total	10.3

Impervious Land Use	acre
ROOF TOPS FLAT	20.5
PARKING FLAT	19
POND	11.1
Impervious Total	50.6
Basin Total	60.9

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Name : Trapezoidal Pond 1
Bottom Length: 614.00 ft.
Bottom Width: 614.00 ft.
Depth: 4.5 ft.
Volume at riser head: 26.7325 acre-feet.
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: 3 ft.
Riser Diameter: 24 in.
Notch Type: Rectangular
Notch Width: 0.670 ft.
Notch Height: 1.333 ft.
Orifice 1 Diameter: 5.75 in. **Elevation:** 0 ft.

Element Flows To:

Outlet 1	Outlet 2

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
116.50	8.654	0.000	0.000	0.000
116.55	8.663	0.432	0.200	0.000
116.60	8.671	0.866	0.283	0.000
116.65	8.680	1.300	0.347	0.000
116.70	8.688	1.734	0.401	0.000
116.75	8.697	2.168	0.448	0.000
116.80	8.705	2.604	0.491	0.000
116.85	8.713	3.039	0.530	0.000

116.90	8.722	3.475	0.567	0.000
116.95	8.730	3.911	0.601	0.000
117.00	8.739	4.348	0.634	0.000
117.05	8.747	4.785	0.665	0.000
117.10	8.756	5.223	0.695	0.000
117.15	8.764	5.661	0.723	0.000
117.20	8.773	6.099	0.750	0.000
117.25	8.782	6.538	0.777	0.000
117.30	8.790	6.978	0.802	0.000
117.35	8.799	7.417	0.827	0.000
117.40	8.807	7.857	0.851	0.000
117.45	8.816	8.298	0.874	0.000
117.50	8.824	8.739	0.897	0.000
117.55	8.833	9.180	0.919	0.000
117.60	8.841	9.622	0.941	0.000
117.65	8.850	10.06	0.962	0.000
117.70	8.858	10.50	0.982	0.000
117.75	8.867	10.95	1.003	0.000
117.80	8.875	11.39	1.023	0.000
117.85	8.884	11.83	1.042	0.000
117.90	8.893	12.28	1.061	0.000
117.95	8.901	12.72	1.080	0.000
118.00	8.910	13.17	1.098	0.000
118.05	8.918	13.61	1.117	0.000
118.10	8.927	14.06	1.134	0.000
118.15	8.936	14.51	1.152	0.000
118.20	8.944	14.95	1.183	0.000
118.25	8.953	15.40	1.240	0.000
118.30	8.961	15.85	1.311	0.000
118.35	8.970	16.30	1.394	0.000
118.40	8.979	16.75	1.487	0.000
118.45	8.987	17.20	1.588	0.000
118.50	8.996	17.65	1.697	0.000
118.55	9.004	18.10	1.813	0.000
118.60	9.013	18.55	1.935	0.000
118.65	9.022	19.00	2.064	0.000
118.70	9.030	19.45	2.198	0.000
118.75	9.039	19.90	2.338	0.000
118.80	9.048	20.35	2.484	0.000
118.85	9.056	20.80	2.634	0.000
118.90	9.065	21.26	2.790	0.000
118.95	9.074	21.71	2.950	0.000
119.00	9.082	22.16	3.114	0.000
119.05	9.091	22.62	3.283	0.000
119.10	9.100	23.07	3.457	0.000
119.15	9.108	23.53	3.634	0.000
119.20	9.117	23.98	3.816	0.000
119.25	9.126	24.44	4.002	0.000
119.30	9.134	24.90	4.191	0.000
119.35	9.143	25.35	4.385	0.000
119.40	9.152	25.81	4.582	0.000
119.45	9.160	26.27	4.783	0.000
119.50	9.169	26.73	4.987	0.000
119.55	9.178	27.19	5.237	0.000
119.60	9.186	27.65	5.683	0.000
119.65	9.195	28.11	6.255	0.000
119.70	9.204	28.57	6.925	0.000

119.75	9.213	29.03	7.674	0.000
119.80	9.221	29.49	8.484	0.000
119.85	9.230	29.95	9.339	0.000
119.90	9.239	30.41	10.22	0.000
119.95	9.248	30.87	11.11	0.000
120.00	9.256	31.33	12.00	0.000
120.05	9.265	31.80	12.85	0.000
120.10	9.274	32.26	13.67	0.000
120.15	9.283	32.73	14.43	0.000
120.20	9.291	33.19	15.12	0.000
120.25	9.300	33.65	15.74	0.000
120.30	9.309	34.12	16.27	0.000
120.35	9.318	34.59	16.71	0.000
120.40	9.326	35.05	17.09	0.000
120.45	9.335	35.52	17.40	0.000
120.50	9.344	35.98	17.69	0.000
120.55	9.353	36.45	18.14	0.000
120.60	9.362	36.92	18.46	0.000
120.65	9.370	37.39	18.77	0.000
120.70	9.379	37.86	19.07	0.000
120.75	9.388	38.33	19.36	0.000
120.80	9.397	38.80	19.65	0.000
120.85	9.406	39.27	19.94	0.000
120.90	9.414	39.74	20.22	0.000
120.95	9.423	40.21	20.49	0.000
121.00	9.432	40.68	20.76	0.000
121.05	9.441	41.15	21.03	0.000

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:60.9
Total Impervious Area:0

Mitigated Landuse Totals for POC #1
Total Pervious Area:10.3
Total Impervious Area:50.6

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	2.046265
5 year	3.139034
10 year	3.981805
25 year	5.187577
50 year	6.191795
100 year	7.290043

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	1.112322
5 year	1.531684
10 year	1.861955
25 year	2.344401
50 year	2.754877
100 year	3.212512

Stream Protection Duration
Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	2.045	0.990
1950	2.090	1.085
1951	1.869	0.916
1952	1.474	0.877
1953	1.235	0.881
1954	6.684	1.030
1955	2.634	1.503
1956	2.325	1.670
1957	2.880	1.162
1958	2.082	0.989
1959	2.064	1.043
1960	1.923	1.091
1961	3.635	1.302
1962	1.794	0.916
1963	2.957	0.970
1964	2.127	0.814
1965	1.777	1.082
1966	1.040	0.916
1967	2.109	0.938
1968	2.565	1.110
1969	6.237	0.989
1970	1.471	0.967
1971	2.323	1.858
1972	1.714	1.011
1973	1.621	1.100
1974	3.508	1.067
1975	1.428	0.870
1976	1.469	1.029
1977	1.239	0.959
1978	1.471	0.886
1979	4.093	0.965
1980	1.918	0.872
1981	1.503	0.907
1982	1.950	1.258
1983	3.324	0.947
1984	2.007	1.993
1985	2.430	1.350
1986	5.715	3.194
1987	2.727	2.408
1988	1.412	1.302
1989	1.438	0.864
1990	1.908	1.162
1991	1.964	1.076
1992	1.497	1.116
1993	1.240	0.836

1994	1.363	1.104
1995	1.997	1.437
1996	3.409	1.229
1997	6.778	5.202
1998	1.248	0.930
1999	1.629	1.119
2000	1.224	1.573
2001	0.491	0.734
2002	1.857	1.152
2003	1.455	1.069
2004	2.448	1.436
2005	1.704	1.070
2006	4.537	1.208
2007	3.590	1.153
2008	5.038	3.171
2009	1.535	1.106

Stream Protection Duration
Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	6.7783	5.2019
2	6.6843	3.1937
3	6.2367	3.1711
4	5.7148	2.4083
5	5.0384	1.9930
6	4.5371	1.8580
7	4.0933	1.6699
8	3.6347	1.5734
9	3.5897	1.5028
10	3.5085	1.4369
11	3.4089	1.4356
12	3.3243	1.3499
13	2.9566	1.3023
14	2.8804	1.3019
15	2.7266	1.2585
16	2.6337	1.2291
17	2.5653	1.2085
18	2.4477	1.1622
19	2.4303	1.1616
20	2.3250	1.1525
21	2.3227	1.1523
22	2.1273	1.1186
23	2.1093	1.1164
24	2.0902	1.1102
25	2.0817	1.1062
26	2.0641	1.1041
27	2.0445	1.0996
28	2.0069	1.0911
29	1.9975	1.0853
30	1.9645	1.0819
31	1.9497	1.0762
32	1.9227	1.0703
33	1.9183	1.0695
34	1.9079	1.0669
35	1.8689	1.0425
36	1.8573	1.0296

37	1.7943	1.0290
38	1.7766	1.0112
39	1.7137	0.9905
40	1.7041	0.9886
41	1.6291	0.9885
42	1.6213	0.9698
43	1.5353	0.9674
44	1.5028	0.9652
45	1.4972	0.9589
46	1.4744	0.9470
47	1.4712	0.9378
48	1.4711	0.9300
49	1.4690	0.9163
50	1.4552	0.9161
51	1.4381	0.9159
52	1.4282	0.9066
53	1.4123	0.8862
54	1.3629	0.8807
55	1.2476	0.8770
56	1.2401	0.8720
57	1.2392	0.8695
58	1.2352	0.8636
59	1.2236	0.8359
60	1.0401	0.8143
61	0.4909	0.7342

Stream Protection Duration
POC #1
The Facility PASSED

The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
1.0231	19605	19070	97	Pass
1.0753	16998	11958	70	Pass
1.1275	14679	6774	46	Pass
1.1798	12746	4068	31	Pass
1.2320	10949	3118	28	Pass
1.2842	9437	2502	26	Pass
1.3364	8173	2138	26	Pass
1.3886	7082	1875	26	Pass
1.4408	6141	1607	26	Pass
1.4930	5311	1352	25	Pass
1.5452	4654	1235	26	Pass
1.5974	4068	1121	27	Pass
1.6496	3555	1038	29	Pass
1.7018	3140	962	30	Pass
1.7541	2757	900	32	Pass
1.8063	2447	844	34	Pass
1.8585	2145	782	36	Pass
1.9107	1894	740	39	Pass
1.9629	1657	697	42	Pass
2.0151	1508	650	43	Pass
2.0673	1370	623	45	Pass
2.1195	1251	599	47	Pass
2.1717	1154	574	49	Pass

2.2239	1071	553	51	Pass
2.2761	1009	528	52	Pass
2.3284	950	506	53	Pass
2.3806	888	474	53	Pass
2.4328	825	450	54	Pass
2.4850	777	434	55	Pass
2.5372	733	418	57	Pass
2.5894	686	408	59	Pass
2.6416	648	393	60	Pass
2.6938	622	380	61	Pass
2.7460	602	358	59	Pass
2.7982	583	339	58	Pass
2.8504	561	308	54	Pass
2.9026	538	289	53	Pass
2.9549	507	267	52	Pass
3.0071	487	255	52	Pass
3.0593	473	242	51	Pass
3.1115	457	223	48	Pass
3.1637	440	186	42	Pass
3.2159	424	169	39	Pass
3.2681	408	166	40	Pass
3.3203	394	163	41	Pass
3.3725	380	160	42	Pass
3.4247	368	156	42	Pass
3.4769	353	148	41	Pass
3.5292	341	139	40	Pass
3.5814	333	120	36	Pass
3.6336	322	111	34	Pass
3.6858	313	106	33	Pass
3.7380	303	99	32	Pass
3.7902	293	95	32	Pass
3.8424	284	92	32	Pass
3.8946	276	88	31	Pass
3.9468	266	86	32	Pass
3.9990	257	82	31	Pass
4.0512	241	79	32	Pass
4.1034	234	75	32	Pass
4.1557	226	71	31	Pass
4.2079	212	69	32	Pass
4.2601	205	66	32	Pass
4.3123	195	62	31	Pass
4.3645	187	60	32	Pass
4.4167	177	56	31	Pass
4.4689	166	54	32	Pass
4.5211	160	50	31	Pass
4.5733	150	47	31	Pass
4.6255	146	45	30	Pass
4.6777	135	43	31	Pass
4.7300	128	40	31	Pass
4.7822	120	38	31	Pass
4.8344	111	35	31	Pass
4.8866	99	26	26	Pass
4.9388	85	24	28	Pass
4.9910	75	21	28	Pass
5.0432	63	19	30	Pass
5.0954	59	16	27	Pass
5.1476	56	9	16	Pass

5.1998	50	2	4	Pass
5.2520	42	0	0	Pass
5.3042	39	0	0	Pass
5.3565	37	0	0	Pass
5.4087	36	0	0	Pass
5.4609	30	0	0	Pass
5.5131	28	0	0	Pass
5.5653	26	0	0	Pass
5.6175	20	0	0	Pass
5.6697	16	0	0	Pass
5.7219	13	0	0	Pass
5.7741	8	0	0	Pass
5.8263	6	0	0	Pass
5.8785	5	0	0	Pass
5.9308	4	0	0	Pass
5.9830	4	0	0	Pass
6.0352	3	0	0	Pass
6.0874	3	0	0	Pass
6.1396	3	0	0	Pass
6.1918	3	0	0	Pass

Water Quality BMP Flow and Volume for POC #1
On-line facility volume: 0 **acre-feet**
On-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**
Off-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**

LID Report

LID Technique	Used for Treatment?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft.)	Cumulative Volume Infiltration Credit	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00	0.00	0.00	0% No Treat. Credit

Compliance with LID Standard 8
Duration Analysis Result = Passed

Perlnd and Implnd Changes

No changes have been made.

WWHM2012
PROJECT REPORT

Project Name: Pond Network 2
Site Name:
Site Address:
City :
Report Date: 1/12/2021
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 1.20
Version Date: 2019/09/13
Version : 4.2.17

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 3N
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Forest, Flat	43.6
Pervious Total	43.6

Impervious Land Use	acre
Impervious Total	0
Basin Total	43.6

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 3N
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Pasture, Flat	9.8
Pervious Total	9.8

Impervious Land Use	acre
ROOF TOPS FLAT	10.9
PARKING FLAT	15.6
POND	7.3
Impervious Total	33.8
Basin Total	43.6

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Name : Trapezoidal Pond 1
Bottom Length: 501.00 ft.
Bottom Width: 500.00 ft.
Depth: 4.5 ft.
Volume at riser head: 17.8800 acre-feet.
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: 3 ft.
Riser Diameter: 24 in.
Notch Type: Rectangular
Notch Width: 0.500 ft.
Notch Height: 1.334 ft.
Orifice 1 Diameter: 4.75 in. **Elevation:** 0 ft.
Orifice 2 Diameter: 3.25 in. **Elevation:** 1.3 ft.

Element Flows To:

Outlet 1	Outlet 2

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
114.50	5.750	0.000	0.000	0.000
114.55	5.757	0.287	0.136	0.000
114.60	5.764	0.575	0.193	0.000
114.65	5.771	0.864	0.237	0.000
114.70	5.778	1.152	0.273	0.000
114.75	5.785	1.442	0.306	0.000
114.80	5.792	1.731	0.335	0.000

114.85	5.799	2.021	0.362	0.000
114.90	5.806	2.311	0.387	0.000
114.95	5.812	2.601	0.410	0.000
115.00	5.819	2.892	0.432	0.000
115.05	5.826	3.183	0.454	0.000
115.10	5.833	3.475	0.474	0.000
115.15	5.840	3.767	0.493	0.000
115.20	5.847	4.059	0.512	0.000
115.25	5.854	4.351	0.530	0.000
115.30	5.861	4.644	0.547	0.000
115.35	5.868	4.938	0.564	0.000
115.40	5.875	5.231	0.580	0.000
115.45	5.882	5.525	0.596	0.000
115.50	5.889	5.819	0.612	0.000
115.55	5.896	6.114	0.627	0.000
115.60	5.903	6.409	0.642	0.000
115.65	5.910	6.704	0.656	0.000
115.70	5.917	7.000	0.670	0.000
115.75	5.924	7.296	0.684	0.000
115.80	5.931	7.593	0.698	0.000
115.85	5.938	7.889	0.775	0.000
115.90	5.945	8.186	0.815	0.000
115.95	5.952	8.484	0.848	0.000
116.00	5.959	8.782	0.878	0.000
116.05	5.966	9.080	0.905	0.000
116.10	5.973	9.378	0.931	0.000
116.15	5.980	9.677	0.956	0.000
116.20	5.987	9.976	0.990	0.000
116.25	5.994	10.27	1.042	0.000
116.30	6.001	10.57	1.103	0.000
116.35	6.008	10.87	1.172	0.000
116.40	6.015	11.17	1.245	0.000
116.45	6.022	11.47	1.323	0.000
116.50	6.029	11.77	1.405	0.000
116.55	6.036	12.08	1.490	0.000
116.60	6.043	12.38	1.578	0.000
116.65	6.050	12.68	1.668	0.000
116.70	6.058	12.98	1.760	0.000
116.75	6.065	13.29	1.854	0.000
116.80	6.072	13.59	1.949	0.000
116.85	6.079	13.89	2.045	0.000
116.90	6.086	14.20	2.142	0.000
116.95	6.093	14.50	2.240	0.000
117.00	6.100	14.81	2.338	0.000
117.05	6.107	15.11	2.437	0.000
117.10	6.114	15.42	2.536	0.000
117.15	6.121	15.72	2.635	0.000
117.20	6.129	16.03	2.746	0.000
117.25	6.136	16.34	2.864	0.000
117.30	6.143	16.64	2.984	0.000
117.35	6.150	16.95	3.106	0.000
117.40	6.157	17.26	3.231	0.000
117.45	6.164	17.57	3.358	0.000
117.50	6.171	17.88	3.486	0.000
117.55	6.178	18.18	3.738	0.000
117.60	6.186	18.49	4.185	0.000
117.65	6.193	18.80	4.758	0.000

117.70	6.200	19.11	5.429	0.000
117.75	6.207	19.42	6.179	0.000
117.80	6.214	19.73	6.991	0.000
117.85	6.221	20.04	7.847	0.000
117.90	6.229	20.36	8.731	0.000
117.95	6.236	20.67	9.625	0.000
118.00	6.243	20.98	10.51	0.000
118.05	6.250	21.29	11.37	0.000
118.10	6.257	21.60	12.18	0.000
118.15	6.265	21.92	12.95	0.000
118.20	6.272	22.23	13.64	0.000
118.25	6.279	22.54	14.25	0.000
118.30	6.286	22.86	14.78	0.000
118.35	6.293	23.17	15.23	0.000
118.40	6.301	23.49	15.61	0.000
118.45	6.308	23.80	15.92	0.000
118.50	6.315	24.12	16.21	0.000
118.55	6.322	24.43	16.67	0.000
118.60	6.329	24.75	16.98	0.000
118.65	6.337	25.07	17.29	0.000
118.70	6.344	25.38	17.59	0.000
118.75	6.351	25.70	17.89	0.000
118.80	6.358	26.02	18.18	0.000
118.85	6.366	26.34	18.46	0.000
118.90	6.373	26.66	18.74	0.000
118.95	6.380	26.98	19.02	0.000
119.00	6.387	27.29	19.29	0.000
119.05	6.395	27.61	19.56	0.000

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:43.6
Total Impervious Area:0

Mitigated Landuse Totals for POC #1
Total Pervious Area:9.8
Total Impervious Area:33.8

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	1.464977
5 year	2.247321
10 year	2.850684
25 year	3.713929
50 year	4.432877
100 year	5.219142

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.840211
5 year	1.19353
10 year	1.473012
25 year	1.883
50 year	2.233153
100 year	2.624705

Stream Protection Duration
Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	1.464	0.680
1950	1.496	0.881
1951	1.338	0.637
1952	1.056	0.607
1953	0.884	0.606
1954	4.785	0.777
1955	1.886	1.136
1956	1.665	1.250
1957	2.062	0.961
1958	1.490	0.688
1959	1.478	0.805
1960	1.376	0.863
1961	2.602	1.073
1962	1.285	0.631
1963	2.117	0.671
1964	1.523	0.560
1965	1.272	0.857
1966	0.745	0.631
1967	1.510	0.648
1968	1.837	0.901
1969	4.465	0.686
1970	1.053	0.668
1971	1.663	1.453
1972	1.227	0.696
1973	1.161	0.896
1974	2.512	0.841
1975	1.023	0.596
1976	1.052	0.757
1977	0.887	0.653
1978	1.053	0.615
1979	2.931	0.663
1980	1.373	0.606
1981	1.076	0.623
1982	1.396	1.066
1983	2.380	0.657
1984	1.437	1.573
1985	1.740	1.088
1986	4.091	2.414
1987	1.952	1.905
1988	1.011	1.073
1989	1.030	0.592
1990	1.366	0.985
1991	1.406	0.858
1992	1.072	0.914

1993	0.888	0.572
1994	0.976	0.880
1995	1.430	1.201
1996	2.441	1.056
1997	4.853	3.813
1998	0.893	0.646
1999	1.166	0.915
2000	0.876	1.282
2001	0.351	0.504
2002	1.330	0.966
2003	1.042	0.836
2004	1.752	1.185
2005	1.220	0.847
2006	3.248	1.031
2007	2.570	0.939
2008	3.607	2.384
2009	1.099	0.890

Stream Protection Duration
Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	4.8528	3.8130
2	4.7855	2.4145
3	4.4651	2.3845
4	4.0914	1.9047
5	3.6071	1.5725
6	3.2482	1.4525
7	2.9305	1.2818
8	2.6022	1.2497
9	2.5700	1.2014
10	2.5118	1.1852
11	2.4405	1.1358
12	2.3799	1.0878
13	2.1167	1.0732
14	2.0622	1.0732
15	1.9520	1.0658
16	1.8855	1.0558
17	1.8365	1.0312
18	1.7524	0.9850
19	1.7399	0.9660
20	1.6645	0.9606
21	1.6629	0.9391
22	1.5230	0.9154
23	1.5101	0.9137
24	1.4964	0.9009
25	1.4903	0.8957
26	1.4777	0.8902
27	1.4638	0.8809
28	1.4368	0.8800
29	1.4300	0.8630
30	1.4064	0.8580
31	1.3958	0.8565
32	1.3765	0.8470
33	1.3733	0.8412
34	1.3659	0.8356
35	1.3380	0.8050

36	1.3297	0.7769
37	1.2846	0.7568
38	1.2719	0.6962
39	1.2269	0.6876
40	1.2200	0.6865
41	1.1663	0.6802
42	1.1607	0.6708
43	1.0992	0.6676
44	1.0759	0.6626
45	1.0719	0.6570
46	1.0556	0.6530
47	1.0533	0.6477
48	1.0532	0.6458
49	1.0517	0.6367
50	1.0418	0.6313
51	1.0296	0.6307
52	1.0225	0.6232
53	1.0111	0.6147
54	0.9757	0.6072
55	0.8932	0.6063
56	0.8878	0.6061
57	0.8871	0.5958
58	0.8843	0.5920
59	0.8760	0.5715
60	0.7446	0.5597
61	0.3514	0.5039

Stream Protection Duration
POC #1
The Facility PASSED

The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.7325	19637	16596	84	Pass
0.7699	17040	15152	88	Pass
0.8072	14675	12555	85	Pass
0.8446	12750	10012	78	Pass
0.8820	10962	7676	70	Pass
0.9194	9445	5632	59	Pass
0.9568	8188	4100	50	Pass
0.9941	7075	3178	44	Pass
1.0315	6139	2650	43	Pass
1.0689	5322	2169	40	Pass
1.1063	4656	1809	38	Pass
1.1436	4075	1547	37	Pass
1.1810	3548	1363	38	Pass
1.2184	3140	1217	38	Pass
1.2558	2763	1122	40	Pass
1.2932	2447	1048	42	Pass
1.3305	2150	989	46	Pass
1.3679	1896	934	49	Pass
1.4053	1657	878	52	Pass
1.4427	1509	825	54	Pass
1.4800	1370	777	56	Pass
1.5174	1252	743	59	Pass

1.5548	1155	696	60	Pass
1.5922	1069	654	61	Pass
1.6296	1009	631	62	Pass
1.6669	951	606	63	Pass
1.7043	888	584	65	Pass
1.7417	826	559	67	Pass
1.7791	777	536	68	Pass
1.8164	734	512	69	Pass
1.8538	687	492	71	Pass
1.8912	648	461	71	Pass
1.9286	622	436	70	Pass
1.9660	602	421	69	Pass
2.0033	583	407	69	Pass
2.0407	561	393	70	Pass
2.0781	538	373	69	Pass
2.1155	507	352	69	Pass
2.1528	488	322	65	Pass
2.1902	473	306	64	Pass
2.2276	457	280	61	Pass
2.2650	440	263	59	Pass
2.3024	424	250	58	Pass
2.3397	410	229	55	Pass
2.3771	394	192	48	Pass
2.4145	380	171	45	Pass
2.4519	368	165	44	Pass
2.4892	353	162	45	Pass
2.5266	341	158	46	Pass
2.5640	333	150	45	Pass
2.6014	322	141	43	Pass
2.6387	313	117	37	Pass
2.6761	302	109	36	Pass
2.7135	293	102	34	Pass
2.7509	284	97	34	Pass
2.7883	276	93	33	Pass
2.8256	266	90	33	Pass
2.8630	257	87	33	Pass
2.9004	241	83	34	Pass
2.9378	234	80	34	Pass
2.9751	225	75	33	Pass
3.0125	212	71	33	Pass
3.0499	205	67	32	Pass
3.0873	195	65	33	Pass
3.1247	187	61	32	Pass
3.1620	177	57	32	Pass
3.1994	166	53	31	Pass
3.2368	160	50	31	Pass
3.2742	150	47	31	Pass
3.3115	146	44	30	Pass
3.3489	135	41	30	Pass
3.3863	128	39	30	Pass
3.4237	120	36	30	Pass
3.4611	111	26	23	Pass
3.4984	99	24	24	Pass
3.5358	85	22	25	Pass
3.5732	75	21	28	Pass
3.6106	63	19	30	Pass
3.6479	59	18	30	Pass

3.6853	56	15	26	Pass
3.7227	50	9	18	Pass
3.7601	42	4	9	Pass
3.7975	39	2	5	Pass
3.8348	37	0	0	Pass
3.8722	36	0	0	Pass
3.9096	30	0	0	Pass
3.9470	28	0	0	Pass
3.9843	26	0	0	Pass
4.0217	20	0	0	Pass
4.0591	16	0	0	Pass
4.0965	13	0	0	Pass
4.1339	8	0	0	Pass
4.1712	6	0	0	Pass
4.2086	5	0	0	Pass
4.2460	4	0	0	Pass
4.2834	4	0	0	Pass
4.3207	3	0	0	Pass
4.3581	3	0	0	Pass
4.3955	3	0	0	Pass
4.4329	3	0	0	Pass

Water Quality BMP Flow and Volume for POC #1
On-line facility volume: 0 **acre-feet**
On-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**
Off-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**

LID Report

LID Technique	Used for Water Quality Treatment?	Total Volume Percent Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft.)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Comment Water Quality Treated
Trapezoidal Pond 1 POC	N	6632.38			N	0.00	
Total Volume Infiltrated		6632.38	0.00	0.00		0.00	
0.00	0%	No Treat. Credit					

Compliance with LID Standard 8
Duration Analysis Result = Failed

Perlnd and Implnd Changes

No changes have been made.

WWHM2012
PROJECT REPORT

Project Name: Pond Network 3
Site Name:
Site Address:
City :
Report Date: 1/11/2021
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 1.20
Version Date: 2019/09/13
Version : 4.2.17

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 3S 8N
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Forest, Flat	52.2
Pervious Total	52.2

Impervious Land Use	acre
Impervious Total	0
Basin Total	52.2

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 3S 8N
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Pasture, Flat	6.8
Pervious Total	6.8

Impervious Land Use	acre
ROOF TOPS FLAT	18.1
PARKING FLAT	16.2
POND	11.1
Impervious Total	45.4
Basin Total	52.2

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Name : Trapezoidal Pond 1
Bottom Length: 630.00 ft.
Bottom Width: 630.00 ft.
Depth: 4.5 ft.
Volume at riser head: 28.1231 acre-feet.
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: 3 ft.
Riser Diameter: 54 in.
Notch Type: Rectangular
Notch Width: 0.470 ft.
Notch Height: 1.334 ft.
Orifice 1 Diameter: 4.809 in. **Elevation:** 0 ft.

Element Flows To:

Outlet 1	Outlet 2

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
112.00	9.111	0.000	0.000	0.000
112.05	9.120	0.455	0.140	0.000
112.10	9.128	0.912	0.198	0.000
112.15	9.137	1.368	0.243	0.000
112.20	9.146	1.825	0.280	0.000
112.25	9.155	2.283	0.313	0.000
112.30	9.163	2.741	0.343	0.000
112.35	9.172	3.199	0.371	0.000

112.40	9.181	3.658	0.396	0.000
112.45	9.189	4.117	0.421	0.000
112.50	9.198	4.577	0.443	0.000
112.55	9.207	5.037	0.465	0.000
112.60	9.216	5.498	0.486	0.000
112.65	9.224	5.959	0.506	0.000
112.70	9.233	6.420	0.525	0.000
112.75	9.242	6.882	0.543	0.000
112.80	9.250	7.344	0.561	0.000
112.85	9.259	7.807	0.578	0.000
112.90	9.268	8.270	0.595	0.000
112.95	9.277	8.734	0.611	0.000
113.00	9.286	9.198	0.627	0.000
113.05	9.294	9.663	0.643	0.000
113.10	9.303	10.12	0.658	0.000
113.15	9.312	10.59	0.673	0.000
113.20	9.321	11.05	0.687	0.000
113.25	9.329	11.52	0.701	0.000
113.30	9.338	11.99	0.715	0.000
113.35	9.347	12.45	0.729	0.000
113.40	9.356	12.92	0.742	0.000
113.45	9.365	13.39	0.755	0.000
113.50	9.373	13.86	0.768	0.000
113.55	9.382	14.33	0.781	0.000
113.60	9.391	14.80	0.793	0.000
113.65	9.400	15.27	0.806	0.000
113.70	9.409	15.74	0.828	0.000
113.75	9.417	16.21	0.867	0.000
113.80	9.426	16.68	0.916	0.000
113.85	9.435	17.15	0.972	0.000
113.90	9.444	17.62	1.034	0.000
113.95	9.453	18.10	1.099	0.000
114.00	9.462	18.57	1.169	0.000
114.05	9.470	19.04	1.242	0.000
114.10	9.479	19.52	1.318	0.000
114.15	9.488	19.99	1.396	0.000
114.20	9.497	20.46	1.476	0.000
114.25	9.506	20.94	1.558	0.000
114.30	9.515	21.41	1.641	0.000
114.35	9.524	21.89	1.726	0.000
114.40	9.532	22.37	1.812	0.000
114.45	9.541	22.84	1.898	0.000
114.50	9.550	23.32	1.985	0.000
114.55	9.559	23.80	2.073	0.000
114.60	9.568	24.28	2.160	0.000
114.65	9.577	24.76	2.248	0.000
114.70	9.586	25.23	2.347	0.000
114.75	9.595	25.71	2.454	0.000
114.80	9.604	26.19	2.562	0.000
114.85	9.612	26.67	2.672	0.000
114.90	9.621	27.16	2.785	0.000
114.95	9.630	27.64	2.899	0.000
115.00	9.639	28.12	3.016	0.000
115.05	9.648	28.60	3.559	0.000
115.10	9.657	29.08	4.544	0.000
115.15	9.666	29.57	5.815	0.000
115.20	9.675	30.05	7.318	0.000

115.25	9.684	30.53	9.020	0.000
115.30	9.693	31.02	10.89	0.000
115.35	9.702	31.50	12.93	0.000
115.40	9.711	31.99	15.11	0.000
115.45	9.720	32.47	17.42	0.000
115.50	9.729	32.96	19.85	0.000
115.55	9.738	33.45	22.38	0.000
115.60	9.747	33.93	25.01	0.000
115.65	9.756	34.42	27.72	0.000
115.70	9.765	34.91	30.51	0.000
115.75	9.774	35.40	33.36	0.000
115.80	9.783	35.89	36.26	0.000
115.85	9.792	36.38	39.19	0.000
115.90	9.801	36.87	42.16	0.000
115.95	9.810	37.36	45.13	0.000
116.00	9.819	37.85	48.11	0.000
116.05	9.828	38.34	51.09	0.000
116.10	9.837	38.83	54.04	0.000
116.15	9.846	39.32	56.96	0.000
116.20	9.855	39.82	59.83	0.000
116.25	9.864	40.31	62.65	0.000
116.30	9.873	40.80	65.41	0.000
116.35	9.882	41.30	68.08	0.000
116.40	9.891	41.79	70.68	0.000
116.45	9.900	42.28	73.18	0.000
116.50	9.909	42.78	75.57	0.000
116.55	9.918	43.28	77.86	0.000

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:52.2
Total Impervious Area:0

Mitigated Landuse Totals for POC #1
Total Pervious Area:6.8
Total Impervious Area:45.4

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	1.753941
5 year	2.690601
10 year	3.412976
25 year	4.446495
50 year	5.307254
100 year	6.24861

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.78925
5 year	1.059752
10 year	1.268591
25 year	1.568554
50 year	1.819902
100 year	2.096676

Stream Protection Duration
Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	1.752	0.693
1950	1.792	0.777
1951	1.602	0.654
1952	1.264	0.631
1953	1.059	0.638
1954	5.729	0.711
1955	2.257	1.314
1956	1.993	1.484
1957	2.469	0.781
1958	1.784	0.722
1959	1.769	0.724
1960	1.648	0.746
1961	3.115	1.017
1962	1.538	0.617
1963	2.534	0.707
1964	1.823	0.568
1965	1.523	0.749
1966	0.891	0.670
1967	1.808	0.699
1968	2.199	0.761
1969	5.346	0.708
1970	1.261	0.700
1971	1.991	1.483
1972	1.469	0.687
1973	1.390	0.803
1974	3.007	0.784
1975	1.224	0.617
1976	1.259	0.743
1977	1.062	0.654
1978	1.261	0.635
1979	3.509	0.631
1980	1.644	0.642
1981	1.288	0.621
1982	1.671	0.820
1983	2.849	0.706
1984	1.720	1.442
1985	2.083	1.140
1986	4.898	1.758
1987	2.337	1.486
1988	1.211	0.864
1989	1.233	0.627
1990	1.635	0.793
1991	1.684	0.783
1992	1.283	0.772
1993	1.063	0.573

1994	1.168	0.797
1995	1.712	0.880
1996	2.922	0.814
1997	5.810	2.840
1998	1.069	0.691
1999	1.396	0.792
2000	1.049	0.984
2001	0.421	0.492
2002	1.592	1.050
2003	1.247	0.733
2004	2.098	0.887
2005	1.461	0.735
2006	3.889	1.100
2007	3.077	1.012
2008	4.319	1.681
2009	1.316	0.793

Stream Protection Duration
Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	5.8100	2.8398
2	5.7294	1.7581
3	5.3458	1.6814
4	4.8984	1.4857
5	4.3186	1.4837
6	3.8889	1.4832
7	3.5085	1.4422
8	3.1155	1.3143
9	3.0769	1.1404
10	3.0073	1.1000
11	2.9219	1.0503
12	2.8494	1.0174
13	2.5342	1.0123
14	2.4689	0.9835
15	2.3371	0.8874
16	2.2574	0.8805
17	2.1988	0.8637
18	2.0980	0.8200
19	2.0831	0.8143
20	1.9929	0.8027
21	1.9909	0.7974
22	1.8234	0.7930
23	1.8080	0.7928
24	1.7916	0.7920
25	1.7843	0.7845
26	1.7692	0.7831
27	1.7525	0.7813
28	1.7202	0.7766
29	1.7121	0.7725
30	1.6839	0.7605
31	1.6712	0.7487
32	1.6480	0.7461
33	1.6442	0.7427
34	1.6353	0.7346
35	1.6019	0.7327
36	1.5920	0.7240

37	1.5379	0.7219
38	1.5228	0.7112
39	1.4689	0.7081
40	1.4607	0.7071
41	1.3963	0.7063
42	1.3897	0.6996
43	1.3160	0.6985
44	1.2881	0.6927
45	1.2833	0.6908
46	1.2638	0.6869
47	1.2610	0.6699
48	1.2610	0.6541
49	1.2591	0.6540
50	1.2473	0.6415
51	1.2326	0.6375
52	1.2242	0.6346
53	1.2106	0.6314
54	1.1682	0.6308
55	1.0694	0.6266
56	1.0629	0.6213
57	1.0621	0.6172
58	1.0587	0.6168
59	1.0488	0.5733
60	0.8915	0.5683
61	0.4207	0.4924

Stream Protection Duration
POC #1
The Facility PASSED

The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.8770	19654	5587	28	Pass
0.9217	17023	4419	25	Pass
0.9665	14679	3503	23	Pass
1.0112	12733	2911	22	Pass
1.0560	10953	2443	22	Pass
1.1007	9454	2043	21	Pass
1.1455	8175	1825	22	Pass
1.1902	7078	1600	22	Pass
1.2350	6145	1406	22	Pass
1.2797	5319	1155	21	Pass
1.3245	4656	1011	21	Pass
1.3692	4066	896	22	Pass
1.4140	3561	787	22	Pass
1.4587	3140	638	20	Pass
1.5035	2761	549	19	Pass
1.5482	2447	511	20	Pass
1.5930	2156	466	21	Pass
1.6377	1894	417	22	Pass
1.6825	1657	349	21	Pass
1.7272	1508	327	21	Pass
1.7720	1372	301	21	Pass
1.8167	1253	292	23	Pass
1.8615	1154	282	24	Pass

1.9062	1069	265	24	Pass
1.9510	1009	256	25	Pass
1.9957	950	244	25	Pass
2.0405	888	234	26	Pass
2.0852	825	225	27	Pass
2.1300	777	217	27	Pass
2.1747	734	199	27	Pass
2.2195	687	177	25	Pass
2.2642	648	150	23	Pass
2.3090	622	143	22	Pass
2.3537	602	137	22	Pass
2.3985	583	126	21	Pass
2.4432	561	113	20	Pass
2.4880	538	96	17	Pass
2.5327	507	81	15	Pass
2.5775	487	74	15	Pass
2.6222	473	64	13	Pass
2.6670	457	54	11	Pass
2.7117	440	45	10	Pass
2.7565	424	38	8	Pass
2.8012	409	18	4	Pass
2.8460	394	0	0	Pass
2.8907	380	0	0	Pass
2.9355	368	0	0	Pass
2.9802	353	0	0	Pass
3.0250	341	0	0	Pass
3.0697	333	0	0	Pass
3.1145	322	0	0	Pass
3.1592	313	0	0	Pass
3.2040	304	0	0	Pass
3.2487	293	0	0	Pass
3.2935	284	0	0	Pass
3.3382	276	0	0	Pass
3.3830	266	0	0	Pass
3.4277	257	0	0	Pass
3.4725	241	0	0	Pass
3.5172	234	0	0	Pass
3.5620	226	0	0	Pass
3.6067	212	0	0	Pass
3.6515	205	0	0	Pass
3.6962	195	0	0	Pass
3.7410	187	0	0	Pass
3.7857	177	0	0	Pass
3.8305	166	0	0	Pass
3.8752	160	0	0	Pass
3.9200	150	0	0	Pass
3.9647	146	0	0	Pass
4.0095	135	0	0	Pass
4.0542	128	0	0	Pass
4.0990	120	0	0	Pass
4.1437	111	0	0	Pass
4.1885	99	0	0	Pass
4.2332	85	0	0	Pass
4.2780	75	0	0	Pass
4.3227	63	0	0	Pass
4.3675	59	0	0	Pass
4.4122	56	0	0	Pass

4.4570	50	0	0	Pass
4.5017	42	0	0	Pass
4.5465	39	0	0	Pass
4.5912	37	0	0	Pass
4.6360	36	0	0	Pass
4.6807	30	0	0	Pass
4.7255	28	0	0	Pass
4.7702	26	0	0	Pass
4.8150	19	0	0	Pass
4.8598	16	0	0	Pass
4.9045	13	0	0	Pass
4.9493	8	0	0	Pass
4.9940	6	0	0	Pass
5.0388	5	0	0	Pass
5.0835	4	0	0	Pass
5.1283	4	0	0	Pass
5.1730	3	0	0	Pass
5.2178	3	0	0	Pass
5.2625	3	0	0	Pass
5.3073	3	0	0	Pass

Water Quality BMP Flow and Volume for POC #1
On-line facility volume: 0 **acre-feet**
On-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**
Off-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**

LID Report

LID Technique	Used for Treatment?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft.)	Cumulative Volume Infiltration Credit	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	N	8472.01			N	0.00	
Total Volume Infiltrated		8472.01	0.00	0.00		0.00	
0.00	0%	No Treat. Credit					

Compliance with LID Standard 8
Duration Analysis Result = Failed

Perlnd and Implnd Changes

No changes have been made.

WWHM2012
PROJECT REPORT

Project Name: Pond Network 4
Site Name:
Site Address:
City :
Report Date: 1/12/2021
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 1.20
Version Date: 2019/09/13
Version : 4.2.17

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 6S
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Forest, Flat	22.2
Pervious Total	22.2

Impervious Land Use	acre
Impervious Total	0
Basin Total	22.2

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 6S
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Pasture, Flat	3.1
Pervious Total	3.1

Impervious Land Use	acre
ROOF TOPS FLAT	7.8
PARKING FLAT	7.8
POND	3.5
Impervious Total	19.1
Basin Total	22.2

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Name : Trapezoidal Pond 1
Bottom Length: 365.00 ft.
Bottom Width: 365.00 ft.
Depth: 4.5 ft.
Volume at riser head: 9.6352 acre-feet.
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: 3 ft.
Riser Diameter: 24 in.
Notch Type: Rectangular
Notch Width: 0.210 ft.
Notch Height: 1.300 ft.
Orifice 1 Diameter: 3.25 in. **Elevation:** 0 ft.
Orifice 2 Diameter: 3.25 in. **Elevation:** 1.42 ft.
Orifice 3 Diameter: 2.6875 in. **Elevation:** 1.62 ft.

Element Flows To:

Outlet 1	Outlet 2

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	3.058	0.000	0.000	0.000
0.0500	3.063	0.153	0.064	0.000
0.1000	3.068	0.306	0.090	0.000
0.1500	3.073	0.459	0.111	0.000
0.2000	3.078	0.613	0.128	0.000
0.2500	3.083	0.767	0.143	0.000

0.3000	3.088	0.922	0.157	0.000
0.3500	3.093	1.076	0.169	0.000
0.4000	3.098	1.231	0.181	0.000
0.4500	3.103	1.386	0.192	0.000
0.5000	3.108	1.541	0.202	0.000
0.5500	3.114	1.697	0.212	0.000
0.6000	3.119	1.853	0.222	0.000
0.6500	3.124	2.009	0.231	0.000
0.7000	3.129	2.165	0.239	0.000
0.7500	3.134	2.322	0.248	0.000
0.8000	3.139	2.479	0.256	0.000
0.8500	3.144	2.636	0.264	0.000
0.9000	3.149	2.793	0.271	0.000
0.9500	3.154	2.951	0.279	0.000
1.0000	3.159	3.109	0.286	0.000
1.0500	3.164	3.267	0.293	0.000
1.1000	3.170	3.425	0.300	0.000
1.1500	3.175	3.584	0.307	0.000
1.2000	3.180	3.743	0.314	0.000
1.2500	3.185	3.902	0.320	0.000
1.3000	3.190	4.061	0.326	0.000
1.3500	3.195	4.221	0.333	0.000
1.4000	3.200	4.381	0.339	0.000
1.4500	3.206	4.541	0.394	0.000
1.5000	3.211	4.701	0.432	0.000
1.5500	3.216	4.862	0.460	0.000
1.6000	3.221	5.023	0.484	0.000
1.6500	3.226	5.184	0.539	0.000
1.7000	3.231	5.346	0.580	0.000
1.7500	3.236	5.507	0.622	0.000
1.8000	3.242	5.669	0.666	0.000
1.8500	3.247	5.831	0.711	0.000
1.9000	3.252	5.994	0.757	0.000
1.9500	3.257	6.157	0.804	0.000
2.0000	3.262	6.320	0.852	0.000
2.0500	3.268	6.483	0.901	0.000
2.1000	3.273	6.647	0.950	0.000
2.1500	3.278	6.810	1.000	0.000
2.2000	3.283	6.974	1.050	0.000
2.2500	3.288	7.139	1.100	0.000
2.3000	3.294	7.303	1.151	0.000
2.3500	3.299	7.468	1.202	0.000
2.4000	3.304	7.633	1.253	0.000
2.4500	3.309	7.799	1.304	0.000
2.5000	3.315	7.964	1.355	0.000
2.5500	3.320	8.130	1.406	0.000
2.6000	3.325	8.296	1.457	0.000
2.6500	3.330	8.463	1.507	0.000
2.7000	3.335	8.629	1.558	0.000
2.7500	3.341	8.796	1.616	0.000
2.8000	3.346	8.963	1.674	0.000
2.8500	3.351	9.131	1.734	0.000
2.9000	3.357	9.299	1.794	0.000
2.9500	3.362	9.466	1.854	0.000
3.0000	3.367	9.635	1.916	0.000
3.0500	3.372	9.803	2.167	0.000
3.1000	3.378	9.972	2.614	0.000

3.1500	3.383	10.14	3.186	0.000
3.2000	3.388	10.31	3.857	0.000
3.2500	3.393	10.48	4.607	0.000
3.3000	3.399	10.65	5.418	0.000
3.3500	3.404	10.82	6.273	0.000
3.4000	3.409	10.99	7.157	0.000
3.4500	3.415	11.16	8.050	0.000
3.5000	3.420	11.33	8.935	0.000
3.5500	3.425	11.50	9.794	0.000
3.6000	3.431	11.67	10.61	0.000
3.6500	3.436	11.84	11.37	0.000
3.7000	3.441	12.01	12.06	0.000
3.7500	3.447	12.19	12.67	0.000
3.8000	3.452	12.36	13.20	0.000
3.8500	3.457	12.53	13.65	0.000
3.9000	3.463	12.70	14.03	0.000
3.9500	3.468	12.88	14.34	0.000
4.0000	3.473	13.05	14.62	0.000
4.0500	3.479	13.23	15.08	0.000
4.1000	3.484	13.40	15.40	0.000
4.1500	3.489	13.57	15.70	0.000
4.2000	3.495	13.75	16.01	0.000
4.2500	3.500	13.92	16.30	0.000
4.3000	3.506	14.10	16.59	0.000
4.3500	3.511	14.27	16.88	0.000
4.4000	3.516	14.45	17.15	0.000
4.4500	3.522	14.63	17.43	0.000
4.5000	3.527	14.80	17.70	0.000
4.5500	3.533	14.98	17.96	0.000

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:22.2
Total Impervious Area:0

Mitigated Landuse Totals for POC #1
Total Pervious Area:3.1
Total Impervious Area:19.1

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.745929
5 year	1.144278
10 year	1.451495
25 year	1.891038
50 year	2.257108
100 year	2.657455

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.476151
5 year	0.733262
10 year	0.940943
25 year	1.250501
50 year	1.518332
100 year	1.820683

Stream Protection Duration
Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	0.745	0.335
1950	0.762	0.528
1951	0.681	0.310
1952	0.537	0.298
1953	0.450	0.303
1954	2.437	0.385
1955	0.960	0.772
1956	0.848	0.820
1957	1.050	0.566
1958	0.759	0.343
1959	0.752	0.407
1960	0.701	0.470
1961	1.325	0.720
1962	0.654	0.304
1963	1.078	0.334
1964	0.775	0.272
1965	0.648	0.458
1966	0.379	0.317
1967	0.769	0.323
1968	0.935	0.480
1969	2.273	0.337
1970	0.536	0.332
1971	0.847	0.913
1972	0.625	0.338
1973	0.591	0.563
1974	1.279	0.525
1975	0.521	0.293
1976	0.535	0.419
1977	0.452	0.323
1978	0.536	0.302
1979	1.492	0.318
1980	0.699	0.301
1981	0.548	0.304
1982	0.711	0.750
1983	1.212	0.328
1984	0.732	1.017
1985	0.886	0.733
1986	2.083	1.450
1987	0.994	1.181
1988	0.515	0.748
1989	0.524	0.298
1990	0.695	0.648
1991	0.716	0.486

1992	0.546	0.545
1993	0.452	0.280
1994	0.497	0.527
1995	0.728	0.758
1996	1.243	0.675
1997	2.471	2.204
1998	0.455	0.322
1999	0.594	0.574
2000	0.446	0.840
2001	0.179	0.245
2002	0.677	0.695
2003	0.530	0.467
2004	0.892	0.818
2005	0.621	0.466
2006	1.654	0.743
2007	1.309	0.634
2008	1.837	1.410
2009	0.560	0.566

Stream Protection Duration
Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	2.4709	2.2044
2	2.4366	1.4504
3	2.2735	1.4105
4	2.0832	1.1810
5	1.8367	1.0167
6	1.6539	0.9132
7	1.4921	0.8400
8	1.3250	0.8195
9	1.3086	0.8178
10	1.2790	0.7724
11	1.2427	0.7578
12	1.2118	0.7504
13	1.0778	0.7480
14	1.0500	0.7430
15	0.9939	0.7332
16	0.9601	0.7204
17	0.9351	0.6953
18	0.8923	0.6753
19	0.8859	0.6482
20	0.8475	0.6337
21	0.8467	0.5740
22	0.7755	0.5661
23	0.7689	0.5658
24	0.7619	0.5633
25	0.7588	0.5448
26	0.7524	0.5280
27	0.7453	0.5268
28	0.7316	0.5245
29	0.7281	0.4860
30	0.7161	0.4800
31	0.7107	0.4702
32	0.7009	0.4667
33	0.6993	0.4658
34	0.6955	0.4580

35	0.6813	0.4193
36	0.6771	0.4074
37	0.6541	0.3854
38	0.6476	0.3425
39	0.6247	0.3382
40	0.6212	0.3375
41	0.5938	0.3354
42	0.5910	0.3341
43	0.5597	0.3322
44	0.5478	0.3276
45	0.5458	0.3233
46	0.5375	0.3230
47	0.5363	0.3221
48	0.5363	0.3184
49	0.5355	0.3166
50	0.5305	0.3102
51	0.5242	0.3044
52	0.5206	0.3043
53	0.5148	0.3033
54	0.4968	0.3025
55	0.4548	0.3010
56	0.4521	0.2982
57	0.4517	0.2982
58	0.4503	0.2930
59	0.4460	0.2797
60	0.3791	0.2721
61	0.1789	0.2453

Stream Protection Duration
POC #1
The Facility PASSED

The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.3730	19740	15779	79	Pass
0.3920	17124	14561	85	Pass
0.4110	14664	12895	87	Pass
0.4301	12728	11347	89	Pass
0.4491	10930	9456	86	Pass
0.4681	9441	7732	81	Pass
0.4872	8173	6496	79	Pass
0.5062	7082	5940	83	Pass
0.5252	6139	5366	87	Pass
0.5443	5317	4851	91	Pass
0.5633	4658	4308	92	Pass
0.5823	4075	3923	96	Pass
0.6013	3559	3540	99	Pass
0.6204	3140	3086	98	Pass
0.6394	2766	2693	97	Pass
0.6584	2453	2334	95	Pass
0.6775	2156	2029	94	Pass
0.6965	1896	1805	95	Pass
0.7155	1658	1602	96	Pass
0.7346	1511	1405	92	Pass
0.7536	1374	1222	88	Pass

0.7726	1253	1123	89	Pass
0.7917	1155	1048	90	Pass
0.8107	1072	978	91	Pass
0.8297	1010	915	90	Pass
0.8488	951	857	90	Pass
0.8678	891	815	91	Pass
0.8868	826	779	94	Pass
0.9059	779	740	94	Pass
0.9249	736	699	94	Pass
0.9439	688	670	97	Pass
0.9629	651	642	98	Pass
0.9820	622	612	98	Pass
1.0010	602	573	95	Pass
1.0200	583	545	93	Pass
1.0391	561	524	93	Pass
1.0581	538	506	94	Pass
1.0771	507	487	96	Pass
1.0962	487	462	94	Pass
1.1152	473	438	92	Pass
1.1342	457	406	88	Pass
1.1533	440	387	87	Pass
1.1723	424	357	84	Pass
1.1913	410	333	81	Pass
1.2104	394	321	81	Pass
1.2294	380	309	81	Pass
1.2484	368	294	79	Pass
1.2675	353	281	79	Pass
1.2865	341	271	79	Pass
1.3055	333	259	77	Pass
1.3246	322	245	76	Pass
1.3436	313	233	74	Pass
1.3626	304	216	71	Pass
1.3816	293	194	66	Pass
1.4007	284	169	59	Pass
1.4197	276	143	51	Pass
1.4387	266	134	50	Pass
1.4578	257	125	48	Pass
1.4768	242	122	50	Pass
1.4958	234	118	50	Pass
1.5149	226	114	50	Pass
1.5339	212	103	48	Pass
1.5529	205	94	45	Pass
1.5720	195	83	42	Pass
1.5910	187	79	42	Pass
1.6100	177	75	42	Pass
1.6291	166	73	43	Pass
1.6481	160	69	43	Pass
1.6671	150	66	44	Pass
1.6862	146	62	42	Pass
1.7052	135	59	43	Pass
1.7242	128	56	43	Pass
1.7433	120	53	44	Pass
1.7623	111	51	45	Pass
1.7813	99	48	48	Pass
1.8003	85	44	51	Pass
1.8194	75	41	54	Pass
1.8384	63	38	60	Pass

1.8574	59	32	54	Pass
1.8765	56	27	48	Pass
1.8955	50	24	48	Pass
1.9145	42	22	52	Pass
1.9336	40	21	52	Pass
1.9526	37	19	51	Pass
1.9716	36	19	52	Pass
1.9907	30	18	60	Pass
2.0097	28	18	64	Pass
2.0287	26	16	61	Pass
2.0478	20	13	65	Pass
2.0668	16	11	68	Pass
2.0858	13	8	61	Pass
2.1049	8	6	75	Pass
2.1239	6	6	100	Pass
2.1429	5	5	100	Pass
2.1619	4	3	75	Pass
2.1810	4	3	75	Pass
2.2000	3	1	33	Pass
2.2190	3	0	0	Pass
2.2381	3	0	0	Pass
2.2571	3	0	0	Pass

Water Quality BMP Flow and Volume for POC #1
On-line facility volume: 0 **acre-feet**
On-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**
Off-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**

LID Report

LID Technique	Used for Water Quality 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 Treated	Comment
Trapezoidal Pond 1 POC	N	3580.49			N	0.00	0.00	
Total Volume Infiltrated		3580.49	0.00	0.00		0.00	0.00	

No Treat. Credit
Compliance with LID Standard 8
Duration Analysis Result = Failed

Perlnd and Implnd Changes

No changes have been made.

WWHM2012
PROJECT REPORT

Project Name: Pond Network 5
Site Name:
Site Address:
City :
Report Date: 1/12/2021
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 1.20
Version Date: 2019/09/13
Version : 4.2.17

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 6N 7S
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Forest, Flat	45
Pervious Total	45

Impervious Land Use	acre
Impervious Total	0
Basin Total	45

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 6N 7S
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Pasture, Flat	8.5
Pervious Total	8.5

Impervious Land Use	acre
ROOF TOPS FLAT	14.4
PARKING FLAT	14.7
POND	7.4
Impervious Total	36.5
Basin Total	45

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Name : Trapezoidal Pond 1
Bottom Length: 511.00 ft.
Bottom Width: 511.00 ft.
Depth: 4.5 ft.
Volume at riser head: 18.6245 acre-feet.
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: 3 ft.
Riser Diameter: 24 in.
Notch Type: Rectangular
Notch Width: 0.470 ft.
Notch Height: 1.334 ft.
Orifice 1 Diameter: 4.75 in. **Elevation:** 0 ft.
Orifice 2 Diameter: 3.25 in. **Elevation:** 1.31 ft.

Element Flows To:

Outlet 1	Outlet 2

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
124.00	5.994	0.000	0.000	0.000
124.05	6.001	0.299	0.136	0.000
124.10	6.008	0.600	0.193	0.000
124.15	6.015	0.900	0.237	0.000
124.20	6.022	1.201	0.273	0.000
124.25	6.029	1.503	0.306	0.000
124.30	6.036	1.804	0.335	0.000

124.35	6.043	2.106	0.362	0.000
124.40	6.051	2.409	0.387	0.000
124.45	6.058	2.711	0.410	0.000
124.50	6.065	3.014	0.432	0.000
124.55	6.072	3.318	0.454	0.000
124.60	6.079	3.622	0.474	0.000
124.65	6.086	3.926	0.493	0.000
124.70	6.093	4.230	0.512	0.000
124.75	6.100	4.535	0.530	0.000
124.80	6.107	4.840	0.547	0.000
124.85	6.114	5.146	0.564	0.000
124.90	6.121	5.452	0.580	0.000
124.95	6.129	5.758	0.596	0.000
125.00	6.136	6.065	0.612	0.000
125.05	6.143	6.372	0.627	0.000
125.10	6.150	6.679	0.642	0.000
125.15	6.157	6.987	0.656	0.000
125.20	6.164	7.295	0.670	0.000
125.25	6.171	7.603	0.684	0.000
125.30	6.178	7.912	0.698	0.000
125.35	6.186	8.221	0.768	0.000
125.40	6.193	8.531	0.810	0.000
125.45	6.200	8.840	0.844	0.000
125.50	6.207	9.151	0.874	0.000
125.55	6.214	9.461	0.902	0.000
125.60	6.221	9.772	0.928	0.000
125.65	6.229	10.08	0.953	0.000
125.70	6.236	10.39	0.986	0.000
125.75	6.243	10.70	1.037	0.000
125.80	6.250	11.02	1.096	0.000
125.85	6.257	11.33	1.161	0.000
125.90	6.265	11.64	1.232	0.000
125.95	6.272	11.95	1.307	0.000
126.00	6.279	12.27	1.385	0.000
126.05	6.286	12.58	1.466	0.000
126.10	6.293	12.90	1.550	0.000
126.15	6.301	13.21	1.635	0.000
126.20	6.308	13.53	1.723	0.000
126.25	6.315	13.84	1.812	0.000
126.30	6.322	14.16	1.902	0.000
126.35	6.329	14.47	1.994	0.000
126.40	6.337	14.79	2.086	0.000
126.45	6.344	15.11	2.179	0.000
126.50	6.351	15.43	2.273	0.000
126.55	6.358	15.74	2.367	0.000
126.60	6.366	16.06	2.460	0.000
126.65	6.373	16.38	2.554	0.000
126.70	6.380	16.70	2.659	0.000
126.75	6.387	17.02	2.771	0.000
126.80	6.395	17.34	2.885	0.000
126.85	6.402	17.66	3.001	0.000
126.90	6.409	17.98	3.119	0.000
126.95	6.417	18.30	3.239	0.000
127.00	6.424	18.62	3.361	0.000
127.05	6.431	18.94	3.612	0.000
127.10	6.438	19.26	4.059	0.000
127.15	6.446	19.59	4.632	0.000

127.20	6.453	19.91	5.304	0.000
127.25	6.460	20.23	6.054	0.000
127.30	6.468	20.55	6.865	0.000
127.35	6.475	20.88	7.722	0.000
127.40	6.482	21.20	8.606	0.000
127.45	6.490	21.53	9.499	0.000
127.50	6.497	21.85	10.38	0.000
127.55	6.504	22.18	11.24	0.000
127.60	6.512	22.50	12.06	0.000
127.65	6.519	22.83	12.82	0.000
127.70	6.526	23.15	13.51	0.000
127.75	6.534	23.48	14.13	0.000
127.80	6.541	23.81	14.66	0.000
127.85	6.548	24.13	15.11	0.000
127.90	6.556	24.46	15.48	0.000
127.95	6.563	24.79	15.80	0.000
128.00	6.570	25.12	16.08	0.000
128.05	6.578	25.45	16.54	0.000
128.10	6.585	25.78	16.86	0.000
128.15	6.592	26.10	17.16	0.000
128.20	6.600	26.43	17.47	0.000
128.25	6.607	26.76	17.76	0.000
128.30	6.615	27.10	18.05	0.000
128.35	6.622	27.43	18.34	0.000
128.40	6.629	27.76	18.62	0.000
128.45	6.637	28.09	18.89	0.000
128.50	6.644	28.42	19.16	0.000
128.55	6.652	28.75	19.43	0.000

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:45
Total Impervious Area:0

Mitigated Landuse Totals for POC #1
Total Pervious Area:8.5
Total Impervious Area:36.5

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	1.512018
5 year	2.319483
10 year	2.94222
25 year	3.833185
50 year	4.575218
100 year	5.386731

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.876755
5 year	1.262887
10 year	1.571659
25 year	2.02875
50 year	2.422323
100 year	2.865329

Stream Protection Duration
Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	1.511	0.698
1950	1.544	0.914
1951	1.381	0.649
1952	1.089	0.621
1953	0.913	0.625
1954	4.939	0.805
1955	1.946	1.217
1956	1.718	1.351
1957	2.128	0.991
1958	1.538	0.732
1959	1.525	0.829
1960	1.421	0.892
1961	2.686	1.152
1962	1.326	0.642
1963	2.185	0.690
1964	1.572	0.570
1965	1.313	0.882
1966	0.769	0.651
1967	1.559	0.663
1968	1.896	0.920
1969	4.608	0.722
1970	1.087	0.687
1971	1.716	1.543
1972	1.266	0.760
1973	1.198	0.931
1974	2.592	0.890
1975	1.055	0.611
1976	1.085	0.813
1977	0.916	0.672
1978	1.087	0.629
1979	3.025	0.674
1980	1.417	0.623
1981	1.110	0.637
1982	1.441	1.157
1983	2.456	0.676
1984	1.483	1.674
1985	1.796	1.168
1986	4.223	2.490
1987	2.015	1.994
1988	1.044	1.175
1989	1.063	0.612
1990	1.410	1.041
1991	1.452	0.883
1992	1.106	0.941

1993	0.916	0.585
1994	1.007	0.915
1995	1.476	1.273
1996	2.519	1.108
1997	5.009	4.433
1998	0.922	0.664
1999	1.204	0.948
2000	0.904	1.375
2001	0.363	0.515
2002	1.372	1.039
2003	1.075	0.875
2004	1.809	1.279
2005	1.259	0.880
2006	3.353	1.114
2007	2.652	0.982
2008	3.723	2.443
2009	1.134	0.934

Stream Protection Duration
Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	5.0086	4.4335
2	4.9391	2.4897
3	4.6084	2.4432
4	4.2228	1.9939
5	3.7230	1.6740
6	3.3525	1.5432
7	3.0246	1.3748
8	2.6858	1.3512
9	2.6525	1.2791
10	2.5925	1.2726
11	2.5189	1.2166
12	2.4563	1.1747
13	2.1847	1.1682
14	2.1284	1.1568
15	2.0147	1.1517
16	1.9461	1.1145
17	1.8955	1.1083
18	1.8087	1.0411
19	1.7958	1.0385
20	1.7180	0.9905
21	1.7163	0.9822
22	1.5719	0.9478
23	1.5586	0.9405
24	1.5445	0.9339
25	1.5382	0.9314
26	1.5252	0.9200
27	1.5108	0.9152
28	1.4829	0.9139
29	1.4760	0.8920
30	1.4516	0.8902
31	1.4407	0.8833
32	1.4207	0.8824
33	1.4174	0.8797
34	1.4098	0.8747
35	1.3809	0.8292

36	1.3724	0.8127
37	1.3258	0.8050
38	1.3128	0.7598
39	1.2663	0.7318
40	1.2592	0.7222
41	1.2037	0.6979
42	1.1980	0.6902
43	1.1345	0.6868
44	1.1105	0.6756
45	1.1063	0.6737
46	1.0895	0.6718
47	1.0871	0.6643
48	1.0870	0.6633
49	1.0854	0.6509
50	1.0753	0.6490
51	1.0626	0.6416
52	1.0553	0.6370
53	1.0436	0.6294
54	1.0071	0.6251
55	0.9219	0.6226
56	0.9163	0.6209
57	0.9156	0.6124
58	0.9127	0.6111
59	0.9041	0.5845
60	0.7685	0.5698
61	0.3627	0.5147

Stream Protection Duration
POC #1
The Facility PASSED

The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.7560	19590	18978	96	Pass
0.7946	17021	16508	96	Pass
0.8332	14675	13409	91	Pass
0.8717	12754	10384	81	Pass
0.9103	10934	7736	70	Pass
0.9489	9458	5535	58	Pass
0.9875	8175	4252	52	Pass
1.0261	7075	3557	50	Pass
1.0646	6141	3018	49	Pass
1.1032	5311	2575	48	Pass
1.1418	4665	2160	46	Pass
1.1804	4068	1771	43	Pass
1.2189	3561	1520	42	Pass
1.2575	3140	1346	42	Pass
1.2961	2759	1210	43	Pass
1.3347	2449	1122	45	Pass
1.3733	2145	1035	48	Pass
1.4118	1896	976	51	Pass
1.4504	1657	918	55	Pass
1.4890	1510	867	57	Pass
1.5276	1370	814	59	Pass
1.5661	1250	765	61	Pass

1.6047	1154	731	63	Pass
1.6433	1069	687	64	Pass
1.6819	1009	641	63	Pass
1.7205	950	616	64	Pass
1.7590	888	591	66	Pass
1.7976	825	567	68	Pass
1.8362	777	543	69	Pass
1.8748	734	522	71	Pass
1.9133	687	498	72	Pass
1.9519	649	475	73	Pass
1.9905	622	440	70	Pass
2.0291	602	420	69	Pass
2.0677	583	405	69	Pass
2.1062	561	391	69	Pass
2.1448	538	368	68	Pass
2.1834	507	343	67	Pass
2.2220	488	318	65	Pass
2.2605	473	298	63	Pass
2.2991	457	272	59	Pass
2.3377	440	258	58	Pass
2.3763	424	239	56	Pass
2.4149	410	219	53	Pass
2.4534	394	180	45	Pass
2.4920	380	164	43	Pass
2.5306	368	161	43	Pass
2.5692	353	157	44	Pass
2.6077	341	148	43	Pass
2.6463	333	139	41	Pass
2.6849	322	118	36	Pass
2.7235	313	109	34	Pass
2.7621	302	105	34	Pass
2.8006	293	96	32	Pass
2.8392	284	93	32	Pass
2.8778	276	89	32	Pass
2.9164	265	85	32	Pass
2.9549	257	81	31	Pass
2.9935	241	77	31	Pass
3.0321	234	72	30	Pass
3.0707	226	68	30	Pass
3.1093	212	66	31	Pass
3.1478	205	62	30	Pass
3.1864	195	57	29	Pass
3.2250	187	55	29	Pass
3.2636	177	52	29	Pass
3.3021	166	48	28	Pass
3.3407	160	44	27	Pass
3.3793	150	41	27	Pass
3.4179	146	40	27	Pass
3.4565	135	39	28	Pass
3.4950	128	37	28	Pass
3.5336	120	33	27	Pass
3.5722	111	28	25	Pass
3.6108	99	26	26	Pass
3.6493	85	25	29	Pass
3.6879	75	25	33	Pass
3.7265	63	24	38	Pass
3.7651	59	24	40	Pass

3.8037	56	22	39	Pass
3.8422	49	22	44	Pass
3.8808	42	21	50	Pass
3.9194	39	21	53	Pass
3.9580	37	19	51	Pass
3.9965	36	18	50	Pass
4.0351	30	18	60	Pass
4.0737	28	16	57	Pass
4.1123	26	14	53	Pass
4.1509	20	12	60	Pass
4.1894	16	10	62	Pass
4.2280	13	7	53	Pass
4.2666	8	6	75	Pass
4.3052	6	5	83	Pass
4.3438	5	5	100	Pass
4.3823	4	3	75	Pass
4.4209	4	1	25	Pass
4.4595	3	0	0	Pass
4.4981	3	0	0	Pass
4.5366	3	0	0	Pass
4.5752	3	0	0	Pass

Water Quality BMP Flow and Volume for POC #1
On-line facility volume: 0 **acre-feet**
On-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**
Off-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**

LID Report

LID Technique	Used for Water Quality	Total Volume Percent Treatment?	Volume Needs Treatment (ac-ft)	Infiltration Through Facility (ac-ft)	Volume (ac-ft.)	Cumulative Infiltration Credit	Percent Volume Infiltrated	Comment Water Quality Treated
Trapezoidal Pond 1 POC		N	7018.04			N	0.00	
Total Volume Infiltrated			7018.04	0.00	0.00		0.00	
0.00	0%	No Treat. Credit						

Compliance with LID Standard 8
Duration Analysis Result = Failed

Perlnd and Implnd Changes

No changes have been made.

WWHM2012
PROJECT REPORT

Project Name: Pond Network 6
Site Name:
Site Address:
City :
Report Date: 1/12/2021
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 1.20
Version Date: 2019/09/13
Version : 4.2.17

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 7N
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Forest, Flat	17.4
Pervious Total	17.4

Impervious Land Use	acre
Impervious Total	0
Basin Total	17.4

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 7N
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Pasture, Flat	2.7
Pervious Total	2.7

Impervious Land Use	acre
ROOF TOPS FLAT	6.9
PARKING FLAT	5.2
POND	2.6
Impervious Total	14.7
Basin Total	17.4

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Name : Trapezoidal Pond 1
Bottom Length: 322.00 ft.
Bottom Width: 322.00 ft.
Depth: 4.5 ft.
Volume at riser head: 7.5474 acre-feet.
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: 3 ft.
Riser Diameter: 24 in.
Notch Type: Rectangular
Notch Width: 0.230 ft.
Notch Height: 1.300 ft.
Orifice 1 Diameter: 3 in. **Elevation:** 0 ft.
Orifice 2 Diameter: 2.75 in. **Elevation:** 1.37 ft.

Element Flows To:

Outlet 1	Outlet 2

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
127.00	2.380	0.000	0.000	0.000
127.05	2.384	0.119	0.054	0.000
127.10	2.389	0.238	0.077	0.000
127.15	2.393	0.358	0.094	0.000
127.20	2.398	0.477	0.109	0.000
127.25	2.402	0.597	0.122	0.000
127.30	2.406	0.718	0.133	0.000

127.35	2.411	0.838	0.144	0.000
127.40	2.415	0.959	0.154	0.000
127.45	2.420	1.080	0.163	0.000
127.50	2.424	1.201	0.172	0.000
127.55	2.429	1.322	0.181	0.000
127.60	2.433	1.444	0.189	0.000
127.65	2.438	1.566	0.196	0.000
127.70	2.442	1.688	0.204	0.000
127.75	2.447	1.810	0.211	0.000
127.80	2.451	1.932	0.218	0.000
127.85	2.456	2.055	0.225	0.000
127.90	2.460	2.178	0.231	0.000
127.95	2.465	2.301	0.238	0.000
128.00	2.469	2.424	0.244	0.000
128.05	2.474	2.548	0.250	0.000
128.10	2.478	2.672	0.256	0.000
128.15	2.483	2.796	0.261	0.000
128.20	2.487	2.920	0.267	0.000
128.25	2.492	3.045	0.273	0.000
128.30	2.497	3.169	0.278	0.000
128.35	2.501	3.294	0.283	0.000
128.40	2.506	3.420	0.324	0.000
128.45	2.510	3.545	0.352	0.000
128.50	2.515	3.671	0.373	0.000
128.55	2.519	3.797	0.391	0.000
128.60	2.524	3.923	0.407	0.000
128.65	2.528	4.049	0.422	0.000
128.70	2.533	4.176	0.436	0.000
128.75	2.538	4.302	0.458	0.000
128.80	2.542	4.429	0.486	0.000
128.85	2.547	4.557	0.517	0.000
128.90	2.551	4.684	0.551	0.000
128.95	2.556	4.812	0.588	0.000
129.00	2.561	4.940	0.626	0.000
129.05	2.565	5.068	0.666	0.000
129.10	2.570	5.196	0.707	0.000
129.15	2.574	5.325	0.749	0.000
129.20	2.579	5.454	0.792	0.000
129.25	2.584	5.583	0.836	0.000
129.30	2.588	5.712	0.881	0.000
129.35	2.593	5.842	0.926	0.000
129.40	2.597	5.971	0.972	0.000
129.45	2.602	6.101	1.018	0.000
129.50	2.607	6.232	1.064	0.000
129.55	2.611	6.362	1.111	0.000
129.60	2.616	6.493	1.157	0.000
129.65	2.621	6.624	1.204	0.000
129.70	2.625	6.755	1.250	0.000
129.75	2.630	6.886	1.305	0.000
129.80	2.635	7.018	1.361	0.000
129.85	2.639	7.150	1.417	0.000
129.90	2.644	7.282	1.475	0.000
129.95	2.649	7.414	1.533	0.000
130.00	2.653	7.547	1.593	0.000
130.05	2.658	7.680	1.837	0.000
130.10	2.663	7.813	2.278	0.000
130.15	2.667	7.946	2.844	0.000

130.20	2.672	8.080	3.509	0.000
130.25	2.677	8.213	4.252	0.000
130.30	2.682	8.347	5.058	0.000
130.35	2.686	8.482	5.908	0.000
130.40	2.691	8.616	6.785	0.000
130.45	2.696	8.751	7.672	0.000
130.50	2.700	8.886	8.552	0.000
130.55	2.705	9.021	9.406	0.000
130.60	2.710	9.156	10.21	0.000
130.65	2.715	9.292	10.97	0.000
130.70	2.719	9.428	11.65	0.000
130.75	2.724	9.564	12.26	0.000
130.80	2.729	9.700	12.79	0.000
130.85	2.734	9.837	13.23	0.000
130.90	2.738	9.973	13.60	0.000
130.95	2.743	10.11	13.91	0.000
131.00	2.748	10.24	14.19	0.000
131.05	2.753	10.38	14.64	0.000
131.10	2.757	10.52	14.95	0.000
131.15	2.762	10.66	15.25	0.000
131.20	2.767	10.80	15.55	0.000
131.25	2.772	10.93	15.84	0.000
131.30	2.777	11.07	16.13	0.000
131.35	2.781	11.21	16.41	0.000
131.40	2.786	11.35	16.68	0.000
131.45	2.791	11.49	16.95	0.000
131.50	2.796	11.63	17.21	0.000
131.55	2.801	11.77	17.48	0.000

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:17.4
Total Impervious Area:0

Mitigated Landuse Totals for POC #1
Total Pervious Area:2.7
Total Impervious Area:14.7

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.584647
5 year	0.896867
10 year	1.137659
25 year	1.482165
50 year	1.769085
100 year	2.08287

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.358446
5 year	0.525859
10 year	0.661658
25 year	0.865112
50 year	1.04218
100 year	1.243222

Stream Protection Duration
Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	0.584	0.278
1950	0.597	0.387
1951	0.534	0.257
1952	0.421	0.246
1953	0.353	0.248
1954	1.910	0.308
1955	0.752	0.486
1956	0.664	0.557
1957	0.823	0.418
1958	0.595	0.278
1959	0.590	0.331
1960	0.549	0.380
1961	1.038	0.482
1962	0.513	0.255
1963	0.845	0.273
1964	0.608	0.227
1965	0.508	0.364
1966	0.297	0.258
1967	0.603	0.263
1968	0.733	0.391
1969	1.782	0.278
1970	0.420	0.272
1971	0.664	0.643
1972	0.490	0.282
1973	0.463	0.399
1974	1.002	0.375
1975	0.408	0.244
1976	0.420	0.320
1977	0.354	0.269
1978	0.420	0.249
1979	1.170	0.269
1980	0.548	0.246
1981	0.429	0.254
1982	0.557	0.500
1983	0.950	0.267
1984	0.573	0.713
1985	0.694	0.466
1986	1.633	1.100
1987	0.779	0.859
1988	0.404	0.505
1989	0.411	0.244
1990	0.545	0.443
1991	0.561	0.372
1992	0.428	0.402

1993	0.354	0.234
1994	0.389	0.388
1995	0.571	0.531
1996	0.974	0.464
1997	1.937	1.631
1998	0.356	0.262
1999	0.465	0.411
2000	0.350	0.585
2001	0.140	0.206
2002	0.531	0.441
2003	0.416	0.370
2004	0.699	0.558
2005	0.487	0.370
2006	1.296	0.477
2007	1.026	0.428
2008	1.440	1.086
2009	0.439	0.401

Stream Protection Duration
Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	1.9367	1.6306
2	1.9098	1.1002
3	1.7819	1.0857
4	1.6328	0.8585
5	1.4395	0.7128
6	1.2963	0.6434
7	1.1695	0.5848
8	1.0385	0.5584
9	1.0256	0.5566
10	1.0024	0.5314
11	0.9740	0.5046
12	0.9498	0.5003
13	0.8447	0.4857
14	0.8230	0.4820
15	0.7790	0.4768
16	0.7525	0.4660
17	0.7329	0.4635
18	0.6993	0.4427
19	0.6944	0.4413
20	0.6643	0.4279
21	0.6636	0.4184
22	0.6078	0.4108
23	0.6027	0.4018
24	0.5972	0.4006
25	0.5948	0.3989
26	0.5897	0.3912
27	0.5842	0.3880
28	0.5734	0.3873
29	0.5707	0.3798
30	0.5613	0.3754
31	0.5571	0.3723
32	0.5493	0.3697
33	0.5481	0.3696
34	0.5451	0.3636
35	0.5340	0.3313

36	0.5307	0.3197
37	0.5126	0.3084
38	0.5076	0.2825
39	0.4896	0.2779
40	0.4869	0.2776
41	0.4654	0.2776
42	0.4632	0.2732
43	0.4387	0.2723
44	0.4294	0.2689
45	0.4278	0.2687
46	0.4213	0.2668
47	0.4203	0.2627
48	0.4203	0.2623
49	0.4197	0.2580
50	0.4158	0.2566
51	0.4109	0.2554
52	0.4081	0.2537
53	0.4035	0.2490
54	0.3894	0.2484
55	0.3565	0.2460
56	0.3543	0.2458
57	0.3540	0.2439
58	0.3529	0.2438
59	0.3496	0.2338
60	0.2972	0.2273
61	0.1402	0.2055

Stream Protection Duration
POC #1
The Facility PASSED

The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.2923	19654	15456	78	Pass
0.3072	17023	14206	83	Pass
0.3222	14679	13017	88	Pass
0.3371	12733	11434	89	Pass
0.3520	11022	10136	91	Pass
0.3669	9501	8637	90	Pass
0.3818	8224	7114	86	Pass
0.3967	7122	5775	81	Pass
0.4117	6164	4646	75	Pass
0.4266	5328	3767	70	Pass
0.4415	4673	2943	62	Pass
0.4564	4079	2460	60	Pass
0.4713	3561	2003	56	Pass
0.4862	3140	1663	52	Pass
0.5012	2761	1481	53	Pass
0.5161	2447	1317	53	Pass
0.5310	2167	1205	55	Pass
0.5459	1906	1104	57	Pass
0.5608	1663	1017	61	Pass
0.5757	1515	958	63	Pass
0.5907	1375	898	65	Pass
0.6056	1254	856	68	Pass

0.6205	1155	809	70	Pass
0.6354	1072	767	71	Pass
0.6503	1009	728	72	Pass
0.6652	950	698	73	Pass
0.6802	888	669	75	Pass
0.6951	825	634	76	Pass
0.7100	781	599	76	Pass
0.7249	737	573	77	Pass
0.7398	688	554	80	Pass
0.7547	651	534	82	Pass
0.7697	622	516	82	Pass
0.7846	603	499	82	Pass
0.7995	583	480	82	Pass
0.8144	561	463	82	Pass
0.8293	538	437	81	Pass
0.8442	507	411	81	Pass
0.8592	487	368	75	Pass
0.8741	473	356	75	Pass
0.8890	457	340	74	Pass
0.9039	440	326	74	Pass
0.9188	424	315	74	Pass
0.9337	411	306	74	Pass
0.9487	394	290	73	Pass
0.9636	380	279	73	Pass
0.9785	369	269	72	Pass
0.9934	353	257	72	Pass
1.0083	341	245	71	Pass
1.0232	333	230	69	Pass
1.0382	322	219	68	Pass
1.0531	313	197	62	Pass
1.0680	305	181	59	Pass
1.0829	293	155	52	Pass
1.0978	284	133	46	Pass
1.1127	276	127	46	Pass
1.1277	267	124	46	Pass
1.1426	257	122	47	Pass
1.1575	242	118	48	Pass
1.1724	234	115	49	Pass
1.1873	226	103	45	Pass
1.2022	212	95	44	Pass
1.2172	205	86	41	Pass
1.2321	195	81	41	Pass
1.2470	187	78	41	Pass
1.2619	177	74	41	Pass
1.2768	166	72	43	Pass
1.2917	160	69	43	Pass
1.3067	151	66	43	Pass
1.3216	146	64	43	Pass
1.3365	135	61	45	Pass
1.3514	128	57	44	Pass
1.3663	120	55	45	Pass
1.3812	111	53	47	Pass
1.3962	99	51	51	Pass
1.4111	85	49	57	Pass
1.4260	75	46	61	Pass
1.4409	63	42	66	Pass
1.4558	59	40	67	Pass

1.4707	56	38	67	Pass
1.4857	50	33	66	Pass
1.5006	42	28	66	Pass
1.5155	40	25	62	Pass
1.5304	37	23	62	Pass
1.5453	36	20	55	Pass
1.5603	30	19	63	Pass
1.5752	28	14	50	Pass
1.5901	26	6	23	Pass
1.6050	19	4	21	Pass
1.6199	16	3	18	Pass
1.6348	14	0	0	Pass
1.6498	8	0	0	Pass
1.6647	6	0	0	Pass
1.6796	5	0	0	Pass
1.6945	4	0	0	Pass
1.7094	4	0	0	Pass
1.7243	3	0	0	Pass
1.7393	3	0	0	Pass
1.7542	3	0	0	Pass
1.7691	3	0	0	Pass

Water Quality BMP Flow and Volume for POC #1
On-line facility volume: 0 **acre-feet**
On-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**
Off-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**

LID Report

LID Technique	Used for Water Quality	Percent Treatment?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft.)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Comment Water Quality Treated
Total Volume Infiltrated			0.00	0.00	0.00	0.00	0.00	0% No Treat. Credit

Compliance with LID Standard 8
Duration Analysis Result = Passed

Perlnd and Implnd Changes

No changes have been made.

WWHM2012
PROJECT REPORT

Project Name: Pond Network 7
Site Name:
Site Address:
City :
Report Date: 1/12/2021
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 1.20
Version Date: 2019/09/13
Version : 4.2.17

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 8S
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Forest, Flat	25.7
Pervious Total	25.7

Impervious Land Use	acre
Impervious Total	0
Basin Total	25.7

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 8S
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Pasture, Flat	3.9
Pervious Total	3.9

Impervious Land Use	acre
ROOF TOPS FLAT	7.2
PARKING FLAT	7.4
POND	7.2
Impervious Total	21.8
Basin Total	25.7

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Name : Trapezoidal Pond 1
Bottom Length: 533.00 ft.
Bottom Width: 533.00 ft.
Depth: 4.5 ft.
Volume at riser head: 20.2335 acre-feet.
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: 3 ft.
Riser Diameter: 24 in.
Notch Type: Rectangular
Notch Width: 0.290 ft.
Notch Height: 1.333 ft.
Orifice 1 Diameter: 3 in. **Elevation:** 0 ft.

Element Flows To:

Outlet 1	Outlet 2

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
107.50	6.521	0.000	0.000	0.000
107.55	6.529	0.326	0.054	0.000
107.60	6.536	0.652	0.077	0.000
107.65	6.543	0.979	0.094	0.000
107.70	6.551	1.307	0.109	0.000
107.75	6.558	1.635	0.122	0.000
107.80	6.565	1.963	0.133	0.000
107.85	6.573	2.291	0.144	0.000

107.90	6.580	2.620	0.154	0.000
107.95	6.588	2.949	0.163	0.000
108.00	6.595	3.279	0.172	0.000
108.05	6.602	3.609	0.181	0.000
108.10	6.610	3.939	0.189	0.000
108.15	6.617	4.270	0.196	0.000
108.20	6.625	4.601	0.204	0.000
108.25	6.632	4.932	0.211	0.000
108.30	6.639	5.264	0.218	0.000
108.35	6.647	5.596	0.225	0.000
108.40	6.654	5.929	0.231	0.000
108.45	6.662	6.262	0.238	0.000
108.50	6.669	6.595	0.244	0.000
108.55	6.676	6.929	0.250	0.000
108.60	6.684	7.263	0.256	0.000
108.65	6.691	7.597	0.261	0.000
108.70	6.699	7.932	0.267	0.000
108.75	6.706	8.267	0.273	0.000
108.80	6.714	8.603	0.278	0.000
108.85	6.721	8.938	0.283	0.000
108.90	6.729	9.275	0.289	0.000
108.95	6.736	9.611	0.294	0.000
109.00	6.743	9.948	0.299	0.000
109.05	6.751	10.28	0.304	0.000
109.10	6.758	10.62	0.308	0.000
109.15	6.766	10.96	0.313	0.000
109.20	6.773	11.30	0.324	0.000
109.25	6.781	11.63	0.346	0.000
109.30	6.788	11.97	0.373	0.000
109.35	6.796	12.31	0.405	0.000
109.40	6.803	12.65	0.440	0.000
109.45	6.811	12.99	0.478	0.000
109.50	6.818	13.33	0.519	0.000
109.55	6.826	13.68	0.561	0.000
109.60	6.833	14.02	0.605	0.000
109.65	6.841	14.36	0.651	0.000
109.70	6.848	14.70	0.698	0.000
109.75	6.856	15.04	0.746	0.000
109.80	6.863	15.39	0.795	0.000
109.85	6.871	15.73	0.845	0.000
109.90	6.878	16.07	0.896	0.000
109.95	6.886	16.42	0.947	0.000
110.00	6.894	16.76	0.998	0.000
110.05	6.901	17.11	1.050	0.000
110.10	6.909	17.45	1.102	0.000
110.15	6.916	17.80	1.154	0.000
110.20	6.924	18.14	1.213	0.000
110.25	6.931	18.49	1.276	0.000
110.30	6.939	18.84	1.341	0.000
110.35	6.947	19.19	1.406	0.000
110.40	6.954	19.53	1.474	0.000
110.45	6.962	19.88	1.542	0.000
110.50	6.969	20.23	1.612	0.000
110.55	6.977	20.58	1.853	0.000
110.60	6.984	20.93	2.289	0.000
110.65	6.992	21.28	2.852	0.000
110.70	7.000	21.63	3.513	0.000

110.75	7.007	21.98	4.253	0.000
110.80	7.015	22.33	5.054	0.000
110.85	7.022	22.68	5.900	0.000
110.90	7.030	23.03	6.774	0.000
110.95	7.038	23.38	7.658	0.000
111.00	7.045	23.73	8.534	0.000
111.05	7.053	24.09	9.384	0.000
111.10	7.061	24.44	10.19	0.000
111.15	7.068	24.79	10.94	0.000
111.20	7.076	25.15	11.62	0.000
111.25	7.084	25.50	12.23	0.000
111.30	7.091	25.85	12.75	0.000
111.35	7.099	26.21	13.19	0.000
111.40	7.107	26.56	13.56	0.000
111.45	7.114	26.92	13.86	0.000
111.50	7.122	27.27	14.14	0.000
111.55	7.130	27.63	14.59	0.000
111.60	7.137	27.99	14.89	0.000
111.65	7.145	28.35	15.19	0.000
111.70	7.153	28.70	15.49	0.000
111.75	7.160	29.06	15.77	0.000
111.80	7.168	29.42	16.06	0.000
111.85	7.176	29.78	16.33	0.000
111.90	7.183	30.14	16.60	0.000
111.95	7.191	30.50	16.87	0.000
112.00	7.199	30.86	17.13	0.000
112.05	7.207	31.22	17.39	0.000

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:25.7
Total Impervious Area:0

Mitigated Landuse Totals for POC #1
Total Pervious Area:3.9
Total Impervious Area:21.8

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.86353
5 year	1.324682
10 year	1.680333
25 year	2.189172
50 year	2.612955
100 year	3.076418

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.289909
5 year	0.389511
10 year	0.464938
25 year	0.571635
50 year	0.659835
100 year	0.755902

Stream Protection Duration
Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	0.863	0.245
1950	0.882	0.294
1951	0.789	0.262
1952	0.622	0.239
1953	0.521	0.232
1954	2.821	0.282
1955	1.111	0.632
1956	0.981	0.704
1957	1.216	0.265
1958	0.878	0.280
1959	0.871	0.273
1960	0.811	0.256
1961	1.534	0.318
1962	0.757	0.217
1963	1.248	0.261
1964	0.898	0.232
1965	0.750	0.283
1966	0.439	0.243
1967	0.890	0.277
1968	1.083	0.290
1969	2.632	0.267
1970	0.621	0.259
1971	0.980	0.588
1972	0.723	0.239
1973	0.684	0.292
1974	1.481	0.310
1975	0.603	0.234
1976	0.620	0.288
1977	0.523	0.219
1978	0.621	0.236
1979	1.727	0.210
1980	0.810	0.244
1981	0.634	0.218
1982	0.823	0.284
1983	1.403	0.288
1984	0.847	0.418
1985	1.026	0.560
1986	2.412	0.416
1987	1.151	0.392
1988	0.596	0.294
1989	0.607	0.229
1990	0.805	0.274
1991	0.829	0.296
1992	0.632	0.271
1993	0.523	0.211

1994	0.575	0.295
1995	0.843	0.312
1996	1.439	0.306
1997	2.860	0.961
1998	0.526	0.270
1999	0.687	0.311
2000	0.516	0.299
2001	0.207	0.167
2002	0.784	0.512
2003	0.614	0.248
2004	1.033	0.282
2005	0.719	0.260
2006	1.915	0.543
2007	1.515	0.460
2008	2.126	0.402
2009	0.648	0.282

Stream Protection Duration
Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	2.8605	0.9608
2	2.8208	0.7036
3	2.6319	0.6315
4	2.4117	0.5882
5	2.1262	0.5598
6	1.9147	0.5434
7	1.7274	0.5115
8	1.5339	0.4605
9	1.5149	0.4181
10	1.4806	0.4155
11	1.4386	0.4017
12	1.4028	0.3925
13	1.2477	0.3176
14	1.2155	0.3125
15	1.1506	0.3110
16	1.1114	0.3100
17	1.0826	0.3064
18	1.0329	0.2989
19	1.0256	0.2961
20	0.9812	0.2949
21	0.9802	0.2941
22	0.8977	0.2938
23	0.8901	0.2919
24	0.8821	0.2903
25	0.8785	0.2883
26	0.8710	0.2878
27	0.8628	0.2844
28	0.8469	0.2829
29	0.8429	0.2823
30	0.8290	0.2823
31	0.8228	0.2817
32	0.8114	0.2798
33	0.8095	0.2767
34	0.8051	0.2741
35	0.7887	0.2733
36	0.7838	0.2712

37	0.7572	0.2701
38	0.7497	0.2670
39	0.7232	0.2654
40	0.7191	0.2621
41	0.6875	0.2608
42	0.6842	0.2598
43	0.6479	0.2587
44	0.6342	0.2565
45	0.6318	0.2484
46	0.6222	0.2450
47	0.6209	0.2442
48	0.6208	0.2431
49	0.6199	0.2389
50	0.6141	0.2387
51	0.6069	0.2361
52	0.6027	0.2340
53	0.5960	0.2324
54	0.5751	0.2316
55	0.5265	0.2291
56	0.5233	0.2187
57	0.5229	0.2182
58	0.5213	0.2168
59	0.5164	0.2113
60	0.4389	0.2095
61	0.2071	0.1673

Stream Protection Duration
POC #1
The Facility PASSED

The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.4318	19693	2950	14	Pass
0.4538	17079	2440	14	Pass
0.4758	14733	2074	14	Pass
0.4979	12795	1683	13	Pass
0.5199	10981	1436	13	Pass
0.5419	9484	1190	12	Pass
0.5640	8209	890	10	Pass
0.5860	7120	677	9	Pass
0.6080	6126	516	8	Pass
0.6301	5311	453	8	Pass
0.6521	4654	411	8	Pass
0.6741	4066	378	9	Pass
0.6962	3551	325	9	Pass
0.7182	3140	297	9	Pass
0.7402	2761	283	10	Pass
0.7622	2449	271	11	Pass
0.7843	2150	257	11	Pass
0.8063	1894	245	12	Pass
0.8283	1657	232	14	Pass
0.8504	1509	220	14	Pass
0.8724	1372	199	14	Pass
0.8944	1253	156	12	Pass
0.9165	1155	104	9	Pass

0.9385	1071	64	5	Pass
0.9605	1009	4	0	Pass
0.9826	951	0	0	Pass
1.0046	890	0	0	Pass
1.0266	826	0	0	Pass
1.0487	779	0	0	Pass
1.0707	735	0	0	Pass
1.0927	688	0	0	Pass
1.1148	649	0	0	Pass
1.1368	622	0	0	Pass
1.1588	603	0	0	Pass
1.1809	583	0	0	Pass
1.2029	562	0	0	Pass
1.2249	538	0	0	Pass
1.2470	508	0	0	Pass
1.2690	489	0	0	Pass
1.2910	473	0	0	Pass
1.3131	457	0	0	Pass
1.3351	440	0	0	Pass
1.3571	424	0	0	Pass
1.3792	409	0	0	Pass
1.4012	394	0	0	Pass
1.4232	380	0	0	Pass
1.4452	368	0	0	Pass
1.4673	353	0	0	Pass
1.4893	341	0	0	Pass
1.5113	333	0	0	Pass
1.5334	322	0	0	Pass
1.5554	313	0	0	Pass
1.5774	303	0	0	Pass
1.5995	293	0	0	Pass
1.6215	284	0	0	Pass
1.6435	276	0	0	Pass
1.6656	266	0	0	Pass
1.6876	257	0	0	Pass
1.7096	242	0	0	Pass
1.7317	234	0	0	Pass
1.7537	226	0	0	Pass
1.7757	212	0	0	Pass
1.7978	205	0	0	Pass
1.8198	195	0	0	Pass
1.8418	187	0	0	Pass
1.8639	177	0	0	Pass
1.8859	166	0	0	Pass
1.9079	160	0	0	Pass
1.9300	151	0	0	Pass
1.9520	146	0	0	Pass
1.9740	135	0	0	Pass
1.9961	128	0	0	Pass
2.0181	120	0	0	Pass
2.0401	111	0	0	Pass
2.0621	99	0	0	Pass
2.0842	85	0	0	Pass
2.1062	75	0	0	Pass
2.1282	63	0	0	Pass
2.1503	59	0	0	Pass
2.1723	56	0	0	Pass

2.1943	50	0	0	Pass
2.2164	42	0	0	Pass
2.2384	39	0	0	Pass
2.2604	37	0	0	Pass
2.2825	36	0	0	Pass
2.3045	30	0	0	Pass
2.3265	28	0	0	Pass
2.3486	26	0	0	Pass
2.3706	20	0	0	Pass
2.3926	16	0	0	Pass
2.4147	13	0	0	Pass
2.4367	8	0	0	Pass
2.4587	6	0	0	Pass
2.4808	5	0	0	Pass
2.5028	4	0	0	Pass
2.5248	4	0	0	Pass
2.5469	3	0	0	Pass
2.5689	3	0	0	Pass
2.5909	3	0	0	Pass
2.6130	3	0	0	Pass

Water Quality BMP Flow and Volume for POC #1
On-line facility volume: 0 **acre-feet**
On-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**
Off-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**

LID Report

LID Technique	Used for Treatment?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft.)	Cumulative Volume Infiltration	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	N	4110.37			N	0.00	
Total Volume Infiltrated		4110.37	0.00	0.00		0.00	
0.00	0%	No Treat. Credit					

Compliance with LID Standard 8
Duration Analysis Result = Failed

Perlnd and Implnd Changes

No changes have been made.

WWHM2012
PROJECT REPORT

Project Name: Pond Network 8
Site Name:
Site Address:
City :
Report Date: 1/12/2021
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 1.20
Version Date: 2019/09/13
Version : 4.2.17

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 9N
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Forest, Flat	25.3
Pervious Total	25.3

Impervious Land Use	acre
Impervious Total	0
Basin Total	25.3

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 9N
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Pasture, Flat	2.8
Pervious Total	2.8

Impervious Land Use	acre
ROOF TOPS FLAT	9.9
PARKING FLAT	7.1
POND	5.5
Impervious Total	22.5
Basin Total	25.3

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Name : Trapezoidal Pond 1
Bottom Length: 447.00 ft.
Bottom Width: 446.00 ft.
Depth: 4.5 ft.
Volume at riser head: 14.2911 acre-feet.
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: 3 ft.
Riser Diameter: 24 in.
Notch Type: Rectangular
Notch Width: 0.350 ft.
Notch Height: 1.333 ft.
Orifice 1 Diameter: 3.5 in. **Elevation:** 0 ft.

Element Flows To:

Outlet 1	Outlet 2

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
104.50	4.576	0.000	0.000	0.000
104.55	4.582	0.229	0.074	0.000
104.60	4.589	0.458	0.105	0.000
104.65	4.595	0.687	0.128	0.000
104.70	4.601	0.917	0.148	0.000
104.75	4.607	1.148	0.166	0.000
104.80	4.613	1.378	0.182	0.000
104.85	4.619	1.609	0.196	0.000

104.90	4.626	1.840	0.210	0.000
104.95	4.632	2.072	0.223	0.000
105.00	4.638	2.303	0.235	0.000
105.05	4.644	2.535	0.246	0.000
105.10	4.650	2.768	0.257	0.000
105.15	4.657	3.000	0.268	0.000
105.20	4.663	3.233	0.278	0.000
105.25	4.669	3.467	0.287	0.000
105.30	4.675	3.700	0.297	0.000
105.35	4.681	3.934	0.306	0.000
105.40	4.688	4.169	0.315	0.000
105.45	4.694	4.403	0.324	0.000
105.50	4.700	4.638	0.332	0.000
105.55	4.706	4.873	0.340	0.000
105.60	4.713	5.109	0.348	0.000
105.65	4.719	5.345	0.356	0.000
105.70	4.725	5.581	0.364	0.000
105.75	4.731	5.817	0.371	0.000
105.80	4.738	6.054	0.379	0.000
105.85	4.744	6.291	0.386	0.000
105.90	4.750	6.528	0.393	0.000
105.95	4.756	6.766	0.400	0.000
106.00	4.763	7.004	0.407	0.000
106.05	4.769	7.242	0.413	0.000
106.10	4.775	7.481	0.420	0.000
106.15	4.781	7.720	0.427	0.000
106.20	4.788	7.959	0.440	0.000
106.25	4.794	8.199	0.466	0.000
106.30	4.800	8.439	0.500	0.000
106.35	4.807	8.679	0.539	0.000
106.40	4.813	8.919	0.582	0.000
106.45	4.819	9.160	0.629	0.000
106.50	4.826	9.401	0.678	0.000
106.55	4.832	9.643	0.730	0.000
106.60	4.838	9.884	0.784	0.000
106.65	4.845	10.12	0.840	0.000
106.70	4.851	10.36	0.897	0.000
106.75	4.857	10.61	0.956	0.000
106.80	4.864	10.85	1.016	0.000
106.85	4.870	11.09	1.077	0.000
106.90	4.876	11.34	1.138	0.000
106.95	4.883	11.58	1.200	0.000
107.00	4.889	11.83	1.263	0.000
107.05	4.895	12.07	1.326	0.000
107.10	4.902	12.32	1.389	0.000
107.15	4.908	12.56	1.453	0.000
107.20	4.914	12.81	1.524	0.000
107.25	4.921	13.05	1.601	0.000
107.30	4.927	13.30	1.680	0.000
107.35	4.934	13.55	1.760	0.000
107.40	4.940	13.79	1.842	0.000
107.45	4.946	14.04	1.925	0.000
107.50	4.953	14.29	2.010	0.000
107.55	4.959	14.53	2.252	0.000
107.60	4.966	14.78	2.689	0.000
107.65	4.972	15.03	3.253	0.000
107.70	4.978	15.28	3.915	0.000

107.75	4.985	15.53	4.656	0.000
107.80	4.991	15.78	5.459	0.000
107.85	4.998	16.03	6.306	0.000
107.90	5.004	16.28	7.181	0.000
107.95	5.010	16.53	8.066	0.000
108.00	5.017	16.78	8.943	0.000
108.05	5.023	17.03	9.795	0.000
108.10	5.030	17.28	10.60	0.000
108.15	5.036	17.53	11.35	0.000
108.20	5.043	17.79	12.04	0.000
108.25	5.049	18.04	12.64	0.000
108.30	5.056	18.29	13.17	0.000
108.35	5.062	18.54	13.61	0.000
108.40	5.069	18.80	13.97	0.000
108.45	5.075	19.05	14.28	0.000
108.50	5.082	19.30	14.56	0.000
108.55	5.088	19.56	15.01	0.000
108.60	5.094	19.81	15.32	0.000
108.65	5.101	20.07	15.62	0.000
108.70	5.107	20.32	15.91	0.000
108.75	5.114	20.58	16.20	0.000
108.80	5.120	20.83	16.48	0.000
108.85	5.127	21.09	16.76	0.000
108.90	5.133	21.35	17.03	0.000
108.95	5.140	21.60	17.30	0.000
109.00	5.147	21.86	17.56	0.000
109.05	5.153	22.12	17.82	0.000

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:25.3
Total Impervious Area:0

Mitigated Landuse Totals for POC #1
Total Pervious Area:2.8
Total Impervious Area:22.5

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.85009
5 year	1.304064
10 year	1.654181
25 year	2.155101
50 year	2.572288
100 year	3.028538

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.399839
5 year	0.536846
10 year	0.642617
25 year	0.794533
50 year	0.921825
100 year	1.061988

Stream Protection Duration
Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	0.849	0.357
1950	0.868	0.395
1951	0.776	0.331
1952	0.613	0.321
1953	0.513	0.327
1954	2.777	0.365
1955	1.094	0.632
1956	0.966	0.735
1957	1.197	0.404
1958	0.865	0.367
1959	0.857	0.371
1960	0.799	0.385
1961	1.510	0.474
1962	0.745	0.319
1963	1.228	0.361
1964	0.884	0.290
1965	0.738	0.385
1966	0.432	0.342
1967	0.876	0.353
1968	1.066	0.388
1969	2.591	0.361
1970	0.611	0.358
1971	0.965	0.731
1972	0.712	0.356
1973	0.674	0.409
1974	1.458	0.399
1975	0.593	0.314
1976	0.610	0.379
1977	0.515	0.341
1978	0.611	0.324
1979	1.701	0.330
1980	0.797	0.326
1981	0.624	0.321
1982	0.810	0.422
1983	1.381	0.357
1984	0.834	0.723
1985	1.010	0.510
1986	2.374	0.960
1987	1.133	0.769
1988	0.587	0.431
1989	0.597	0.322
1990	0.793	0.409
1991	0.816	0.397
1992	0.622	0.397
1993	0.515	0.296

1994	0.566	0.406
1995	0.830	0.435
1996	1.416	0.416
1997	2.816	1.595
1998	0.518	0.350
1999	0.677	0.400
2000	0.508	0.482
2001	0.204	0.257
2002	0.772	0.461
2003	0.605	0.380
2004	1.017	0.442
2005	0.708	0.379
2006	1.885	0.506
2007	1.491	0.460
2008	2.093	0.920
2009	0.638	0.407

Stream Protection Duration
Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	2.8160	1.5951
2	2.7769	0.9596
3	2.5910	0.9200
4	2.3741	0.7693
5	2.0931	0.7349
6	1.8849	0.7310
7	1.7005	0.7226
8	1.5100	0.6322
9	1.4913	0.5099
10	1.4576	0.5058
11	1.4162	0.4818
12	1.3810	0.4735
13	1.2283	0.4613
14	1.1966	0.4600
15	1.1327	0.4416
16	1.0941	0.4347
17	1.0657	0.4306
18	1.0169	0.4217
19	1.0096	0.4159
20	0.9659	0.4091
21	0.9649	0.4090
22	0.8838	0.4067
23	0.8763	0.4059
24	0.8683	0.4037
25	0.8648	0.4001
26	0.8575	0.3993
27	0.8494	0.3974
28	0.8337	0.3970
29	0.8298	0.3954
30	0.8161	0.3876
31	0.8100	0.3855
32	0.7987	0.3850
33	0.7969	0.3797
34	0.7926	0.3792
35	0.7764	0.3787
36	0.7716	0.3706

37	0.7454	0.3665
38	0.7381	0.3647
39	0.7119	0.3614
40	0.7080	0.3606
41	0.6768	0.3576
42	0.6735	0.3570
43	0.6378	0.3569
44	0.6243	0.3558
45	0.6220	0.3534
46	0.6125	0.3499
47	0.6112	0.3422
48	0.6112	0.3406
49	0.6103	0.3314
50	0.6045	0.3299
51	0.5974	0.3266
52	0.5933	0.3257
53	0.5867	0.3240
54	0.5662	0.3216
55	0.5183	0.3214
56	0.5152	0.3208
57	0.5148	0.3193
58	0.5131	0.3145
59	0.5083	0.2965
60	0.4321	0.2896
61	0.2039	0.2566

Stream Protection Duration
POC #1
The Facility PASSED

The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.4250	19603	5565	28	Pass
0.4467	17073	3527	20	Pass
0.4684	14694	2825	19	Pass
0.4901	12733	2396	18	Pass
0.5118	10977	2023	18	Pass
0.5335	9456	1802	19	Pass
0.5552	8173	1589	19	Pass
0.5769	7116	1473	20	Pass
0.5986	6151	1317	21	Pass
0.6202	5315	1108	20	Pass
0.6419	4684	997	21	Pass
0.6636	4079	906	22	Pass
0.6853	3557	819	23	Pass
0.7070	3136	714	22	Pass
0.7287	2768	617	22	Pass
0.7504	2449	553	22	Pass
0.7721	2145	510	23	Pass
0.7938	1897	487	25	Pass
0.8155	1657	461	27	Pass
0.8371	1508	439	29	Pass
0.8588	1374	414	30	Pass
0.8805	1253	380	30	Pass
0.9022	1154	332	28	Pass

0.9239	1072	296	27	Pass
0.9456	1009	283	28	Pass
0.9673	950	264	27	Pass
0.9890	892	259	29	Pass
1.0107	826	251	30	Pass
1.0323	777	238	30	Pass
1.0540	733	229	31	Pass
1.0757	688	218	31	Pass
1.0974	649	202	31	Pass
1.1191	622	180	28	Pass
1.1408	603	159	26	Pass
1.1625	583	153	26	Pass
1.1842	561	148	26	Pass
1.2059	538	144	26	Pass
1.2275	507	139	27	Pass
1.2492	487	134	27	Pass
1.2709	473	122	25	Pass
1.2926	457	110	24	Pass
1.3143	440	94	21	Pass
1.3360	424	88	20	Pass
1.3577	410	82	20	Pass
1.3794	394	76	19	Pass
1.4011	380	69	18	Pass
1.4228	369	62	16	Pass
1.4444	353	56	15	Pass
1.4661	341	49	14	Pass
1.4878	333	44	13	Pass
1.5095	322	40	12	Pass
1.5312	313	36	11	Pass
1.5529	304	26	8	Pass
1.5746	293	9	3	Pass
1.5963	284	0	0	Pass
1.6180	276	0	0	Pass
1.6396	266	0	0	Pass
1.6613	257	0	0	Pass
1.6830	241	0	0	Pass
1.7047	234	0	0	Pass
1.7264	226	0	0	Pass
1.7481	212	0	0	Pass
1.7698	205	0	0	Pass
1.7915	195	0	0	Pass
1.8132	187	0	0	Pass
1.8349	177	0	0	Pass
1.8565	166	0	0	Pass
1.8782	160	0	0	Pass
1.8999	151	0	0	Pass
1.9216	146	0	0	Pass
1.9433	135	0	0	Pass
1.9650	128	0	0	Pass
1.9867	120	0	0	Pass
2.0084	111	0	0	Pass
2.0301	99	0	0	Pass
2.0517	86	0	0	Pass
2.0734	75	0	0	Pass
2.0951	63	0	0	Pass
2.1168	59	0	0	Pass
2.1385	56	0	0	Pass

2.1602	50	0	0	Pass
2.1819	42	0	0	Pass
2.2036	40	0	0	Pass
2.2253	37	0	0	Pass
2.2469	36	0	0	Pass
2.2686	30	0	0	Pass
2.2903	28	0	0	Pass
2.3120	26	0	0	Pass
2.3337	20	0	0	Pass
2.3554	16	0	0	Pass
2.3771	13	0	0	Pass
2.3988	8	0	0	Pass
2.4205	6	0	0	Pass
2.4422	5	0	0	Pass
2.4638	4	0	0	Pass
2.4855	4	0	0	Pass
2.5072	3	0	0	Pass
2.5289	3	0	0	Pass
2.5506	3	0	0	Pass
2.5723	3	0	0	Pass

Water Quality BMP Flow and Volume for POC #1
On-line facility volume: 0 **acre-feet**
On-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**
Off-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**

LID Report

LID Technique	Used for Treatment?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft.)	Cumulative Volume Infiltration Credit	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	N	4159.10			N	0.00	
Total Volume Infiltrated		4159.10	0.00	0.00		0.00	
0.00	0%	No Treat. Credit					

Compliance with LID Standard 8
Duration Analysis Result = Failed

Perlnd and Implnd Changes

No changes have been made.

WWHM2012
PROJECT REPORT

Project Name: Pond Network 9
Site Name:
Site Address:
City :
Report Date: 1/12/2021
Gage : Everett
Data Start : 1948/10/01
Data End : 2009/09/30
Precip Scale: 1.20
Version Date: 2019/09/13
Version : 4.2.17

Low Flow Threshold for POC 1 : 50 Percent of the 2 Year

High Flow Threshold for POC 1: 50 year

PREDEVELOPED LAND USE

Name : Basin 9S
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Forest, Flat	7
Pervious Total	7

Impervious Land Use	acre
Impervious Total	0
Basin Total	7

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : Basin 9S
Bypass: No

GroundWater: No

Pervious Land Use	acre
C, Pasture, Flat	2
Pervious Total	2

Impervious Land Use	acre
PARKING FLAT	3.2
POND	1.8
Impervious Total	5
Basin Total	7

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Name : Trapezoidal Pond 1
Bottom Length: 251.00 ft.
Bottom Width: 250.00 ft.
Depth: 4.5 ft.
Volume at riser head: 4.6396 acre-feet.
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: 3 ft.
Riser Diameter: 24 in.
Notch Type: Rectangular
Notch Width: 0.350 ft.
Notch Height: 1.333 ft.
Orifice 1 Diameter: 2 in. **Elevation:** 0 ft.

Element Flows To:

Outlet 1	Outlet 2

Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
101.50	1.440	0.000	0.000	0.000
101.55	1.444	0.072	0.024	0.000
101.60	1.447	0.144	0.034	0.000
101.65	1.450	0.216	0.042	0.000
101.70	1.454	0.289	0.048	0.000
101.75	1.457	0.362	0.054	0.000
101.80	1.461	0.435	0.059	0.000
101.85	1.464	0.508	0.064	0.000
101.90	1.468	0.581	0.068	0.000

101.95	1.471	0.655	0.072	0.000
102.00	1.475	0.728	0.076	0.000
102.05	1.478	0.802	0.080	0.000
102.10	1.482	0.876	0.084	0.000
102.15	1.485	0.951	0.087	0.000
102.20	1.489	1.025	0.090	0.000
102.25	1.492	1.099	0.094	0.000
102.30	1.496	1.174	0.097	0.000
102.35	1.499	1.249	0.100	0.000
102.40	1.503	1.324	0.103	0.000
102.45	1.506	1.399	0.105	0.000
102.50	1.510	1.475	0.108	0.000
102.55	1.513	1.550	0.111	0.000
102.60	1.517	1.626	0.113	0.000
102.65	1.521	1.702	0.116	0.000
102.70	1.524	1.778	0.118	0.000
102.75	1.528	1.855	0.121	0.000
102.80	1.531	1.931	0.123	0.000
102.85	1.535	2.008	0.126	0.000
102.90	1.538	2.085	0.128	0.000
102.95	1.542	2.162	0.130	0.000
103.00	1.545	2.239	0.132	0.000
103.05	1.549	2.316	0.135	0.000
103.10	1.553	2.394	0.137	0.000
103.15	1.556	2.472	0.139	0.000
103.20	1.560	2.550	0.148	0.000
103.25	1.563	2.628	0.170	0.000
103.30	1.567	2.706	0.200	0.000
103.35	1.571	2.784	0.235	0.000
103.40	1.574	2.863	0.274	0.000
103.45	1.578	2.942	0.316	0.000
103.50	1.581	3.021	0.362	0.000
103.55	1.585	3.100	0.410	0.000
103.60	1.589	3.179	0.460	0.000
103.65	1.592	3.259	0.512	0.000
103.70	1.596	3.339	0.565	0.000
103.75	1.600	3.419	0.620	0.000
103.80	1.603	3.499	0.676	0.000
103.85	1.607	3.579	0.733	0.000
103.90	1.610	3.659	0.791	0.000
103.95	1.614	3.740	0.850	0.000
104.00	1.618	3.821	0.909	0.000
104.05	1.621	3.902	0.969	0.000
104.10	1.625	3.983	1.028	0.000
104.15	1.629	4.064	1.088	0.000
104.20	1.632	4.146	1.156	0.000
104.25	1.636	4.228	1.230	0.000
104.30	1.640	4.310	1.305	0.000
104.35	1.643	4.392	1.382	0.000
104.40	1.647	4.474	1.460	0.000
104.45	1.651	4.556	1.540	0.000
104.50	1.655	4.639	1.622	0.000
104.55	1.658	4.722	1.861	0.000
104.60	1.662	4.805	2.295	0.000
104.65	1.666	4.888	2.856	0.000
104.70	1.669	4.972	3.515	0.000
104.75	1.673	5.055	4.253	0.000

104.80	1.677	5.139	5.052	0.000
104.85	1.681	5.223	5.897	0.000
104.90	1.684	5.307	6.769	0.000
104.95	1.688	5.391	7.650	0.000
105.00	1.692	5.476	8.524	0.000
105.05	1.695	5.561	9.373	0.000
105.10	1.699	5.646	10.18	0.000
105.15	1.703	5.731	10.93	0.000
105.20	1.707	5.816	11.61	0.000
105.25	1.710	5.901	12.21	0.000
105.30	1.714	5.987	12.73	0.000
105.35	1.718	6.073	13.17	0.000
105.40	1.722	6.159	13.53	0.000
105.45	1.726	6.245	13.84	0.000
105.50	1.729	6.331	14.11	0.000
105.55	1.733	6.418	14.56	0.000
105.60	1.737	6.505	14.86	0.000
105.65	1.741	6.592	15.16	0.000
105.70	1.745	6.679	15.45	0.000
105.75	1.748	6.766	15.74	0.000
105.80	1.752	6.854	16.02	0.000
105.85	1.756	6.941	16.29	0.000
105.90	1.760	7.029	16.56	0.000
105.95	1.764	7.118	16.83	0.000
106.00	1.767	7.206	17.09	0.000
106.05	1.771	7.294	17.35	0.000

ANALYSIS RESULTS

Stream Protection Duration

Predeveloped Landuse Totals for POC #1
Total Pervious Area:7
Total Impervious Area:0

Mitigated Landuse Totals for POC #1
Total Pervious Area:2
Total Impervious Area:5

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.235203
5 year	0.360808
10 year	0.457679
25 year	0.596273
50 year	0.711701
100 year	0.837936

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)

2 year	0.104503
5 year	0.130536
10 year	0.149152
25 year	0.174263
50 year	0.194151
100 year	0.215079

Stream Protection Duration
Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	0.235	0.096
1950	0.240	0.109
1951	0.215	0.091
1952	0.169	0.088
1953	0.142	0.087
1954	0.768	0.102
1955	0.303	0.129
1956	0.267	0.130
1957	0.331	0.114
1958	0.239	0.100
1959	0.237	0.104
1960	0.221	0.107
1961	0.418	0.121
1962	0.206	0.088
1963	0.340	0.097
1964	0.245	0.079
1965	0.204	0.108
1966	0.120	0.092
1967	0.242	0.094
1968	0.295	0.108
1969	0.717	0.099
1970	0.169	0.096
1971	0.267	0.132
1972	0.197	0.098
1973	0.186	0.112
1974	0.403	0.106
1975	0.164	0.084
1976	0.169	0.101
1977	0.142	0.090
1978	0.169	0.089
1979	0.470	0.091
1980	0.220	0.089
1981	0.173	0.088
1982	0.224	0.115
1983	0.382	0.096
1984	0.231	0.132
1985	0.279	0.123
1986	0.657	0.145
1987	0.313	0.135
1988	0.162	0.116
1989	0.165	0.085
1990	0.219	0.114
1991	0.226	0.108
1992	0.172	0.111
1993	0.143	0.079
1994	0.157	0.110

1995	0.230	0.121
1996	0.392	0.117
1997	0.779	0.448
1998	0.143	0.095
1999	0.187	0.109
2000	0.141	0.121
2001	0.056	0.070
2002	0.213	0.117
2003	0.167	0.103
2004	0.281	0.118
2005	0.196	0.104
2006	0.522	0.123
2007	0.413	0.116
2008	0.579	0.171
2009	0.176	0.109

Stream Protection Duration
Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.7791	0.4477
2	0.7683	0.1705
3	0.7169	0.1449
4	0.6569	0.1350
5	0.5791	0.1325
6	0.5215	0.1319
7	0.4705	0.1305
8	0.4178	0.1294
9	0.4126	0.1226
10	0.4033	0.1225
11	0.3918	0.1215
12	0.3821	0.1209
13	0.3398	0.1205
14	0.3311	0.1179
15	0.3134	0.1171
16	0.3027	0.1168
17	0.2949	0.1161
18	0.2813	0.1157
19	0.2793	0.1147
20	0.2672	0.1143
21	0.2670	0.1138
22	0.2445	0.1117
23	0.2425	0.1110
24	0.2403	0.1097
25	0.2393	0.1094
26	0.2372	0.1094
27	0.2350	0.1091
28	0.2307	0.1084
29	0.2296	0.1077
30	0.2258	0.1076
31	0.2241	0.1073
32	0.2210	0.1061
33	0.2205	0.1042
34	0.2193	0.1036
35	0.2148	0.1029
36	0.2135	0.1017
37	0.2062	0.1009

38	0.2042	0.1003
39	0.1970	0.0993
40	0.1959	0.0977
41	0.1872	0.0972
42	0.1864	0.0961
43	0.1765	0.0961
44	0.1727	0.0959
45	0.1721	0.0946
46	0.1695	0.0940
47	0.1691	0.0916
48	0.1691	0.0915
49	0.1688	0.0914
50	0.1673	0.0904
51	0.1653	0.0887
52	0.1642	0.0887
53	0.1623	0.0881
54	0.1567	0.0880
55	0.1434	0.0879
56	0.1425	0.0870
57	0.1424	0.0847
58	0.1420	0.0845
59	0.1406	0.0791
60	0.1195	0.0791
61	0.0564	0.0701

Stream Protection Duration
POC #1
The Facility PASSED

The Facility PASSED.

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.1176	19879	6139	30	Pass
0.1236	17227	3352	19	Pass
0.1296	14874	2091	14	Pass
0.1356	12917	947	7	Pass
0.1416	11092	631	5	Pass
0.1476	9565	462	4	Pass
0.1536	8286	421	5	Pass
0.1596	7178	384	5	Pass
0.1656	6222	341	5	Pass
0.1716	5375	296	5	Pass
0.1776	4718	289	6	Pass
0.1836	4115	282	6	Pass
0.1896	3608	273	7	Pass
0.1956	3166	267	8	Pass
0.2016	2787	259	9	Pass
0.2076	2479	255	10	Pass
0.2136	2184	250	11	Pass
0.2196	1920	244	12	Pass
0.2256	1677	240	14	Pass
0.2316	1518	236	15	Pass
0.2376	1381	230	16	Pass
0.2436	1260	226	17	Pass
0.2496	1164	222	19	Pass
0.2556	1076	218	20	Pass

0.2616	1013	207	20	Pass
0.2676	955	197	20	Pass
0.2736	894	188	21	Pass
0.2796	830	169	20	Pass
0.2856	782	153	19	Pass
0.2916	738	146	19	Pass
0.2976	690	142	20	Pass
0.3036	654	139	21	Pass
0.3096	624	135	21	Pass
0.3156	603	131	21	Pass
0.3216	585	123	21	Pass
0.3276	564	116	20	Pass
0.3336	541	109	20	Pass
0.3396	508	102	20	Pass
0.3456	489	93	19	Pass
0.3516	473	82	17	Pass
0.3576	459	79	17	Pass
0.3636	441	75	17	Pass
0.3696	425	72	16	Pass
0.3756	414	66	15	Pass
0.3816	395	62	15	Pass
0.3876	380	57	15	Pass
0.3936	369	54	14	Pass
0.3996	354	50	14	Pass
0.4056	342	45	13	Pass
0.4117	335	42	12	Pass
0.4177	323	40	12	Pass
0.4237	313	37	11	Pass
0.4297	305	31	10	Pass
0.4357	293	16	5	Pass
0.4417	284	8	2	Pass
0.4477	277	2	0	Pass
0.4537	267	0	0	Pass
0.4597	257	0	0	Pass
0.4657	243	0	0	Pass
0.4717	234	0	0	Pass
0.4777	227	0	0	Pass
0.4837	213	0	0	Pass
0.4897	205	0	0	Pass
0.4957	195	0	0	Pass
0.5017	187	0	0	Pass
0.5077	177	0	0	Pass
0.5137	166	0	0	Pass
0.5197	160	0	0	Pass
0.5257	153	0	0	Pass
0.5317	147	0	0	Pass
0.5377	135	0	0	Pass
0.5437	129	0	0	Pass
0.5497	122	0	0	Pass
0.5557	111	0	0	Pass
0.5617	100	0	0	Pass
0.5677	88	0	0	Pass
0.5737	75	0	0	Pass
0.5797	64	0	0	Pass
0.5857	59	0	0	Pass
0.5917	56	0	0	Pass
0.5977	50	0	0	Pass

0.6037	43	0	0	Pass
0.6097	40	0	0	Pass
0.6157	37	0	0	Pass
0.6217	36	0	0	Pass
0.6277	32	0	0	Pass
0.6337	28	0	0	Pass
0.6397	26	0	0	Pass
0.6457	20	0	0	Pass
0.6517	16	0	0	Pass
0.6577	14	0	0	Pass
0.6637	9	0	0	Pass
0.6697	6	0	0	Pass
0.6757	5	0	0	Pass
0.6817	4	0	0	Pass
0.6877	4	0	0	Pass
0.6937	3	0	0	Pass
0.6997	3	0	0	Pass
0.7057	3	0	0	Pass
0.7117	3	0	0	Pass

Water Quality BMP Flow and Volume for POC #1
On-line facility volume: 0 **acre-feet**
On-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**
Off-line facility target flow: 0 **cfs.**
Adjusted for 15 min: 0 **cfs.**

LID Report

LID Technique	Used for Water Quality Treatment?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft.)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Comment Water Quality Treated
Trapezoidal Pond 1 POC	N	1018.81			N	0.00	
Total Volume Infiltrated		1018.81	0.00	0.00		0.00	
0.00	0%	No Treat. Credit					

Compliance with LID Standard 8
Duration Analysis Result = Failed

Perlnd and Implnd Changes

No changes have been made.

Appendix D: Conveyance Analysis and Design

N/A