Birch Point Subwatershed Drainage Study Report

Prepared for:

Whatcom County
Public Works
Stormwater Division

Birch Bay Watershed
and Aquatic
Resources
Management District

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(Tt Project Number T42523)

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1.0 INTRODUCTION

1.1 PROJECT OVERVIEW AND BACKGROUND

This study provides updates to the hydrologic and hydraulic analyses for the Birch Point and Shintaffer subwatersheds. The original models were developed for the Birch Point Subwatershed Master Plan (Tetra Tech, 2016b), and for the Central North Subwatershed Master Plan (Tetra Tech, 2013), respectively. This report will provide hydrologic and hydraulic analysis and preliminary sizing for conceptual design options to mitigate flooding in residential areas impacted by drainage from upland areas to where it enters Birch Bay.

The findings, conclusions, and project recommendations presented in this report are intended to help guide selection of a preferred solution to reduce flood hazards in the study area. The information provided should be considered planning level only and is based on limited ground survey and incomplete information on site conditions. Additional effort will be needed to optimize performance, investigate potential adverse impacts, and develop the design configuration of the options presented in this report prior to construction.

1.2 PREVIOUS STUDIES

The Central North Subwatershed Master Plan (Tetra Tech, 2013) was developed as a systematic approach to solving stormwater problems in the Central North subwatershed, improving drainage, and reducing flooding. The Shintaffer subbasin was included in the 2013 Master Plan hydrologic and hydraulic analysis. Stormwater drainage issues identified in the Shintaffer subbasin include inadequate conveyance, failing infrastructure, and inadequate maintenance.

The 2016 Tetra Tech Hydrologic and Hydraulic technical memorandum prepared for the Birch Point Subwatershed Master Plan previously summarized the hydrology and hydraulics of the study area (Tetra Tech, 2016a). The purpose of the 2016 technical memorandum was to develop an understanding of the hydrologic regime, determine the capacity of the existing storm drainage system and identify capacity restrictions, and identify flooding problems in the Birch Point, Terrell Creek Urban Area, and Point Whitehorn subwatersheds. The hydrologic and hydraulic model development, as well as updates to the models, are discussed below as part of this report. The Birch Bay Village development was outside the scope of the 2016 study so was not included in that report.

1.3 STUDY AREA

The study area (see Figure 1) is approximately 1,600 acres in size and is located north of Birch Bay and bounded by Shintaffer Road on the east. The northern boundary is defined by a line from Shintaffer Road 2,000 feet north of Lincoln Road extending in a northwesterly direction to Semiahmoo Parkway. The western boundary extends from Birch Bay to Birch Point Road about one mile west of Selder Road then in a northeasterly direction to Semiahmoo Parkway.

The study area includes the following subbasins identified in the 2016 Birch Point Subwatershed Master Plan: Semiahmoo Uplands, Birch Bay Marina, Rogers Slough Lower Trib, Rogers Slough Upper Trib and the Shintaffer subbasin from the Central North subwatershed plan (Tetra Tech, 2013). For this report, the subbasins have been reorganized into subareas for convenience in reporting and to reflect a better understanding of drainage patterns developed with this detailed study. The study area vicinity map with subarea delineation is shown on Figure 1 and subareas are described in greater detail in Section 2.0. The subbasins used as planning units for the 2013 and 2016 subwatershed master planning are also shown on this figure for reference.

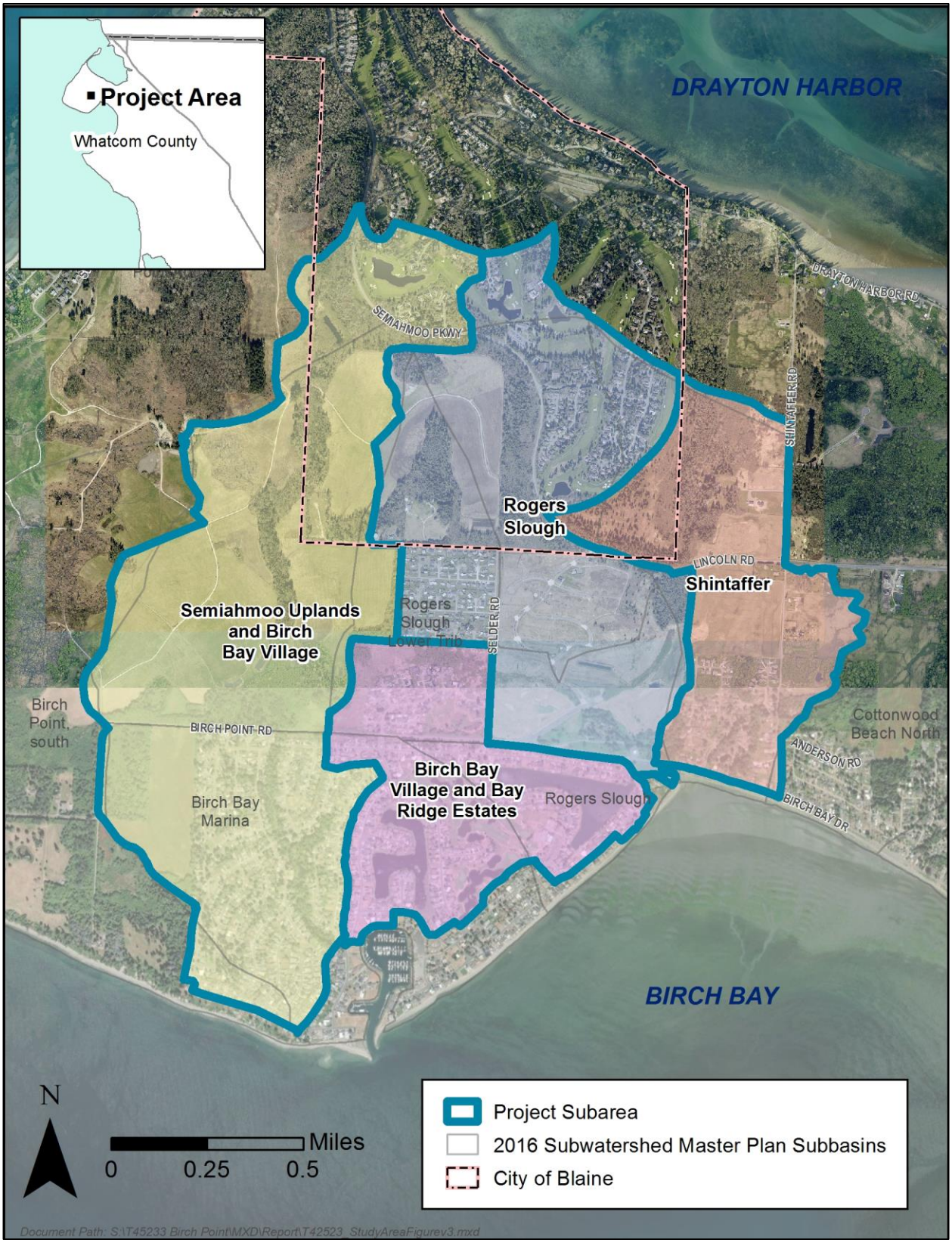


Figure 1. Birch Point Subwatershed Vicinity Map and Project Area

2.0 SUBAREA DESCRIPTIONS

The Birch Point Study Area is subdivided into four planning subareas aligned with primary drainage paths through the tributary basins:

- Semiahmoo Uplands and Birch Bay Village
- Birch Bay Village and Bay Ridge Estates
- Rogers Slough
- Shintaffer

2.1 SEMIAHMOO UPLANDS AND BIRCH BAY VILLAGE SUBAREA

The Semiahmoo Uplands and Birch Bay Village subarea covers the western third of the study area (see Figure 2). This subarea covers 705 acres between the residential neighborhood north of Semiahmoo Parkway to Birch Bay. Semiahmoo Parkway runs near the northern portion and Birch Bay is along the southern boundary. The subarea is bisected by Birch Point Road. Land use northwest of Semiahmoo Parkway is residential and recreational (golf course). Between Semiahmoo Parkway and Birch Point Road land use is undeveloped agricultural, with a forested riparian area surrounding an ephemeral stream that carries stormwater runoff. This stream originates in the subarea uplands and flows south under Birch Point Road through a 24-inch culvert. The west side of the Birch Bay Village neighborhood is located south (downstream) of Birch Point Road. Future land use assumes the undeveloped land in unincorporated Whatcom County between Semiahmoo Parkway and Birch Point Road will convert based on zoning as rural residential with five and ten acre lots. Zoning for the area in the City of Blaine is Residential Planned Recreation. The residential area north of Semiahmoo Parkway and Birch Bay Village are assumed to be fully built out and are representative of future land use.

The drainage system for this subarea starts in the residential golf course neighborhood north of Semiahmoo Parkway where stormwater runoff is collected in a golf course pond and routed south under Semiahmoo Parkway. The drainageway flows in a natural channel to an inline impoundment downstream of the parkway then continues in a natural channel to the Beaver Creek Wetland north of Birch Point Road. Stormwater runoff from five upland areas is routed through detention facilities located on the perimeter of the wetland and discharge to the wetland area. The hydraulic analysis (see Section 4.2) showed that during large runoff events, surface water flows overland to the Bay Ridge Estates area located to the east of Beaver Creek Wetland area. The wetland discharges through a 24-inch diameter culvert to Beaver Creek and into the west side of the Birch Bay Village neighborhood. Beaver Creek flows south through an open channel and two road culverts then into a pond controlled by a 42-inch diameter pipeline to the Birch Bay Marina.

2.2 BIRCH BAY VILLAGE AND BAY RIDGE ESTATES SUBAREA

The Birch Bay Village and Bay Ridge Estates Subarea covers 246 acres and generally includes the Bay Ridge Estates neighborhood and is bounded by Skyvue Road on the north, Chehalis Road on the west side, and Selder Road and Birch Bay to the south and east (see Figure 3). The subarea is mostly medium-density residential in Birch Bay Village and Bay Ridge Estates neighborhoods. The remaining area is undeveloped vacant land (north of Bay Ridge Estates) and open space/golf course in Birch Bay Village.

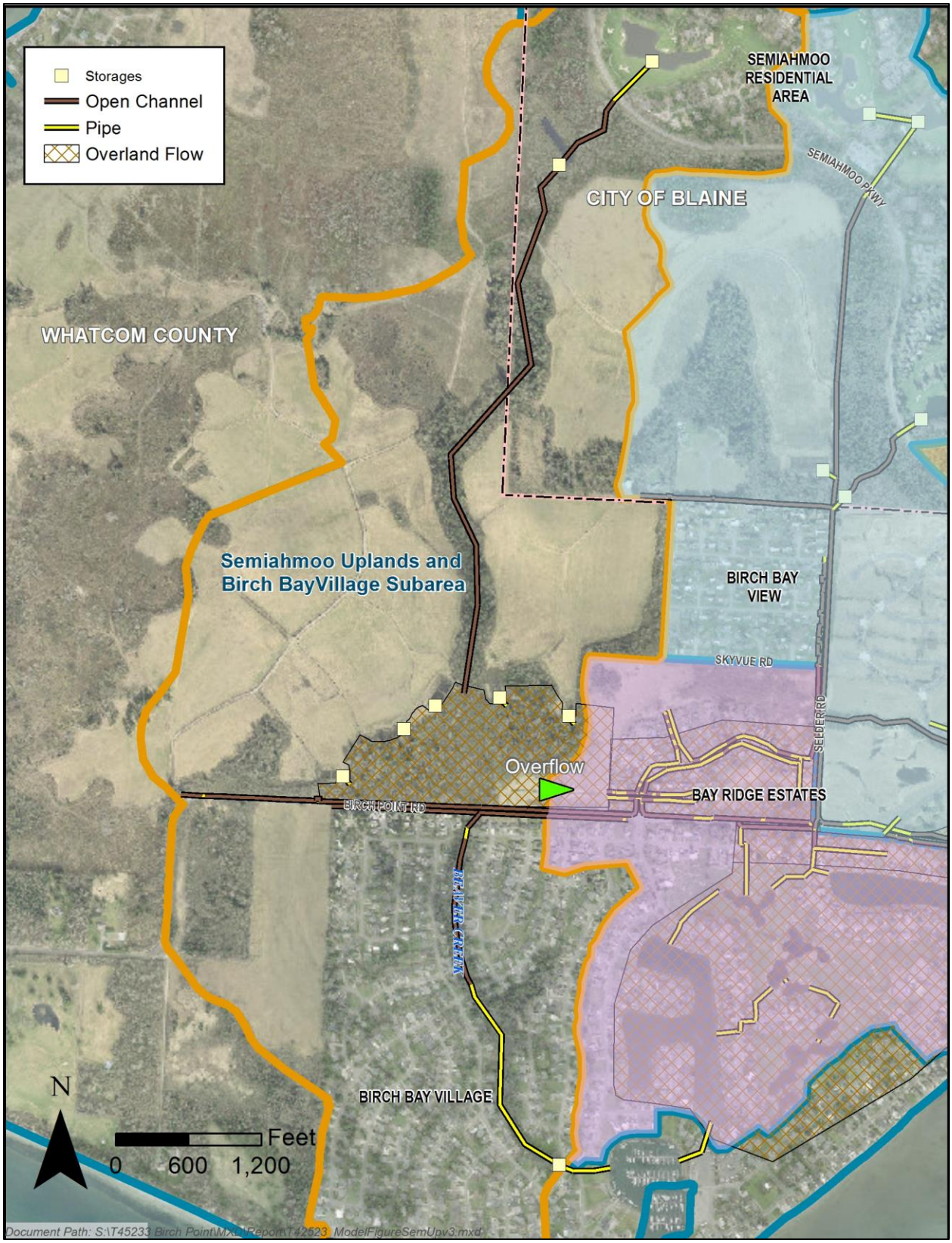


Figure 2. Semiahmoo Uplands and Birch Bay Village Subarea

Figure 3. Birch Bay Village and Bay Ridge Estates Subarea

Bay Ridge Estates is served by a piped storm drain system within the development and discharges to a pond at the northwest corner of Selder Road and Birch Point Road. The Bay Ridge Estates system combines with the Birch Point Road and Selder Road drainage system and crosses under Birch Point Road at two locations: at the entrance to Birch Bay Village and at Selder Road. From this point, the drainageway enters the Birch Bay Village drainage system and is combined with the golf course ponds and is conveyed to Thunderbird Lake and then to the Birch Bay Marina.

The hydraulic analysis showed that stormwater runoff from adjacent subareas overflows to the Birch Bay Village and Bay Ridge Estates subarea at three locations during large storm events (see green arrows in Figure 3):

- From the Semiahmoo Uplands and Birch Bay Village subarea (see Section 4.2) to the west end of Bay Ridge Estates.
- From the Rogers Slough subarea from the culvert under Selder Road at Skyvue Road (see Section 4.3).
- From the Rogers Slough subarea at Birch Bay Drive near Birch Point Loop to Nootka Loop and Salish Road in Birch Bay Village (see Section 4.5).

2.3 ROGERS SLOUGH SUBAREA

The Rogers Slough Subarea covers 444 acres along the eastern edge of the subwatershed (see Figure 4). The subbasin extends from the north side of Semiahmoo Parkway to Birch Point Road. Land use is medium-density residential north of Semiahmoo Parkway and undeveloped agricultural land south of the parkway to the north end of Selder Road. The undeveloped land is in the City of Blaine and is zoned Residential Planned Recreation. The Birch Bay View residential neighborhood is located west of Selder Road. The area east of Selder Road is vacant land but actively developing as the Horizon at Semiahmoo neighborhood. The area south of Horizon Drive and Birch Bay Drive is vacant land or low density residential and is zoned as Rural Residential.

The subbasin drains through roadside ditches and culverts, eventually combining flow with drainage from the north end of Selder Road near the Horizons development north of Birch Point Road and east of Selder Road. The combined runoff forms a defined stream along the east side of Selder Road and north of Bay Ridge Drive. The stream flows east of Birch Point Road then south to Birch Bay Drive where it discharges under the road through 18- and 30-inch concrete culverts into Rogers Slough. A tide gate that was installed immediately downstream of the road crossing was removed in November 2022. However this gate was present during the large storm event that occurred in November 2021.

2.4 SHINTAFFER SUBAREA

The Shintaffer subarea is 256 acres on the west side of the Central North subwatershed (see Figure 5). The subbasin is west of Shintaffer Road except for a moderately sized area immediately south of Lincoln Road. The Shintaffer subbasin is bisected by Lincoln Road. Land use in the subbasin is primarily agricultural north of Richmond Park and residential to the south. An undeveloped area is located north of Semiahmoo Parkway and west of Shintaffer Road. The subarea crosses into the City of Blaine in the northwest corner. The area north of Richmond Park is zoned Urban Residential, Neighborhood Commercial, and Rural Residential.

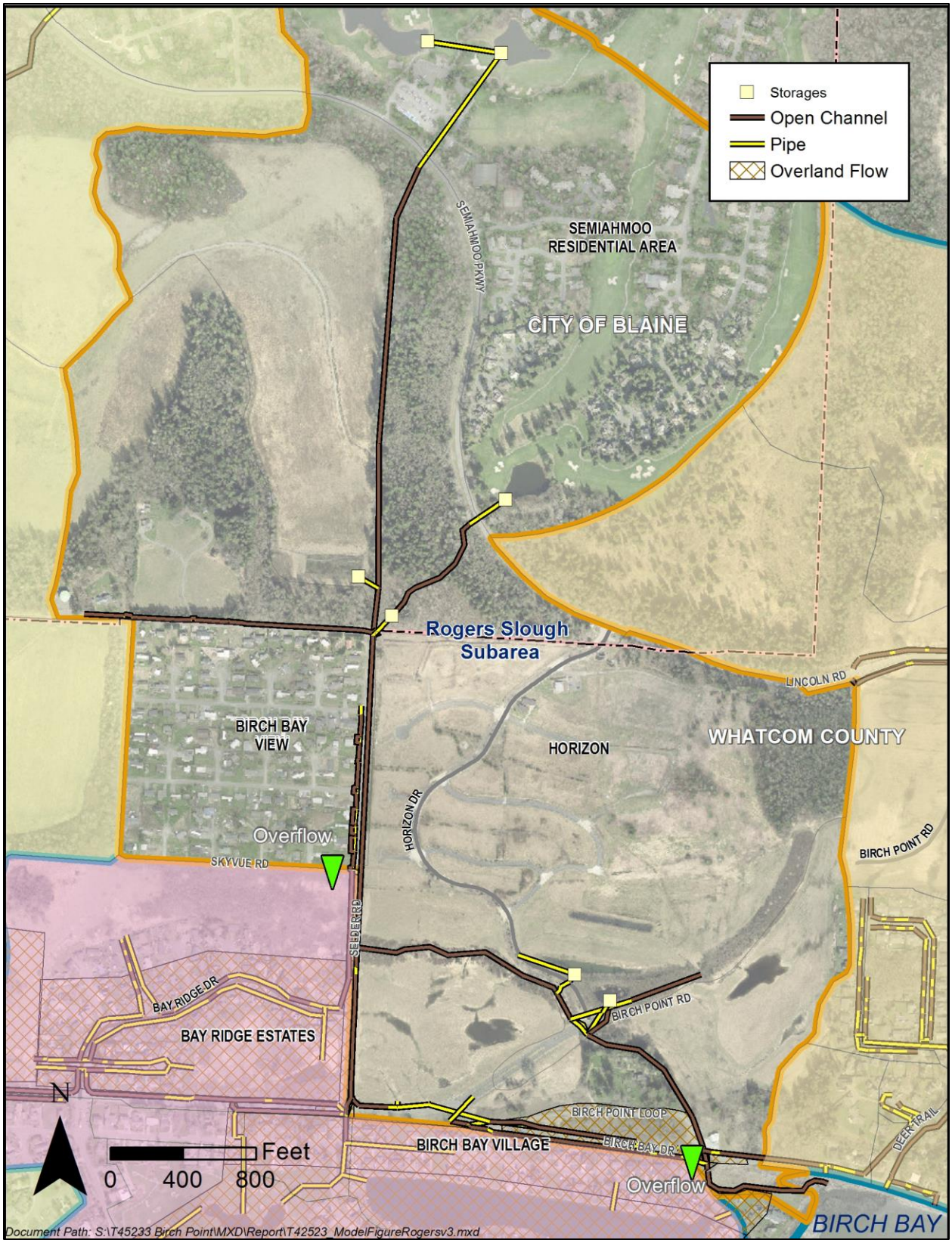


Figure 4. Rogers Slough Subarea

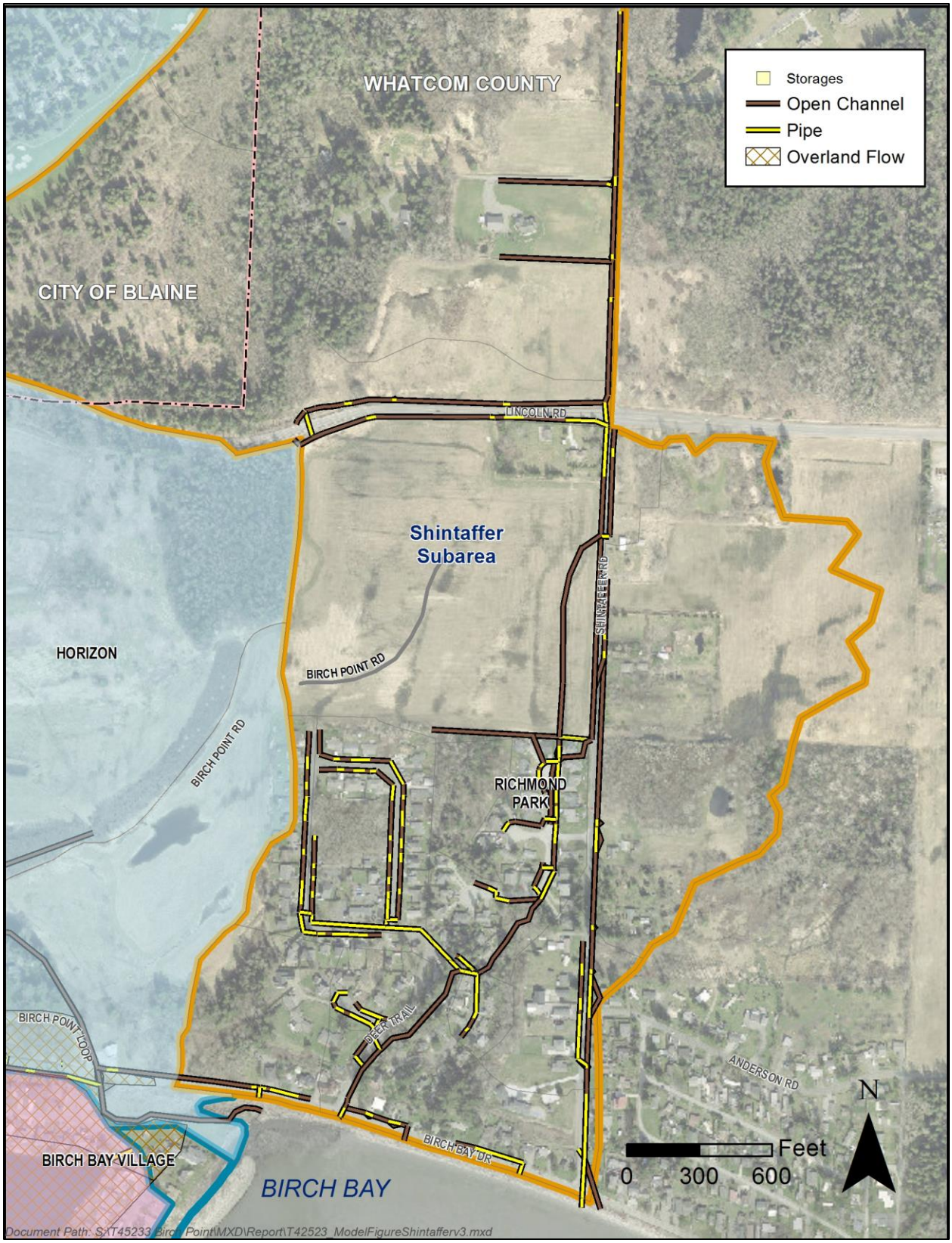


Figure 5. Shintaffer Subarea

Surface water in the Shintaffer subarea flows south to Birch Bay from headwaters north of Semiahmoo Parkway and west of Shintaffer Road. Drainage from the Semiahmoo residential area discharges to a wetland area east of Shintaffer Road and north of Lincoln Road. A network of field ditches drains the wetland area to roadside ditches along the north side of Lincoln Road and the west side of Shintaffer Road. The main conveyance pathway continues south along Shintaffer Road where it becomes a storm drain pipeline at Richmond Park Road. This 24-inch concrete pipe conveys flow through the Richmond Park subdivision and outfalls to a steep ravine. Ultimately, stormwater is discharged to Birch Bay through an ungated outfall near Deer Trail. A small local system along the north side of Birch Bay Drive is also served by the outfall.

A system of ditches, culverts, and storm drains collects runoff from the area east of Shintaffer Road and conveys it to a pipeline south of Anderson Road. This pipeline discharges to Birch Bay through an ungated outfall at Shintaffer Road.

Two local storm drain systems with separate outfalls to Birch Bay collect runoff from along Birch Bay Drive. One system discharges to Birch Bay west of Deer Trail and the other discharges to Birch Bay west of Shintaffer Road.

3.0 UPDATES TO HYDROLOGIC MODEL

The Hydrologic Simulation Program-Fortran (HSPF) (USEPA, 2005) is a continuous simulation hydrology model that uses long-term climate data (rainfall and evapotranspiration data) and land use parameter inputs to determine runoff characteristics for a watershed. HSPF simulates all phases of the hydrologic cycle, including rainfall, direct surface runoff, evapotranspiration, and ground infiltration. Runoff from discrete subbasins is routed through rating tables used to represent pipes, channels, lakes, and other flood storage areas.

Generally, rainfall that falls on the land surface and is not removed through evapotranspiration either soaks into the ground or discharges to a stream channel or other body of water as direct surface runoff. Water that infiltrates into the ground moves laterally through the unsaturated zone as interflow or percolates into the saturated zone as groundwater. Interflow discharges to stream channels but at a slower rate than direct runoff. Groundwater also discharges to stream channels that intersect the saturated zone, contributing to long-term base flow in the system. Groundwater can also leave the surface watershed by entering deep groundwater or moving outside the watershed basin.

3.1 SUBCATCHMENT DELINEATION

The Birch Point subwatershed was previously delineated into 25 subcatchments (Tetra Tech, 2016a).The existing subcatchment delineation was re-evaluated for this report and modified into 40 subcatchments based on 2017 LiDAR data (Quantum Spatial, 2017), as-builts drawings, and aerial photography (see Appendix A). Specifically, Shintaffer (Tetra Tech, 2013), and Birch Bay Village subbasins were included in the study area, and resolution was added to the Semiahmoo Uplands and Birch Bay Village subarea and the Roger Slough subarea.

3.2 LAND USE AND IMPERVIOUS AREA

Flow characteristics were computed for existing land use conditions at the 40 subcatchments in the study area. Existing land use conditions were updated based on 2019 aerial photography provided by Whatcom County. Existing land use conditions and impervious area are shown in Figure 6. Impervious area estimates developed for the watershed characterization study (ESA Adolfson, 2007) were used as the

impervious area input to the HSPF model. The ESA Adolfson study represents the most complete representation of impervious area in the Birch Bay watershed The measured impervious area was assumed to be directly connected to the storm drain system. Table 1 shows the existing and future impervious area in the Birch Point study area.

Table 1. Impervious Area in the Birch Point Study Area

Return Period	Semiahmoo Uplands and Birch Bay Village Subarea	Birch Bay Village and Bay Ridge Estates Subarea	Rogers Slough Subarea	Shintaffer Subarea	Birch Point Study Area
Total Area (acres)	705	246	444	256	**1,652**
Existing Conditions					
Impervious Area (acres)	97	100	60	21	**277**
Impervious Area (%)	14%	41%	14%	8%	17%
Future Conditions					
Impervious Area (acres)	150	105	166	64	**485**
Impervious Area (%)	21%	42%	37%	25%	29%
Change from Existing					
Impervious Area (acres)	54	4	106	44	**208**
Percent Change (%)	56%	5%	176%	209%	75%

Currently, impervious area in the Birch Point study area is found mostly in unincorporated Whatcom County with a small amount in the City of Blaine, primarily in the residential neighborhoods east of Semiahmoo Parkway. Figure 7 illustrates the distribution of impervious area in the study area.

3.1 FUTURE LAND USE

In 2013, the Birch Bay Urban Growth Area (UGA), which includes portions of the Birch Point study area, was added to Whatcom County's National Pollutant Discharge Elimination System (NPDES) Phase II permit coverage area. Coverage under this permit requires the County to implement minimum standards for maintenance of the existing stormwater system. Flow control and water quality treatment for new development will be required to meet more stringent minimum technical requirements specified in the Stormwater Manual for Western Washington. However, a significant portion of the Birch Point subwatershed is outside the NPDES boundary and could potentially develop without flow control. For these areas, an increase in peak stormwater runoff rates may occur with redevelopment so the future developed land use condition is included as part of this analysis.

Flow estimates for future land use runoff are not intended to establish detention based runoff rates and would represent the worst case scenario for sizing estimates. The performance of future stormwater management facilities due to design deficiencies and the potential for poor maintenance result in uncertain estimates of peak flow rates. Using uncontrolled flow rates would allow the Birch Bay Watershed & Aquatic Resources Management (BBWARM) district, a stormwater utility provider, to provide resiliency in solutions to resolve flooding and conveyance issues.

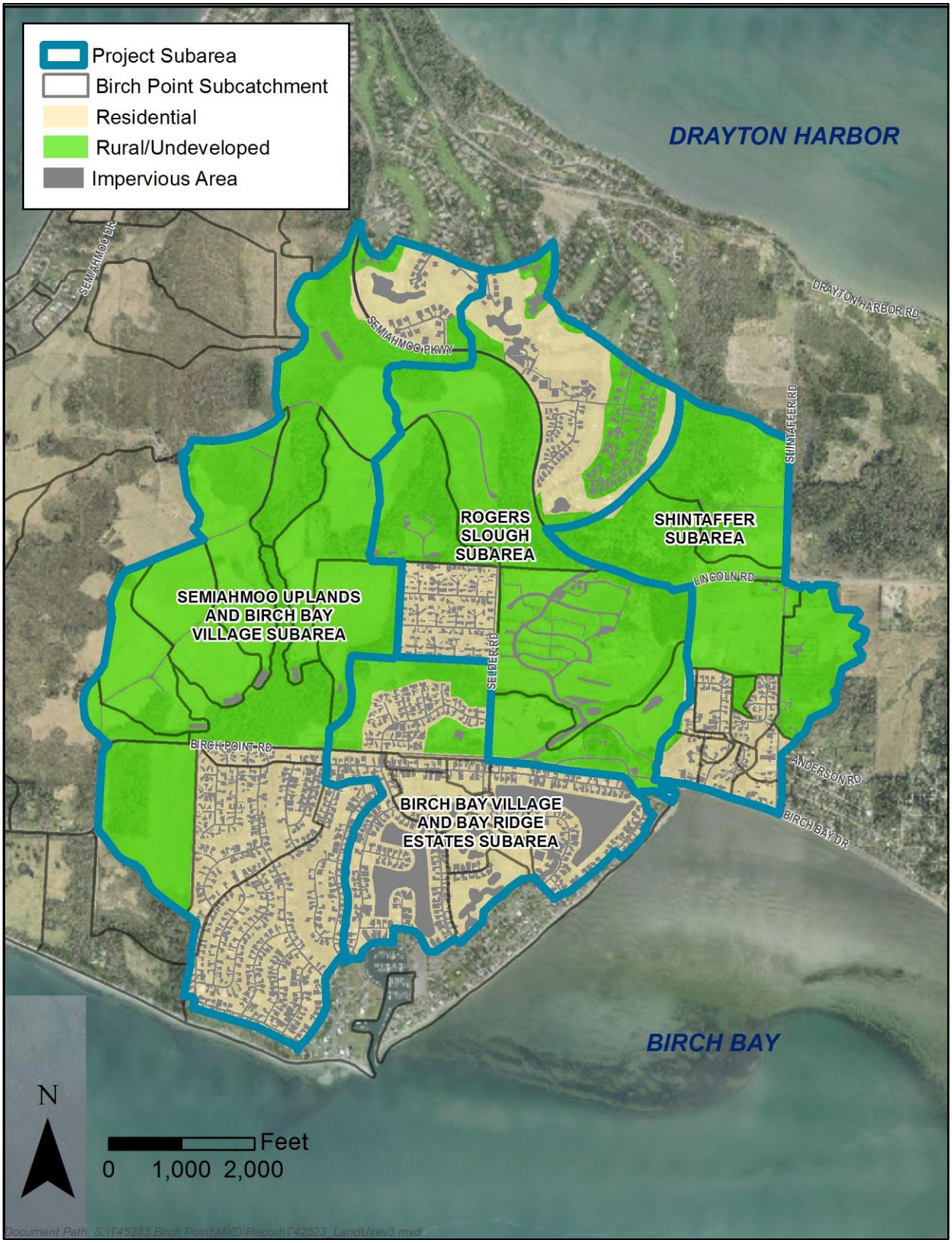


Figure 6. Existing Land Use Condition

Figure 7. Impervious Area Distribution by Jurisdiction

Runoff for future conditions was evaluated based on land cover defined by Whatcom County and the City of Blaine zoning. Land use conversion is assumed to occur only for vacant areas currently undeveloped. Areas currently developed as single-family residential areas were assumed to be fully built-out and would remain at the current housing density into the future. This includes the Semiahmoo residential area, Birch Bay Village, Bay Ridge Estates, Richmond Park, and the residential area along Shintaffer Road, Deer Trail, Pheasant and Grouse Crescent and Birch Bay Drive near Shintaffer Road. Wetland and riparian corridors along with associated buffers and other critical areas were also retained and land use in these areas was not converted to a higher density land use. Impervious area is computed by applying the directly connected impervious fraction by zoning classification listed in Table 2 for the undeveloped areas. Directly connected impervious area is the portion of the land cover that is directly connected to the storm drainage system. Land use conversion in non-critical areas was assumed to occur over the entire zoned area regardless of parcel size. Figure 8 shows the zoning used to define future land use.

Table 2. Impervious Area Assignments for Zoning Classifications

Zoning[a]	Density	Directly Connected Impervious Area
Rural Residential	5 to 10 acre lots	5%
Residential Planned Recreation (Blaine)	3 lots per acres	40%
Urban Residential	4 lots per acre	40%
Urban Residential Medium Density	6 lots per acres	50%
General Commercial		80%
Neighborhood Commercial		85%
Open Water		100%

a. Whatcom County zoning except as noted, See Figure 8

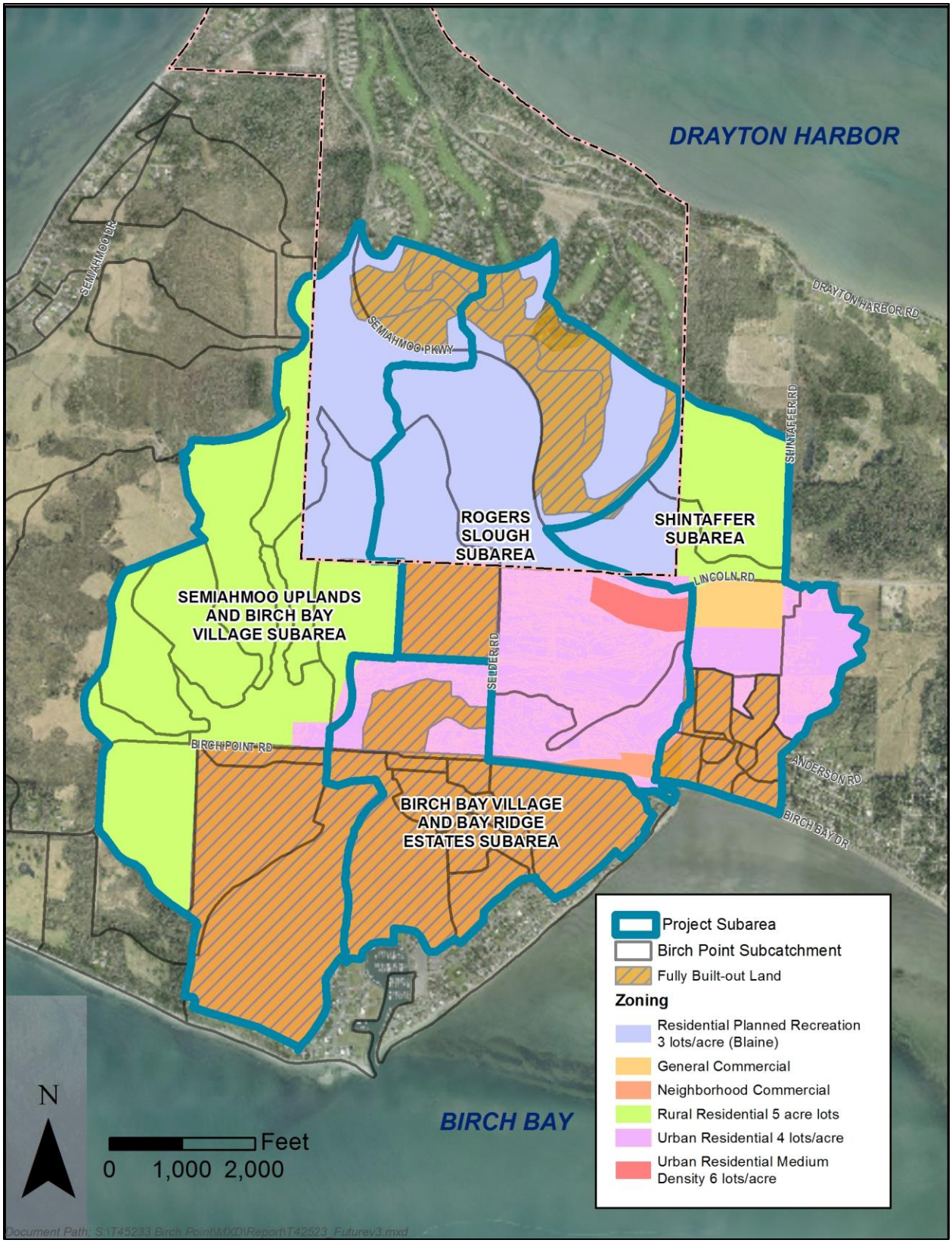


Figure 8. Future Land Use Condition

Table 1 shows that total impervious area under future conditions is expected to increase by over 200 acres, or a 75% increase in impervious area in the study area. Figure 7 shows that the impervious area will increase disproportionality in the City of Blaine for the Semiahmoo Uplands and Birch Bay Village subarea and the Rogers Slough subarea. The increase in impervious area in the Shintaffer subarea will occur mostly in Whatcom County but is also expected to increase in the City of Blaine where currently there is very little impervious surface in the study area.

The increase in impervious area with future development will also increase stormwater runoff volume (see Section 4.1) and peak flow rates. The City and County will need to coordinate future stormwater management efforts in the study area to ensure effective stormwater controls are implemented to control peak flows and sufficient conveyance is provided with storm drain infrastructure improvements.

3.2 CLIMATE DATA

Long-term precipitation data collected at Blaine from 1948 to 2009 was previously used to compute a continuous flow record (Agweathernet, 2022). This report further incorporates data collected at Blaine in November 2021 that corresponded to a large rainfall event. Long-term average precipitation values recorded at Blaine were compared to precipitation data collected by the Birch Bay Water and Sewer District (BBWSD) and found to be equivalent. Potential evaporation data was developed from pan evaporation data collected at the Washington State University Extension in Puyallup, Washington (WSU, 2022) adjusted by a factor 0.76 to account for regional differences in potential evapotranspiration (NOAA, 1982).

3.3 UPDATES TO HYDRAULIC MODEL

The storm drainage system within the Birch Point subwatershed is complex and requires a sophisticated hydraulic model such as the PCSWMM model (CHI, 2023) which uses the United States Environmental Protection Agency's (USEPA's) Stormwater Management Model (SWMM5) (USEPA, 2011) as it's computational engine. SWMM5 can represent tidal fluctuation, surcharging and flooding of pipes and open channels, split flows, and hydraulic features such as natural and constructed detention facilities. The two-dimensional (2-D) flow module in PCSWMM can represent overland flow conditions in areas with flat topography and indistinct flow patterns where routing elements (e.g. channels and pipe) are unsuitable for representing the hydraulic conditions. PCSWMM with SWMM5 is well-suited for hydraulic analysis of the storm drainage system.

Runoff from HSPF subcatchments is input to the SWMM5 model at discrete nodes in the model schematic. The routing portion of SWMM5 conveys this runoff through a system of pipes, channels, storage, and outfalls. SWMM5 tracks the flow rate and volume of water in each pipe and channel.

3.4 CONVEYANCE SYSTEM DATA INPUTS

The storm drainage inventory data previously collected by Whatcom County, Land Development Engineering and Survey, Inc. (LDES), and Wilson Engineering were used as the primary sources of data for the SWMM5 model network. The Bay Ridge Estates system was surveyed by Whatcom County in 2022. The survey data consisted of pipe, culvert, ditches, manholes, catch basins, and drain points. Other data sources included a topographic grid surface derived from LiDAR mapping, as-built drawings, and observations made during field reconnaissance.

Storm drain and culvert pipe characteristics were obtained from the Whatcom County Geographic Information System (GIS) geodatabase. Data elements included pipe size, pipe material, and conduit length. Upstream and downstream pipe invert elevations were obtained from field survey completed to support the watershed master plan. Pipe size is assumed to be one foot in diameter where GIS data is

not available. Catch basin and manhole information was also obtained from the storm drainage inventory. Data elements included geographic coordinates (northing and easting), rim elevation and structure invert elevation. Rim elevations are measured based on LiDAR where GIS data was not available. Manning's roughness coefficients for pipes were based on accepted engineering values for pipe material assuming fair condition. Smooth pipes (e.g., concrete, polyvinyl chloride, high density polyethylene) were assigned a roughness coefficient of 0.012 and rough pipes (e.g., corrugated metal) were assigned a coefficient of 0.024. An entrance loss coefficient of 0.5 to 0.8 was assigned to pipes where transitions from open-channel flow to closed conduit flow exist. An exit loss coefficient of 1.0 was assumed for pipes that discharge to open channels.

Open channel (roadside ditch and natural channel) characteristics were estimated from approximate field measurements for bottom width, side slope, and depth. Invert elevations were obtained from the topographic survey. Roadside ditches and natural channels were previously assumed to have a trapezoidal shape with varying width and depth. As part of this study, roadside ditch cross-section dimensions were extracted from LiDAR at critical locations. Channels were assigned a roughness coefficient of 0.035, assuming an average maintained condition. The level of accuracy used to dimension most ditches channel sections is appropriate for this planning-level analysis because flow through the roadside ditch and culvert system in the four subareas is controlled by culvert size and material rather than channel characteristics. However, certain ditches were measured in the field on a case-by-case basis when known problems had been reported or were observed in the hydraulic model.

Generally, overflow channels for roadway culverts were not included in the model unless preliminary model runs indicted surface flooding. For these cases, overflow conduits were added as trapezoidal open channels with dimensions measured from LiDAR. A roughness coefficient of 0.024 was assigned to overflow channels.

Overtopping elevations for surveyed structures corresponded to the rim elevation of the catch basin or manhole. Overtopping elevations for drain points associated with open channels, non-surveyed structures, and ponds were estimated from LiDAR mapping. The LiDAR-derived data were adjusted at some locations where they were determined to be inaccurate due to vegetation or other obstructions. For these cases, the overtopping elevation was replaced with a value obtained from a nearby point in an unobstructed area. Topographic survey points collected at the top of ditches were also supplemented for the LiDAR when available.

Flat areas with indistinct flow patterns were modeled using the 2-D overland flow routing model in PCSWMM. The interconnections between the storm drainage system and the overland flow pathways are relatively complex and not intuitively obvious from a review of the topography. To address this uncertainty, a 2-D hydraulic model was developed to simulate the overland flow paths between networks. A flow mesh of the ground surface was created from the LiDAR using the pre-processing capabilities of the PCSWMM software and merged with the storm drain system network.

Model nodes, representing catch basin and manholes are named using the facility identifier number assigned by the county during their inventory (e.g. 1500). An alphabetical prefix was used for gravity mains, culverts, ditches, and other drainage pipes. Gravity main pipes are preceded with "GM", culverts begin with a "C", and open ditches begin with an "OD" prefix. For example, a ditch may be denoted "OD1000". Overtopping conduits were assigned the suffix "-OF" and includes the two node names connecting the upstream and downstream ends (e.g. 1500_1600-OF). Weirs are assigned a "-W" suffix and orifices are assigned a "-O" suffix. Nodes obtained from LDES were given a "LDES" prefix in front on each identification number (e.g. LDES1600). Nodes created by Tetra Tech were assigned a "TT" prefix (e.g. TT1600). Elevation data for Tetra Tech nodes was sampled using existing LiDAR or interpolated between known elevation points. Names with the prefix "BBV-" indicate the structure is located in Birch Bay Village.

As part of this study, several details were added to the hydraulic model, including:

- Details and stormwater facilities were added at the private developments of Birch Bay Village and Bay Ridge Estates based on LiDAR and Whatcom County GIS geodatabase data.
- Modified routing from upland areas to study area based on LiDAR.
- Golf course ponds and outflow details were added for ponds east of Semiahmoo Parkway, near the Semiahmoo Golf and Country Club, based on site drawings (Raper and Associates, 1985)
- Detail added at the new Horizon at Semiahmoo development based on as-builts drawings (David Evans and Associates, 2007).
- Added storm drain network in Bay Ridge Estates based on survey provided by Whatcom County.
- Details were added at Birch Point Road and Birch Bay Drive based on record drawings (David Evans and Associates, 2008).
- Modified storm drain and tide gate at Birch Bay Drive and Nootka Loop based on record drawings (Tetra Tech, 2020) and concept plans (Osbourn Consultants, 2011).
- Kwan Lake and Thunderbird Lake bathymetry information was added to the model based on survey data provided by William Reilly from Birch Bay Village.

3.5 DESIGN EVENTS

Peak flows were computed by routing a hydrograph extracted from the long-term continuous simulation hydrologic model output (see Section 3.0) through the hydraulic model. The extracted hydrograph with scaling factors represents the 25- and 100-year flood events, November 2021 peak rainfall event, and a climate change scenario. The largest simulated event in the combined runoff time series is the December 1983 event which is equivalent to the 25-year so the hydrograph for this event is used as the design hydrograph and adjusted by a scaling factor to represent the other design events. The scaling factor is computed as a ratio of the rainfall for the design event to the 25-year rainfall. Rainfall events are described in Table 3.

In November 2021, the Birch Point subwatershed experienced a rainfall event in excess of the 100-year return period that caused extensive flooding throughout the Birch Bay watershed area. Approximately 6.1 inches of rain was recorded over a 36-hour period at the Blaine weather station operated by Washington Conservation District (Agweathernet, 2022) located approximately 5 miles northwest of the Birch Point study area.

This study also evaluates a climate change scenario. This evaluation assumes a 22% increase in the 100-year design event (Whatcom, 2020), which results in a 48% increase in the 25-year event.

Table 3. Application of the Design Event for Hydrologic Input

Return Period	Rainfall Amount[a] (in)	Scale Factor[b]
25-Year	4.5	1.0
100-Year	5.2	1.21
November 2021	6.1	1.33
Climate Change	6.67	1.48

a. After scaling factor applied.
b. The scale factor is in reference to the 25-year event.

3.6 MODEL VALIDATION

The November 2021 event listed in Table 3 was also used to verify flood elevations observed in the model against flooding observed in Birch Bay Village. William Reilly of Birch Bay Village provided a high water mark measure after the November 2021 event of 9.5 feet (in the North American Vertical Datum of 1988; NAVD88). Mr. Reilly also provided photos of flooding on Nootka Loop and Salish Road north of Kwann Lake. These photos show extensive flooding on the roadway.

The initial run of the hydraulic model showed it was unable to replicate flood level and inundation extents using the hydrograph computed by HSPF for this event. The inability of the model to replicate flood conditions for this event is likely due to the use of an uncalibrated HSPF model to simulate runoff during early wet season events. To rectify the deficiency, the December 1983 design hydrograph was adjusted by a scaling factor derived from rainfall comparison at the BBWSD shops (see Scale Factor in Table 3). With this approach, the hydraulic model was able to predict peak stage at Thunderbird Lake within 0.7 feet and also more closely simulate the flood extent on Salish Road.

4.0 MODEL RESULTS AND FLOOD PROBLEM AREAS

Design event flow hydrographs representing existing and future land use conditions were routed through the SWMM5 hydraulic models to estimate peak flows and depths throughout the four subareas. The chosen events from the hydrologic models were used as inputs to the hydraulic model to evaluate the performance of the stormwater conveyance system and identify flood problem areas in the subwatershed and capacity limitations in the storm drainage network. Output flow data was analyzed at four subareas described in Section 2.0:

- Semiahmoo Uplands and Birch Bay Village Subarea
- Birch Bay Village and Bay Ridge Estates Subarea
- Rogers Slough Subarea
- Shintaffer Subarea

Stage (depth in feet NAVD88) is reported at selected locations represented by green circles in Figure 9 and flow (cubic feet per second [cfs]) output locations are represented with orange bars to show where conveyance capacity may be restricted in the storm drain system resulting in surface flooding in residential areas and on public and private roads.

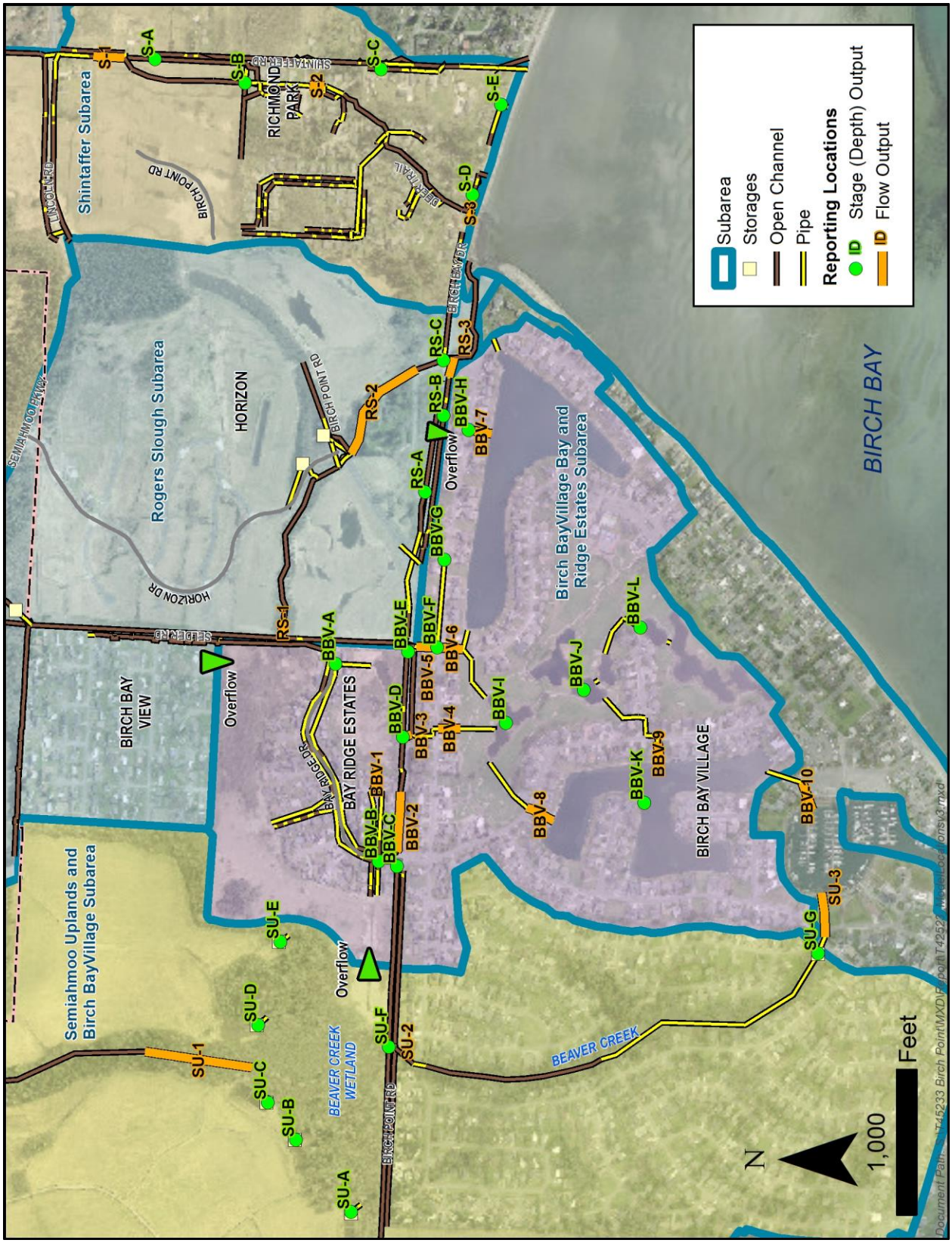
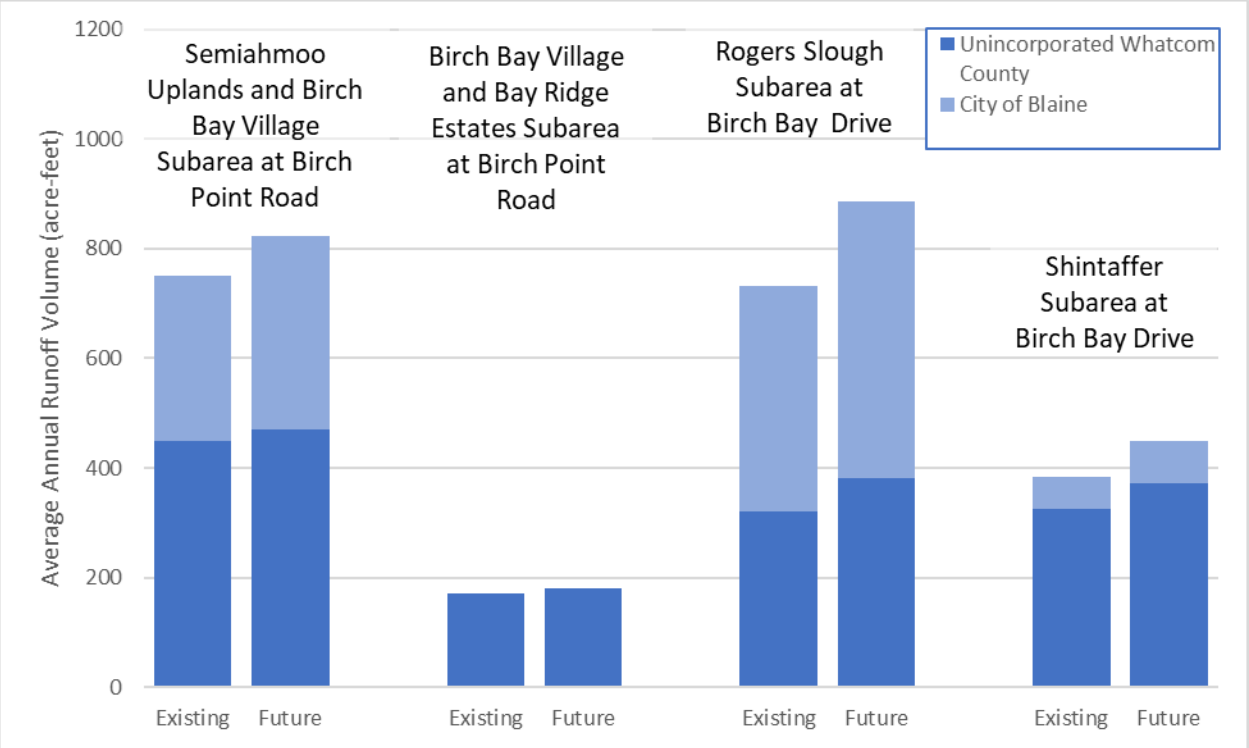


Figure 9. Model Output Locations

4.1 STORMWATER RUNOFF CONTRIBUTION

For three of the four subareas a significant portion of stormwater runoff is generated in the City of Blaine and flows downhill to unincorporated Whatcom County. Figure 10 shows the average annual volume of stormwater runoff contribution from the City of Blaine and Whatcom County. This figure shows that approximately 40 percent of stormwater runoff is generated in the City of Blaine for the Semiahmoo Uplands and Birch Bay Village subarea (measured at Birch Point Road) and over 50 percent of stormwater runoff comes from the City in the Rogers Slough subarea. Only about 15 percent of stormwater runoff is generated in the City of Blaine in the Shintaffer subarea. Stormwater runoff in the Birch Bay Village and Bay Ridge Estates subarea is generated entirely in the County however the evaluation of runoff volume does not consider the overflows from adjacent subareas described later in this section.

Stormwater runoff volume will increase with future development which will result in an increase in peak flow rates if stormwater controls are not properly implemented. The City and County will need to coordinate future stormwater management efforts in the Birch Point watershed to ensure effective stormwater controls are implemented to control peak flows and sufficient conveyance is provided in storm drain infrastructure.



One acre-foot = 1 foot of flooding over 1 acre of land (43,560 cubic feet or 326,000 gallons)

Figure 10.Existing Conditions Runoff Contribution from City of Blaine and Unincorporated Whatcom County

4.2 SEMIAHMOO UPLANDS AND BIRCH BAY VILLAGE

4.2.1 Existing Conditions

Table 4 and Table 5 show predicted peak stage and flow at selected locations in the Semiahmoo Uplands and Birch Bay Village subarea. The hydraulic analysis showed that for existing conditions, two of the detention ponds (SU-B, SU-E) along the perimeter of the wetland overflow starting at the 25-year event and at thee additional facilities (SU-A, SU-C, SU-D) at the 100-year event indicating the facilities may be undersized for stormwater control. However, natural storage in the wetland area north of Birch Point Road and west of Bay Ridge Estates partially mitigates overflow from these ponds although overland flow to Bay Ridge Estates likely contributes to flooding in that neighborhood. The travel lane on Birch Point Road at the Beaver Creek crossing (SU-F) was predicted to flood during the November 2021 event but floodwater did not get high enough to overtop the roadway. No other flooding problems are identified in this subarea.

4.2.2 Future Conditions

The future conditions hydraulic analysis showed that peak stage is predicted to increase in all of the detention facilities (SU-A, SU-B, SU-C, SU-D, SU-E). Future conditions peak flows entering the wetland from upland areas (S-1) will be higher than existing conditions if flow control is not provided with future development. This increase is transferred to Birch Point Road (SU-2) and flooding is predicted to occur at this location (SU-F) for all events analyzed.

Table 4. Peak Stage in the Semiahmoo Uplands and Birch Bay Village Subarea

ID[a]	Flood Stage[b] (feet NAVD88)	Peak Stage (feet NAVD88)				Height above Flood Stage[c] (feet)			
		25-Year	100-Year	Nov. 2021	Climate Change	25-Year	100-Year	Nov. 2021	Climate Change
Existing Conditions									
SU-A	80.6	80.6	81.1	81.1	81.3	0.0	0.5	0.5	0.7
SU-B	81.8	82.6	82.7	82.7	82.8	0.8	0.9	0.9	1.0
SU-C	90.3	90.0	90.4	90.5	90.6	-0.3	0.1	0.2	0.3
SU-D	75.5	75.5	75.7	75.9	76.0	0.0	0.2	0.3	0.5
SU-E	74.0	74.8	75.0	75.0	75.1	0.8	1.0	1.0	1.1
SU-F	51.1	48.4	50.2	51.9	52.5	-2.7	-0.9	0.8	1.4
SU-G	26.3	24.8	25.0	25.1	25.3	-1.5	-1.3	-1.2	-1.0
Future Conditions									
SU-A	80.6	81.0	81.1	81.3	81.4	0.4	0.5	0.6	0.8
SU-B	81.8	82.6	82.7	82.8	82.8	0.8	0.9	1.0	1.0
SU-C	90.3	90.4	90.6	90.7	90.7	0.1	0.3	0.4	0.4
SU-D	75.5	76.2	76.3	76.3	76.4	0.7	0.8	0.8	0.9
SU-E	74.0	74.9	75.1	75.1	75.2	0.9	1.1	1.1	1.2
SU-F	51.1	51.2	52.4	52.6	52.6	0.1	1.3	1.5	1.5
SU-G	26.3	24.9	25.1	25.2	25.4	-1.4	-1.2	-1.1	-0.9

a. See Figure 9.

b. Flood stage is the elevation where surface flooding is assumed to occur.

c. Red highlighted values indicate predicted peak stage above flood stage.

Table 5. Peak Flow in the Semiahmoo Uplands and Birch Bay Village Subarea

ID[a]	25-Year	100-Year	Nov. 2021	Climate Change
Existing Conditions Flow (cfs)				
SU-1	12.9	15.4	16.9	18.7
SU-2	29.0	36.5	42.7	47.3
SU-3	94.7	115.9	127.8	135.3
Future Conditions Flow (cfs)				
SU-1	20.5	24.7	27.0	29.9
SU-2	40.6	47.2	47.3	47.5
SU-3	102.6	125.9	133.4	138.8
Future Change from Existing (%)				
SU-1	59.3%	59.7%	60.0%	60.1%
SU-2	40.3%	29.4%	10.8%	0.4%
SU-3	8.4%	8.6%	4.4%	2.7%

a. See Figure 9.

4.3 BIRCH BAY VILLAGE AND BAY RIDGE ESTATES SUBAREA

4.3.1 Existing Conditions

The existing conditions hydraulic analysis predicted flooding at four locations in the Birch Bay Village and Bay Ridge Estates subarea. Table 6 and Table 7 show predicted peak stage and flow at selected locations in this subarea. Figure 11 and Figure 12 show flood inundation in the subarea.

- Bay Ridge Drive at Selder Road (BBV-A) – High storm flows exceed the capacity of the cross culvert under Selder Road at Skyvue Road and overflow into the ditch located on the west side of Selder Road. Flow then continues south along the road to accumulate at the intersection with Bay Ridge Drive. Figure 11 shows the inundation extent of flooding in this area for the 100-year event.
- East and West Shoreview (BBV-C, BBV-D) – Flooding is partly due to the undersized storm drain system along East and West Shoreview but is exacerbated by overflow through the roadside ditch from the adjacent subarea to the west and accumulates in the low area at Bay Ridge Drive on East Shoreview. Figure 11 shows the inundation extent of flooding in this area for the 100-year event.
- Birch Bay Village Golf Course Ponds – High flow from upland areas (BBV-3, BBV-5) cause flooding in the Birch Bay Village golf course ponds (BBV-I BBV-J, BBV-K, BBV-L). For the 100-year event and larger, stormwater flow exceeds the capacity of a control structure located on the south side of Birch Point Road (BBV-D). Stormwater also overflows Birch Point Road at Selder Road into Birch Bay Village (BBV-F) and overflows the ditch that conveys drainage from the Birch Point Road system into the Birch Bay Village system.
- Salish Road and Nootka Loop (BBV-G, BBV-H) – Flooding at this location is due to the undersized culvert at Birch Point Road (RS-C, see Table 8) that causes water to eventually spill over Birch Bay Drive towards Salish Road. Removing the Rogers Slough tide gate reduced flooding at this location but did not eliminate it entirely. The cause of flooding at this location is discussed in greater detail in Section 4.5.

4.3.2 Future Conditions

Under future conditions, flood risk increases slightly with 0.1 to 0.2 foot increase expected at most locations in the Birch Bay Village and Bay Ridge Estates subarea. However, the overflow from the Rogers Slough subarea will increase flood depth on Salish Road (BBV-H) by almost a foot for all events analyzed and worsening the existing flood conditions at that location. Additional flooding will also occur on Selder Road at Birch Point Road (BBV-E) under future conditions.

Table 6. Peak Stage in the Birch Bay Village and Bay Ridge Estates Subarea

Junction ID[a]	Flood Stage[b] (feet NAVD88)	Peak Stage (feet NAVD88)				Height above Flood Stage[c] (feet)			
		25-Year	100-Year	Nov. 2021	Climate Change	25-Year	100-Year	Nov. 2021	Climate Change
Existing Conditions (Rogers Slough Tide Gate Removed)									
BBV-A	34.2	34.5	34.6	34.6	34.6	0.3	0.4	0.4	0.4
BBV-B	52.4	52.3	52.4	52.5	52.5	0.1	0.2	0.3	0.3
BBV-C	52.1	52.3	52.4	52.4	52.5	0.2	0.3	0.3	0.4
BBV-D	28.7	28.1	29.3	29.4	29.5	-0.6	0.6	0.7	0.8
BBV-E	28.1	26.8	27.9	28.1	28.1	-1.3	-0.2	0.0	0.0
BBV-F	12.6	11.7	12.1	14.2	14.2	-0.9	-0.5	1.6	1.7
BBV-G	12.6	11.7	12.1	12.9	12.9	-0.9	-0.5	0.3	0.3
BBV-H	10.4	8.2	10.5	10.8	11.0	-2.2	0.1	0.4	0.6
BBV-I	8.4	8.7	8.7	8.8	8.8	0.3	0.3	0.4	0.4
BBV-J	8.4	8.0	8.5	8.6	8.8	-0.4	0.1	0.2	0.4
BBV-K	11.5	7.7	7.9	8.0	8.1	-3.8	-3.6	-3.5	-3.4
BBV-L	8.4	7.7	8.1	8.4	8.6	-0.7	-0.3	0.0	0.2
Future Conditions									
BBV-A	34.2	34.5	34.6	34.6	34.6	0.3	0.4	0.4	0.4
BBV-B	52.4	52.5	52.6	52.7	52.7	0.3	0.4	0.5	0.5
BBV-C	52.1	52.5	52.5	52.5	52.6	0.4	0.4	0.4	0.4
BBV-D	28.7	29.4	29.5	29.5	29.6	0.7	0.8	0.8	0.9
BBV-E	28.1	28.1	28.2	28.2	28.2	0.0	0.1	0.1	0.1
BBV-F	12.6	13.7	14.3	14.3	14.4	1.2	1.7	1.7	1.8
BBV-G	12.6	12.9	12.9	12.9	12.9	0.3	0.3	0.3	0.3
BBV-H	10.4	11.0	11.4	11.6	11.7	0.6	1.0	1.2	1.3
BBV-I	8.4	8.7	8.8	8.9	9.0	0.3	0.4	0.5	0.6
BBV-J	8.4	8.5	8.7	8.9	9.0	0.1	0.3	0.5	0.6
BBV-K	11.5	7.8	8.0	8.1	8.2	-3.7	-3.5	-3.4	-3.3
BBV-L	8.4	7.9	8.4	8.5	8.8	-0.5	0.0	0.1	0.4

a. See Figure 9.

b. Flood stage is the elevation where surface flooding is assumed to occur.

c. Red highlighted values indicate predicted peak stage above flood stage.

Peak flow will increase at all locations with the largest increase occurring for smaller events. For instance, Table 7 shows that future conditions peak flow in the Birch Bay Village storm drain system at Selder Road

(BBV-5) will be 15 percent higher than existing conditions for the 25-year event but less than 5 percent higher for larger events due to limited pipe capacity of the culvert under Birch Point Road.

Table 7. Peak Flow in the Birch Bay Village and Bay Ridge Estates Subarea

Conduit ID[a]	25-Year	100-Year	Nov. 2021	Climate Change
Existing Conditions Flow (cfs) (Rogers Slough Tide Gate Removed)				
BBV-1	13.2	14.3	15.4	18.9
BBV-2	9.5	12.8	14.6	16.5
BBV-3	24.5	27.2	27.3	28.2
BBV-4	20.9	22.1	22.5	22.7
BBV-5	18.4	20.6	21.2	21.6
BBV-6	18.9	24.9	30.7	31.3
BBV-7	0.3	4.1	4.2	4.3
BBV-8	26.6	26.6	26.6	26.6
BBV-9	11.2	13.4	13.5	13.6
BBV-10	15.2	18.3	19.8	21.6
Future Conditions Flow (cfs)				
BBV-1	19.0	19.2	19.2	19.3
BBV-2	16.6	17.7	18.4	19.1
BBV-3	28.5	28.9	29.1	29.5
BBV-4	22.1	22.6	22.7	22.7
BBV-5	21.2	21.7	21.9	22.2
BBV-6	29.7	31.6	31.7	31.8
BBV-7	4.5	4.6	4.7	4.6
BBV-8	26.6	26.6	26.6	26.6
BBV-9	13.9	14.1	14.3	14.3
BBV-10	16.6	19.6	21.1	22.8
Future Change from Existing (%)				
BBV-1	43.9%	34.5%	24.9%	1.9%
BBV-2	74.8%	38.1%	26.4%	15.5%
BBV-3	16.0%	6.4%	6.5%	4.6%
BBV-4	5.8%	2.0%	0.9%	0.0%
BBV-5	14.9%	5.2%	3.3%	2.6%
BBV-6	57.0%	26.8%	3.3%	1.4%
BBV-7	--[b]	13.6%	11.5%	9.2%
BBV-8	0.0%	0.0%	0.0%	0.0%
BBV-9	24.4%	5.8%	5.5%	5.5%
BBV-10	9.2%	7.0%	6.5%	5.6%

a. See Figure 9.

b. Not computed: existing conditions flow too low to provide a meaningful value.

Land use in this subarea is not expected to change significantly with future development. The increase in peak flow will be due to the increase in the volume of overflow from the Beaver Creek wetlands in the

Semiahmoo Uplands and Birch Bay Village subarea rather than an increase in impervious area (less than 5%, see Table 1 and Figure 7). Increased overflow also occurs from the Rogers Slough subarea to the Birch Bay View neighborhood and the drainageway adjacent to Birch Point Loop at Nootka Loop.

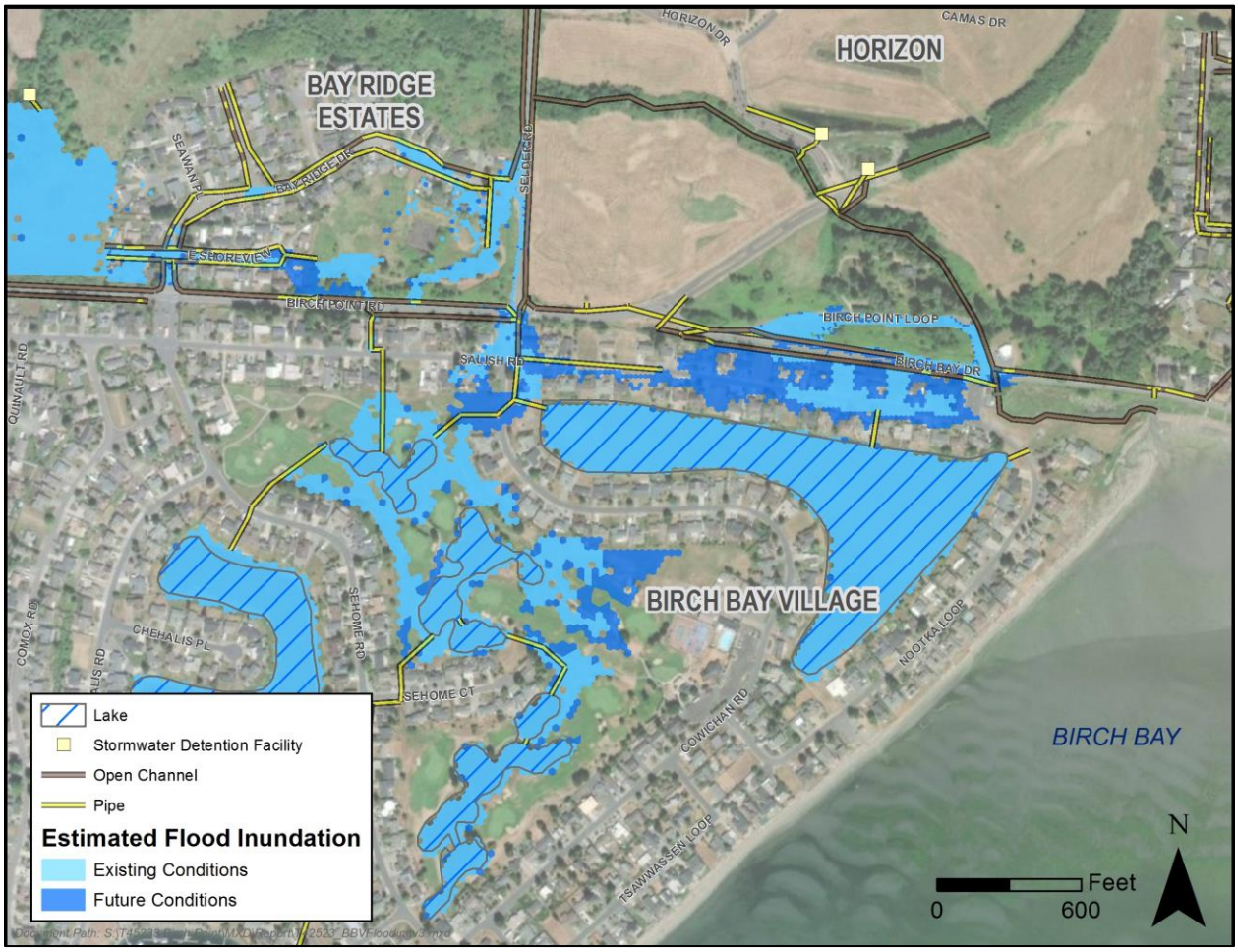


Figure 11. Simulated Flooding in Birch Bay Village and Bay Ridge Estates Subarea - Existing and Future Conditions, 100-year Event

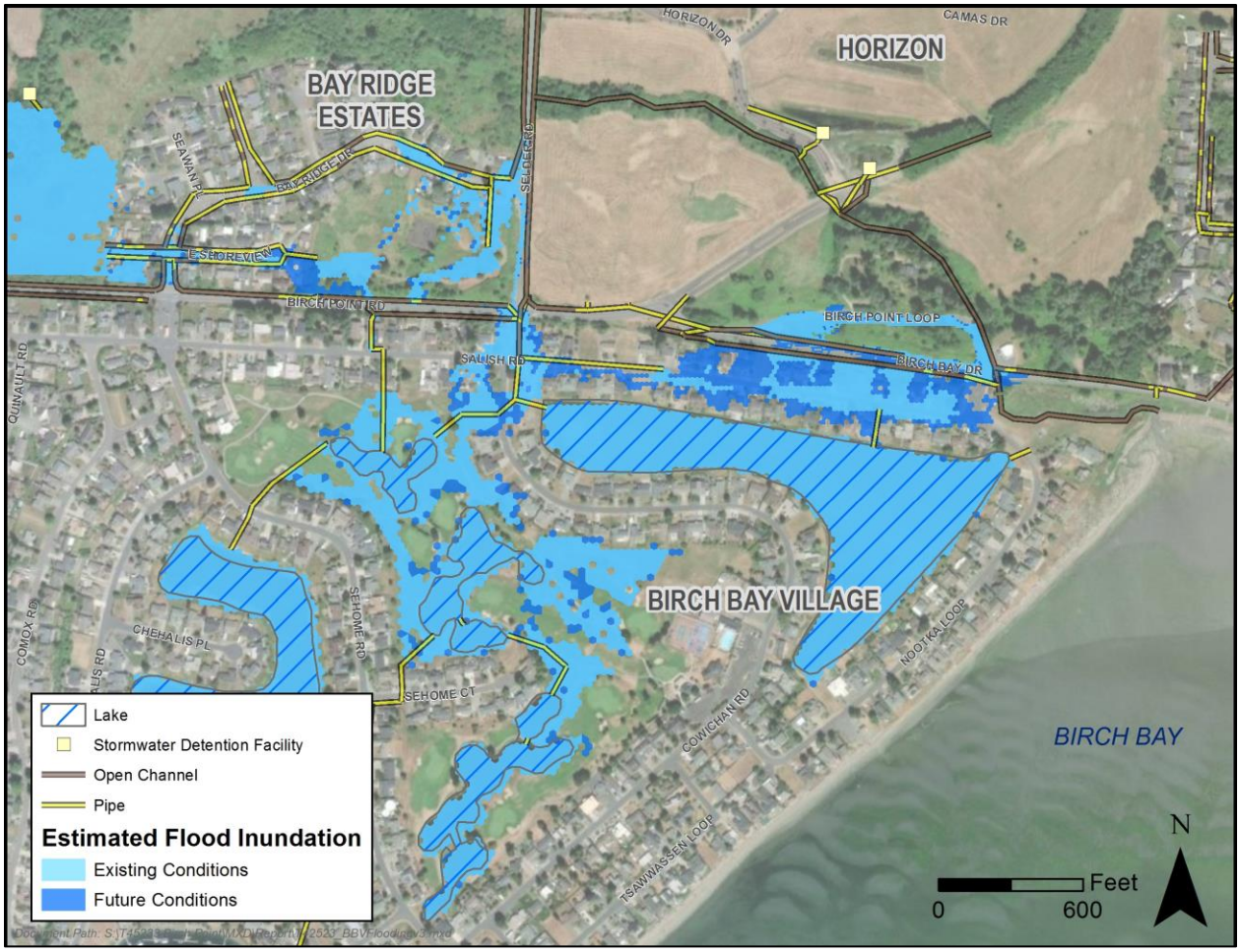


Figure 12. Simulated Flooding in Bay Village and Bay Ridge Estates Subarea - Existing and Future Conditions, November 2021 Event

4.4 ROGERS SLOUGH TIDE GATE REMOVAL

The impact of removing the Rogers Slough tide gate at Birch Bay Drive and Nootka Loop was evaluated with the hydraulic model. This gate was removed in November 2022 at the beginning of the study and was used as the baseline condition for subsequent analysis. Table 8, Figure 13, and Figure 14 show the change in existing condition flows pre- and post-tide gate removal in the vicinity of Rogers Slough. The post-tide gate removal condition is considered the existing condition (baseline) for comparison purposes for this study.

The hydraulic analysis showed that removing the Rogers Slough tide gate reduced flood inundation in the vicinity of the Birch Bay Drive (RS-B) and Birch Point Loop (RS-C). Flooding is also eliminated on Salish Road (BBV-H) for the 25-year event and reduced by 0.4 feet for all other events analyzed. Flood levels were unchanged in the golf course ponds (BBV-J).

Table 8. Peak Stage with Rogers Slough Tide Gate Removal

ID[a]	Flood Stage[b] (feet NAVD88)	Peak Stage (feet NAVD88)				Height above Flood Stage[c] (feet)			
		25-Year	100-Year	Nov. 2021	Climate Change	25-Year	100-Year	Nov. 2021	Climate Change
Existing Conditions (Rogers Slough Tide Gate In Place)									
BBV-G	12.6	11.8	12.9	12.9	12.9	-0.9	0.3	0.3	0.3
BBV-H	10.4	10.7	11.1	11.2	11.4	0.3	0.7	0.8	1.0
BBV-J	8.4	8.7	8.7	8.8	8.8	0.3	0.3	0.4	0.4
RS-A	9.9	12.1	12.2	12.3	12.3	2.1	2.3	2.3	2.4
RS-B	9.2	11.4	11.7	11.9	12.1	2.2	2.5	2.7	2.9
RS-C	11.2	12.1	12.2	12.2	12.3	0.9	1.0	1.0	1.1
Existing Conditions (Rogers Slough Tide Gate Removed)									
BBV-G	12.6	11.8	12.7	12.9	12.9	-0.9	0.1	0.3	0.3
BBV-H	10.4	7.7	10.5	10.8	11.0	-2.7	0.1	0.4	0.6
BBV-J	8.4	8.7	8.7	8.8	8.8	0.3	0.3	0.4	0.4
RS-A	9.9	11.5	12.0	12.1	12.2	1.6	2.1	2.2	2.3
RS-B	9.2	10.8	11.1	11.4	11.6	1.6	1.9	2.2	2.4
RS-C	11.2	11.9	12.0	12.1	12.2	0.7	0.8	0.9	1.0

a. See Figure 9.

b. Flood stage is the elevation where surface flooding is assumed to occur.

c. Red highlighted values indicate predicted peak stage above flood stage.

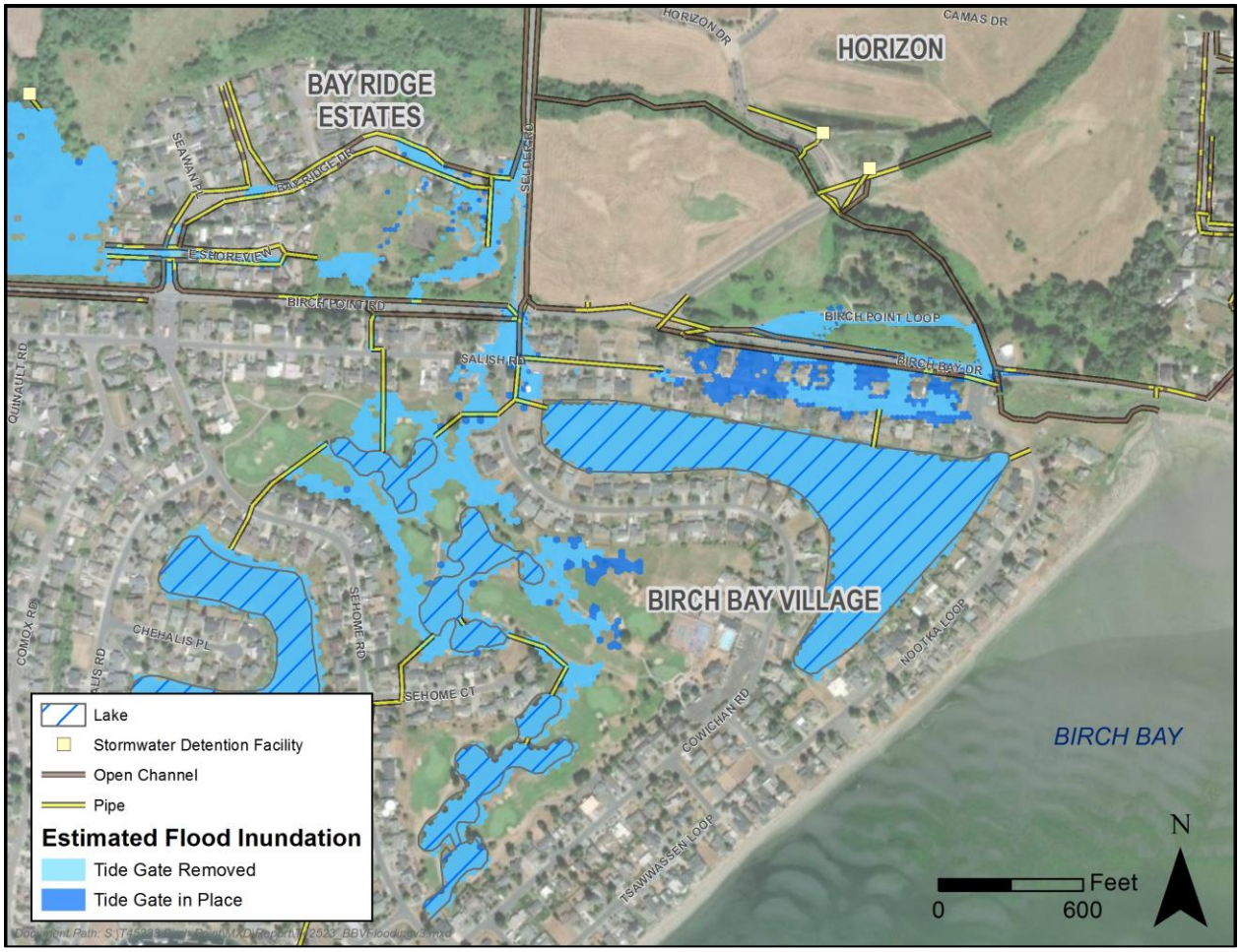


Figure 13. Effect of Tide Gate Removal, Existing Conditions 100-year Event

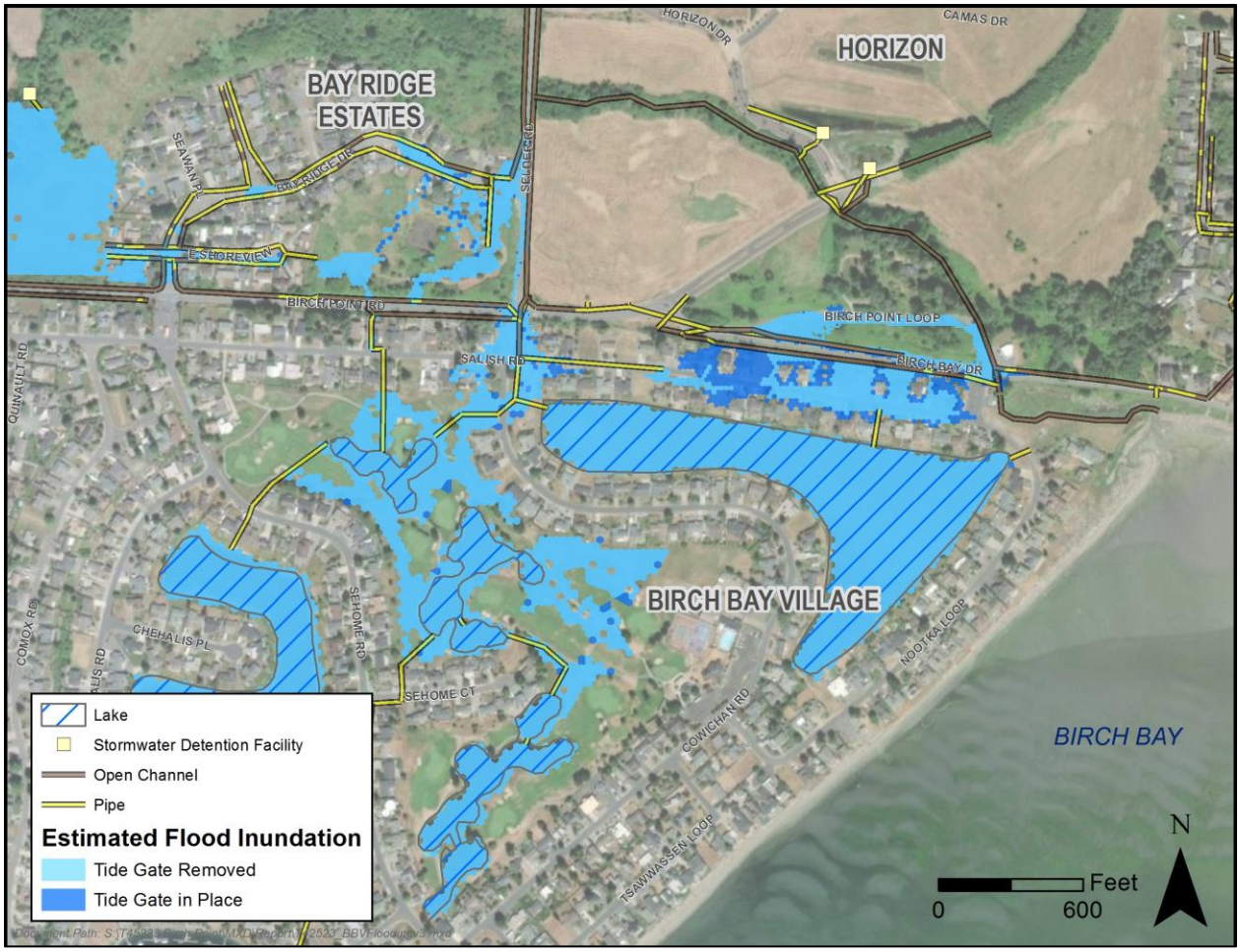


Figure 14. Effect of Tide Gate Removal, Existing Conditions November 2021 Event

4.5 ROGERS SLOUGH SUBAREA

4.5.1 Existing Conditions

The hydraulic analysis predicted flooding at one location at Birch Loop Road at Birch Bay Drive (RS-A, RS-B, RS-C). However, flooding at this location is widespread for all events analyzed and also overflows into adjacent subareas. Table 9 and Table 10 show predicted peak stage and flow at selected locations in this subarea. Figure 11 and Figure 12 show flood inundation in this subarea.

Flooding at this location is due to the undersized culverts under Birch Bay Drive (RS-C) that back up flood water into the shallow ditch on the east side of Birch Point Loop. Backwater in this ditch overtops the bank and spills onto Birch Point Loop, then flows over the road into the drainage system along Birch Bay Drive (RS-A). The overflow is conveyed under Birch Bay Drive in a cross culvert located west of the east intersection with Birch Point Loop (RS-B) and into the roadside ditch on the south side of Birch Bay Drive. Increased flow in this ditch exceeds the capacity of the cross culvert under Nootka Loop, backs up in the ditch adjacent to Birch Point Road (RS-B), and spills over the bank towards Salish Road. Flood waters also overtop Birch Bay Drive and flow towards Nootka Loop which exacerbates flooding at this location.

Flooding at this location is exacerbated with king tide events in Birch Bay that increase the submergence of the outlet of the culvert under Birch Bay Drive thus reducing the ability of this pipeline to convey flow to the slough. Natural shore current in combination with king tide events in Birch Bay also push large wood

and sediment north along the shore where both accumulate at the mouth of Rogers Slough and obstruct flow from the slough during high flow events.

4.5.2 Future Conditions

Table 10 shows that future conditions peak flows will be higher than existing conditions at all locations reported for all events in the Rogers Slough Subarea. Future conditions peak runoff from the watershed is likely higher than the peak flow reported because the additional upstream flooding would store stormwater runoff and mitigate the increase in peak flow.

Table 9. Peak Stage in the Rogers Slough Subarea

ID[a]	Flood Stage[b] (feet NAVD88)	Peak Stage (feet NAVD88)				Height above Flood Stage[c] (feet)			
		25-Year	100-Year	Nov. 2021	Climate Change	25-Year	100-Year	Nov. 2021	Climate Change
Existing Conditions (Rogers Slough Tide Gate Removed)									
RS-A	9.9	11.5	12.0	12.1	12.2	1.6	2.1	2.2	2.3
RS-B	9.2	10.8	11.1	11.4	11.6	1.6	1.9	2.2	2.4
RS-C	11.2	11.9	12.0	12.1	12.2	0.7	0.8	0.9	1.0
Future Conditions									
RS-A	9.9	12.3	12.4	12.4	12.5	2.4	2.5	2.5	2.6
RS-B	9.2	11.8	12.1	12.3	12.5	2.5	2.9	3.1	3.3
RS-C	11.2	12.2	12.3	12.3	12.5	1.0	1.1	1.1	1.3

a. See Figure 9.

b. Flood stage is the elevation where surface flooding is assumed to occur.

c. Red highlighted values indicate predicted peak stage above flood stage.

Table 10. Peak Flow in the Rogers Slough Subarea

ID[a]	25-Year	100-Year	Nov. 2021	Climate Change
Existing Conditions Flow (cfs)				
RS-1	60.9	71.6	77.5	89.9
RS-2	79.1	97.0	105.3	116.4
RS-3	11.5	12.2	12.8	13.2
Future Conditions Flow (cfs)				
RS-1	110.4	142.7	156.2	170.7
RS-2	126.3	140.4	148.4	158.8
RS-3	13.4	14.1	14.4	14.4
Future Change from Existing (%)				
RS-1	81.3%	99.3%	101.7%	90.0%
RS-2	59.7%	44.6%	40.9%	36.4%
RS-3	16.8%	15.4%	12.9%	9.2%

a. See Figure 9.

4.6 SHINTAFFER SUBAREA

4.6.1 Existing Conditions

The hydraulic analysis predicted flooding at three locations under existing conditions in the Shintaffer subarea. Table 11 and Table 12 show predicted peak stage and flow at selected locations in this sub area. Figure 15 and Figure 16 show the estimated flood inundation extents for the 100-year and November 2021 events.

- Richmond Park Area (S-B) – Floodwaters accumulate in the farm field located north of Richmond Park and spill into the neighborhood. Drainage from this area is conveyed south through Richmond Park in the primary drainage system comprised of a series of open ditches and culverts. When the capacity of the primary drainage system through the park is exceeded, extensive flooding occurs in Richmond Park (S-B) for all events analyzed. Minor flooding also occurs on the west side of Shintaffer Road between Lincoln Road and Richmond Park.
- Shintaffer Road at Anderson Road (S-C) – Flooding occurs on the west side of Shintaffer Road at Anderson Road due to an undersized and shallow conveyance system.
- Birch Bay Drive (S-D, S-E) – Flooding occurs for all events analyzed along the north side of Birch Bay Drive at Deer Trail due to an obstructed outfall to Birch Bay. Flooding occurs near Shintaffer starting with the 100-year event.

Table 11. Peak Stage in the Shintaffer Subarea

ID[a]	Flood Stage[b] (feet NAVD88)	Peak Stage (feet NAVD88)				Height above Flood Stage[c] (feet)			
		25-Year	100-Year	Nov. 2021	Climate Change	25-Year	100-Year	Nov. 2021	Climate Change
Existing Conditions									
S-A	54.4	52.7	52.8	53.0	53.1	-1.8	-1.6	-1.5	-1.3
S-B	52.4	52.6	52.8	52.9	53.0	0.2	0.4	0.5	0.6
S-C	51.7	51.3	52.1	52.5	53.0	-0.4	0.4	0.8	1.3
S-D	13.0	13.8	13.8	13.8	13.8	0.6	0.8	0.8	0.8
S-E	13.2	10.1	10.2	10.2	10.3	-3.1	-3.0	-3.0	-3.0
Future Conditions									
S-A	54.4	53.1	53.4	53.5	53.7	-1.3	-1.0	-0.9	-0.8
S-B	52.4	53.0	53.2	53.4	53.6	0.6	0.9	1.0	1.2
S-C	51.7	51.4	52.2	52.6	53.2	-0.3	0.5	0.9	1.5
S-D	13.0	13.8	13.9	13.9	13.9	0.7	0.8	0.9	0.9
S-E	13.2	10.4	10.5	10.5	10.6	-2.8	-2.8	-2.7	-2.7

a. See Figure 9.

b. Flood stage is the elevation where surface flooding is assumed to occur.

c. Red highlighted values indicate predicted peak stage above flood stage.

Table 12. Peak Flow in the Shintaffer Subarea

ID[a]	25-Year	100-Year	Nov. 2021	Climate Change
Existing Conditions Flow (cfs)				
S-1	21.4	24.0	25.4	27.6
S-2	14.0	16.2	17.6	18.1
S-3	20.3	21.2	21.3	21.4
Future Conditions Flow (cfs)				
S-1	30.5	33.7	35.2	35.0
S-2	18.2	18.9	19.2	20.2
S-3	21.1	21.5	21.6	21.7
Future Change from Existing (%)				
S-1	42.9%	40.6%	38.5%	27.0%
S-2	29.5%	16.5%	9.3%	11.3%
S-3	3.8%	2.9%	3.4%	1.3%

a. See Figure 9.

4.6.2 Future Conditions

The hydraulic analysis of future conditions showed that flood depth will increase up to 0.5 feet in the Richmond Park area (S-B) if flow control is not provided with upstream development. Peak flow rates would increase for all events along Shintaffer Road, but the increase would be mitigated with the depression storage on the farm field north of Richmond Park. The peak flow attenuation of this storage is demonstrated by the peak flow reduction that occurs between the farm field (S-1) and Richmond Park (S-2) for all events analyzed. For example, Table 12 shows peak flow for the 100-year event is about 34 cfs in the roadside ditch west of Shintaffer Road (S-1) but is reduced to about 18 cfs downstream of Richmond Park (S-2).

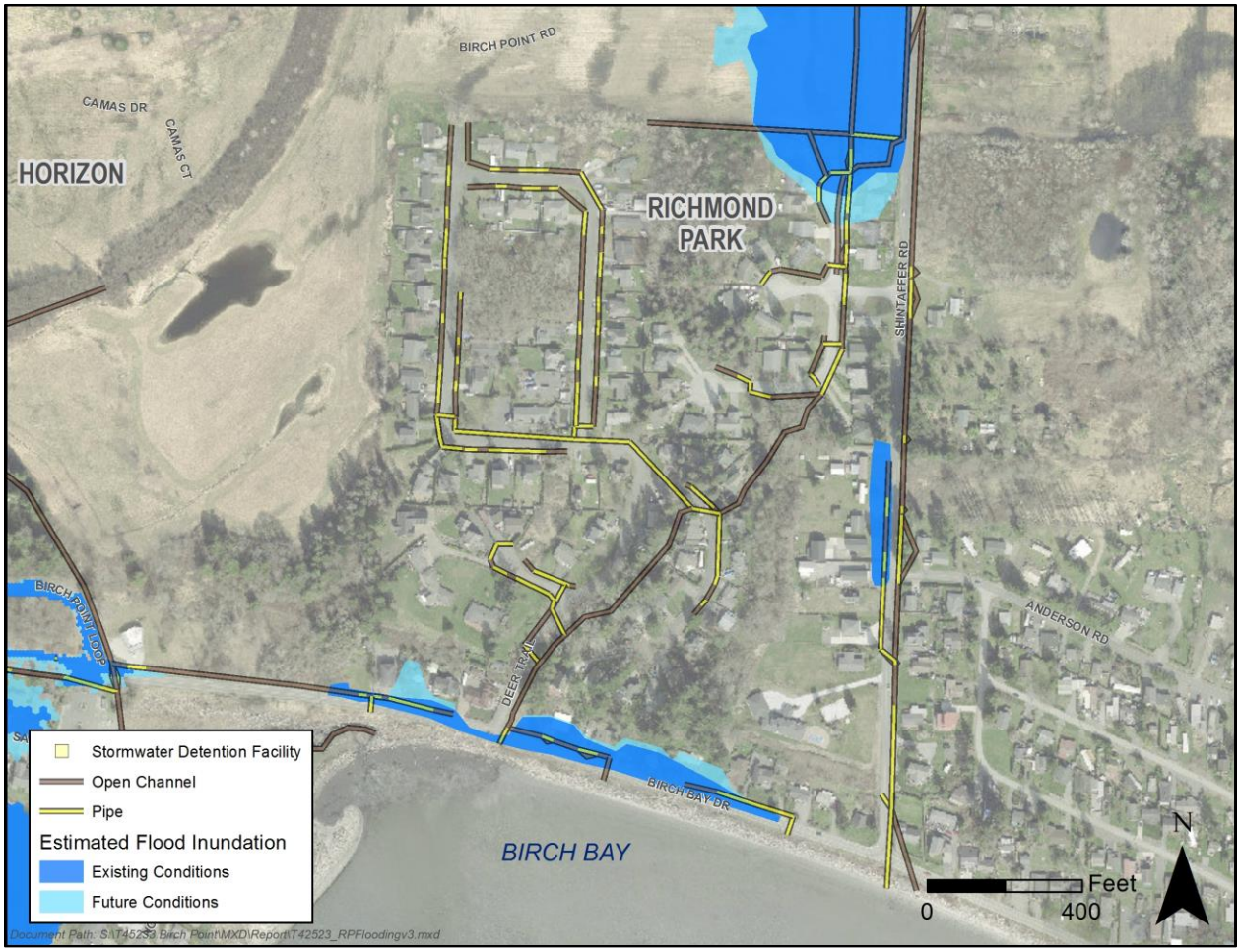


Figure 15. Simulated Flooding in Shintaffer Sub Area - Existing and Future Conditions, 100-year Event

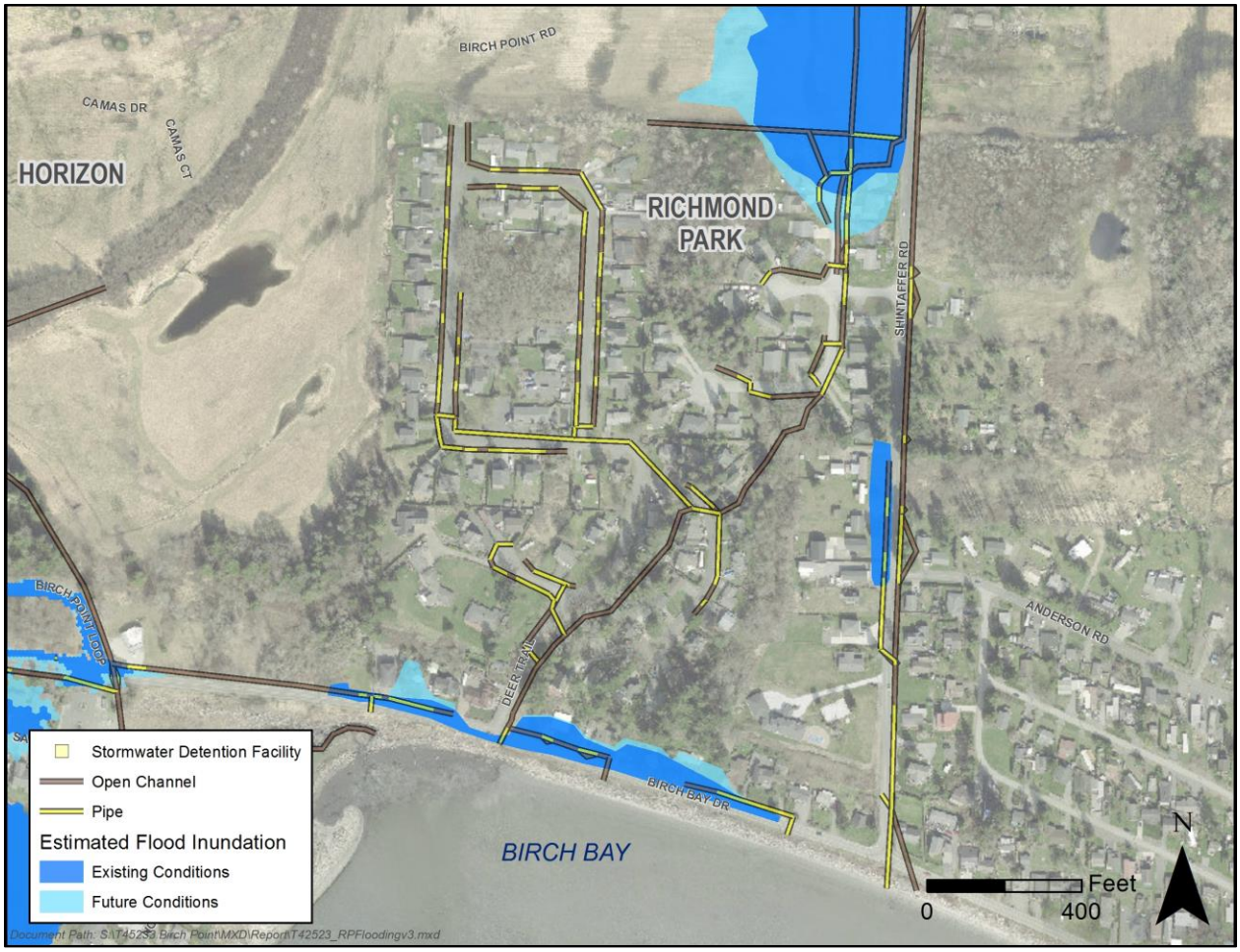


Figure 16. Simulated Flooding in Shintaffer Sub Area - Existing and Future Conditions, November 2021 Event

5.0 CONCEPT DESIGN AND ANALYSIS

5.1 DESIGN OPTIONS

Conceptual design options were evaluated using SWMM5 for five capital projects to resolve flooding problems in the Birch Point study area (see Figure 17). Capital project are sized to convey the existing conditions 100-year peak flow and eliminate flooding at the problem areas. A second variation of the concept is sized to convey the future conditions 100-year peak flow for systems where the future conditions flows are predicted to increase over the existing conditions. A project designed to convey future conditions assumes stormwater controls are not provided with land use conversion and excess stormwater is conveyed directly to Birch Bay in a larger pipeline. The performance for each concept is summarized in Table 13 which shows predicted stage for the simulated November 2021 event and the climate change scenario.

The design options considered single improvements or a combination of improvements to provide a range of performance and conceptual costs for evaluation toward further development. The design options are summarized in Appendix B project sheets which provide the quantities, conceptual cost, and maps that detail the location and extent. The capital projects are generally described below and in Table 14.

Beaver Creek Drainage Improvements – The Beaver Creek Drainage Improvements project is located on Beaver Creek where it flows through the west side of Birch Bay Village. The cross culvert carrying Beaver Creek under Birch Point Road would be replaced with a larger fish passable structure. The proposed culvert would be seven feet wide and four feet high. Bankfull width was not measured for this study so the size would need to be confirmed during design. This project diverts floodwaters from the wetland area upstream of Birch Point Road to larger roadside ditches and excavated floodplain connections to eliminate the overflow to the Bay Ridge Estates. Eliminating the overflow to Bay Ridge Estates also reduces the volume of water flowing into the Birch Bay Village in the storm drains under Birch Point Road near Selder Road. The existing conditions 100-year peak flow would increase in Beaver Creek by 13 cfs which also increases stage at Chehalis Road. However, the increase in stage is limited to 0.1 feet and would not cause flooding in this area because the stage is still well below the overflow elevation.

Bay Ridge Estates Stormwater Improvements – The Bay Ridge Estates Stormwater Improvements project is located in the vicinity of Birch Point Road and Selder Road. A roadside culvert would be installed under Bay Ridge Drive at Birch Point Road at to divert floodwaters from Bay Ridge Estates through a new larger diameter culvert on the north side of Birch Point Road to replace the existing undersized pipe. A new storm drain connection would also be provided at Selder Road and Birch Point Road to collect road drainage that accumulates in this area. The cross culvert under Selder Road at Skyvue Road would be increased to improve conveyance capacity and eliminate the ditch overtopping that occurs on the west side of Selder Road. Table 13 shows that flooding is eliminated at critical locations (BBV-B and BBV-C) in the Bay Ridge Estates neighborhood for the simulated November 2021 flood and the climate change scenario for existing and future conditions. The flow diversion to Beaver Creek would reduce flow though the storm drains that pass through Birch Bay Village at Selder Road (BBV-5) and west of Selder Road (BBV-3).

Roger's Slough Drainage Improvements – The two existing culverts under Birch Bay Drive at Birch Point Loop would be replaced with a seven-foot-wide by four-foot-high fish-passable box culvert. The cross culvert under Birch Bay Drive west of Birch Point Loop would be abandoned and replaced with a cross culvert under the eastern Birch Point Loop entrance and connect to the ditch on the east side of Birch Point Loop. This ditch would also be widened and deepened to keep flow in the channel. Table 13 shows that flooding is eliminated at critical locations on Birch Point Loop (RS-B) and in Birch Bay Village (BBV-I) for the simulated November 2021 flood and the climate change scenario for existing and future conditions. A new outfall pipe to Birch Bay would be installed to bypass high flows around log jams that may occur at the mouth of Rogers Slough.

To convey future conditions flows, a larger culvert (8 feet wide and 5 feet high) would need to be installed under Birch Bay Drive at Birch Point Loop.

Birch Bay Village Stormwater Improvements – This project is located on the east side of Birch Bay Village in the vicinity of the Kwann Lake and Salish Road. New drainage pipe lateral connections would be added to the Salish Road storm drain system to connect Birch Bay Drive and Kwann Lake to divert storm runoff from the road to the pond. Outflow conveyance capacity from the lake would be increased with a second new pipe connection to Rogers Slough at the east end of the pond and the existing inlet/outlet pipe at the west end of the lake would be replaced with larger diameter pipes. This pipe would be connected to a new outfall pipe to Birch Bay installed to convey high flows around any log jams that may occur at the mouth of Rogers Slough. Table 13 shows that flooding is eliminated at critical locations (BBV-G and BBV-I) in Birch Bay Village for the simulated November 2021 flood and the climate change scenario for existing conditions, but flooding would still occur in the golf course pond (BBV-I) for the climate change scenario for future conditions.

Richmond Park Stormwater Improvements – The Richmond Park stormwater improvements are located in the Shintaffer subarea along Shintaffer Road from Richmond Park to Birch Bay Drive. This project would construct a new pipeline on the west side of Shintaffer Road to convey flows directly to Birch Bay.

This project would also move the location of the Deer Trail outfall or lengthen the pipe to reduce the potential for obstruction. Table 13 shows that flooding is eliminated at critical locations in Richmond Park (S-B) and Deer Trail (S-C) for the simulated November 2021 event, but flooding would still occur in Richmond Park for the climate change scenario for existing conditions.

For future conditions, a larger diameter pipeline would need to be constructed adjacent to Shintaffer Road. The culvert under Birch Bay Drive at Deer Trail would also need to be replaced with a larger diameter pipe. These improvements would eliminate flooding for all events including the November 2021 and climate change scenario.

Table 13. Peak Stage at Critical Flooding Locations

ID[a]	Location	Flood Stage[b] (feet NAVD88)	Peak Stage (feet NAVD88)		Height above Flood Stage[c] (feet)	
			Nov. 2021	Climate Change	Nov. 2021	Climate Change
Existing Conditions						
BBV-A	*Bay Ridge Estates Stormwater Improvements* Selder Road at Bay Ridge Drive	34.2	32.6	32.7	-1.6	-1.5
BBV-B	*Bay Ridge Estates Stormwater Improvements* Birch Point Road and Bay Ridge Drive	53.9	50.6	50.7	-1.7	-1.5
BBV-F	*Birch Bay Village Stormwater Improvements* Salish Road at Cowichan Road	12.6	11.4	11.4	-1.2	-1.2
BBV-H	*Birch Bay Village Stormwater Improvements* Salish Road	10.0	8.4	9.1	-1.6	-0.9
RS-B	*Roger's Slough Drainage Improvements* Birch Bay Drive at Birch Point Loop	9.2	8.5	8.7	-0.8	-0.6
S-B	*Richmond Park Stormwater Improvements* Richmond Park	52.4	52.3	52.5	-0.1	0.1
S-D	*Richmond Park Stormwater Improvements* Birch Bay Drive at Deer Trail	13.0	12.4	12.7	-0.6	-0.4
Future Conditions						
BBV-A	*Bay Ridge Estates Stormwater Improvements* Selder Road at Bay Ridge Drive	34.2	32.8	32.9	-1.4	-1.3
BBV-B	*Bay Ridge Estates Stormwater Improvements* Birch Point Road and Bay Ridge Drive	53.9	51.0	51.2	-1.2	-1.0
BBV-F	*Birch Bay Village Stormwater Improvements* Salish Road at Cowichan Road	12.6	11.6	11.8	-1.0	-0.8
BBV-H	*Birch Bay Village Stormwater Improvements* Salish Road	10.0	8.0	10.1	-2.0	0.1
RS-B	*Roger's Slough Drainage Improvements* Birch Bay Drive at Birch Point Loop	9.2	8.8	8.9	-0.4	-0.3
S-B	*Richmond Park Stormwater Improvements* Richmond Park	52.4	52.2	52.3	-0.2	-0.1
S-D	*Richmond Park Stormwater Improvements* Birch Bay Drive at Deer Trail	13.0	12.1	12.1	-0.9	-0.9

a. See Figure 17.

b. Flood stage is the elevation where surface flooding is assumed to occur.

c. Red highlighted values indicate predicted peak stage above flood stage.

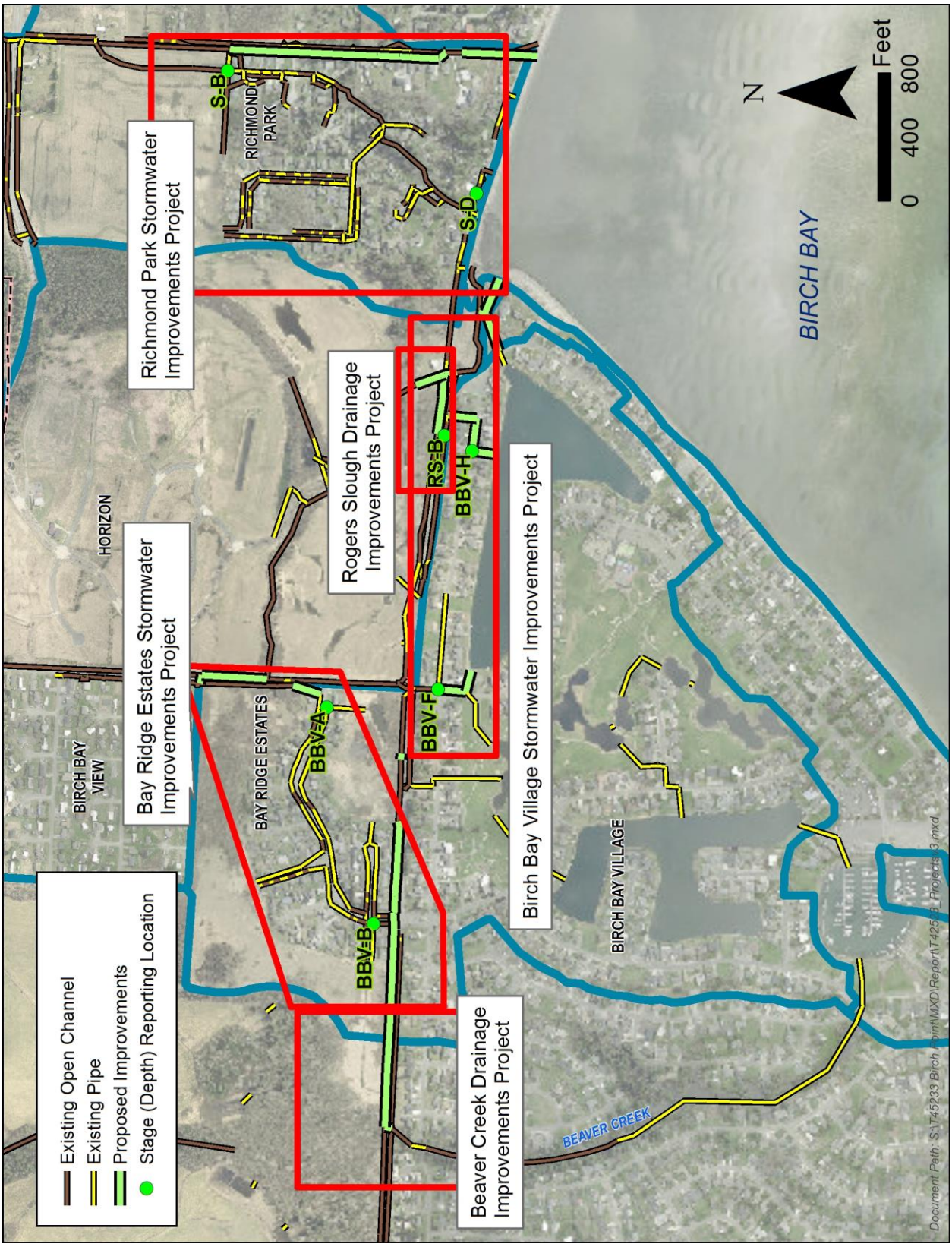


Figure 17. Concept Project Locations

5.2 COST OPINION

Planning level project costs were estimated for each concept described above, as summarized in Table 14. This cost estimate includes engineering, permitting and construction. The construction cost estimate is based on Washington State Department of Transportation (WSDOT) unit cost factors, experience with local projects, and a 50% contingency**.** Engineering and administration, permitting, and construction management costs are included in the estimate. Typical engineering cost range from 15% to 40% of total construction cost depending on size and complexity of the project. Permitting costs range from 5% to 10% of total construction costs depending on the degree of environmental impacts. Construction management ranges from 5% to 10% depending on the size and complexity of the project. The total cost breakdown is included in Table 15.

Table 14 shows two entries for the planning level cost for projects that would be configured differently depending on the land use conditions assumed. Project costs for future land use conditions would be higher than existing due to the need to have larger pipes to convey the higher flow rates estimated for future conditions. Projects with a single cost entry would be able to convey both existing and future land use condition flows without changing the size of the facility.

Table 14. Capital Project Summary

Concept Name	Description	Planning Level Cost	Priority[a]
Beaver Creek Drainage Improvements Project	Install fish passable culvert under Birch Point Road, deepen roadside ditches along Birch Point Road.	$1,250,000[b]	5
Bay Ridge Estates Stormwater Improvements Project	Install new cross culverts on Birch Point Road at Bay Ridge Drive and Selder Road at Bay Ridge Drive.	$770,000[b]	4
Roger's Slough Drainage Improvements Project	Install fish passable culvert under Birch Bay Drive at Birch Point Loop and construct local improvements to the drainage system.	$2,444,000 (Ex.)[c] $2,850,000 (Fu.)[c]	2
Birch Bay Village Stormwater Improvements Project	Improve stormwater conveyance on Salish Road and increase outfall capacity from Kwann Lake.	$1,260,000[b,c]	3
Richmond Park Stormwater Improvements Project	Construct diversion pipeline along Shintaffer Road to convey high flows directly to Birch Bay.	$1,770,000 (Ex.) $2,605,000 (Fu.)	1

a. Priority may change in the future based on available funding.
b. Planning level costs are identical for future and existing conditions.
c. Roger's Slough Drainage Improvements Project and the Birch Bay Village Stormwater Improvements Project both include a bypass at Roger's Slough. The cost of this facility is included in both projects for this report but only the first project constructed would actually include this cost.

Table 15. Total Project Cost Summary

Concept Name	Const. Cost[a]	Eng. - Survey	Permitting	Const. Mgmt.	Total Project Cost
Beaver Creek Drainage Improvements Project	$844,000	$279,000	$64,000	$64,000	$1,250,000
Bay Ridge Estates Stormwater Improvements Project	$519,000	$171,000	$39,000	$39,000	$770,000
Roger's Slough Drainage Improvements Project *(Existing Conditions)*	$1,651,000	$545,000	$124,000	$124,000	$2,440,000
Roger's Slough Drainage Improvements Project *(Future Conditions)*	$1,927,000	$636,000	$145,000	$145,000	$2,850,000
Birch Bay Village Stormwater Improvements Project	$848,000	$280,000	$64,000	$64,000	$1,260,000
Richmond Park Stormwater Improvements Project *(Existing Conditions)*	$1,196,000	$395,000	$90,000	$90,000	$1,770,000
Richmond Park Stormwater Improvements Project *(Future Conditions)*	$1,760,000	$581,000	$132,000	$132,000	$2,605,000

a. Includes Contingency and Sales Tax.

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APPENDIX A.
HYDROLOGIC AND HYDRAULIC MODEL DOCUMENTATION

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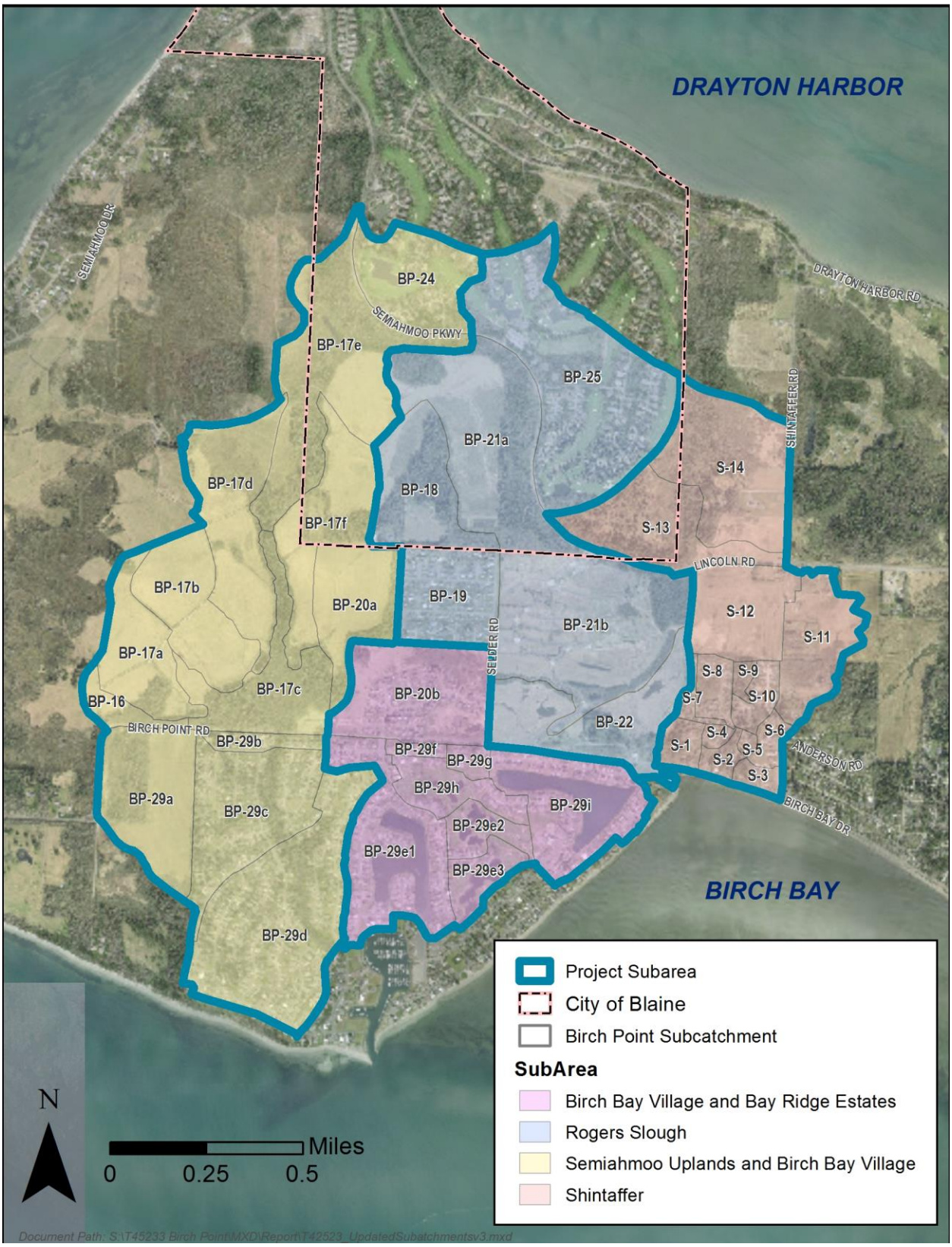

Figure A-1. Subcatchments

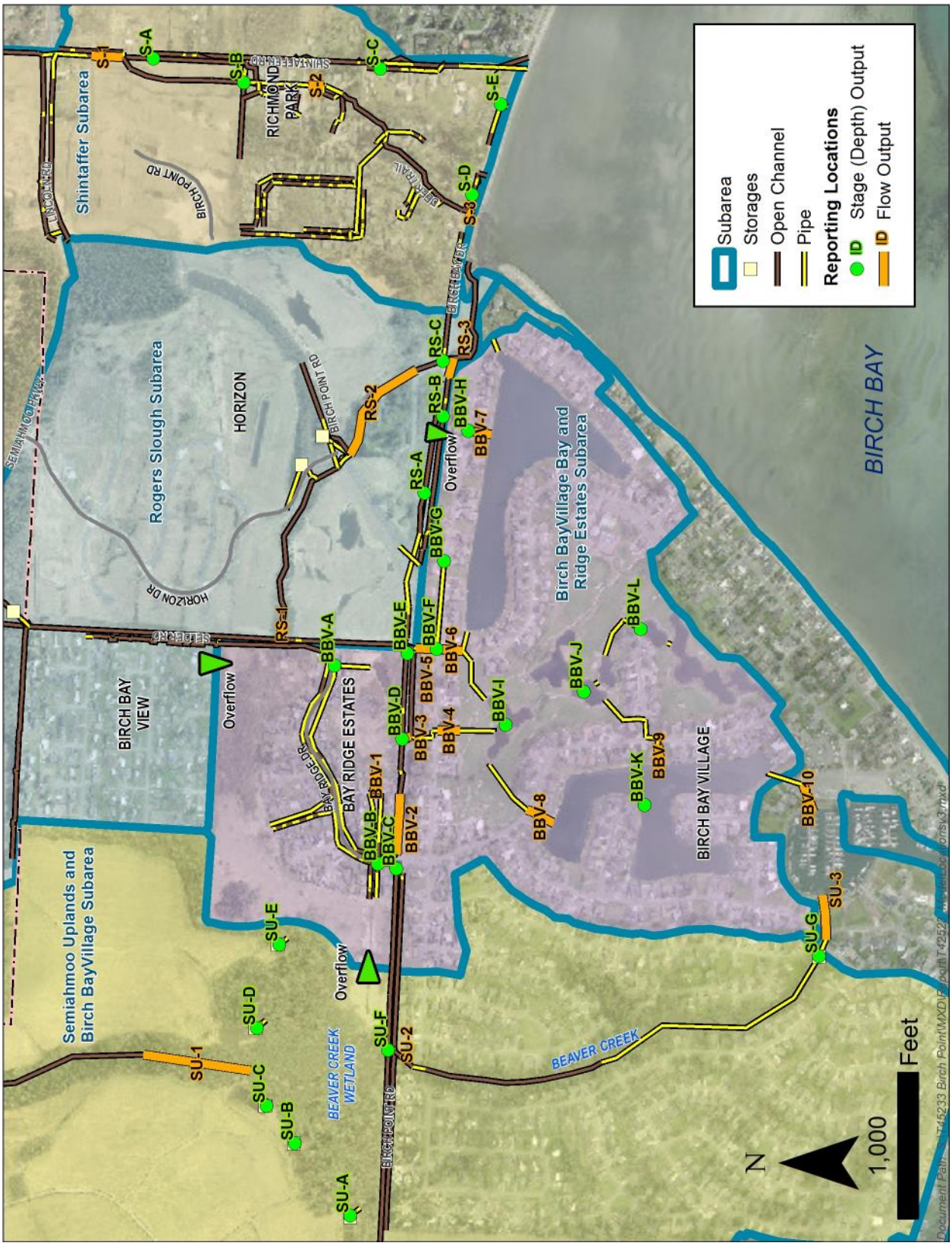

Figure A-2. Model Reporting Locations

Table A-1

HSPF Input Paramters - Existing Land Use

PERLND Area (Acres)	BP-16	BP-17a	BP-17b	BP-17c	BP-17d	BP-17e	BP-17f	BP-18	BP-19	BP-20a	BP-20b	BP-20b1	BP-20b2	BP-20b3	BP-21a	BP-21b	BP-22	BP-24	BP-25
Pervious Area	9.88	36.66	45.13	46.44	61.24	93.77	49.29	44.14	26.71	40.49	50.05	20.70	15.95	13.40	89.67	92.21	52.96	55.74	78.92
A, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Shrub, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Shrub, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Shrub, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Pasture, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Pasture, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Pasture, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Lawn, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Lawn, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Lawn, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Shrub, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Shrub, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Shrub, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Pasture, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Pasture, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Pasture, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Lawn, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Lawn, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Lawn, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.00	0.00	0.00
C, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.87	0.00	0.00	0.00
C, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.85	0.00	0.00	0.00
C, Shrub, Flat	1.33	0.90	0.00	1.68	6.32	19.76	3.57	8.17	0.00	0.37	0.00	0.00	0.00	0.00	12.81	0.70	1.31	6.87	14.00
C, Shrub, Mod	2.12	1.42	0.01	5.84	9.21	27.51	8.38	12.71	0.00	1.44	0.00	0.00	0.00	0.00	13.73	1.52	1.04	7.34	11.83
C, Shrub, Steep	0.37	0.18	0.00	3.68	0.91	3.12	1.47	1.19	0.00	0.31	0.00	0.00	0.00	0.00	1.05	0.71	0.64	0.34	1.28
C, Pasture, Flat	2.42	7.50	6.56	0.11	20.68	24.96	20.21	9.08	0.00	5.16	0.00	0.00	0.00	0.00	25.53	5.36	1.33	0.00	0.00
C, Pasture, Mod	3.26	6.21	9.91	0.74	17.43	9.70	15.00	9.19	0.00	22.93	0.00	0.00	0.00	0.00	17.08	16.23	0.79	0.00	0.02
C, Pasture, Steep	0.02	1.06	1.97	0.43	2.76	1.80	0.67	0.28	0.00	0.13	0.00	0.00	0.00	0.00	0.50	2.51	0.67	0.00	0.01
C, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.52	17.49
C, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.93	11.96
C, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95	0.84
C, Lawn, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	9.27	8.73
C, Lawn, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.71	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.62	6.95	7.63
C, Lawn, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.56	0.54
D, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00
D, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.85	0.00	0.00	0.00
D, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00
D, Shrub, Flat	0.17	0.87	0.03	9.94	0.00	2.44	0.00	0.90	0.00	1.57	0.89	0.54	0.00	0.35	6.18	0.01	2.25	0.00	0.69
D, Shrub, Mod	0.14	1.61	0.04	14.25	0.00	2.61	0.00	2.13	0.00	4.11	0.59	0.36	0.00	0.23	10.66	0.11	1.80	0.00	1.47
D, Shrub, Steep	0.03	0.12	0.02	1.51	0.00	0.72	0.00	0.15	0.00	0.67	0.00	0.00	0.00	0.00	1.34	0.02	1.87	0.00	0.38
D, Pasture, Flat	0.01	6.76	11.71	4.69	1.83	0.00	0.00	0.11	0.09	1.16	18.15	11.02	0.00	7.14	0.36	24.19	24.26	0.00	0.00
D, Pasture, Mod	0.01	8.11	12.39	2.04	1.58	0.00	0.00	0.15	0.39	2.20	12.78	7.76	0.00	5.02	0.40	28.85	12.26	0.00	0.00
D, Pasture, Steep	0.01	1.91	2.49	0.52	0.53	0.00	0.00	0.01	0.12	0.35	1.68	1.02	0.00	0.66	0.04	3.79	2.25	0.00	0.00
D, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39
D, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81
D, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.42
D, Lawn, Flat	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.03	5.18	0.01	8.68	0.00	8.68	0.00	0.00	0.00	0.14	0.00	0.08
D, Lawn, Mod	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.03	16.36	0.05	5.54	0.00	5.54	0.00	0.00	0.00	0.29	0.00	0.23
D, Lawn, Steep	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	1.78	0.00	1.73	0.00	1.73	0.00	0.00	0.01	0.21	0.00	0.12
Impervious	0.7	1.4	1.3	0.5	2.2	4.0	0.9	2.1	14.6	0.5	12.3	0.0	12.0	0.3	3.2	13.5	4.9	15.9	21.5
Total	10.6	38.1	46.4	46.9	63.4	97.8	50.2	46.2	41.3	41.0	62.4	20.7	28.0	13.7	92.9	105.7	57.9	71.6	100.4

Table A-1

HSPF Input Paramters - Existing Land Use

PERLND Area (Acres)	BP-29a	BP-29b	BP-29c	BP-29d	BP-29e1	BP-29e2	BP-29e3	BP-29f	BP-29g	BP-29h	BP-29i	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10	S-11	S-12	S-13	S-14
Pervious Area	55.41	5.54	41.31	67.61	28.85	9.71	9.51	2.06	3.53	15.02	22.10	8.39	4.06	4.28	1.94	1.06	5.01	3.31	6.60	3.06	6.16	35.63	38.83	48.60	68.43
A, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Shrub, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Shrub, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
A, Shrub, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
A, Pasture, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
A, Pasture, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81
A, Pasture, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.92
A, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Lawn, Flat	0.00	0.00	0.00	0.00	0.00	0.07	0.04	0.00	0.00	0.00	11.51	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Lawn, Mod	0.00	0.00	0.00	0.00	0.00	0.04	0.02	0.00	0.02	0.00	3.45	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Lawn, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	1.18	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Shrub, Flat	9.58	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.31	0.00
B, Shrub, Mod	5.72	0.00	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.80	0.00
B, Shrub, Steep	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22	0.00
B, Pasture, Flat	5.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Pasture, Mod	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Pasture, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00
B, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00
B, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
B, Lawn, Flat	0.09	0.00	1.02	8.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Lawn, Mod	0.09	0.00	0.72	6.51	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Lawn, Steep	0.00	0.00	0.05	1.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.68	0.00	0.00	0.01	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00
C, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.51	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00
C, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.28	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00
C, Shrub, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.29	0.00
C, Shrub, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.10	0.00
C, Shrub, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.50	0.00
C, Pasture, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.90	0.00	0.14	11.95
C, Pasture, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.23	7.47
C, Pasture, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.17	8.31
C, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
C, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
C, Lawn, Flat	0.00	0.00	0.64	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.61	3.25	0.00	0.00	0.00	0.00	2.91	0.00	0.00	0.00	0.00
C, Lawn, Mod	0.00	0.00	2.89	4.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.37	1.04	0.00	0.00	0.00	1.52	0.00	0.00	0.00	0.00	0.00
C, Lawn, Steep	0.00	0.00	0.24	4.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.14	0.00	0.00	0.00	0.71	0.00	0.00	0.00	0.00	0.00
D, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.02	0.00	0.00	0.00	0.00	0.00	1.19	0.00	0.00	0.01	0.00	0.00
D, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.26	0.00	0.00	0.00	0.00	0.00	1.37	0.01	0.00	0.01	0.00	0.00
D, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.08	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00
D, Shrub, Flat	2.46	0.00	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00
D, Shrub, Mod	2.56	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.98	0.00
D, Shrub, Steep	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00
D, Pasture, Flat	21.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.01	28.52	35.84	4.20	22.21
D, Pasture, Mod	6.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.01	5.37	2.67	2.04	10.80
D, Pasture, Steep	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.30	0.79	1.91
D, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D, Lawn, Flat	0.29	3.30	18.00	19.31	14.69	6.87	6.06	0.94	1.95	9.50	4.47	2.18	0.00	0.00	1.64	0.00	0.46	1.84	4.12	0.00	0.73	0.00	0.01	0.00	0.00
D, Lawn, Mod	0.30	1.62	12.47	14.77	7.46	2.46	2.72	0.83	1.40	4.14	0.99	1.32	0.00	0.00	0.26	0.00	0.09	0.85	2.32	0.00	0.22	0.00	0.00	0.00	0.00
D, Lawn, Steep	0.04	0.61	5.18	7.12	6.69	0.27	0.66	0.29	0.14	1.38	0.51	1.26	0.00	0.00	0.00	0.00	0.02	0.03	0.15	0.00	0.02	0.00	0.00	0.00	0.00
Impervious	0.7	3.5	22.2	43.1	37.2	3.5	4.7	1.6	2.0	6.0	32.7	1.6	1.8	1.5	0.8	0.6	1.6	1.1	3.4	0.0	3.4	1.6	0.8	1.3	1.0
Total	56.1	9.0	63.5	110.7	66.5	14.2	15.7	3.7	5.6	21.6	56.9	10.0	5.9	5.8	2.7	1.7	6.6	4.5	10.0	3.1	9.6	37.2	39.6	49.9	69.5

Table A-2
HSPF Input Paramters - Future Land Use

PERLND Area (acres)	BP-16	BP-17a	BP-17b	BP-17c	BP-17d	BP-17e	BP-17f	BP-18	BP-19	BP-20a	BP-20b	BP-20b1	BP-20b2	BP-20b3	BP-21a	BP-21b	BP-22	BP-24	BP-25
Total Pervious	9.60	34.99	42.88	45.77	58.19	71.93	35.80	26.51	26.47	37.33	45.64	16.87	15.95	13.40	55.72	64.40	38.24	49.92	67.17
A, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Shrub, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Shrub, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Shrub, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Pasture, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Pasture, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Pasture, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Lawn, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Lawn, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Lawn, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Shrub, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Shrub, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Shrub, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Pasture, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Pasture, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Pasture, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Lawn, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Lawn, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Lawn, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.00	0.00	0.00
C, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.87	0.00	0.00	0.00
C, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.85	0.00	0.00	0.00
C, Shrub, Flat	1.33	0.87	0.00	1.63	6.00	7.56	0.24	0.00	0.00	0.27	0.00	0.00	0.00	0.00	2.81	0.02	0.68	0.00	0.00
C, Shrub, Mod	2.11	1.38	0.01	5.67	8.75	10.91	0.88	0.00	0.00	0.96	0.00	0.00	0.00	0.00	1.42	0.16	0.48	0.00	0.00
C, Shrub, Steep	0.36	0.17	0.00	3.65	0.86	1.48	0.16	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.03	0.22	0.21	0.00	0.00
C, Pasture, Flat	2.31	7.18	6.23	0.11	19.64	6.69	4.42	0.00	0.00	4.72	0.00	0.00	0.00	0.00	0.11	0.46	0.06	0.00	0.00
C, Pasture, Mod	3.11	5.92	9.43	0.73	16.56	7.33	10.57	0.00	0.00	21.74	0.00	0.00	0.00	0.00	0.04	2.11	0.11	0.00	0.00
C, Pasture, Steep	0.02	1.01	1.87	0.42	2.63	0.28	0.61	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.56	0.02	0.00	0.00
C, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39	0.03
C, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.23	0.13
C, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.04
C, Lawn, Flat	0.00	0.00	0.00	0.00	0.00	18.17	11.32	10.35	0.94	0.17	0.00	0.00	0.00	0.00	21.25	3.12	0.91	22.53	34.59
C, Lawn, Mod	0.00	0.00	0.00	0.00	0.00	11.17	6.80	13.14	1.71	0.31	0.00	0.00	0.00	0.00	17.61	8.84	0.84	21.05	26.57
C, Lawn, Steep	0.00	0.00	0.00	0.00	0.00	2.02	0.80	0.88	0.14	0.07	0.00	0.00	0.00	0.00	0.91	1.44	1.07	2.18	2.13
D, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00
D, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.31	0.00	0.00	0.00
D, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00
D, Shrub, Flat	0.16	0.83	0.03	9.87	0.00	2.43	0.00	0.00	0.00	0.91	0.09	0.09	0.00	0.35	0.01	0.01	1.16	0.00	0.15
D, Shrub, Mod	0.14	1.53	0.04	14.13	0.00	2.61	0.00	0.00	0.00	2.70	0.04	0.04	0.00	0.23	0.13	0.09	1.04	0.00	0.14
D, Shrub, Steep	0.03	0.12	0.02	1.51	0.00	0.72	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.04	0.02	1.15	0.00	0.00
D, Pasture, Flat	0.00	6.44	11.12	4.59	1.74	0.00	0.00	0.00	0.00	1.05	13.14	6.01	0.00	7.14	0.06	3.77	8.56	0.00	0.00
D, Pasture, Mod	0.01	7.71	11.76	1.96	1.50	0.00	0.00	0.00	0.00	1.89	8.50	3.48	0.00	5.02	0.10	7.59	4.14	0.00	0.00
D, Pasture, Steep	0.01	1.83	2.37	0.51	0.51	0.00	0.00	0.00	0.00	0.27	1.35	0.69	0.00	0.66	0.03	2.20	0.53	0.00	0.00
D, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
D, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31
D, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
D, Lawn, Flat	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.64	5.23	0.42	12.16	3.48	8.68	0.00	3.88	12.31	10.21	0.00	0.70
D, Lawn, Mod	0.00	0.00	0.00	0.65	0.00	0.00	0.00	1.41	16.60	0.94	8.43	2.90	5.54	0.00	6.50	13.03	5.55	0.00	1.53
D, Lawn, Steep	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.10	1.85	0.16	1.92	0.20	1.73	0.00	0.78	0.98	1.54	0.00	0.52
Impervious	1.0	3.1	3.5	1.1	5.2	25.9	14.4	19.7	14.8	3.6	16.7	4.7	12.0	0.3	37.2	41.3	19.6	21.7	33.3
Total	10.6	38.1	46.4	46.9	63.4	97.8	50.2	46.2	41.3	41.0	62.4	21.6	28.0	13.7	92.9	105.7	57.9	71.6	100.4

Table A-2
HSPF Input Paramters - Future Land Use

PERLND Area (acres)	BP-29a	BP-29b	BP-29c	BP-29d	BP-29e1	BP-29e2	BP-29e3	BP-29f	BP-29g	BP-29h	BP-29i	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10	S-11	S-12	S-13	S-14
Total Pervious	53.89	5.54	41.30	67.57	28.83	9.71	9.52	2.06	3.53	15.02	22.10	7.59	3.11	2.53	1.94	1.06	5.00	3.09	6.60	2.49	6.15	30.62	20.08	36.05	65.49
A, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Shrub, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Shrub, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Shrub, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Pasture, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
A, Pasture, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63
A, Pasture, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.35
A, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A, Lawn, Flat	0.00	0.00	0.00	0.00	0.00	0.07	0.04	0.00	0.00	0.00	11.52	0.88	0.08	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
A, Lawn, Mod	0.00	0.00	0.00	0.00	0.00	0.04	0.02	0.00	0.02	0.00	3.45	0.83	0.13	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
A, Lawn, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	1.18	0.82	0.40	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
B, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Shrub, Flat	9.41	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Shrub, Mod	5.63	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Shrub, Steep	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Pasture, Flat	5.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Pasture, Mod	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Pasture, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B, Lawn, Flat	0.10	0.00	1.02	8.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00
B, Lawn, Mod	0.09	0.00	0.73	6.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.56	0.00
B, Lawn, Steep	0.00	0.00	0.05	1.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.00
C, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00
C, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00
C, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
C, Shrub, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70	0.00
C, Shrub, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.38	0.00
C, Shrub, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.39	0.00
C, Pasture, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.00	0.14	11.73
C, Pasture, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.23	6.38
C, Pasture, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.17	4.64
C, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C, Lawn, Flat	0.00	0.00	0.64	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.41	0.03	0.62	3.25	0.00	0.00	0.12	2.91	0.46	0.00	0.35	0.02
C, Lawn, Mod	0.00	0.00	2.89	4.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.30	0.01	0.37	1.04	0.00	0.00	0.09	1.53	0.19	0.00	3.44	0.63
C, Lawn, Steep	0.00	0.00	0.24	4.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.17	0.00	0.07	0.14	0.00	0.00	0.01	0.71	0.01	0.00	3.08	2.18
D, Forest, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.01	0.00	0.00
D, Forest, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.01	0.00	0.00
D, Forest, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00
D, Shrub, Flat	2.37	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.00
D, Shrub, Mod	2.46	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
D, Shrub, Steep	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00
D, Pasture, Flat	20.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.01	19.04	11.51	3.99	21.87
D, Pasture, Mod	5.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	3.52	0.65	1.88	10.75
D, Pasture, Steep	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.10	0.75	1.90
D, Grass, Flat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D, Grass, Mod	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D, Grass, Steep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D, Lawn, Flat	0.31	3.30	18.00	19.33	14.69	6.87	6.06	0.94	1.95	9.50	4.47	2.41	0.13	0.01	1.64	0.00	0.46	2.06	4.12	0.30	0.73	5.69	7.10	0.30	0.00
D, Lawn, Mod	0.32	1.63	12.48	14.77	7.46	2.47	2.73	0.83	1.40	4.13	0.99	1.38	0.08	0.15	0.26	0.00	0.10	0.96	2.32	0.34	0.22	1.11	0.62	0.61	0.00
D, Lawn, Steep	0.04	0.61	5.18	7.12	6.69	0.27	0.66	0.29	0.14	1.38	0.51	1.26	0.06	0.04	0.00	0.00	0.02	0.03	0.15	0.01	0.02	0.05	0.10	0.14	0.00
Impervious	2.2	3.5	22.2	43.1	37.2	3.5	4.7	1.6	2.0	6.0	32.7	2.4	2.7	3.3	0.8	0.6	1.6	1.4	3.4	0.6	3.5	6.6	19.5	13.8	4.0
Total	56.1	9.0	63.5	110.7	66.5	14.2	15.7	3.7	5.6	21.6	56.9	10.0	5.9	5.8	2.7	1.7	6.6	4.5	10.0	3.1	9.6	37.2	39.6	49.9	69.5

Table A-3
Birch Point Drainage Study - Peak Stage Summary

		Existing Land Use								Existing Land Use with Rogers Slough Structure Removed								Future Land Use								
		Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				
Junction	Flood Elev	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	mate Chan	25 Year	100 Year	Nov-21	limate Chang	Location
LDES2448	112.1	110.3	110.4	110.4	110.5	-1.8	-1.72	-1.66	-1.58	110.3	110.4	110.4	110.5	-1.8	-1.72	-1.66	-1.58	110.3	110.4	110.5	110.6	-1.8	-1.69	-1.6	-1.5	Birch Point Road West of Selder
LDES2449	111.2	109.7	109.7	109.8	109.8	-1.5	-1.47	-1.45	-1.43	109.7	109.7	109.8	109.8	-1.5	-1.47	-1.45	-1.43	109.7	109.7	109.8	109.8	-1.5	-1.46	-1.4	-1.4	Birch Point Road West of Selder
LDES2456	80.0	76.3	76.4	76.4	76.5	-3.7	-3.61	-3.56	-3.51	76.3	76.4	76.4	76.5	-3.7	-3.61	-3.56	-3.51	76.3	76.4	76.5	76.5	-3.7	-3.58	-3.5	-3.5	Birch Point Road West of Selder
LDES2457	77.6	75.0	75.0	75.0	75.1	-2.6	-2.58	-2.57	-2.55	75.0	75.0	75.0	75.1	-2.6	-2.58	-2.57	-2.55	75.0	75.0	75.0	75.1	-2.6	-2.57	-2.6	-2.6	Birch Point Road West of Selder
LDES2463	50.3	48.2	48.2	48.2	48.2	-2.1	-2.10	-2.10	-2.10	48.2	48.2	48.2	48.2	-2.1	-2.10	-2.10	-2.10	48.2	48.2	48.6	50.3	-2.1	-2.10	-1.7	0.0	Birch Point Road West of Selder
LDES2464	51.1	44.7	44.9	45.0	46.7	-6.4	-6.23	-6.14	-4.40	44.7	44.9	45.0	46.7	-6.4	-6.24	-6.14	-4.40	44.9	46.6	48.6	50.3	-6.2	-4.49	-2.5	-0.8	Birch Point Road West of Selder
LDES2470	51.1	48.4	50.2	51.9	52.5	-2.7	-0.90	0.76	1.36	48.4	50.2	51.9	52.5	-2.7	-0.94	0.76	1.36	51.2	52.4	52.6	52.6	0.1	1.34	1.5	1.5	Birch Point Road West of Selder
Od1010_3	55.3	51.7	51.7	51.9	52.5	-3.6	-3.58	-3.40	-2.80	51.7	51.8	51.9	52.5	-3.6	-3.52	-3.40	-2.80	51.8	52.5	52.6	52.7	-3.6	-2.84	-2.7	-2.6	Birch Point Road West of Selder
OD1010-1	62.3	61.9	61.9	61.9	62.0	-0.4	-0.38	-0.36	-0.34	61.9	61.9	61.9	62.0	-0.4	-0.38	-0.36	-0.34	61.9	61.9	62.0	62.0	-0.4	-0.37	-0.3	-0.3	Birch Point Road West of Selder
OD1010-2	59.4	56.8	56.9	57.0	57.1	-2.6	-2.54	-2.44	-2.34	56.9	56.9	57.0	57.1	-2.5	-2.48	-2.44	-2.34	56.9	57.0	57.1	57.1	-2.5	-2.45	-2.4	-2.3	Birch Point Road West of Selder
TT1018	117.0	115.3	115.4	115.4	115.4	-1.7	-1.64	-1.62	-1.60	115.3	115.4	115.4	115.4	-1.7	-1.64	-1.62	-1.60	115.3	115.4	115.4	115.4	-1.7	-1.63	-1.6	-1.6	Birch Point Road West of Selder
TT1019	72.0	68.0	68.0	68.0	68.0	-4.0	-4.0	-4.00	-4.00	68.0	68.0	68.0	68.0	-4.0	-4.0	-4.00	-4.00	68.0	68.0	68.0	68.0	-4.0	-4.0	-4.0	-4.0	Birch Point Road West of Selder
2886	28.1	27.2	28.0	28.1	28.1	-1.0	-0.1	0.00	0.03	26.8	27.9	28.1	28.1	-1.3	-0.2	0.00	0.03	28.1	28.2	28.2	28.2	0.0	0.1	0.1	0.1	Birch Point Road West of Selder
2887	39.1	36.4	36.5	36.5	36.6	-2.7	-2.64	-2.60	-2.54	36.5	36.6	36.5	36.6	-2.6	-2.52	-2.60	-2.54	36.8	36.8	36.8	36.8	-2.3	-2.31	-2.3	-2.3	Birch Point Road West of Selder
2888	29.4	26.1	26.5	26.6	26.6	-3.3	-2.9	-2.85	-2.80	25.8	26.4	26.6	26.6	-3.6	-3.0	-2.85	-2.80	26.5	26.6	26.7	26.7	-2.9	-2.8	-2.7	-2.7	Birch Point Road West of Selder
LDES2482	46.3	44.5	44.6	44.7	44.7	-1.8	-1.7	-1.63	-1.57	45.9	46.5	44.7	44.7	-0.4	0.2	-1.63	-1.57	46.7	46.7	46.8	46.8	0.4	0.4	0.5	0.5	Birch Point Road West of Selder
LDES2490	52.2	51.1	51.1	51.1	51.1	-1.1	-1.1	-1.10	-1.10	51.1	51.1	51.1	51.1	-1.1	-1.1	-1.10	-1.10	51.1	51.1	51.1	51.1	-1.1	-1.1	-1.1	-1.1	Birch Point Road West of Selder
LDES2491	52.2	50.8	50.8	50.8	50.8	-1.4	-1.4	-1.40	-1.40	50.8	50.8	50.8	50.8	-1.4	-1.4	-1.40	-1.40	50.8	50.8	50.8	50.8	-1.4	-1.4	-1.4	-1.4	Birch Point Road West of Selder
LDES2498	36.0	34.5	34.6	34.7	34.7	-1.5	-1.4	-1.34	-1.29	34.5	34.6	34.7	34.7	-1.5	-1.4	-1.34	-1.29	34.7	34.8	34.8	34.8	-1.3	-1.2	-1.2	-1.2	Birch Point Road West of Selder
LDES2502	28.7	28.6	29.4	29.4	29.5	-0.1	0.7	0.71	0.76	28.1	29.3	29.4	29.5	-0.6	0.6	0.71	0.76	29.4	29.5	29.5	29.6	0.7	0.78	0.8	0.9	Birch Point Road West of Selder
LDES2503	28.0	26.5	27.0	27.1	27.2	-1.5	-1.0	-0.89	-0.78	26.1	27.0	27.1	27.2	-1.9	-1.1	-0.89	-0.78	27.0	27.2	27.3	27.3	-1.0	-0.8	-0.7	-0.7	Birch Point Road West of Selder
LDES2508	30.0	28.6	29.4	29.4	29.5	-1.4	-0.6	-0.59	-0.55	28.1	29.3	29.4	29.5	-1.9	-0.7	-0.59	-0.55	29.4	29.5	29.5	29.6	-0.6	-0.5	-0.5	-0.4	Birch Point Road West of Selder
LDES2509	27.8	27.6	28.6	28.6	28.7	-0.2	0.8	0.84	0.91	27.2	28.5	28.6	28.7	-0.6	0.6	0.84	0.91	28.6	28.7	28.8	28.9	0.8	0.9	1.0	1.1	Birch Point Road West of Selder
LDES2516	27.8	27.5	28.5	28.6	28.6	-0.3	0.7	0.79	0.83	27.1	28.4	28.6	28.6	-0.7	0.6	0.79	0.83	28.6	28.6	28.7	28.7	0.8	0.8	0.9	0.9	Birch Point Road West of Selder
LDES2521	27.8	26.1	26.5	26.6	26.6	-1.7	-1.3	-1.25	-1.19	25.9	26.4	26.6	26.6	-2.0	-1.4	-1.25	-1.19	26.5	26.6	26.7	26.7	-1.3	-1.2	-1.1	-1.1	Birch Point Road West of Selder
OD1020-1	53.4	53.0	53.1	53.2	53.3	-0.4	-0.3	-0.21	-0.11	53.0	53.1	53.2	53.3	-0.4	-0.3	-0.21	-0.11	53.3	53.4	53.4	53.5	-0.1	0.0	0.0	0.1	Birch Point Road West of Selder
OD1020-2	53.4	52.7	52.9	53.0	53.1	-0.7	-0.5	-0.42	-0.29	52.7	52.9	53.0	53.1	-0.7	-0.5	-0.42	-0.29	53.1	53.2	53.2	53.3	-0.3	-0.2	-0.2	-0.1	Birch Point Road West of Selder
OD1020-3	53.3	52.5	52.6	52.7	52.8	-0.8	-0.7	-0.60	-0.48	52.5	52.6	52.7	52.8	-0.8	-0.7	-0.60	-0.48	52.8	52.9	52.9	53.0	-0.5	-0.4	-0.4	-0.3	Birch Point Road West of Selder
OF-TT6	29.4	23.7	23.7	23.7	23.8	-5.7	-5.7	-5.66	-5.65	23.7	23.7	23.7	23.8	-5.7	-5.7	-5.66	-5.65	23.7	23.8	23.8	23.8	-5.7	-5.7	-5.7	-5.7	Birch Point Road West of Selder
TT1020	52.2	52.4	52.4	52.5	52.5	0.1	0.2	0.26	0.33	52.3	52.4	52.5	52.5	0.1	0.2	0.26	0.33	52.5	52.6	52.7	52.7	0.3	0.4	0.5	0.5	Birch Point Road West of Selder
TT1021	52.2	51.6	51.6	51.6	51.6	-0.6	-0.6	-0.60	-0.60	51.6	51.6	51.6	51.6	-0.6	-0.6	-0.60	-0.60	51.6	51.6	51.6	51.6	-0.6	-0.6	-0.6	-0.6	Birch Point Road West of Selder
TT1022	52.2	52.2	52.3	52.3	52.4	0.0	0.1	0.12	0.16	52.1	52.2	52.3	52.4	-0.1	0.0	0.12	0.16	52.3	52.4	52.4	52.4	0.1	0.2	0.2	0.2	Birch Point Road West of Selder
TT1023	28.0	26.5	27.0	27.1	27.2	-1.6	-1.0	-0.90	-0.79	26.1	26.9	27.1	27.2	-1.9	-1.1	-0.90	-0.79	27.0	27.2	27.3	27.3	-1.0	-0.8	-0.8	-0.7	Birch Point Road West of Selder
35701	53.4	53.3	53.3	53.3	53.3	-0.1	-0.1	-0.09	-0.06	53.3	53.3	53.3	53.3	-0.1	-0.1	-0.09	-0.06	53.3	53.4	53.4	53.4	-0.1	0.0	0.0	0.0	Bay Ridge Estates - West Shoreview Road
35702	53.3	53.3	53.3	53.3	53.3	0.0	0.0	0.00	0.03	53.3	53.3	53.3	53.3	0.0	0.0	0.00	0.03	53.3	53.4	53.4	53.4	0.0	0.1	0.1	0.1	Bay Ridge Estates - West Shoreview Road
35711	53.3	53.3	53.3	53.3	53.3	0.0	0.0	0.00	0.03	53.3	53.3	53.3	53.3	0.0	0.0	0.00	0.03	53.3	53.4	53.4	53.4	0.0	0.1	0.1	0.1	Bay Ridge Estates - West Shoreview Road
35712	52.8	52.4	52.5	52.5	52.6	-0.4	-0.3	-0.30	-0.25	52.4	52.4	52.5	52.6	-0.4	-0.4	-0.30	-0.25	52.6	52.6	52.6	52.6	-0.3	-0.2	-0.2	-0.2	Bay Ridge Estates - West Shoreview Road
35721	52.2	52.4	52.4	52.4	52.5	0.1	0.2	0.24	0.29	52.4	52.4	52.4	52.5	0.1	0.2	0.24	0.29	52.5	52.5	52.5	52.6	0.3	0.3	0.3	0.3	Bay Ridge Estates - West Shoreview Road
10001	53.8	53.6	53.6	53.6	53.6	-0.2	-0.2	-0.18	-0.17	53.6	53.6	53.6	53.6	-0.2	-0.2	-0.18	-0.17	53.6	53.6	53.6	53.6	-0.2	-0.2	-0.1	-0.1	Bay Ridge Estates - West Shoreview Road
35861	52.1	52.4	52.4	52.4	52.5	0.3	0.3	0.34	0.39	52.3	52.4	52.4	52.5	0.2	0.3	0.34	0.39	52.5	52.5	52.5	52.6	0.4	0.4	0.4	0.4	Bay Ridge Estates - West Shoreview Road
6365	52.8	53.0	53.1	53.1	53.2	0.2	0.3	0.33	0.43	53.0	53.1	53.1	53.2	0.2	0.3	0.33	0.43	53.2	53.3	53.3	53.3	0.4	0.5	0.5	0.5	Bay Ridge Estates - West Shoreview Road
LDES2476	52.1	52.5	52.6	52.6	52.6	0.4	0.5	0.49	0.52	52.5	52.6	52.6	52.6	0.4	0.5	0.49	0.52	52.6	52.6	52.7	52.7	0.5	0.5	0.5	0.6	Bay Ridge Estates - West Shoreview Road
LDES2478	52.7	53.5	53.5	53.5	53.5	0.8	0.77	0.79	0.81	53.5	53.5	53.5	53.5	0.8	0.77	0.79	0.81	53.5	53.5	53.5	53.5	0.8	0.82	0.8	0.8	Bay Ridge Estates - West Shoreview Road
35722	52.4	51.4	51.4	51.4	51.4	-1.0	-1.0	-0.99	-0.98	51.4	51.4	51.4	51.4	-1.0	-1.0	-0.99	-0.98	51.5	51.5	51.5	51.5	-0.9	-0.9	-0.9	-0.9	Bay Ridge Estates - East Shoreview Road
35751	51.5	51.4	51.4	51.4	51.4	-0.1	-0.1	-0.10	-0.09	51.4	51.4	51.4	51.4	-0.1	-0.1	-0.10	-0.09	51.4	51.4	51.4	51.5	-0.1	-0.1	-0.1	0.0	Bay Ridge Estates - East Shoreview Road
35752	52.5	50.9	50.9	50.9	51.0	-1.6	-1.6	-1.57	-1.47	50.9	50.9	50.9	51.0	-1.6	-1.6	-1.57	-1.47	51.0	51.1	51.1	51.2	-1.5	-1.4	-1.4	-1.3	Bay Ridge Estates - East Shoreview Road
35862	51.9	51.2	51.2	51.3	51.6	-0.7	-0.7	-0.58	-0.35	51.2	51.2	51.3	51.6	-0.7	-0.7	-0.58	-0.35	51.5	51.7	51.7	51.8	-0.4	-0.3	-0.2	-0.1	Bay Ridge Estates - East Shoreview Road
6399	50.1	50.0	50.1	50.1	50.8	-0.1	0.0	-0.01	0.68	50.0	50.1	50.1	50.8	-0.1	-0.1	-0.01	0.68	50.7	50.9	50.9	51.0	0.6	0.8	0.8	0.8	Bay Ridge Estates - East Shoreview Road
6501	49.8	50.5	50.5	50.5	50.6	0.7	0.7	0.73	0.84	50.5	50.5	50.5	50.6	0.7	0.7	0.73	0.84	50.6	50.7	50.8	50.8	0.8	0.9	1.0	1.0	Bay Ridge Estates - East Shoreview Road
6502	49.5	48.6	48.6	48.6	50.4	-0.9	-0.89	-0.83	0.91	48.6	48.6	48.6	50.4	-0.9	-0.90	-0.83	0.91	50.2	50.4	50.4	50.4	0.8	0.96	1.0	1.0	Bay Ridge Estates - East Shoreview Road
6503	49.0	49.9	49.9	49.9	50.1	0.9	0.9	0.89	1.10	49.9	49.9	49.9	50.1	0.9	0.9	0.89	1.10	50.0	50.2	50.3	50.3	1.0	1.2	1.2	1.3	Bay Ridge Estates - East Shoreview Road
6504	49.6	49.8	49.7	49.8	50.1	0.1	0.1	0.14	0.49	49.8	49.8	49.8	50.1	0.1	0.1	0.14	0.49	50.0	50.2	50.3	50.3	0.3	0.6	0.6	0.6	Bay Ridge Estates - East Shoreview Road
6505	48.8	47.6	47.7	47.8	50.1	-1.1	-1.1	-0.95	1.37	47.6	47.6	47.8	50.1	-1.2	-1.1	-0.95	1.37	50.0	50.2	50.3	50.3	1.2	1.5	1.5	1.5	Bay Ridge Estates - East Shoreview Road
6506	50.3	47.8	48.0	48.1	50.2	-2.5	-2.36	-2.23	-0.11	47.8	47.9	48.1	50.2	-2.5	-2.45	-2.23	-0.11	50.1	50.3	50.3	50.3	-0.3	-0.02	0.0	0.0	Bay Ridge Estates - East Shoreview Road
7801	50.4	50.9	50.9	50.9	51.0	0.5	0.5	0.53	0.63	50.9	50.9	50.9	51.0	0.5	0.5	0.53	0.63	51.0	51.1	51.1	51.2	0.6	0.7	0.7	0.8	Bay Ridge Estates - East Shoreview Road
7881	50.6	51.1	51.1	51.1	51.2	0.5	0.5	0.53	0.60	51.1	51.1	51.1	51.2	0.5	0.5	0.53	0.60	51.2	51.3	51.3	51.3	0.6	0.6	0.7	0.7	Bay Ridge Estates - East Shoreview Road
35441	52.7	52.7	52.7	52.7	52.7	0.0	0.0	0.04	0.04	52.7	52.7	52.7	52.7	0.0	0.0	0.04	0.04	52.7	52.7	52.7	52.7	0.0	0.0	0.0	0.0	Bay Ridge Estates - Bay Ridge Drive South
35442	52.7	52.4	52.4	52.5	52.5	-0.3	-0.3	-0.27	-0.23	52.4	52.4	52.5	52.5	-0.3	-0.3	-0.27	-0.23	52.5	52.5	52.5	52.6	-0.2	-0.2	-0.2	-0.2	Bay Ridge Estates - Bay Ridge Drive South
35962	51.8	52.3	52.4	52.4	52.5	0.5	0.6	0.61	0.66	52.2	52.3	52.4	52.5	0.4	0.5	0.61	0.66	52.5	52.5	52.5	52.5	0.7	0.7	0.7	0.7	Bay Ridge Estates - Bay Ridge Drive South
6370	34.2	31.7	31.7	31.8	31.8	-2.5	-2.42	-2.40	-2.38	31.7	31.7	31.8	31.8	-2.5	-2.44	-2.40	-2.38	31.7	31.7	31.8	31.8	-2.5	-2.42	-2.4	-2.4	Bay Ridge Estates - Bay Ridge Drive South
6387	52.5	51.4	51.5	51.6	51.7	-1.1	-1.0	-0.93	-0.84	51.4	51.5	51.6	51.7	-1.1	-1.0	-0.93	-0.84	51.4	51.5	51.6	51.7	-1.1	-1.0	-0.9	-0.8	Bay Ridge Estates - Bay Ridge Drive South
6388	52.9	53.4	53.4	53.4	53.4	0.5	0.5	0.50	0.52	53.4	53.4	53.4	53.4	0.4	0.5	0.50	0.52	53.4	53.4	53.4	53.4	0.5	0.5	0.5	0.5	Bay Ridge Estates - Bay Ridge Drive South
6389	52.5	51.4	51.5	51.6	51.6	-1.1	-1.0	-0.97	-0.89	51.4	51.5	51.6	51.6	-1.1	-1.1	-0.97	-0.89	51.4	51.5	51.6	51.7	-1.1	-1.0	-1.0	-0.8	Bay Ridge Estates - Bay Ridge Drive South
6390	53.2	53.3	53.2	53.2	53.3	0.0	0.0	-0.01	0.01	53.1	53.2	53.2	53.3	-0.1	-0.1	-0.01	0.01	53.2	53.2	53.2	53.2	-0.1	0.0	0.0	0.0	Bay Ridge Estates - Bay Ridge Drive South
6398	53.1	53.1	53.1	53.1	53.1	0.0	0.0	0.01	0.04	53.0	53.1	53.1	53.1	-0.1	0.0	0.01	0.04	53.1	53.1	53.1	53.1	0.0	0.0	0.0	0.0	Bay Ridge Estates - Bay Ridge Drive South
7552	52.8	52.8	52.8	52.8	52.8	0.0	0.0	-0.02	-0.02	52.8	52.8	52.8	52.8	0.0	0.0	-0.02	-0.02	52.8	52.8	52.8	52.8	0.0	0.0	0.0	0.0	Bay Ridge Estates - Bay Ridge Drive South
6386	52.8	53.5	53.5	53.5	53.5	0.7	0.7	0.68	0.68	53.5	53.5	53.5	53.5	0.6	0.7	0.68	0.68	53.5	53.5	53.5	53.5	0.7	0.7	0.7	0.7	Bay Ridge Estates - Bay Ridge Drive South
757753	52.8	51.4	51.5	51.6	51.7	-1.4	-1.3	-1.23	-1.13	51.4	51.5	51.6	51.7	-1.4	-1.3	-1.23	-1.13	51.4	51.5	51.6	51.8	-1.4	-1.3	-1.2	-1.1	Bay Ridge Estates - Bay Ridge Drive South
7612	52.8	51.4	51.4	51.4	51.4	-1.4	-1.4	-1.39	-1.38	51.4	51.4	51.4	51.4	-1.4	-1.4	-1.39	-1.38	51.5	51.5	51.5	51.5	-1.3	-1.3	-1.3	-1.3	Bay Ridge Estates - Bay Ridge Drive South
33461	60.6	56.1	56.1	56.1	56.2	-4.6	-4.5	-4.48	-4.45	56.0	56.1	56.1	56.2	-4.6	-4.6	-4.48	-4.45	56.1	56.1	56.2	56.2	-4.5	-4.5	-4.5	-4.4	Bay Ridge Estates - Seawan Place
33571	61.5	60.0	60.1	60.2	60.4	-1.5	-1.4	-1.35	-1.06	59.9	60.0	60.2	60.4	-1.6	-1.5	-1.35	-1.06	60.0	60.1	60.2	60.6	-1.5	-1.4	-1.3	-0.9	Bay Ridge Estates - Seawan Place
33572	61.0	59.4	59.6	59.8	60.2	-1.6	-1.4	-1.21	-0.82	59.4	59.4	59.8	60.2	-1.6	-1.6	-1.21	-0.82	59.5	59.7	59.9	60.3	-1.5	-1.4	-1.1	-0.7	Bay Ridge Estates - Seawan Place
33771	60.8	59.4	59.6	59.8	60.2	-1.4	-1.2	-1.01	-0.62	59.4	59.4	59.8	60.2	-1.4	-1.4	-1.01	-0.62	59.5	59.6	59.9	60.3	-1.3	-1.2	-0.9	-0.5	Bay Ridge Estates - Seawan Place
33772	60.5	58.9	59.3	59.5	59.8	-1.6	-1.2	-1.01	-0.69	58.8	58.9	59.5	59.8	-1.7	-1.6	-1.01	-0.69	59.0	59.3	59.6	59.9	-1.5	-1.2	-0.9	-0.6	Bay Ridge Estates - Seawan Place
33991	60.0	58.9	59.3	59.5	59.8	-1.1	-0.8	-0.51	-0.19	58.8	58.9	59.5	59.8	-1.2	-1.1	-0.51	-0.19	59.0	59.3	59.6	59.9	-1.0	-0.7	-0.4	-0.1	Bay Ridge Estates - Seawan Place
33992	59.2	57.3	57.4	57.4	57.4	-1.9	-1.9	-1.84	-1.83	57.3	57.3	57.4	57.4	-1.9	-1.9	-1.84	-1.83	57.3	57.4	57.4	58.2	-1.9	-1.8	-1.8	-1.1	Bay Ridge Estates - Seawan Place
34341	57.5	56.4	56.8	57.0	57.3	-1.1	-0.7	-0.47	-0.16	56.3	56.5	57.0	57.3	-1.2	-1.1	-0.47	-0.16	56.5	56.9	57.1	58.1	-1.0	-0.6	-0.4	0.6	Bay Ridge Estates - Seawan Place
34342	55.6	55.0	55.0	55.0	55.0	-0.6	-0.5	-0.54	-0.53	55.0	55.0	55.0	55.0	-0.6	-0.6	-0.54	-0.53	55.0	55.0	55.0	55.6	-0.6	-0.5	-0.5	0.1	Bay Ridge Estates - Seawan Place
6385	57.0	54.4	54.4	54.4	54.4	-2.6	-2.6	-2.58	-2.56	54.3	54.4	54.4	54.4	-2.7	-2.6	-2.58	-2.59	54.4	54.4	54.5	54.5	-2.6	-2.6	-2.6	-2.5	Bay Ridge Estates - Seawan Place
7141	56.1	54.7	54.8	54.8	54.9	-1.5	-1.4	-1.30	-1.23	54.6	54.7	54.8	54.8	-1.5	-1.4	-1.30	-1.34	54.7	54.8	54.8	55.6	-1.4	-1.4	-1.3	-0.5	Bay Ridge Estates - Seawan Place
6380	49.8	48.6	48.6	48.7	48.7	-1.2	-1.1	-1.10	-1.06	48.5	48.6	48.7	48.7	-1.2	-1.2	-1.10	-1.10	48.6	48.6	48.7	48.7	-1.2	-1.1	-1.1	-1.1	Bay Ridge Estates - Bay Ridge Drive Middle
6381	51.2	50.2	50.7	51.0	51.2	-1.0	-0.5	-0.23	-0.02	49.8	50.3	51.0	50.9	-1.4	-0.9	-0.23	-0.37	50.3	50.7	51.0	51.2	-1.0	-0.5	-0.3	0.0	Bay Ridge Estates - Bay Ridge Drive Middle

Table A-3
Birch Point Drainage Study - Peak Stage Summary

		Existing Land Use								Existing Land Use with Rogers Slough Structure Removed								Future Land Use								
		Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				
Junction	Flood Elev	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	mate Chan	25 Year	100 Year	Nov-21	limate Chang	Location
6383	51.1	50.4	51.0	51.3	51.5	-0.7	-0.1	0.19	0.42	49.9	50.5	51.3	51.1	-1.2	-0.6	0.19	0.03	50.4	50.9	51.3	51.5	-0.7	-0.1	0.2	0.4	Bay Ridge Estates - Bay Ridge Drive Middle
6384	52.5	51.1	51.2	51.3	51.4	-1.4	-1.3	-1.26	-1.13	51.1	51.1	51.3	51.2	-1.5	-1.4	-1.26	-1.28	51.1	51.2	51.3	51.5	-1.4	-1.3	-1.3	-1.1	Bay Ridge Estates - Bay Ridge Drive Middle
6951	50.1	48.3	48.7	48.9	49.1	-1.8	-1.4	-1.22	-0.99	48.0	48.4	48.9	48.8	-2.1	-1.7	-1.22	-1.27	48.2	48.6	48.8	49.0	-1.8	-1.5	-1.3	-1.1	Bay Ridge Estates - Bay Ridge Drive Middle
7042	52.3	51.1	51.3	51.6	51.8	-1.2	-1.0	-0.68	-0.46	51.1	51.1	51.6	51.4	-1.2	-1.2	-0.68	-0.87	51.1	51.3	51.6	51.8	-1.2	-1.1	-0.7	-0.5	Bay Ridge Estates - Bay Ridge Drive Middle
7052	50.8	48.5	48.7	48.9	49.1	-2.3	-2.1	-1.93	-1.70	48.4	48.5	48.9	48.8	-2.4	-2.3	-1.93	-1.98	48.5	48.6	48.8	49.0	-2.3	-2.2	-2.0	-1.8	Bay Ridge Estates - Bay Ridge Drive Middle
7102	51.0	48.8	48.9	48.9	49.0	-2.3	-2.1	-2.06	-1.97	48.7	48.8	48.9	48.9	-2.3	-2.2	-2.06	-2.07	48.7	48.9	48.9	49.1	-2.3	-2.2	-2.1	-1.9	Bay Ridge Estates - Bay Ridge Drive Middle
7201	52.1	48.8	48.9	48.9	49.0	-3.3	-3.2	-3.16	-3.06	48.8	48.8	48.9	48.9	-3.3	-3.3	-3.16	-3.17	48.8	48.9	48.9	49.1	-3.3	-3.2	-3.2	-3.0	Bay Ridge Estates - Bay Ridge Drive Middle
72011	51.6	50.4	50.5	50.5	50.6	-1.2	-1.1	-1.07	-0.99	50.3	50.4	50.5	50.5	-1.3	-1.2	-1.07	-1.08	50.4	50.5	50.5	50.6	-1.2	-1.1	-1.1	-1.0	Bay Ridge Estates - Bay Ridge Drive Middle
7242	51.8	50.7	51.2	51.6	51.8	-1.1	-0.6	-0.19	0.03	50.6	50.7	51.6	51.4	-1.2	-1.1	-0.19	-0.38	50.7	51.2	51.6	51.8	-1.1	-0.6	-0.2	0.0	Bay Ridge Estates - Bay Ridge Drive Middle
6371	34.1	31.1	31.2	31.2	31.2	-3.0	-3.0	-2.93	-2.90	31.1	31.1	31.2	31.2	-3.0	-3.0	-2.93	-2.92	31.1	31.2	31.2	31.2	-3.0	-3.0	-2.9	-2.9	Bay Ridge Estates - Bay Ridge Drive West
6372	35.2	35.0	36.4	36.4	36.4	-0.1	1.3	1.27	1.28	34.3	35.5	36.4	36.4	-0.8	0.4	1.27	1.27	34.8	36.2	36.4	36.4	-0.4	1.0	1.3	1.3	Bay Ridge Estates - Bay Ridge Drive West
6373	39.6	38.2	38.2	38.2	38.2	-1.4	-1.4	-1.42	-1.42	38.2	38.2	38.2	38.2	-1.4	-1.4	-1.42	-1.42	38.2	38.2	38.2	38.2	-1.4	-1.4	-1.4	-1.4	Bay Ridge Estates - Bay Ridge Drive West
6374	46.5	47.3	47.3	47.3	47.3	0.8	0.9	0.85	0.85	47.3	47.3	47.3	47.3	0.8	0.8	0.85	0.85	47.3	47.3	47.3	47.3	0.8	0.8	0.9	0.9	Bay Ridge Estates - Bay Ridge Drive West
6972	43.8	43.6	43.6	43.6	43.7	-0.2	-0.2	-0.16	-0.15	43.5	43.6	43.6	43.6	-0.3	-0.2	-0.16	-0.16	43.6	43.6	43.6	43.6	-0.2	-0.2	-0.2	-0.2	Bay Ridge Estates - Bay Ridge Drive West
7271	35.5	33.1	33.1	33.1	33.1	-2.4	-2.4	-2.40	-2.38	33.1	33.1	33.1	33.1	-2.5	-2.4	-2.40	-2.40	33.1	33.1	33.1	33.1	-2.4	-2.4	-2.4	-2.4	Bay Ridge Estates - Bay Ridge Drive West
7311	34.2	34.5	34.6	34.6	34.6	0.3	0.4	0.38	0.40	34.5	34.6	34.6	34.6	0.3	0.4	0.38	0.40	34.5	34.6	34.6	34.6	0.3	0.4	0.4	0.4	Bay Ridge Estates - Bay Ridge Drive West
734738	34.4	32.3	32.4	32.4	32.4	-2.1	-2.0	-1.99	-1.98	32.3	32.3	32.4	32.4	-2.2	-2.1	-1.99	-1.99	32.3	32.4	32.4	32.4	-2.1	-2.0	-2.0	-2.0	Bay Ridge Estates - Bay Ridge Drive West
9581	36.6	35.4	35.4	35.4	35.4	-1.2	-1.2	-1.21	-1.20	35.4	35.4	35.4	35.4	-1.2	-1.2	-1.21	-1.21	35.4	35.4	35.4	35.4	-1.2	-1.2	-1.2	-1.2	Bay Ridge Estates - Bay Ridge Drive West
6375	49.1	47.9	48.1	48.2	48.4	-1.2	-1.0	-0.83	-0.69	47.7	48.0	48.2	48.2	-1.3	-1.1	-0.83	-0.86	47.9	48.1	48.2	48.3	-1.2	-1.0	-0.9	-0.7	Bay Ridge Estates - Bay Ridge Drive West
6376	48.9	46.5	46.6	46.6	46.6	-2.4	-2.3	-2.27	-2.24	46.5	46.5	46.6	46.6	-2.4	-2.3	-2.27	-2.28	46.5	46.5	46.6	46.6	-2.4	-2.3	-2.3	-2.3	Bay Ridge Estates - Bay Ridge Drive West
9391	43.1	43.0	43.0	43.0	43.0	-0.1	-0.1	-0.09	-0.07	43.0	43.0	43.0	43.0	-0.1	-0.1	-0.09	-0.08	43.0	43.0	43.0	43.0	-0.1	-0.1	-0.1	-0.1	Bay Ridge Estates
BayRidgePond	30.5	29.4	29.5	29.6	29.6	-1.1	-1.0	-0.93	-0.89	29.4	29.5	29.6	29.6	-1.1	-1.0	-0.93	-0.90	29.5	29.6	29.6	29.7	-1.0	-0.9	-0.9	-0.8	Bay Ridge Estates
9391	43.1	43.0	43.0	43.0	43.0	-0.1	-0.1	-0.09	-0.07	43.0	43.0	43.0	43.0	-0.1	-0.1	-0.09	-0.08	43.0	43.0	43.0	43.0	-0.1	-0.1	-0.1	-0.1	Bay Ridge Estates
BBV-0009	8.7	7.8	8.0	8.1	8.2	-0.9	-0.66	-0.56	-0.45	8.2	8.4	8.1	8.7	-0.5	-0.28	-0.56	0.01	8.3	8.6	8.8	9.0	-0.4	-0.08	0.1	0.3	Birch Bay Village
BBVJ-005	12.6	11.8	13.4	14.2	14.2	-0.8	0.9	1.61	1.67	11.7	12.1	14.2	14.2	-0.9	-0.5	1.61	1.66	13.7	14.3	14.3	14.4	1.2	1.7	1.7	1.8	Birch Bay Village
BBVJ-007	45.0	39.4	39.5	39.5	39.6	-5.6	-5.5	-5.48	-5.42	39.4	39.5	39.5	39.6	-5.6	-5.5	-5.48	-5.42	39.5	39.6	39.6	39.7	-5.5	-5.4	-5.4	-5.3	Birch Bay Village
BBVJ-008	35.0	27.9	28.1	28.3	28.7	-7.2	-6.9	-6.73	-6.35	27.9	28.1	28.3	28.6	-7.2	-6.9	-6.73	-6.36	28.0	28.4	28.9	29.8	-7.0	-6.7	-6.1	-5.2	Birch Bay Village
BBVJ-009	7.8	7.5	7.8	7.9	8.2	-0.2	0.04	0.15	0.40	7.7	8.1	8.4	8.6	0.0	0.36	0.63	0.80	7.9	8.4	8.5	8.8	0.1	0.63	0.8	1.0	Birch Bay Village
BBVJ-009a	7.6	7.7	8.0	8.0	8.2	0.1	0.4	0.39	0.52	7.8	8.1	8.4	8.6	0.2	0.5	0.75	0.92	8.0	8.4	8.5	8.8	0.4	0.8	0.9	1.2	Birch Bay Village
BBVJ-20	10.8	12.4	12.4	12.4	12.4	1.6	1.6	1.59	1.59	12.4	12.4	12.4	12.4	1.6	1.6	1.59	1.59	12.4	12.4	12.4	12.4	1.6	1.6	1.6	1.6	Birch Bay Village
BBVJ-21	17.6	18.1	18.2	18.2	18.9	0.5	0.6	0.63	1.28	18.0	18.1	18.2	18.8	0.5	0.6	0.61	1.24	18.1	18.2	18.8	18.9	0.6	0.6	1.2	1.3	Birch Bay Village
BBVJ-22	22.2	21.8	22.2	22.3	22.7	-0.5	0.0	0.07	0.48	21.6	22.1	22.3	22.7	-0.6	-0.1	0.02	0.41	22.1	22.3	22.6	22.8	-0.1	0.1	0.4	0.6	Birch Bay Village
BBVJ-23	28.0	26.3	26.8	26.9	27.0	-1.7	-1.2	-1.09	-0.97	26.0	26.8	26.9	27.0	-2.1	-1.3	-1.13	-0.99	26.8	27.0	27.1	27.1	-1.2	-1.0	-0.9	-0.9	Birch Bay Village
BBVJ-24	18.8	19.7	20.0	20.0	20.6	1.0	1.2	1.26	1.78	19.7	19.9	20.0	20.5	0.9	1.1	1.22	1.73	19.9	20.0	20.5	20.6	1.1	1.2	1.7	1.9	Birch Bay Village
BBVJ-26	9.0	9.0	9.4	9.6	9.7	0.0	0.4	0.66	0.76	9.0	9.2	9.5	9.7	0.0	0.2	0.56	0.74	9.5	9.7	9.8	9.8	0.5	0.8	0.8	0.8	Birch Bay Village
BBVJ-27	9.9	9.2	9.7	10.1	10.3	-0.7	-0.2	0.16	0.42	9.2	9.5	9.9	10.3	-0.7	-0.4	-0.03	0.36	9.8	10.4	10.5	10.5	-0.1	0.4	0.6	0.6	Birch Bay Village
BBVJ-28	11.5	9.4	9.9	10.3	10.7	-2.1	-1.61	-1.21	-0.86	9.3	9.6	10.1	10.6	-2.2	-1.90	-1.45	-0.95	10.0	10.7	11.0	11.3	-1.5	-0.81	-0.5	-0.2	Birch Bay Village
BBVJ-29	10.9	8.8	8.6	7.9	8.4	-2.2	-2.33	-2.99	-2.49	7.8	7.9	8.0	8.1	-3.1	-3.04	-2.94	-2.82	10.2	9.2	8.1	8.2	-0.7	-1.70	-2.9	-2.8	Birch Bay Village
BBVJ-30	7.9	7.3	7.5	7.5	7.7	-0.6	-0.4	-0.33	-0.22	7.7	7.9	8.0	8.1	-0.2	0.0	0.12	0.24	7.8	8.0	8.1	8.2	-0.1	0.1	0.2	0.3	Birch Bay Village
BBVJ-31	9.7	7.7	8.0	8.1	8.3	-2.0	-1.6	-1.55	-1.40	7.8	8.2	8.3	8.4	-1.9	-1.5	-1.41	-1.25	8.0	8.3	8.4	8.6	-1.7	-1.4	-1.3	-1.1	Birch Bay Village
BBVJ-32	8.6	7.7	8.0	8.1	8.3	-0.9	-0.6	-0.50	-0.35	7.8	8.1	8.3	8.4	-0.8	-0.5	-0.35	-0.19	8.0	8.3	8.4	8.6	-0.6	-0.3	-0.2	0.0	Birch Bay Village
BBVJ-33	8.6	7.6	7.9	8.0	8.1	-1.0	-0.7	-0.60	-0.46	7.7	8.1	8.2	8.3	-0.9	-0.5	-0.42	-0.26	7.9	8.2	8.3	8.5	-0.7	-0.4	-0.3	-0.1	Birch Bay Village
BBVJ-34	8.6	7.5	7.8	7.9	8.1	-1.1	-0.8	-0.67	-0.53	7.7	8.0	8.2	8.3	-0.9	-0.6	-0.45	-0.29	7.9	8.1	8.3	8.4	-0.7	-0.5	-0.3	-0.2	Birch Bay Village
BBVJ-35	7.3	7.5	7.8	7.9	8.0	0.2	0.5	0.61	0.75	7.7	8.0	8.1	8.3	0.4	0.7	0.85	1.00	7.9	8.1	8.3	8.4	0.6	0.8	1.0	1.1	Birch Bay Village
BBVJ-36	23.7	19.3	19.9	21.7	21.8	-4.4	-3.8	-2.04	-1.85	19.3	19.9	21.6	21.8	-4.4	-3.8	-2.05	-1.94	19.5	21.2	21.8	21.9	-4.2	-2.5	-1.9	-1.8	Birch Bay Village
BBVJ-37	10.4	10.7	11.1	11.2	11.4	0.3	0.7	0.82	1.02	8.2	10.5	10.8	11.0	-2.2	0.1	0.39	0.61	11.1	11.4	11.6	11.7	0.7	1.0	1.2	1.3	Birch Bay Village
BBVJ-39	12.6	11.8	12.9	12.9	12.9	-0.9	0.3	0.31	0.32	11.7	12.1	12.9	12.9	-0.9	-0.5	0.30	0.31	12.9	12.9	12.9	12.9	0.3	0.3	0.3	0.3	Birch Bay Village
BBVS_Pond1	8.4	8.7	8.7	8.8	8.8	0.3	0.3	0.37	0.42	8.7	8.7	8.8	8.8	0.3	0.3	0.35	0.40	8.7	8.8	8.9	9.0	0.3	0.4	0.5	0.6	Birch Bay Village
BBVS_Pond2	8.4	8.0	8.5	8.6	8.8	-0.4	0.1	0.24	0.40	8.0	8.5	8.6	8.8	-0.4	0.1	0.21	0.37	8.5	8.7	8.9	9.0	0.1	0.3	0.5	0.6	Birch Bay Village
BBVS_Pond3	8.4	7.4	7.7	7.9	8.2	-1.0	-0.7	-0.50	-0.25	7.7	8.1	8.4	8.6	-0.7	-0.3	-0.02	0.15	7.9	8.4	8.5	8.8	-0.5	0.0	0.1	0.4	Birch Bay Village
Kwan_Pond	12.0	7.8	8.0	8.1	8.2	-4.2	-4.0	-3.87	-3.76	8.2	8.4	8.5	8.7	-3.8	-3.6	-3.46	-3.30	8.3	8.6	8.8	9.0	-3.7	-3.4	-3.2	-3.1	Birch Bay Village
hunderbird_Pon	11.5	7.3	7.4	7.5	7.6	-4.2	-4.1	-3.97	-3.87	7.7	7.9	8.0	8.1	-3.8	-3.6	-3.52	-3.40	7.8	8.0	8.1	8.2	-3.7	-3.5	-3.4	-3.3	Birch Bay Village
Kwan_Pond	12.0	7.8	8.0	8.1	8.2	-4.2	-4.0	-3.87	-3.76	8.2	8.4	8.5	8.7	-3.8	-3.6	-3.46	-3.30	8.3	8.6	8.8	9.0	-3.7	-3.4	-3.2	-3.1	Birch Bay Village
BV_BeaverCreel	26.3	24.8	25.0	25.1	25.3	-1.5	-1.3	-1.19	-1.04	24.8	25.0	25.1	25.3	-1.5	-1.3	-1.20	-1.04	24.9	25.1	25.2	25.4	-1.4	-1.2	-1.1	-0.9	Birch Bay Village
LDES2569	42.9	39.7	39.7	39.7	39.7	-3.2	-3.2	-3.20	-3.20	39.7	39.7	39.7	39.7	-3.2	-3.2	-3.20	-3.20	39.7	39.7	39.7	39.7	-3.2	-3.2	-3.2	-3.2	Selder Road
LDES2570	44.0	40.6	40.6	40.6	40.6	-3.4	-3.4	-3.40	-3.40	40.6	40.6	40.6	40.6	-3.4	-3.4	-3.40	-3.40	40.6	40.6	40.6	40.6	-3.4	-3.4	-3.4	-3.4	Selder Road
LDES2578	66.1	64.1	64.2	64.3	64.3	-2.0	-1.9	-1.85	-1.80	64.1	64.2	64.3	64.3	-2.0	-1.9	-1.85	-1.80	64.4	64.5	64.5	64.6	-1.7	-1.6	-1.6	-1.5	Selder Road
LDES2586	66.0	65.1	65.1	65.2	65.2	-0.9	-0.9	-0.84	-0.81	65.1	65.1	65.2	65.2	-0.9	-0.9	-0.84	-0.81	65.1	65.1	65.2	65.2	-0.9	-0.9	-0.8	-0.8	Selder Road
LDES2587	67.5	67.6	67.6	67.7	67.7	0.1	0.11	0.15	0.18	67.6	67.6	67.7	67.7	0.1	0.11	0.15	0.18	67.6	67.6	67.7	67.7	0.1	0.11	0.2	0.2	Selder Road
LDES2594	74.5	73.0	73.0	73.1	73.1	-1.5	-1.5	-1.44	-1.40	73.0	73.0	73.1	73.1	-1.5	-1.5	-1.44	-1.40	73.0	73.0	73.1	73.1	-1.5	-1.5	-1.4	-1.4	Selder Road
LDES2595	79.6	79.7	79.8	79.8	79.8	0.1	0.2	0.21	0.23	79.7	79.8	79.8	79.8	0.1	0.2	0.21	0.23	79.7	79.8	79.8	79.8	0.1	0.2	0.2	0.2	Selder Road
LDES2602	81.7	81.0	81.0	81.1	81.1	-0.7	-0.7	-0.65	-0.61	81.0	81.0	81.1	81.1	-0.7	-0.7	-0.65	-0.61	81.0	81.0	81.1	81.1	-0.7	-0.7	-0.6	-0.6	Selder Road
LDES2603	85.8	85.9	86.0	86.0	86.0	0.1	0.2	0.18	0.20	85.9	86.0	86.0	86.0	0.1	0.2	0.18	0.20	85.9	86.0	86.0	86.0	0.1	0.2	0.2	0.2	Selder Road
LDES2610	86.8	86.4	86.5	86.5	86.6	-0.4	-0.3	-0.28	-0.24	86.4	86.5	86.5	86.6	-0.4	-0.3	-0.28	-0.24	86.4	86.5	86.5	86.6	-0.4	-0.3	-0.3	-0.2	Selder Road
LDES2611	93.0	93.1	93.2	93.2	93.2	0.1	0.2	0.18	0.21	93.1	93.2	93.2	93.2	0.1	0.2	0.18	0.21	93.1	93.2	93.2	93.2	0.1	0.2	0.2	0.2	Selder Road
LDES2618	99.9	98.1	98.1	98.2	98.2	-1.8	-1.8	-1.72	-1.69	98.1	98.1	98.2	98.2	-1.8	-1.8	-1.72	-1.69	98.1	98.1	98.2	98.2	-1.8	-1.8	-1.7	-1.7	Selder Road
LDES2619	102.5	101.5	102.4	102.6	102.6	-1.0	-0.1	0.05	0.07	101.5	102.4	102.6	102.6	-1.0	-0.1	0.05	0.07	101.5	102.5	102.6	102.6	-1.0	0.0	0.0	0.1	Selder Road
LDES2626	111.0	108.9	109.0	109.0	109.0	-2.1	-2.0	-2.02	-1.99	108.9	109.0	109.0	109.0	-2.1	-2.0	-2.02	-1.99	108.9	109.0	109.0	109.0	-2.1	-2.0	-2.0	-2.0	Selder Road
LDES2627	112.4	112.3	112.5	112.5	112.5	-0.1	0.1	0.08	0.10	112.3	112.5	112.5	112.5	-0.1	0.1	0.08	0.10	112.4	112.5	112.5	112.5	-0.1	0.1	0.1	0.1	Selder Road
LDES2634	116.8	115.8	115.9	115.9	115.9	-1.0	-0.9	-0.91	-0.89	115.8	115.9	115.9	115.9	-1.0	-0.9	-0.91	-0.89	115.8	115.9	115.9	115.9	-1.0	-0.9	-0.9	-0.9	Selder Road
LDES2635	118.9	119.0	119.0	119.0	119.0	0.1	0.11	0.13	0.14	119.0	119.0	119.0	119.0	0.1	0.11	0.13	0.14	119.0	119.0	119.0	119.0	0.1	0.11	0.1	0.1	Selder Road
LDES2639	126.3	124.5	124.6	124.7	124.8	-1.8	-1.7	-1.64	-1.55	124.5	124.6	124.7	124.8	-1.8	-1.7	-1.64	-1.55	124.5	124.6	124.7	124.8	-1.8	-1.7	-1.6	-1.6	Selder Road
LDES2646	124.0	122.2	122.2	122.2	122.2	-1.8	-1.8	-1.79	-1.76	122.2	122.2	122.2	122.2	-1.8	-1.8	-1.79	-1.76	122.2	122.2	122.2	122.2	-1.8	-1.8	-1.8	-1.8	Selder Road
TT1009	80.0	76.9	76.9	76.9	76.9	-3.1	-3.1	-3.10	-3.10	76.9	76.9	76.9	76.9	-3.1	-3.1	-3.10	-3.10	76.9	76.9	76.9	76.9	-3.1	-3.1	-3.1	-3.1	Selder Road
TT9	47.0	43.1	43.1	43.2	43.2	-3.9	-3.9	-3.82	-3.78	43.1	43.1	43.2	43.2	-3.9	-3.9	-3.82	-3.78	43.3	43.4	43.4	43.5	-3.7	-3.6	-3.6	-3.5	Selder Road
LDES2674	144.3	141.8	141.9	142.0	142.0	-2.5	-2.4	-2.35	-2.31	141.8	141.9	142.0	142.0	-2.5	-2.4	-2.35	-2.31	142.1	142.2	142.2	142.3	-2.3	-2.2	-2.1	-2.0	Selder Road
LDES2675	144.7	144.6	144.8	144.9	144.9	-0.1	0.1	0.15	0.20	144.6	144.8	144.9	144.9	-0.1	0.1	0.15	0.20	145.0	145.1	145.1	145.1	0.3	0.4	0.4	0.4	Selder Road
LDES4214	160.7	160.9	160.9	160.9	161.0	0.2	0.2	0.24	0.26	160.9	160.9	160.9	161.0	0.2	0.2	0.24	0.26	161.1	161.1	161.2	161.2	0.4	0.4	0.5	0.5	Selder Road
LDES4215	160.1	159.6	159.6	159.7	159.7	-0.5	-0.5	-0.44	-0.40	159.6	159.6	159.7	159.7	-0.5	-0.5	-0.44	-0.40	159.9	160.0	160.1	160.1	-0.2	-0.1	0.0	0.0	Selder Road
LDES4222	155.6	155.7	155.7	155.7	155.7	0.1	0.1	0.13	0.14	155.7	155.7	155.7	155.7	0.1	0.1	0.13	0.14	155.8	155.9	155.9	155.9	0.2	0.3	0.3	0.3	Selder Road
LDES4223	154.8	153.3	153.4	153.5	153.5	-1.5	-1.4	-1.34	-1.29	153.3	153.4	153.5	153.5	-1.5	-1.4	-1.34	-1.29	153.8	153.9	154.0	154.0	-1.0	-0.9	-0.9	-0.8	Selder Road
LDES4278	170.5	170.8	170.9	170.9	170.9	0.3	0.4	0.40	0.43	170.8	170.9	170.9	170.9	0.3	0.4	0.40	0.43	171.2	171.4	171.5	171.6	0.7	0.9	1.0	1.1	Selder Road
LDES4279	174.2	173.7	173.8	173.8	173.9	-0.5	-0.4	-0.39	-0.34	173.7	173.8	173.8	173.9	-0.5	-0.4	-0.39	-0.34	174.1	174.2	174.3	174.4	-0.1	0.0	0.1	0.2	Selder Road
TT1007	170.7	169.4	169.5	169.5	169.6	-1.3	-1.2	-1.20	-1.15	169.4	169.5	169.5	169.6	-1.3	-1.2	-1.20	-1.15	169.8	169.9	169.9	170.0	-0.9	-0.8	-0.8	-0.7	Selder Road

Table A-3
Birch Point Drainage Study - Peak Stage Summary

		Existing Land Use								Existing Land Use with Rogers Slough Structure Removed								Future Land Use								
		Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				
Junction	Flood Elev	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	mate Chan	25 Year	100 Year	Nov-21	limate Chang	Location
2728	29.7	26.1	26.5	26.6	26.6	-3.6	-3.2	-3.14	-3.10	25.8	26.4	26.5	26.6	-3.9	-3.3	-3.18	-3.11	26.5	26.6	26.7	26.7	-3.2	-3.1	-3.0	-3.0	Birch Point Road East of Selder
3897	28.0	24.5	24.6	24.7	25.5	-3.5	-3.4	-3.29	-2.50	24.5	24.6	24.7	25.5	-3.5	-3.4	-3.29	-2.50	24.8	26.8	28.0	28.0	-3.2	-1.2	0.0	0.0	Birch Point Road East of Selder
5382	29.2	23.9	24.1	24.2	24.9	-5.3	-5.2	-5.05	-4.28	23.9	24.1	24.2	24.9	-5.3	-5.2	-5.05	-4.28	24.2	26.2	27.4	27.6	-5.0	-3.1	-1.8	-1.6	Birch Point Road East of Selder
LDES2552	30.0	26.1	26.5	26.6	26.6	-3.9	-3.5	-3.45	-3.40	25.8	26.4	26.5	26.6	-4.2	-3.6	-3.48	-3.41	26.5	26.6	26.7	26.7	-3.5	-3.4	-3.3	-3.3	Birch Point Road East of Selder
OD1038_In	29.7	27.8	27.8	27.8	27.8	-1.9	-1.9	-1.90	-1.90	27.8	27.8	27.8	27.8	-1.9	-1.9	-1.90	-1.90	27.8	27.8	28.1	28.1	-1.9	-1.9	-1.7	-1.6	Birch Point Road East of Selder
SM800_In	28.0	25.6	25.6	25.7	25.9	-2.5	-2.4	-2.33	-2.13	25.6	25.6	25.7	25.9	-2.5	-2.4	-2.33	-2.13	25.7	27.1	28.4	28.5	-2.3	-0.9	0.4	0.5	Birch Point Road East of Selder
SM802_In	29.2	25.3	25.4	25.4	25.6	-3.9	-3.8	-3.76	-3.65	25.3	25.4	25.4	25.6	-3.9	-3.8	-3.76	-3.65	25.5	26.4	27.7	27.9	-3.7	-2.9	-1.5	-1.3	Birch Point Road East of Selder
TR19	28.0	24.5	24.6	24.7	25.5	-3.5	-3.4	-3.29	-2.50	24.5	24.6	24.7	25.5	-3.5	-3.4	-3.29	-2.50	24.8	26.8	28.0	28.1	-3.2	-1.2	0.0	0.1	Birch Point Road East of Selder
1	12.0	11.4	11.7	11.9	12.1	-0.6	-0.3	-0.07	0.13	10.8	11.1	11.4	11.6	-1.2	-0.9	-0.60	-0.36	11.8	12.1	12.3	12.5	-0.3	0.1	0.3	0.5	Birch Bay Drive at Birch Loop
5380	36.5	34.5	34.5	34.6	34.7	-2.0	-2.0	-1.92	-1.85	34.5	34.5	34.6	34.7	-2.0	-2.0	-1.92	-1.85	34.6	36.5	36.5	36.5	-1.9	0.0	0.0	0.0	Birch Bay Drive at Birch Loop
7851	9.8	11.4	11.7	11.9	12.1	1.6	1.9	2.08	2.29	10.7	11.0	11.3	11.5	0.9	1.2	1.48	1.71	11.6	12.0	12.2	12.3	1.8	2.2	2.4	2.5	Birch Bay Drive at Birch Loop
CS52	25.9	22.7	22.7	22.8	22.8	-3.2	-3.2	-3.13	-3.09	22.7	22.7	22.8	22.8	-3.2	-3.2	-3.13	-3.09	22.8	22.9	22.9	22.9	-3.1	-3.1	-3.0	-3.0	Birch Bay Drive at Birch Loop
CS52-D	25.9	22.9	22.9	22.9	22.9	-3.1	-3.0	-3.00	-2.98	22.9	22.9	22.9	22.9	-3.1	-3.0	-3.00	-2.98	22.9	22.9	23.0	23.0	-3.0	-3.0	-3.0	-2.9	Birch Bay Drive at Birch Loop
CV2738-1	12.0	12.1	12.2	12.2	12.3	0.1	0.2	0.23	0.27	11.9	12.0	12.1	12.2	-0.1	0.0	0.12	0.20	12.2	12.3	12.3	12.5	0.2	0.3	0.3	0.5	Birch Bay Drive at Birch Loop
CV3690-1	19.0	15.3	15.4	15.4	15.4	-3.7	-3.6	-3.61	-3.58	15.3	15.4	15.4	15.4	-3.7	-3.6	-3.61	-3.58	15.4	15.5	15.5	15.5	-3.6	-3.5	-3.5	-3.5	Birch Bay Drive at Birch Loop
CV3690-2	11.2	11.4	11.7	11.9	12.1	0.2	0.5	0.73	0.93	10.8	11.1	11.4	11.6	-0.4	-0.1	0.21	0.44	11.8	12.1	12.3	12.5	0.6	0.9	1.1	1.3	Birch Bay Drive at Birch Loop
CV3714-1	12.1	12.0	12.2	12.2	12.3	-0.1	0.1	0.11	0.16	11.5	12.0	12.1	12.2	-0.6	-0.1	0.01	0.09	12.2	12.3	12.3	12.5	0.1	0.2	0.2	0.4	Birch Bay Drive at Birch Loop
CV3714-2	9.2	11.4	11.7	11.9	12.1	2.2	2.5	2.72	2.92	10.8	11.1	11.4	11.6	1.6	1.9	2.20	2.43	11.8	12.1	12.3	12.5	2.5	2.9	3.1	3.3	Birch Bay Drive at Birch Loop
CV3723-1	12.0	12.0	12.2	12.2	12.3	0.0	0.2	0.21	0.26	11.9	12.0	12.1	12.2	-0.1	0.0	0.11	0.19	12.2	12.3	12.3	12.5	0.2	0.3	0.3	0.5	Birch Bay Drive at Birch Loop
CV3723-2	12.0	12.0	12.2	12.2	12.3	0.0	0.2	0.21	0.26	11.9	12.0	12.1	12.2	-0.1	0.0	0.11	0.19	12.2	12.3	12.3	12.5	0.2	0.3	0.3	0.5	Birch Bay Drive at Birch Loop
CV3732-1	11.2	12.1	12.2	12.2	12.3	0.9	1.0	1.03	1.07	11.9	12.0	12.1	12.2	0.7	0.8	0.92	1.00	12.2	12.3	12.3	12.5	1.0	1.1	1.1	1.3	Birch Bay Drive at Birch Loop
CV3732-2	12.2	10.4	10.5	10.5	10.5	-1.8	-1.8	-1.73	-1.69	8.9	8.9	8.9	8.9	-3.3	-3.3	-3.26	-3.26	9.0	9.0	9.0	9.0	-3.3	-3.3	-3.3	-3.3	Birch Bay Drive at Birch Loop
CV3738-2	11.9	12.1	12.2	12.2	12.3	0.2	0.3	0.33	0.37	11.9	12.0	12.1	12.2	0.0	0.1	0.22	0.30	12.2	12.3	12.3	12.5	0.3	0.4	0.4	0.6	Birch Bay Drive at Birch Loop
CV3740-1	9.2	11.4	11.7	11.9	12.1	2.2	2.5	2.72	2.92	10.8	11.1	11.4	11.6	1.6	1.9	2.19	2.43	11.8	12.1	12.3	12.5	2.5	2.9	3.1	3.3	Birch Bay Drive at Birch Loop
CV3740-2	9.8	11.4	11.7	11.9	12.1	1.6	1.9	2.13	2.33	10.8	11.1	11.4	11.6	1.0	1.3	1.60	1.84	11.8	12.1	12.3	12.5	1.9	2.3	2.5	2.7	Birch Bay Drive at Birch Loop
DP-77	19.3	17.3	17.3	17.4	17.4	-2.0	-1.96	-1.95	-1.94	17.3	17.3	17.4	17.4	-2.0	-1.96	-1.95	-1.94	17.4	17.4	17.4	17.4	-1.9	-1.93	-1.9	-1.9	Birch Bay Drive at Birch Loop
DP-78	15.0	14.9	15.1	15.1	15.2	-0.1	0.1	0.14	0.19	14.6	15.1	15.1	15.2	-0.4	0.1	0.12	0.18	15.2	15.2	15.2	15.2	0.2	0.2	0.2	0.2	Birch Bay Drive at Birch Loop
OD1058-1	11.2	12.1	12.2	12.2	12.3	0.9	1.0	1.03	1.08	11.9	12.0	12.1	12.2	0.7	0.8	0.93	1.01	12.3	12.3	12.3	12.5	1.1	1.1	1.1	1.3	Birch Bay Drive at Birch Loop
OD1058-2	11.8	12.2	12.3	12.3	12.4	0.4	0.5	0.54	0.59	12.1	12.2	12.3	12.3	0.3	0.4	0.48	0.54	12.4	12.4	12.5	12.5	0.6	0.6	0.6	0.7	Birch Bay Drive at Birch Loop
OD1058-3	13.0	13.3	13.4	13.4	13.5	0.3	0.4	0.47	0.52	13.3	13.4	13.4	13.5	0.3	0.4	0.46	0.51	13.5	13.6	13.6	13.6	0.5	0.6	0.6	0.7	Birch Bay Drive at Birch Loop
OD1071_2	12.2	12.0	12.2	12.2	12.3	-0.2	0.0	0.03	0.09	11.5	12.0	12.1	12.2	-0.7	-0.2	-0.08	0.01	12.2	12.3	12.4	12.5	0.0	0.1	0.2	0.3	Birch Bay Drive at Birch Loop
OD1071_3	12.2	12.0	12.2	12.2	12.3	-0.2	-0.03	0.02	0.08	11.5	12.0	12.1	12.2	-0.7	-0.18	-0.08	0.00	12.2	12.3	12.3	12.5	0.0	0.11	0.1	0.3	Birch Bay Drive at Birch Loop
OD1073-up	23.6	19.7	19.8	19.8	19.8	-3.9	-3.85	-3.83	-3.81	19.7	19.8	19.8	19.8	-3.9	-3.85	-3.83	-3.81	19.8	19.8	19.8	19.9	-3.8	-3.78	-3.8	-3.8	Birch Bay Drive at Birch Loop
OD1075-1	11.1	11.4	11.7	11.9	12.1	0.3	0.6	0.83	1.03	10.8	11.1	11.4	11.6	-0.3	0.0	0.31	0.54	11.8	12.1	12.3	12.5	0.7	1.0	1.2	1.4	Birch Bay Drive at Birch Loop
OD1075-2	11.0	11.4	11.7	11.9	12.1	0.4	0.7	0.93	1.13	10.8	11.1	11.4	11.6	-0.2	0.1	0.41	0.64	11.8	12.1	12.3	12.5	0.8	1.1	1.3	1.5	Birch Bay Drive at Birch Loop
OD1075-3	11.1	11.4	11.7	11.9	12.1	0.3	0.6	0.83	1.03	10.8	11.1	11.4	11.6	-0.3	0.0	0.31	0.54	11.8	12.1	12.3	12.5	0.7	1.0	1.2	1.4	Birch Bay Drive at Birch Loop
OD1075-4	11.4	11.4	11.7	11.9	12.1	0.0	0.3	0.53	0.73	10.8	11.1	11.4	11.6	-0.6	-0.3	0.01	0.24	11.8	12.1	12.3	12.5	0.4	0.7	0.9	1.1	Birch Bay Drive at Birch Loop
OD1075-5	10.6	11.4	11.7	11.9	12.1	0.8	1.1	1.33	1.53	10.8	11.1	11.4	11.6	0.2	0.5	0.81	1.04	11.8	12.1	12.3	12.5	1.2	1.5	1.7	1.9	Birch Bay Drive at Birch Loop
OD1075-6	11.1	11.4	11.7	11.9	12.1	0.3	0.6	0.83	1.03	10.8	11.1	11.4	11.6	-0.3	0.0	0.31	0.54	11.8	12.1	12.3	12.5	0.7	1.0	1.2	1.4	Birch Bay Drive at Birch Loop
PD46_In	28.0	23.1	23.1	23.1	23.2	-4.9	-4.88	-4.87	-4.85	23.1	23.1	23.1	23.2	-4.9	-4.88	-4.87	-4.85	23.1	23.2	23.2	23.2	-4.9	-4.83	-4.8	-4.8	Birch Bay Drive at Birch Loop
PD46_Out	28.0	23.1	23.1	23.1	23.2	-4.9	-4.9	-4.87	-4.85	23.1	23.1	23.1	23.2	-4.9	-4.9	-4.87	-4.85	23.1	23.2	23.2	23.2	-4.9	-4.8	-4.8	-4.8	Birch Bay Drive at Birch Loop
SM840-2	12.3	12.1	12.2	12.3	12.3	-0.3	-0.11	-0.05	0.02	11.5	12.0	12.1	12.2	-0.8	-0.26	-0.16	-0.07	12.3	12.4	12.4	12.5	0.0	0.06	0.1	0.2	Birch Bay Drive at Birch Loop
SM9799	9.8	11.4	11.7	11.9	12.1	1.6	1.94	2.13	2.33	10.8	11.1	11.4	11.6	1.0	1.32	1.60	1.84	11.8	12.1	12.3	12.5	2.0	2.34	2.5	2.7	Birch Bay Drive at Birch Loop
TG-1	12.0	10.4	10.5	10.5	10.5	-1.6	-1.55	-1.53	-1.49	8.9	8.9	8.9	8.9	-3.1	-3.06	-3.06	-3.06	8.9	8.9	8.9	9.0	-3.1	-3.06	-3.1	-3.1	Birch Bay Drive at Birch Loop
TG-2	9.8	8.9	8.9	8.9	8.9	-0.9	-0.86	-0.86	-0.86																	Birch Bay Drive at Birch Loop
1366	52.5	50.4	50.8	50.9	51.1	-2.1	-1.7	-1.56	-1.38	50.4	50.8	50.9	51.1	-2.1	-1.7	-1.56	-1.38	50.4	50.7	50.9	51.1	-2.1	-1.7	-1.6	-1.4	Pheasant - Grouse Cress
1367	52.3	50.4	50.8	50.9	51.1	-1.9	-1.5	-1.36	-1.17	50.4	50.8	50.9	51.1	-1.9	-1.5	-1.36	-1.17	50.4	50.7	50.9	51.1	-1.9	-1.5	-1.4	-1.2	Pheasant - Grouse Cress
1368	53.1	50.9	51.4	51.6	51.9	-2.1	-1.6	-1.42	-1.17	50.9	51.4	51.6	51.9	-2.1	-1.6	-1.42	-1.17	50.9	51.4	51.6	51.9	-2.1	-1.6	-1.4	-1.2	Pheasant - Grouse Cress
1372	53.0	45.2	45.3	45.5	45.7	-7.8	-7.6	-7.50	-7.26	45.2	45.3	45.5	45.7	-7.8	-7.6	-7.50	-7.26	45.2	45.4	45.6	45.9	-7.7	-7.5	-7.3	-7.0	Pheasant - Grouse Cress
1373	52.7	50.7	51.2	51.4	51.6	-1.9	-1.5	-1.27	-1.03	50.7	51.2	51.4	51.6	-1.9	-1.5	-1.27	-1.03	50.7	51.2	51.4	51.6	-2.0	-1.4	-1.3	-1.0	Pheasant - Grouse Cress
1374	53.3	51.0	51.5	51.7	52.0	-2.4	-1.8	-1.62	-1.35	51.0	51.5	51.7	52.0	-2.4	-1.8	-1.62	-1.35	50.9	51.5	51.7	52.0	-2.4	-1.8	-1.6	-1.4	Pheasant - Grouse Cress
1375	52.5	50.9	51.4	51.6	51.9	-1.5	-1.0	-0.84	-0.59	50.9	51.4	51.6	51.9	-1.5	-1.0	-0.84	-0.59	50.9	51.4	51.6	51.9	-1.5	-1.1	-0.8	-0.6	Pheasant - Grouse Cress
1376	52.7	51.1	51.7	51.9	52.2	-1.6	-1.0	-0.80	-0.53	51.1	51.7	51.9	52.2	-1.6	-1.0	-0.80	-0.53	51.1	51.7	51.9	52.2	-1.6	-1.1	-0.8	-0.5	Pheasant - Grouse Cress
1377	53.3	51.0	51.5	51.7	52.0	-2.3	-1.8	-1.58	-1.31	51.0	51.5	51.7	52.0	-2.3	-1.8	-1.58	-1.31	51.0	51.5	51.7	52.0	-2.3	-1.8	-1.6	-1.3	Pheasant - Grouse Cress
1378	52.8	51.4	51.8	52.0	52.3	-1.5	-1.0	-0.81	-0.52	51.4	51.8	52.0	52.3	-1.5	-1.0	-0.81	-0.52	51.4	51.8	52.0	52.3	-1.5	-1.1	-0.8	-0.5	Pheasant - Grouse Cress
1379	53.7	51.1	51.7	51.9	52.2	-2.6	-2.0	-1.79	-1.53	51.1	51.7	51.9	52.2	-2.6	-2.0	-1.79	-1.53	51.1	51.7	51.9	52.2	-2.6	-2.0	-1.8	-1.5	Pheasant - Grouse Cress
1380	53.6	51.4	52.0	52.2	52.5	-2.2	-1.7	-1.39	-1.09	51.4	52.0	52.2	52.5	-2.2	-1.7	-1.39	-1.09	51.4	51.9	52.2	52.5	-2.3	-1.7	-1.4	-1.1	Pheasant - Grouse Cress
1381	53.3	51.4	51.8	52.0	52.3	-1.9	-1.5	-1.26	-0.97	51.4	51.8	52.0	52.3	-1.9	-1.5	-1.26	-0.97	51.4	51.8	52.0	52.3	-1.9	-1.5	-1.3	-1.0	Pheasant - Grouse Cress
1382	54.4	51.9	52.1	52.4	52.7	-2.5	-2.3	-2.02	-1.69	51.9	52.1	52.4	52.7	-2.5	-2.3	-2.02	-1.69	51.9	52.1	52.4	52.7	-2.5	-2.3	-2.0	-1.7	Pheasant - Grouse Cress
1383	53.8	51.4	52.0	52.2	52.5	-2.5	-1.9	-1.61	-1.31	51.4	52.0	52.2	52.5	-2.5	-1.9	-1.61	-1.31	51.4	51.9	52.2	52.5	-2.5	-1.9	-1.6	-1.3	Pheasant - Grouse Cress
1384	53.9	51.6	52.3	52.6	52.9	-2.2	-1.6	-1.31	-0.98	51.6	52.3	52.6	52.9	-2.2	-1.6	-1.31	-0.98	51.6	52.2	52.5	52.9	-2.3	-1.6	-1.3	-1.0	Pheasant - Grouse Cress
1385	54.2	51.9	52.1	52.4	52.7	-2.3	-2.0	-1.80	-1.47	51.9	52.1	52.4	52.7	-2.3	-2.0	-1.80	-1.47	51.9	52.1	52.4	52.7	-2.3	-2.1	-1.8	-1.5	Pheasant - Grouse Cress
1386	54.9	52.1	52.4	52.7	53.0	-2.8	-2.5	-2.25	-1.89	52.1	52.4	52.7	53.0	-2.8	-2.5	-2.25	-1.89	52.1	52.4	52.7	53.0	-2.8	-2.5	-2.3	-1.9	Pheasant - Grouse Cress
1387	53.7	51.6	52.3	52.6	52.9	-2.0	-1.4	-1.11	-0.78	51.6	52.3	52.6	52.9	-2.0	-1.4	-1.11	-0.78	51.6	52.2	52.5	52.9	-2.0	-1.4	-1.1	-0.8	Pheasant - Grouse Cress
1388	53.5	52.0	52.6	53.0	53.4	-1.6	-0.9	-0.53	-0.15	52.0	52.6	53.0	53.4	-1.6	-0.9	-0.53	-0.15	52.0	52.6	53.0	53.4	-1.6	-0.9	-0.5	-0.2	Pheasant - Grouse Cress
1389	54.2	52.0	52.6	53.0	53.4	-2.2	-1.6	-1.20	-0.81	52.0	52.6	53.0	53.4	-2.2	-1.6	-1.20	-0.81	52.0	52.6	53.0	53.4	-2.2	-1.6	-1.2	-0.8	Pheasant - Grouse Cress
1390	53.6	52.7	53.1	53.5	54.0	-1.0	-0.5	-0.12	0.33	52.7	53.1	53.5	54.0	-1.0	-0.5	-0.12	0.33	52.7	53.1	53.5	54.0	-1.0	-0.6	-0.1	0.3	Pheasant - Grouse Cress
1391	53.7	52.1	52.4	52.7	53.0	-1.6	-1.3	-1.07	-0.70	52.1	52.4	52.7	53.0	-1.6	-1.3	-1.07	-0.70	52.1	52.4	52.7	53.0	-1.6	-1.3	-1.1	-0.7	Pheasant - Grouse Cress
1392	53.5	52.1	52.4	52.7	53.0	-1.4	-1.1	-0.82	-0.46	52.1	52.4	52.7	53.0	-1.4	-1.1	-0.82	-0.46	52.1	52.4	52.7	53.0	-1.4	-1.1	-0.8	-0.5	Pheasant - Grouse Cress
1393	54.1	52.7	53.1	53.5	54.0	-1.5	-1.0	-0.63	-0.18	52.7	53.1	53.5	54.0	-1.5	-1.0	-0.63	-0.18	52.7	53.1	53.5	54.0	-1.5	-1.1	-0.6	-0.2	Pheasant - Grouse Cress
1394	54.5	52.7	53.1	53.5	54.0	-1.8	-1.4	-0.93	-0.47	52.7	53.1	53.5	54.0	-1.8	-1.4	-0.93	-0.47	52.7	53.1	53.5	54.0	-1.8	-1.4	-1.0	-0.5	Pheasant - Grouse Cress
1395	55.6	52.1	52.4	52.7	53.0	-3.5	-3.2	-2.95	-2.59	52.1	52.4	52.7	53.0	-3.5	-3.2	-2.95	-2.59	52.1	52.4	52.7	53.0	-3.5	-3.2	-3.0	-2.6	Pheasant - Grouse Cress
1396	55.5	52.1	52.4	52.7	53.0	-3.4	-3.1	-2.84	-2.48	52.1	52.4	52.7	53.0	-3.4	-3.1	-2.84	-2.48	52.1	52.4	52.7	53.0	-3.4	-3.1	-2.9	-2.5	Pheasant - Grouse Cress
1397	55.6	52.1	52.4	52.7	53.0	-3.5	-3.2	-2.87	-2.51	52.1	52.4	52.7	53.0	-3.5	-3.2	-2.87	-2.51	52.1	52.4	52.7	53.0	-3.5	-3.2	-2.9	-2.5	Pheasant - Grouse Cress
1398	55.9	52.2	52.4	52.7	53.0	-3.7	-3.5	-3.27	-2.91	52.2	52.4	52.7	53.0	-3.7	-3.5	-3.27	-2.91	52.2	52.4	52.7	53.0	-3.7	-3.6	-3.3	-2.9	Pheasant - Grouse Cress
1399	54.8	52.7	53.1	53.5	54.0	-2.1	-1.7	-1.29	-0.83	52.7	53.1	53.5	54.0	-2.1	-1.7	-1.29	-0.83	52.7	53.1	53.5	54.0	-2.2	-1.7	-1.3	-0.8	Pheasant - Grouse Cress
1400	55.8	53.0	53.1	53.5	54.0	-2.9	-2.7	-2.33	-1.87	53.0	53.1	53.5	54.0	-2.9	-2.7	-2.33	-1.87	53.0	53.1	53.5	54.0	-2.9	-2.8	-2.3	-1.9	Pheasant - Grouse Cress
1401	56.2	53.7	53.7	53.7	54.0	-2.6	-2.6	-2.56	-2.24	53.7	53.7	53.7	54.0	-2.6	-2.6	-2.56	-2.24	53.7	53.7	53.7	54.0	-2.6	-2.6	-2.6	-2.3	Pheasant - Grouse Cress
1402	56.3	53.4	53.4	53.4	54.0	-2.9	-2.9	-2.85	-2.30	53.4	53.4	53.4	54.0	-2.9	-2.9	-2.85	-2.30	53.4	53.4	53.4	54.0	-2.9	-2.9	-2.9	-2.3	Pheasant - Grouse Cress
1403	55.7	53.3	53.3	53.3	53.3	-2.4	-2.4	-2.39	-2.39	53.3	53.3	53.3	53.3	-2.4	-2.4	-2.39	-2.39	53.3	53.3	53.3	53.3	-2.4	-2.4	-2.4	-2.4	Pheasant - Grouse Cress
1404	55.5	53.4	53.4	53.4	53.4	-2.1	-2.1	-2.06	-2.06	53.4	53.4	53.4	53.4	-2.1	-2.1	-2.06	-2.06	53.4	53.4	53.4	53.4	-2.1	-2.1	-2.1	-2.1	Pheasant - Grouse Cress
1405	55.0	53.7	53.7	53.7	53.7	-1.4	-1.4	-1.35	-1.35	53.7	53.7	53.7	53.7	-1.4	-1.4	-1.35	-1.35	53.7	53.7	53.7	53.7	-1.4	-1.4	-1.4	-1.4	Pheasant - Grouse Cress
1406	55.9	54.2	54.2	54.2	54.2	-1.8	-1.8	-1.76	-1.76	54.2	54.2	54.2	54.2	-1.8	-1.8	-1.76	-1.76	54.2	54.2	54.2	54.2	-1.8	-1.8	-1.8	-1.8	Pheasant - Grouse Cress
1407	57.1	55.6	55.6	55.6	55.6	-1.5	-1.5	-1.52	-1.52	55.6	55.6	55.6	55.6	-1.5	-1.5	-1.52	-1.52	55.6	55.6	55.6	55.6	-1.5	-1.5	-1.5	-1.5	Pheasant - Grouse Cress

Table A-3
Birch Point Drainage Study - Peak Stage Summary

		Existing Land Use								Existing Land Use with Rogers Slough Structure Removed								Future Land Use								
		Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				
Junction	Flood Elev	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	mate Chan	25 Year	100 Year	Nov-21	limate Chang	Location
1408	58.4	57.2	57.2	57.2	57.2	-1.2	-1.2	-1.17	-1.17	57.2	57.2	57.2	57.2	-1.2	-1.2	-1.17	-1.17	57.2	57.2	57.2	57.2	-1.2	-1.2	-1.2	-1.2	Pheasant - Grouse Cress
1409	57.9	55.1	55.1	55.1	55.1	-2.8	-2.8	-2.79	-2.79	55.1	55.1	55.1	55.1	-2.8	-2.8	-2.79	-2.79	55.1	55.1	55.1	55.1	-2.8	-2.8	-2.8	-2.8	Pheasant - Grouse Cress
1410	57.7	54.7	54.7	54.7	54.7	-3.0	-3.0	-3.02	-3.02	54.7	54.7	54.7	54.7	-3.0	-3.0	-3.02	-3.02	54.7	54.7	54.7	54.7	-3.0	-3.0	-3.0	-3.0	Pheasant - Grouse Cress
1411	57.5	54.8	54.8	54.8	54.8	-2.7	-2.7	-2.75	-2.75	54.8	54.8	54.8	54.8	-2.7	-2.7	-2.75	-2.75	54.8	54.8	54.8	54.8	-2.7	-2.7	-2.7	-2.7	Pheasant - Grouse Cress
1412	57.1	54.4	54.4	54.4	54.4	-2.7	-2.7	-2.69	-2.67	54.4	54.4	54.4	54.4	-2.7	-2.7	-2.69	-2.67	54.4	54.4	54.4	54.4	-2.7	-2.7	-2.7	-2.7	Pheasant - Grouse Cress
1413	57.1	54.3	54.4	54.4	54.4	-2.8	-2.8	-2.76	-2.75	54.3	54.4	54.4	54.4	-2.8	-2.8	-2.76	-2.75	54.4	54.4	54.4	54.4	-2.8	-2.8	-2.7	-2.7	Pheasant - Grouse Cress
1414	56.9	54.3	54.4	54.4	54.4	-2.6	-2.6	-2.57	-2.56	54.3	54.4	54.4	54.4	-2.6	-2.6	-2.57	-2.56	54.3	54.4	54.4	54.4	-2.6	-2.6	-2.5	-2.5	Pheasant - Grouse Cress
1415	56.7	53.5	53.5	53.6	53.6	-3.2	-3.1	-3.10	-3.06	53.5	53.5	53.6	53.6	-3.2	-3.1	-3.10	-3.06	53.5	53.6	53.6	53.7	-3.1	-3.1	-3.1	-3.0	Pheasant - Grouse Cress
1416	56.0	53.5	53.5	53.6	53.6	-2.6	-2.5	-2.47	-2.43	53.5	53.5	53.6	53.6	-2.6	-2.5	-2.47	-2.43	53.5	53.6	53.6	53.7	-2.5	-2.4	-2.4	-2.4	Pheasant - Grouse Cress
1417	56.1	53.2	53.2	53.2	53.2	-3.0	-3.0	-2.96	-2.94	53.2	53.2	53.2	53.2	-3.0	-3.0	-2.96	-2.94	53.2	53.2	53.2	53.2	-3.0	-2.9	-2.9	-2.9	Pheasant - Grouse Cress
1418	56.6	52.5	52.5	52.5	52.5	-4.1	-4.1	-4.08	-4.08	52.5	52.5	52.5	52.5	-4.1	-4.1	-4.08	-4.08	52.5	52.5	52.5	52.5	-4.1	-4.1	-4.1	-4.1	Pheasant - Grouse Cress
1419	54.6	52.9	53.0	53.0	53.1	-1.6	-1.6	-1.52	-1.48	52.9	53.0	53.0	53.1	-1.6	-1.6	-1.52	-1.48	53.0	53.1	53.1	53.1	-1.6	-1.5	-1.5	-1.4	Pheasant - Grouse Cress
1420	54.9	52.6	52.6	52.6	52.6	-2.4	-2.4	-2.36	-2.35	52.6	52.6	52.6	52.6	-2.4	-2.4	-2.36	-2.35	52.6	52.6	52.6	52.6	-2.4	-2.4	-2.3	-2.3	Pheasant - Grouse Cress
1421	56.7	52.4	52.4	52.4	52.4	-4.3	-4.3	-4.29	-4.29	52.4	52.4	52.4	52.4	-4.3	-4.3	-4.29	-4.29	52.4	52.4	52.4	52.4	-4.3	-4.3	-4.3	-4.3	Pheasant - Grouse Cress
1422	54.9	52.5	52.5	52.5	52.5	-2.4	-2.4	-2.40	-2.40	52.5	52.5	52.5	52.5	-2.4	-2.4	-2.40	-2.40	52.5	52.5	52.5	52.5	-2.4	-2.4	-2.4	-2.4	Pheasant - Grouse Cress
1423	54.5	52.5	52.5	52.5	52.5	-2.0	-2.0	-2.00	-2.00	52.5	52.5	52.5	52.5	-2.0	-2.0	-2.00	-2.00	52.5	52.5	52.5	52.5	-2.0	-2.0	-2.0	-2.0	Pheasant - Grouse Cress
1424	54.4	51.8	51.8	51.8	51.8	-2.6	-2.6	-2.60	-2.60	51.8	51.8	51.8	51.8	-2.6	-2.6	-2.60	-2.60	51.8	51.8	51.8	51.8	-2.6	-2.6	-2.6	-2.6	Pheasant - Grouse Cress
1425	54.7	51.8	51.8	51.8	51.8	-2.9	-2.9	-2.94	-2.94	51.8	51.8	51.8	51.8	-2.9	-2.9	-2.94	-2.94	51.8	51.8	51.8	51.8	-2.9	-2.9	-2.9	-2.9	Pheasant - Grouse Cress
1426	54.5	51.8	51.8	51.8	51.8	-2.7	-2.7	-2.64	-2.61	51.8	51.8	51.8	51.8	-2.7	-2.7	-2.64	-2.61	51.8	51.8	51.8	51.9	-2.7	-2.6	-2.6	-2.6	Pheasant - Grouse Cress
1427	53.3	49.6	49.6	49.6	49.6	-3.8	-3.8	-3.76	-3.76	49.6	49.6	49.6	49.6	-3.8	-3.8	-3.76	-3.76	49.6	49.6	49.6	49.6	-3.8	-3.8	-3.8	-3.8	Pheasant - Grouse Cress
1428	51.4	48.2	48.2	48.2	48.2	-3.3	-3.3	-3.26	-3.26	48.2	48.2	48.2	48.2	-3.3	-3.3	-3.26	-3.26	48.2	48.2	48.2	48.2	-3.3	-3.3	-3.3	-3.3	Pheasant - Grouse Cress
1429	51.9	49.0	49.0	49.0	49.0	-2.9	-2.9	-2.91	-2.90	49.0	49.0	49.0	49.0	-2.9	-2.9	-2.91	-2.90	49.0	49.0	49.0	49.0	-2.9	-2.9	-2.9	-2.9	Pheasant - Grouse Cress
1430	49.6	47.3	47.5	47.6	47.8	-2.3	-2.2	-1.99	-1.81	47.3	47.5	47.6	47.8	-2.3	-2.2	-1.99	-1.81	47.4	47.7	47.9	48.1	-2.2	-1.9	-1.7	-1.5	Pheasant - Grouse Cress
1431	49.2	46.5	46.5	46.5	46.6	-2.8	-2.7	-2.69	-2.65	46.5	46.5	46.5	46.6	-2.8	-2.7	-2.69	-2.65	46.5	46.6	46.6	46.7	-2.7	-2.7	-2.6	-2.5	Pheasant - Grouse Cress
1434	50.2	45.9	46.0	46.0	46.2	-4.2	-4.2	-4.12	-3.99	45.9	46.0	46.0	46.2	-4.2	-4.2	-4.12	-3.99	46.0	46.1	46.2	46.5	-4.2	-4.1	-4.0	-3.7	Pheasant - Grouse Cress
1436	49.4	48.1	48.2	48.2	48.2	-1.2	-1.2	-1.21	-1.20	48.1	48.2	48.2	48.2	-1.2	-1.2	-1.21	-1.20	48.2	48.2	48.2	48.2	-1.2	-1.2	-1.2	-1.2	Pheasant - Grouse Cress
1437	50.8	48.3	48.3	48.3	48.3	-2.6	-2.6	-2.53	-2.50	48.3	48.3	48.3	48.3	-2.6	-2.6	-2.53	-2.50	48.3	48.3	48.4	48.4	-2.6	-2.5	-2.5	-2.5	Pheasant - Grouse Cress
1438	52.2	49.6	49.6	49.6	49.6	-2.7	-2.6	-2.61	-2.59	49.6	49.6	49.6	49.6	-2.7	-2.6	-2.61	-2.59	49.6	49.6	49.7	49.7	-2.6	-2.6	-2.6	-2.6	Pheasant - Grouse Cress
1439	52.1	49.7	49.8	49.8	49.8	-2.4	-2.4	-2.34	-2.32	49.7	49.8	49.8	49.8	-2.4	-2.4	-2.34	-2.32	49.8	49.8	49.8	49.8	-2.4	-2.3	-2.3	-2.3	Pheasant - Grouse Cress
1440	51.8	50.1	50.2	50.2	50.2	-1.7	-1.6	-1.61	-1.57	50.1	50.2	50.2	50.2	-1.7	-1.6	-1.61	-1.57	50.2	50.2	50.3	50.3	-1.6	-1.6	-1.6	-1.5	Pheasant - Grouse Cress
1441	50.4	47.3	47.5	47.6	47.8	-3.1	-2.9	-2.78	-2.60	47.3	47.5	47.6	47.8	-3.1	-2.9	-2.78	-2.60	47.4	47.7	47.9	48.1	-3.0	-2.7	-2.5	-2.3	Pheasant - Grouse Cress
1442	48.9	46.5	46.5	46.6	46.6	-2.4	-2.4	-2.36	-2.32	46.5	46.5	46.6	46.6	-2.4	-2.4	-2.36	-2.32	46.5	46.6	46.6	46.7	-2.4	-2.3	-2.3	-2.2	Pheasant - Grouse Cress
1443	52.3	50.3	50.3	50.3	50.4	-2.0	-2.0	-1.96	-1.93	50.3	50.3	50.3	50.4	-2.0	-2.0	-1.96	-1.93	50.3	50.4	50.4	50.4	-2.0	-1.9	-1.9	-1.9	Pheasant - Grouse Cress
1446	51.3	50.4	50.4	50.5	50.5	-1.0	-0.9	-0.84	-0.79	50.4	50.4	50.5	50.5	-1.0	-0.9	-0.84	-0.79	50.4	50.5	50.6	50.6	-0.9	-0.8	-0.8	-0.7	Pheasant - Grouse Cress
1447	52.5	50.4	50.4	50.5	50.5	-2.1	-2.1	-2.03	-1.97	50.4	50.4	50.5	50.5	-2.1	-2.1	-2.03	-1.97	50.4	50.5	50.6	50.6	-2.1	-2.0	-1.9	-1.9	Pheasant - Grouse Cress
1448	53.1	51.4	51.4	51.4	51.4	-1.8	-1.8	-1.78	-1.78	51.4	51.4	51.4	51.4	-1.8	-1.8	-1.78	-1.78	51.4	51.4	51.4	51.4	-1.8	-1.8	-1.8	-1.8	Pheasant - Grouse Cress
1449	49.6	47.3	47.5	47.6	47.8	-2.3	-2.2	-1.99	-1.81	47.3	47.5	47.6	47.8	-2.3	-2.2	-1.99	-1.81	47.4	47.7	47.9	48.1	-2.2	-1.9	-1.7	-1.5	Pheasant - Grouse Cress
1450	48.6	46.5	46.5	46.5	46.6	-2.2	-2.1	-2.09	-2.05	46.5	46.5	46.5	46.6	-2.2	-2.1	-2.09	-2.05	46.5	46.6	46.6	46.7	-2.1	-2.1	-2.0	-1.9	Pheasant - Grouse Cress
1460	53.4	43.5	43.6	43.7	43.7	-9.8	-9.7	-9.70	-9.65	43.5	43.6	43.7	43.7	-9.8	-9.7	-9.70	-9.65	43.6	43.7	43.7	43.8	-9.8	-9.7	-9.7	-9.6	Pheasant - Grouse Cress
1239	52.4	50.9	50.9	50.9	50.9	-1.5	-1.5	-1.54	-1.54	50.9	50.9	50.9	50.9	-1.5	-1.5	-1.54	-1.54	50.9	50.9	50.9	50.9	-1.5	-1.5	-1.5	-1.5	Deer Trail Area
1240	52.4	50.6	50.6	50.6	50.6	-1.8	-1.8	-1.80	-1.80	50.6	50.6	50.6	50.6	-1.8	-1.8	-1.80	-1.80	50.6	50.6	50.6	50.6	-1.8	-1.8	-1.8	-1.8	Deer Trail Area
1241	52.1	50.6	50.6	50.6	50.6	-1.5	-1.5	-1.54	-1.54	50.6	50.6	50.6	50.6	-1.5	-1.5	-1.54	-1.54	50.6	50.6	50.6	50.6	-1.5	-1.5	-1.5	-1.5	Deer Trail Area
1242	52.0	49.8	49.8	49.8	49.8	-2.1	-2.1	-2.13	-2.13	49.8	49.8	49.8	49.8	-2.1	-2.1	-2.13	-2.13	49.8	49.8	49.8	49.8	-2.1	-2.1	-2.1	-2.1	Deer Trail Area
1243	50.6	50.0	50.0	50.0	50.0	-0.6	-0.6	-0.58	-0.57	50.0	50.0	50.0	50.0	-0.6	-0.6	-0.58	-0.57	50.0	50.0	50.0	50.0	-0.6	-0.6	-0.6	-0.6	Deer Trail Area
1451	42.7	36.9	37.2	37.3	37.5	-5.8	-5.5	-5.40	-5.22	36.9	37.2	37.3	37.5	-5.8	-5.5	-5.40	-5.22	37.2	37.8	38.1	38.3	-5.5	-4.9	-4.6	-4.4	Deer Trail Area
1452	46.2	45.0	45.0	45.0	45.0	-1.1	-1.1	-1.15	-1.15	45.0	45.0	45.0	45.0	-1.1	-1.1	-1.15	-1.15	45.0	45.0	45.0	45.0	-1.1	-1.1	-1.1	-1.1	Deer Trail Area
1453	49.1	46.3	46.3	46.3	46.3	-2.8	-2.8	-2.75	-2.75	46.3	46.3	46.3	46.3	-2.8	-2.8	-2.75	-2.75	46.3	46.3	46.3	46.3	-2.8	-2.8	-2.8	-2.8	Deer Trail Area
1454	49.3	47.0	47.0	47.0	47.0	-2.3	-2.3	-2.28	-2.28	47.0	47.0	47.0	47.0	-2.3	-2.3	-2.28	-2.28	47.0	47.0	47.0	47.0	-2.3	-2.3	-2.3	-2.3	Deer Trail Area
1457	47.9	35.9	36.0	36.0	36.1	-12.1	-12.0	-11.94	-11.89	35.9	36.0	36.0	36.1	-12.1	-12.0	-11.94	-11.89	35.9	36.1	36.2	36.2	-12.0	-11.8	-11.8	-11.7	Deer Trail Area
1463	51.8	50.4	50.4	50.5	50.5	-1.3	-1.3	-1.31	-1.30	50.4	50.4	50.5	50.5	-1.3	-1.3	-1.31	-1.30	50.4	50.4	50.5	50.5	-1.3	-1.3	-1.3	-1.3	Deer Trail Area
1464	52.0	50.0	50.0	50.0	50.0	-2.0	-2.0	-2.00	-1.98	50.0	50.0	50.0	50.0	-2.0	-2.0	-2.00	-1.98	50.0	50.0	50.0	50.0	-2.0	-2.0	-2.0	-2.0	Deer Trail Area
1467	51.1	49.6	49.7	49.7	49.7	-1.5	-1.4	-1.39	-1.36	49.6	49.6	49.7	49.7	-1.5	-1.5	-1.44	-1.41	49.6	49.6	49.7	49.7	-1.5	-1.5	-1.4	-1.4	Deer Trail Area
1468	52.3	50.7	50.7	50.7	50.7	-1.6	-1.6	-1.63	-1.62	50.7	50.7	50.7	50.7	-1.6	-1.6	-1.63	-1.62	50.7	50.7	50.7	50.7	-1.6	-1.6	-1.6	-1.6	Deer Trail Area
1469	52.5	51.0	51.0	51.0	51.0	-1.5	-1.5	-1.46	-1.45	51.0	51.0	51.1	51.0	-1.5	-1.4	-1.42	-1.44	51.0	51.0	51.0	51.0	-1.5	-1.5	-1.5	-1.5	Deer Trail Area
1472	50.4	51.0	51.0	51.0	51.0	0.6	0.6	0.63	0.63	51.0	51.0	51.0	51.1	0.6	0.6	0.63	0.65	51.0	51.0	51.0	51.0	0.6	0.6	0.6	0.6	Deer Trail Area
1473	51.4	51.0	51.0	51.0	51.0	-0.5	-0.5	-0.45	-0.43	51.0	51.0	51.0	51.0	-0.5	-0.5	-0.45	-0.43	51.0	51.0	51.0	51.0	-0.5	-0.5	-0.5	-0.4	Deer Trail Area
1474	51.7	51.0	51.0	51.0	51.0	-0.8	-0.7	-0.73	-0.71	51.0	51.0	51.0	51.0	-0.8	-0.7	-0.73	-0.71	51.0	51.0	51.0	51.0	-0.8	-0.7	-0.7	-0.7	Deer Trail Area
1475	52.6	50.9	51.0	51.0	51.0	-1.6	-1.6	-1.60	-1.59	50.9	51.0	51.0	51.0	-1.6	-1.6	-1.60	-1.59	50.9	51.0	51.0	51.0	-1.6	-1.6	-1.6	-1.6	Deer Trail Area
1476	52.5	50.9	50.9	51.0	51.0	-1.5	-1.5	-1.51	-1.50	50.9	50.9	51.0	51.0	-1.5	-1.5	-1.51	-1.50	50.9	50.9	51.0	51.0	-1.5	-1.5	-1.5	-1.5	Deer Trail Area
1477	52.8	50.7	50.7	50.7	50.7	-2.2	-2.2	-2.13	-2.12	50.7	50.7	50.7	50.7	-2.2	-2.1	-2.13	-2.12	50.7	50.7	50.7	50.7	-2.2	-2.1	-2.1	-2.1	Deer Trail Area
1478	52.7	50.5	50.5	50.6	50.6	-2.2	-2.1	-2.13	-2.12	50.5	50.5	50.5	50.6	-2.2	-2.2	-2.14	-2.12	50.5	50.5	50.5	50.6	-2.2	-2.2	-2.1	-2.1	Deer Trail Area
1479	52.7	50.0	50.0	50.0	50.0	-2.7	-2.7	-2.68	-2.68	50.0	50.0	50.0	50.0	-2.7	-2.7	-2.67	-2.66	50.0	50.0	50.0	50.0	-2.7	-2.7	-2.7	-2.7	Deer Trail Area
1481	50.1	47.6	47.7	47.7	47.7	-2.5	-2.5	-2.47	-2.46	47.4	47.5	47.5	47.5	-2.7	-2.7	-2.70	-2.69	47.4	47.5	47.5	47.5	-2.7	-2.7	-2.7	-2.7	Deer Trail Area
1348	12.8	13.6	13.7	13.7	13.7	0.8	0.9	0.94	0.97	13.6	13.7	13.7	13.8	0.8	0.9	0.96	0.99	13.7	13.8	13.8	13.8	0.9	1.0	1.0	1.0	Birch Bay Drive East at Deer Trail
1349	12.9	13.6	13.7	13.7	13.7	0.7	0.8	0.81	0.84	13.6	13.7	13.7	13.8	0.7	0.8	0.83	0.86	13.7	13.8	13.8	13.8	0.8	0.9	0.9	0.9	Birch Bay Drive East at Deer Trail
1350	13.2	13.6	13.7	13.8	13.8	0.4	0.6	0.60	0.64	13.7	13.8	13.8	13.8	0.5	0.6	0.63	0.67	13.8	13.9	13.9	13.9	0.6	0.7	0.7	0.8	Birch Bay Drive East at Deer Trail
1351	13.0	13.6	13.7	13.8	13.8	0.6	0.7	0.75	0.79	13.7	13.8	13.8	13.8	0.6	0.8	0.79	0.82	13.8	13.9	13.9	13.9	0.7	0.8	0.9	0.9	Birch Bay Drive East at Deer Trail
1352	13.9	13.7	14.1	14.2	14.3	-0.2	0.2	0.32	0.37	13.9	14.2	14.3	14.3	0.0	0.3	0.37	0.41	14.2	14.3	14.4	14.4	0.3	0.4	0.5	0.5	Birch Bay Drive East at Deer Trail
1353	12.9	13.7	14.1	14.2	14.3	0.8	1.2	1.30	1.35	13.9	14.2	14.3	14.3	1.0	1.3	1.35	1.39	14.2	14.3	14.4	14.4	1.3	1.4	1.5	1.5	Birch Bay Drive East at Deer Trail
1483	18.0	13.7	14.1	14.2	14.3	-4.3	-3.9	-3.78	-3.73	13.9	14.2	14.3	14.3	-4.1	-3.8	-3.73	-3.68	14.2	14.3	14.4	14.4	-3.8	-3.7	-3.6	-3.6	Birch Bay Drive East at Deer Trail
1355	15.4	13.7	14.1	14.2	14.3	-1.6	-1.2	-1.13	-1.08	13.9	14.2	14.3	14.3	-1.4	-1.1	-1.08	-1.04	14.2	14.3	14.4	14.4	-1.2	-1.0	-1.0	-0.9	Birch Bay Drive East at Deer Trail
1339	13.2	10.1	10.2	10.2	10.3	-3.1	-3.0	-3.00	-2.97	10.1	10.2	10.2	10.3	-3.1	-3.0	-3.00	-2.97	10.4	10.5	10.5	10.6	-2.8	-2.8	-2.7	-2.7	Birch Bay Drive East at Deer Trail
1340	12.6	11.1	11.2	11.3	11.3	-1.5	-1.4	-1.36	-1.29	11.1	11.2	11.3	11.3	-1.5	-1.4	-1.36	-1.29	12.0	12.6	12.9	13.3	-0.6	0.0	0.3	0.7	Birch Bay Drive East at Deer Trail
1346	12.9	12.0	12.0	12.0	12.0	-0.9	-0.9	-0.95	-0.95	12.0	12.0	12.0	12.0	-0.9	-0.9	-0.95	-0.95	12.0	12.6	12.9	13.3	-0.9	-0.4	0.0	0.4	Birch Bay Drive East at Deer Trail
1347	12.6	10.8	10.9	10.9	11.0	-1.8	-1.7	-1.65	-1.59	10.8	10.9	10.9	11.0	-1.8	-1.7	-1.65	-1.59	12.1	12.6	12.1	12.6	-0.5	0.0	-0.5	0.0	Birch Bay Drive East at Deer Trail
1356	14.0	12.8	13.0	13.6	14.3	-1.2	-1.0	-0.44	0.27	12.7	12.7	12.7	12.7	-1.3	-1.3	-1.28	-1.26	12.7	12.7	12.8	12.9	-1.3	-1.3	-1.2	-1.1	Birch Bay Drive West at Deer Trail
1357	12.4	12.1	13.0	13.6	14.3	-0.4	0.6	1.13	1.84	11.1	11.4	11.7	12.1	-1.4	-1.1	-0.75	-0.38	11.4	12.0	12.4	12.9	-1.1	-0.5	-0.1	0.4	Birch Bay Drive West at Deer Trail
1358	12.3	11.3	11.9	12.3	12.8	-1.0	-0.4	-0.05	0.41	10.7	11.0	11.2	11.5	-1.6	-1.3	-1.15	-0.88	11.0	11.4	11.7	12.1	-1.4	-0.9	-0.7	-0.3	Birch Bay Drive West at Deer Trail
1359	12.2	11.3	11.9	12.3	12.8	-0.9	-0.3	0.06	0.52	10.7	11.0	11.2	11.5	-1.5	-1.2	-1.04	-0.77	11.0	11.4	11.7	12.1	-1.3	-0.8	-0.6	-0.2	Birch Bay Drive West at Deer Trail
1360	11.8	11.0	11.4	11.7	12.1	-0.9	-0.4	-0.10	0.24	10.5	10.8	11.0	11.2	-1.3	-1.0	-0.86	-0.63	10.8	11.2	11.4	11.7	-1.0	-0.7	-0.4	-0.1	Birch Bay Drive West at Deer Trail
1361	11.6	11.0	11.4	11.7	12.1	-0.7	-0.2	0.12	0.46	10.5	10.8	11.0	11.2	-1.1	-0.8	-0.64	-0.41	10.8	11.2	11.4	11.7	-0.8	-0.5	-0.2	0.1	Birch Bay Drive West at Deer Trail
1362	11.4	11.0	11.4	11.7	12.1	-0.4	0.1	0.36	0.70	10.5	10.8	11.0	11.2	-0.9	-0.6	-0.40	-0.17	10.8	11.2	11.4	11.7	-0.6	-0.2	0.0	0.3	Birch Bay Drive West at Deer Trail
1363	11.9	11.1	11.6	11.9	12.3	-0.8	-0.3	0.01	0.39	10.7	11.0	11.2	11.5	-1.2	-0.9	-0.71	-0.45	11.0	11.4	11.7	12.1	-0.9	-0.5	-0.2	0.2	Birch Bay Drive West at Deer Trail
1364	11.9	11.1	11.6	11.9	12.3	-0.8	-0.3	0.05	0.42	10.9	11.1	11.2	11.5	-0.9	-0.8	-0.64	-0.40	11.1	11.4	11.7	12.1	-0.8	-0.4	-0.2	0.2	Birch Bay Drive West at Deer Trail

Table A-3
Birch Point Drainage Study - Peak Stage Summary

		Existing Land Use								Existing Land Use with Rogers Slough Structure Removed								Future Land Use								
		Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				
Junction	Flood Elev	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	mate Char	25 Year	100 Year	Nov-21	limate Chang	Location
1171	52.0	50.6	50.6	50.6	50.7	-1.4	-1.4	-1.35	-1.33	50.6	50.6	50.6	50.7	-1.4	-1.4	-1.35	-1.33	50.6	50.7	50.7	50.7	-1.4	-1.3	-1.3	-1.3	Richmond Park - Richmond Park Road South
1172	51.5	49.9	49.9	49.9	50.0	-1.7	-1.6	-1.63	-1.59	49.9	49.9	49.9	50.0	-1.7	-1.6	-1.63	-1.59	49.9	50.0	50.0	50.2	-1.6	-1.6	-1.5	-1.4	Richmond Park - Richmond Park Road South
1173	50.7	48.8	48.9	49.0	49.3	-1.9	-1.8	-1.74	-1.47	48.8	48.9	49.0	49.3	-1.9	-1.8	-1.74	-1.47	48.9	49.2	49.5	49.8	-1.8	-1.5	-1.3	-1.0	Richmond Park - Richmond Park Road South
1180	50.6	47.9	47.9	47.9	48.0	-2.7	-2.7	-2.63	-2.61	47.9	47.9	47.9	48.0	-2.7	-2.7	-2.63	-2.61	47.9	47.9	48.0	48.0	-2.7	-2.6	-2.6	-2.6	Richmond Park - Richmond Park Road South
1181	50.7	48.6	48.7	48.8	49.0	-2.0	-1.9	-1.84	-1.62	48.6	48.7	48.8	49.0	-2.0	-1.9	-1.84	-1.62	48.7	49.0	49.2	49.4	-1.9	-1.6	-1.5	-1.2	Richmond Park - Richmond Park Road South
1182	49.3	47.5	47.5	47.5	47.5	-1.8	-1.8	-1.81	-1.80	47.5	47.5	47.5	47.5	-1.8	-1.8	-1.81	-1.80	47.5	47.5	47.5	47.5	-1.8	-1.8	-1.8	-1.8	Richmond Park - Richmond Park Road South
1184	51.7	44.2	44.3	44.3	44.3	-7.5	-7.4	-7.42	-7.40	44.2	44.3	44.3	44.3	-7.5	-7.4	-7.42	-7.40	44.3	44.3	44.3	44.4	-7.4	-7.4	-7.3	-7.3	Richmond Park - Richmond Park Road South
1188	49.2	47.2	47.3	47.3	47.3	-2.0	-2.0	-1.97	-1.96	47.2	47.3	47.3	47.3	-2.0	-2.0	-1.97	-1.96	47.2	47.3	47.4	47.5	-2.0	-1.9	-1.8	-1.8	Richmond Park - Richmond Park Road South
1189	50.1	47.0	47.1	47.2	47.2	-3.1	-3.0	-2.92	-2.88	47.0	47.1	47.2	47.2	-3.1	-3.0	-2.92	-2.88	47.2	47.3	47.4	47.5	-2.9	-2.8	-2.7	-2.7	Richmond Park - Richmond Park Road South
1190	50.5	46.9	47.0	47.1	47.2	-3.6	-3.5	-3.39	-3.34	46.9	47.0	47.1	47.2	-3.6	-3.5	-3.39	-3.34	47.2	47.2	47.3	47.4	-3.3	-3.3	-3.2	-3.1	Richmond Park - Richmond Park Road South
1191	50.2	47.0	47.1	47.2	47.2	-3.2	-3.1	-3.00	-2.97	47.0	47.1	47.2	47.2	-3.2	-3.1	-3.00	-2.97	47.2	47.3	47.3	47.4	-3.0	-2.9	-2.8	-2.8	Richmond Park - Richmond Park Road South
1192	50.7	47.0	47.1	47.2	47.2	-3.7	-3.6	-3.50	-3.46	47.0	47.1	47.2	47.2	-3.7	-3.6	-3.50	-3.46	47.2	47.3	47.4	47.5	-3.5	-3.4	-3.3	-3.2	Richmond Park - Richmond Park Road South
1193	50.7	48.3	48.3	48.3	48.3	-2.5	-2.5	-2.46	-2.46	48.3	48.3	48.3	48.3	-2.5	-2.5	-2.46	-2.46	48.3	48.3	48.3	48.3	-2.5	-2.5	-2.5	-2.5	Richmond Park - Richmond Park Road South
1194	51.1	48.1	48.2	48.2	48.2	-3.0	-2.9	-2.85	-2.83	48.1	48.2	48.2	48.2	-3.0	-2.9	-2.85	-2.83	48.2	48.2	48.3	48.3	-2.8	-2.8	-2.8	-2.8	Richmond Park - Richmond Park Road North
1195	50.9	49.4	49.7	49.9	50.0	-1.5	-1.3	-1.05	-0.95	49.4	49.7	49.9	50.0	-1.5	-1.3	-1.05	-0.95	50.0	50.1	50.2	50.4	-0.9	-0.8	-0.7	-0.5	Richmond Park - Richmond Park Road North
1196	51.9	49.4	49.7	49.9	50.0	-2.5	-2.2	-1.99	-1.87	49.4	49.7	49.9	50.0	-2.5	-2.2	-1.99	-1.87	50.0	50.1	50.2	50.4	-1.9	-1.7	-1.7	-1.5	Richmond Park - Richmond Park Road North
1197	51.2	50.2	50.7	51.0	51.2	-1.0	-0.5	-0.17	0.02	50.2	50.7	51.0	51.2	-1.0	-0.5	-0.17	0.02	51.2	51.5	51.6	51.7	0.0	0.3	0.4	0.5	Richmond Park - Richmond Park Road North
1198	51.1	50.2	50.7	51.1	51.2	-0.8	-0.4	-0.02	0.16	50.2	50.7	51.1	51.2	-0.8	-0.4	-0.02	0.16	51.2	51.5	51.6	51.8	0.2	0.4	0.5	0.7	Richmond Park - Richmond Park Road North
1199	52.0	50.7	51.3	51.7	51.9	-1.2	-0.7	-0.27	-0.05	50.7	51.3	51.7	51.9	-1.2	-0.7	-0.27	-0.04	52.0	52.3	52.3	52.4	0.0	0.3	0.3	0.4	Richmond Park - Richmond Park Road North
1200	51.6	50.7	51.3	51.7	51.9	-0.9	-0.4	0.05	0.29	50.7	51.3	51.7	51.9	-0.9	-0.4	0.04	0.28	52.0	52.2	52.3	52.3	0.3	0.6	0.6	0.7	Richmond Park - Richmond Park Road North
1201	52.5	51.4	52.1	52.6	52.9	-1.1	-0.4	0.11	0.42	51.4	52.1	52.6	52.9	-1.1	-0.4	0.10	0.42	52.9	53.3	53.4	53.6	0.5	0.8	0.9	1.1	Richmond Park - Richmond Park Road North
1202	52.3	51.9	52.4	52.7	53.0	-0.4	0.1	0.45	0.70	51.9	52.4	52.7	53.0	-0.3	0.1	0.47	0.72	53.0	53.3	53.4	53.6	0.7	1.1	1.2	1.3	Richmond Park - Richmond Park Road North
1203	52.4	52.6	52.8	52.9	53.0	0.2	0.4	0.49	0.61	52.6	52.8	52.9	53.0	0.2	0.4	0.48	0.61	53.0	53.3	53.4	53.6	0.6	0.9	1.0	1.2	Richmond Park - Richmond Park Road North
1204	52.4	52.6	52.8	52.9	53.0	0.2	0.4	0.50	0.62	52.6	52.8	52.9	53.0	0.2	0.4	0.50	0.62	53.0	53.3	53.4	53.6	0.6	0.9	1.0	1.2	Richmond Park - Richmond Park Road North
1204B	52.0	52.6	52.8	52.8	53.0	0.6	0.8	0.80	0.95	52.6	52.8	52.8	53.0	0.6	0.8	0.80	0.95	53.0	53.3	53.4	53.5	1.0	1.3	1.4	1.5	Richmond Park - Richmond Park Road North
1205	52.2	51.4	52.1	52.6	52.9	-0.8	-0.1	0.37	0.68	51.4	52.1	52.6	52.9	-0.8	-0.1	0.36	0.68	53.0	53.3	53.4	53.6	0.7	1.1	1.2	1.3	Richmond Park - Richmond Park Road North
1206	53.2	51.3	52.1	52.8	53.0	-1.9	-1.0	-0.35	-0.22	51.3	52.1	52.8	53.0	-1.9	-1.1	-0.37	-0.22	53.0	53.3	53.4	53.5	-0.2	0.1	0.2	0.4	Richmond Park - Richmond Park Road North
1207	53.1	51.3	52.1	52.8	52.9	-1.8	-1.0	-0.27	-0.12	51.3	52.1	52.8	52.9	-1.8	-1.0	-0.27	-0.12	53.0	53.3	53.4	53.5	-0.1	0.2	0.3	0.5	Richmond Park - Richmond Park Road North
1208	52.6	51.2	51.7	52.1	52.2	-1.4	-0.9	-0.51	-0.41	51.2	51.7	52.1	52.2	-1.4	-0.9	-0.50	-0.40	52.2	52.5	52.6	52.9	-0.4	-0.1	0.0	0.3	Richmond Park - Richmond Park Road North
1209	52.6	51.2	51.7	52.1	52.2	-1.4	-1.0	-0.58	-0.46	51.2	51.7	52.1	52.2	-1.4	-1.0	-0.58	-0.46	52.2	52.5	52.6	52.8	-0.4	-0.2	-0.1	0.2	Richmond Park - Richmond Park Road North
1210	52.8	51.1	51.2	51.2	51.3	-1.7	-1.6	-1.58	-1.51	51.1	51.2	51.2	51.3	-1.7	-1.6	-1.58	-1.51	51.3	51.5	51.6	51.7	-1.5	-1.3	-1.2	-1.0	Richmond Park - Richmond Park Road North
1211	51.8	51.1	51.2	51.2	51.3	-0.7	-0.7	-0.63	-0.56	51.1	51.2	51.2	51.3	-0.7	-0.7	-0.63	-0.56	51.3	51.5	51.6	51.7	-0.5	-0.3	-0.2	-0.1	Richmond Park - Richmond Park Road North
1220	51.9	49.5	49.7	49.9	50.0	-2.5	-2.3	-2.02	-1.91	49.5	49.7	49.9	50.0	-2.5	-2.3	-2.02	-1.91	50.0	50.2	50.2	50.4	-1.9	-1.8	-1.7	-1.5	Richmond Park - Richmond Park Road North
1221	51.0	49.4	49.7	49.9	50.0	-1.5	-1.3	-1.07	-0.96	49.4	49.7	49.9	50.0	-1.5	-1.3	-1.07	-0.96	50.0	50.1	50.2	50.4	-0.9	-0.8	-0.7	-0.6	Richmond Park - Richmond Park Road North
1222	51.4	50.0	50.1	50.1	50.1	-1.4	-1.4	-1.34	-1.33	50.0	50.1	50.1	50.1	-1.4	-1.4	-1.34	-1.33	50.0	50.2	50.2	50.4	-1.4	-1.3	-1.2	-1.0	Richmond Park - Richmond Park Road North
1227	52.1	51.0	51.0	51.1	51.1	-1.1	-1.0	-1.03	-1.01	51.0	51.0	51.1	51.1	-1.1	-1.0	-1.03	-1.01	51.0	51.0	51.1	51.1	-1.1	-1.0	-1.0	-1.0	Richmond Park - Richmond Crescent
1228	53.5	51.0	51.0	51.1	51.1	-2.5	-2.5	-2.44	-2.42	51.0	51.0	51.1	51.1	-2.5	-2.5	-2.44	-2.42	51.0	51.0	51.1	51.1	-2.5	-2.5	-2.4	-2.4	Richmond Park - Richmond Crescent
1229	52.4	51.0	51.0	51.0	51.1	-1.4	-1.4	-1.36	-1.35	51.0	51.0	51.0	51.1	-1.4	-1.4	-1.36	-1.35	51.0	51.0	51.0	51.1	-1.4	-1.4	-1.4	-1.3	Richmond Park - Richmond Crescent
1230	51.8	51.0	51.0	51.0	51.0	-0.9	-0.8	-0.81	-0.80	51.0	51.0	51.0	51.0	-0.9	-0.8	-0.81	-0.80	51.0	51.0	51.0	51.0	-0.8	-0.8	-0.8	-0.8	Richmond Park - Richmond Crescent
1272	61.1	59.7	59.7	59.7	59.8	-1.5	-1.4	-1.37	-1.35	59.7	59.7	59.7	59.8	-1.5	-1.4	-1.37	-1.35	59.7	59.7	59.8	59.8	-1.4	-1.4	-1.4	-1.3	Shintaffer north of Semiahmoo Parkway
1273	60.3	59.7	59.7	59.7	59.8	-0.6	-0.6	-0.55	-0.53	59.7	59.7	59.7	59.8	-0.6	-0.6	-0.56	-0.53	59.7	59.7	59.8	59.8	-0.6	-0.6	-0.5	-0.5	Shintaffer north of Semiahmoo Parkway
1274	63.2	61.2	61.2	61.2	61.2	-2.0	-2.0	-2.02	-2.01	61.2	61.2	61.2	61.2	-2.0	-2.0	-2.02	-2.01	61.2	61.2	61.2	61.2	-2.0	-2.0	-2.0	-2.0	Shintaffer north of Semiahmoo Parkway
1275	59.7	59.6	59.7	59.7	59.7	-0.1	0.0	0.01	0.04	59.6	59.7	59.7	59.7	-0.1	0.0	0.01	0.04	59.6	59.7	59.7	59.7	0.0	0.0	0.0	0.1	Shintaffer north of Semiahmoo Parkway
1276	59.3	57.8	57.9	57.9	58.0	-1.5	-1.4	-1.39	-1.35	57.8	57.9	57.9	58.0	-1.5	-1.4	-1.39	-1.35	57.8	57.9	57.9	57.9	-1.5	-1.5	-1.4	-1.4	Shintaffer north of Semiahmoo Parkway
1277	64.1	63.0	63.4	63.6	63.8	-1.1	-0.7	-0.55	-0.31	63.0	63.4	63.6	63.8	-1.1	-0.7	-0.55	-0.31	63.2	63.5	63.8	64.0	-0.9	-0.6	-0.3	-0.1	Shintaffer north of Semiahmoo Parkway
1278	64.3	61.7	61.8	61.8	61.8	-2.5	-2.5	-2.47	-2.45	61.7	61.8	61.8	61.8	-2.5	-2.5	-2.47	-2.45	61.7	61.8	61.8	61.8	-2.5	-2.5	-2.5	-2.4	Shintaffer north of Semiahmoo Parkway
1280	63.7	61.6	61.7	61.7	61.7	-2.1	-2.0	-2.00	-1.98	61.6	61.7	61.7	61.7	-2.1	-2.0	-2.00	-1.98	61.6	61.7	61.7	61.7	-2.0	-2.0	-2.0	-2.0	Shintaffer north of Semiahmoo Parkway
1281	64.8	63.2	63.4	63.5	63.6	-1.6	-1.4	-1.29	-1.20	63.2	63.4	63.5	63.6	-1.6	-1.4	-1.29	-1.20	63.3	63.5	63.6	63.7	-1.5	-1.3	-1.2	-1.1	Shintaffer north of Semiahmoo Parkway
1284	58.2	54.2	54.7	55.0	55.6	-3.9	-3.5	-3.20	-2.56	54.1	54.6	54.9	55.3	-4.0	-3.6	-3.30	-2.86	56.2	56.7	57.3	57.3	-2.0	-1.4	-0.9	-0.9	Shintaffer north of Semiahmoo Parkway
1298	56.9	54.8	54.9	55.0	55.6	-2.1	-2.1	-1.94	-1.33	54.8	54.9	54.9	55.3	-2.1	-2.1	-2.02	-1.63	55.9	56.7	57.3	57.3	-1.1	-0.2	0.3	0.3	Shintaffer north of Semiahmoo Parkway
1308	65.7	63.2	63.4	63.5	63.6	-2.4	-2.2	-2.14	-2.05	63.2	63.4	63.5	63.6	-2.4	-2.2	-2.14	-2.05	63.3	63.5	63.6	63.7	-2.3	-2.2	-2.1	-2.0	Shintaffer north of Semiahmoo Parkway
1309	64.7	63.3	63.4	63.5	63.6	-1.4	-1.3	-1.19	-1.09	63.3	63.4	63.5	63.6	-1.4	-1.3	-1.19	-1.09	63.3	63.5	63.6	63.7	-1.4	-1.2	-1.1	-1.0	Shintaffer north of Semiahmoo Parkway
1310	65.5	63.3	63.4	63.5	63.6	-2.3	-2.1	-2.04	-1.94	63.3	63.4	63.5	63.6	-2.3	-2.1	-2.04	-1.94	63.3	63.5	63.6	63.7	-2.2	-2.0	-1.9	-1.8	Shintaffer north of Semiahmoo Parkway
1311	66.3	63.8	63.8	63.8	63.9	-2.5	-2.5	-2.45	-2.43	63.8	63.8	63.8	63.9	-2.5	-2.5	-2.45	-2.43	63.8	63.8	63.9	63.9	-2.5	-2.4	-2.4	-2.4	Shintaffer north of Semiahmoo Parkway
1316	67.0	64.4	64.5	64.5	64.5	-2.6	-2.6	-2.54	-2.51	64.4	64.5	64.5	64.5	-2.6	-2.6	-2.54	-2.51	64.5	64.5	64.5	64.6	-2.6	-2.5	-2.5	-2.5	Shintaffer north of Semiahmoo Parkway
1317	65.5	64.4	64.4	64.4	64.4	-1.1	-1.1	-1.09	-1.07	64.4	64.4	64.4	64.4	-1.1	-1.1	-1.09	-1.07	64.4	64.4	64.4	64.4	-1.1	-1.1	-1.1	-1.1	Shintaffer north of Semiahmoo Parkway
1253	78.6	77.2	77.2	77.2	77.2	-1.5	-1.5	-1.47	-1.47	77.2	77.2	77.2	77.2	-1.5	-1.5	-1.47	-1.47	77.2	77.2	77.2	77.2	-1.5	-1.5	-1.5	-1.5	Semiahmoo Parkway
1254	82.3	80.4	80.4	80.4	80.4	-1.9	-1.9	-1.86	-1.86	80.4	80.4	80.4	80.4	-1.9	-1.9	-1.86	-1.86	80.4	80.4	80.4	80.4	-1.9	-1.9	-1.9	-1.9	Semiahmoo Parkway
1256	66.6	63.3	63.3	63.3	63.3	-3.3	-3.3	-3.35	-3.35	65.5	65.7	65.7	65.8	-1.1	-1.0	-0.90	-0.82	66.0	66.2	66.3	66.4	-0.6	-0.4	-0.3	-0.2	Semiahmoo Parkway
1257	67.0	64.1	64.1	64.1	64.1	-2.9	-2.9	-2.92	-2.92	65.4	65.5	65.6	65.6	-1.7	-1.6	-1.50	-1.42	65.8	66.0	66.1	66.3	-1.2	-1.0	-0.9	-0.8	Semiahmoo Parkway
1258	80.8	77.5	77.5	77.5	77.5	-3.4	-3.4	-3.36	-3.36	77.5	77.5	77.5	77.5	-3.4	-3.4	-3.36	-3.36	77.5	77.5	77.5	77.5	-3.4	-3.4	-3.4	-3.4	Semiahmoo Parkway
1259	67.0	62.8	62.8	62.8	62.8	-4.2	-4.2	-4.22	-4.22	63.8	63.9	64.1	64.2	-3.3	-3.1	-2.97	-2.85	64.5	65.1	65.4	65.9	-2.5	-2.0	-1.6	-1.1	Semiahmoo Parkway
1260	68.6	62.6	62.6	62.6	62.6	-6.0	-6.0	-6.05	-6.05	62.9	63.0	63.0	63.0	-5.7	-5.7	-5.64	-5.61	63.1	63.2	63.2	63.2	-5.5	-5.5	-5.4	-5.4	Semiahmoo Parkway
1261	64.7	62.7	62.7	62.8	62.8	-1.9	-1.9	-1.91	-1.91	63.4	63.5	63.5	63.5	-1.2	-1.2	-1.19	-1.18	63.6	63.6	63.6	63.6	-1.1	-1.1	-1.0	-1.0	Semiahmoo Parkway
1262	64.0	62.4	62.4	62.4	62.4	-1.6	-1.6	-1.63	-1.63	62.7	62.8	62.8	62.8	-1.3	-1.3	-1.28	-1.28	62.8	62.8	62.8	62.8	-1.2	-1.2	-1.2	-1.2	Semiahmoo Parkway
1263	64.9	61.9	61.9	61.9	62.0	-3.0	-3.0	-2.96	-2.93	61.8	61.8	61.9	61.9	-3.2	-3.1	-3.05	-3.02	62.0	62.0	62.0	62.1	-3.0	-2.9	-2.9	-2.8	Semiahmoo Parkway
1264	65.8	61.5	61.6	61.6	61.6	-4.3	-4.2	-4.20	-4.17	61.4	61.4	61.5	61.5	-4.4	-4.4	-4.33	-4.29	61.6	61.7	61.7	61.8	-4.2	-4.1	-4.1	-4.0	Semiahmoo Parkway
1265	64.5	61.5	61.6	61.6	61.6	-2.9	-2.9	-2.87	-2.84	61.4	61.4	61.5	61.5	-3.1	-3.0	-3.00	-2.95	61.6	61.7	61.7	61.8	-2.8	-2.8	-2.7	-2.7	Semiahmoo Parkway
1266	60.0	57.9	58.1	58.2	58.3	-2.1	-1.9	-1.85	-1.76	57.6	57.7	57.8	57.9	-2.4	-2.3	-2.20	-2.09	58.2	58.4	58.6	58.7	-1.8	-1.6	-1.5	-1.3	Semiahmoo Parkway
1267	60.1	57.1	57.2	57.2	57.2	-3.1	-3.0	-2.97	-2.93	56.9	57.0	57.1	57.1	-3.2	-3.1	-3.10	-3.05	57.2	57.3	57.6	57.7	-2.9	-2.8	-2.5	-2.5	Semiahmoo Parkway
1268	59.8	57.3	57.3	57.3	57.3	-2.5	-2.5	-2.45	-2.45	58.2	58.2	58.2	58.2	-1.6	-1.6	-1.59	-1.58	58.3	58.4	58.4	58.4	-1.5	-1.4	-1.4	-1.4	Semiahmoo Parkway
1269	60.2	57.2	57.2	57.2	57.2	-3.1	-3.0	-3.03	-3.03	58.0	58.0	58.0	58.0	-2.3	-2.2	-2.24	-2.23	58.1	58.1	58.1	58.1	-2.1	-2.1	-2.1	-2.1	Semiahmoo Parkway
1270	60.2	57.2	57.2	57.2	57.2	-3.1	-3.0	-3.02	-3.02	58.0	58.0	58.0	58.0	-2.3	-2.2	-2.24	-2.23	58.1	58.1	58.1	58.1	-2.1	-2.1	-2.1	-2.1	Semiahmoo Parkway
1271	60.0	56.9	56.9	56.9	56.9	-3.1	-3.1	-3.09	-3.09	57.5	57.5	57.5	57.5	-2.5	-2.5	-2.53	-2.52	57.6	57.6	57.6	57.6	-2.4	-2.4	-2.4	-2.4	Semiahmoo Parkway
1286	56.8	55.4	55.4	55.4	55.4	-1.4	-1.4	-1.35	-1.35	55.8	55.8	55.8	55.8	-1.0	-1.0	-0.96	-0.95	55.9	56.2	56.5	56.5	-0.9	-0.6	-0.3	-0.3	Semiahmoo Parkway
1297	56.4	53.8	54.2	54.4	54.9	-2.5	-2.1	-1.95	-1.47	53.9	54.3	54.5	54.8	-2.5	-2.1	-1.89	-1.54	55.7	56.1	56.4	56.4	-0.7	-0.3	0.0	0.0	Semiahmoo Parkway
1327	67.8	63.6	63.6	63.6	63.6	-4.2	-4.2	-4.21	-4.21	64.4	64.5	64.5	64.6	-3.4	-3.3	-3.23	-3.16	64.8	65.1	65.5	65.9	-3.0	-2.6	-2.3	-1.8	Semiahmoo Parkway
1328	67.7	63.9	63.9	63.9	63.9	-3.8	-3.8	-3.81	-3.81	64.9	65.1	65.1	65.2	-2.8	-2.6	-2.58	-2.52	65.4	65.6	65.7	66.0	-2.3	-2.1	-2.0	-1.7	Semiahmoo Parkway
1329	66.7	64.0	64.0	64.0	64.0	-2.7	-2.7	-2.74	-2.74	65.2	65.3	65.4	65.5	-1.6	-1.4	-1.36	-1.29	65.6	65.8	66.0	66.2	-1.1	-0.9	-0.8	-0.6	Semiahmoo Parkway
1330	67.5	64.4	64.4	64.4	64.4	-3.1	-3.1	-3.06	-3.06	65.5	65.6	65.7	65.8	-2.0	-1.9	-1.78	-1.70	66.0	66.1	66.2	66.4	-1.5	-1.3	-1.2	-1.1	Semiahmoo Parkway
1331	64.5	62.7	62.7	62.8	62.8	-1.8	-1.8	-1.77	-1.77	63.6	63.6	63.6	63.6	-0.9	-0.9	-0.92	-0.91	63.7	63.7	63.8	63.8	-0.8	-0.8	-0.8	-0.7	Semiahmoo Parkway
1332	65.5	64.1	64.1	64.1	64.1	-1.4	-1.4	-1.42	-1.42	64.1	64.1	64.1	64.1	-1.4	-1.4	-1.42	-1.42	64.1	64.1	64.1	64.1	-1.4	-1.4	-1.4	-1.4	Semiahmoo Parkway
1333	64.8	62.7	62.7	62.8	62.8	-2.0	-2.0	-2.01	-2.01	63.6	63.6	63.6	63.6	-1.2	-1.2	-1.15	-1.14	63.7	63.8	63.8	63.8	-1.0	-1.0	-1.0	-1.0	Semiahmoo Parkway
1291	55.0	52.9	53.0	53.1	53.2	-2.1	-2.0	-1.89	-1.76	53.0	53.1	53.1	53.2	-2.1	-2.0	-1.88	-1.76	53.3	53.6	53.7	53.8	-1.7	-1.4	-1.3	-1.2	Shintaffer North of Richmond Park - West Side

Table A-3
Birch Point Drainage Study - Peak Stage Summary

		Existing Land Use								Existing Land Use with Rogers Slough Structure Removed								Future Land Use								
		Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				Peak HGL (feet NAVD 88)				Height Above Flood Depth (feet)				
Junction	Flood Elev	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	limate Chang	25 Year	100 Year	Nov-21	mate Char	25 Year	100 Year	Nov-21	limate Chang	Location
1296	56.3	53.8	54.2	54.4	54.9	-2.5	-2.1	-1.87	-1.39	53.9	54.3	54.5	54.8	-2.5	-2.0	-1.83	-1.48	55.6	56.0	56.3	56.3	-0.7	-0.3	0.0	0.0	Shintaffer North of Richmond Park - West Side
1318	54.3	52.9	53.0	53.1	53.2	-1.4	-1.3	-1.19	-1.10	52.9	53.0	53.1	53.2	-1.4	-1.3	-1.19	-1.10	53.3	53.6	53.7	53.8	-1.0	-0.7	-0.6	-0.5	Shintaffer North of Richmond Park - West Side
1326	55.2	52.7	52.9	53.0	53.1	-2.5	-2.3	-2.21	-2.08	52.7	52.9	53.0	53.1	-2.5	-2.3	-2.21	-2.08	53.2	53.5	53.7	53.8	-2.0	-1.7	-1.5	-1.4	Shintaffer North of Richmond Park - West Side
1326A	54.4	52.7	52.8	53.0	53.1	-1.8	-1.6	-1.45	-1.32	52.7	52.8	53.0	53.1	-1.8	-1.6	-1.45	-1.32	53.1	53.4	53.5	53.7	-1.3	-1.0	-0.9	-0.8	Shintaffer North of Richmond Park - West Side
1326B	53.1	52.6	52.8	52.9	53.0	-0.4	-0.2	-0.13	-0.01	52.6	52.8	52.9	53.0	-0.4	-0.2	-0.13	-0.01	53.1	53.3	53.4	53.6	0.0	0.3	0.4	0.5	Shintaffer North of Richmond Park - West Side
1326C	52.8	52.6	52.8	52.9	53.0	-0.2	0.0	0.15	0.28	52.6	52.8	52.9	53.0	-0.2	0.0	0.15	0.28	53.1	53.3	53.4	53.6	0.3	0.6	0.7	0.8	Shintaffer North of Richmond Park - West Side
1319	54.2	52.1	52.3	52.5	52.7	-2.1	-1.9	-1.68	-1.46	52.1	52.3	52.5	52.7	-2.1	-1.9	-1.68	-1.46	52.4	52.8	53.2	53.8	-1.8	-1.4	-1.0	-0.4	Middle Shintaffer
1320	53.0	52.1	52.3	52.5	52.7	-0.9	-0.7	-0.49	-0.27	52.1	52.3	52.5	52.7	-0.9	-0.7	-0.49	-0.27	52.4	52.8	53.2	55.4	-0.6	-0.2	0.2	2.4	Middle Shintaffer
1321	53.2	52.1	52.3	52.5	52.7	-1.2	-0.9	-0.72	-0.51	52.1	52.3	52.5	52.7	-1.2	-0.9	-0.72	-0.51	52.4	52.8	53.3	54.1	-0.9	-0.4	0.0	0.9	Middle Shintaffer
1322	52.4	52.1	52.3	52.5	52.7	-0.4	-0.1	0.07	0.28	52.1	52.3	52.5	52.7	-0.4	-0.1	0.07	0.28	52.4	52.8	53.3	54.1	-0.1	0.4	0.8	1.6	Middle Shintaffer
1323	52.7	51.9	52.1	52.2	52.4	-0.8	-0.6	-0.46	-0.30	51.9	52.1	52.2	52.4	-0.8	-0.6	-0.46	-0.30	52.1	52.8	53.2	53.6	-0.6	0.1	0.5	0.9	Middle Shintaffer
1323	52.7	51.9	52.1	52.2	52.4	-0.8	-0.6	-0.46	-0.30	51.9	52.1	52.2	52.4	-0.8	-0.6	-0.46	-0.30	52.1	52.8	53.2	53.6	-0.6	0.1	0.5	0.9	Middle Shintaffer
1323A	52.7	51.9	52.1	52.2	52.4	-0.8	-0.6	-0.48	-0.32	51.9	52.1	52.2	52.4	-0.8	-0.6	-0.48	-0.32	52.1	52.8	54.6	54.6	-0.6	0.1	1.9	1.9	Middle Shintaffer
1324	52.4	52.6	52.8	52.9	53.0	0.2	0.4	0.50	0.62	52.6	52.8	52.9	53.0	0.2	0.4	0.50	0.62	53.0	53.3	53.4	53.6	0.6	0.9	1.0	1.2	Middle Shintaffer
1235	53.2	51.7	51.9	52.0	52.2	-1.5	-1.3	-1.20	-1.05	51.7	51.9	52.0	52.2	-1.5	-1.3	-1.20	-1.05	51.9	52.3	52.7	53.2	-1.3	-0.9	-0.5	0.0	Middle Shintaffer
1236	53.6	51.7	51.9	52.0	52.2	-1.9	-1.7	-1.57	-1.42	51.7	51.9	52.0	52.2	-1.9	-1.7	-1.57	-1.42	51.9	52.3	52.7	53.2	-1.7	-1.3	-0.9	-0.4	Middle Shintaffer
1237	52.9	51.9	52.1	52.2	52.4	-1.0	-0.8	-0.63	-0.47	51.9	52.1	52.2	52.4	-1.0	-0.8	-0.63	-0.47	52.1	52.8	53.2	53.6	-0.8	-0.1	0.3	0.7	Middle Shintaffer
1238	53.9	51.7	51.9	52.0	52.2	-2.2	-2.0	-1.86	-1.71	51.7	51.9	52.0	52.2	-2.2	-2.0	-1.86	-1.71	51.9	52.3	52.7	53.2	-2.0	-1.6	-1.2	-0.7	Middle Shintaffer
1292	54.6	52.7	52.9	53.0	53.1	-1.9	-1.7	-1.61	-1.48	52.7	52.9	53.0	53.1	-1.9	-1.7	-1.61	-1.48	53.2	53.5	53.7	53.8	-1.4	-1.1	-0.9	-0.8	Middle Shintaffer
1293	55.4	52.7	52.9	53.0	53.1	-2.7	-2.5	-2.37	-2.24	52.7	52.9	53.0	53.1	-2.7	-2.5	-2.37	-2.24	53.2	53.5	53.7	53.8	-2.2	-1.9	-1.7	-1.6	Middle Shintaffer
1294	54.9	53.4	53.5	53.5	53.5	-1.5	-1.5	-1.47	-1.46	53.4	53.5	53.5	53.5	-1.5	-1.5	-1.47	-1.46	53.5	53.5	53.7	53.8	-1.4	-1.4	-1.3	-1.1	Middle Shintaffer
1295	55.9	53.9	53.9	54.0	54.0	-2.0	-1.9	-1.90	-1.88	53.9	53.9	54.0	54.0	-2.0	-1.9	-1.90	-1.88	54.0	54.1	54.1	54.1	-1.8	-1.8	-1.8	-1.7	Middle Shintaffer
1300	54.9	54.0	54.0	54.0	54.0	-1.0	-1.0	-0.97	-0.95	54.0	54.0	54.0	54.0	-1.0	-1.0	-0.97	-0.95	54.0	54.1	54.1	54.1	-0.9	-0.9	-0.8	-0.8	Middle Shintaffer
1325	54.8	52.7	52.9	53.0	53.1	-2.1	-1.9	-1.81	-1.68	52.7	52.9	53.0	53.1	-2.1	-1.9	-1.81	-1.68	53.2	53.5	53.7	53.8	-1.6	-1.3	-1.1	-1.0	Middle Shintaffer
501	26.5	23.0	23.0	23.0	23.0	-3.6	-3.5	-3.53	-3.51	23.0	23.0	23.0	23.0	-3.6	-3.5	-3.53	-3.51	23.0	23.0	23.0	23.0	-3.6	-3.5	-3.5	-3.5	Lower Shintaffer
505	30.0	27.1	27.1	27.1	27.1	-2.9	-2.9	-2.92	-2.92	27.1	27.1	27.1	27.1	-2.9	-2.9	-2.92	-2.92	27.1	27.1	27.1	27.1	-2.9	-2.9	-2.9	-2.9	Lower Shintaffer
507	48.9	45.1	45.1	45.1	45.1	-3.9	-3.8	-3.82	-3.80	45.1	45.1	45.1	45.1	-3.9	-3.8	-3.82	-3.80	45.1	45.1	45.1	45.1	-3.8	-3.8	-3.8	-3.8	Lower Shintaffer
508	51.7	47.8	47.8	47.8	47.9	-3.9	-3.8	-3.83	-3.82	47.8	47.8	47.8	47.9	-3.9	-3.8	-3.83	-3.82	47.8	47.8	47.9	47.9	-3.9	-3.8	-3.8	-3.8	Lower Shintaffer
509	52.5	50.1	50.3	50.4	50.6	-2.5	-2.2	-2.12	-1.98	50.1	50.3	50.4	50.6	-2.5	-2.2	-2.12	-1.98	50.1	50.4	50.5	50.7	-2.4	-2.2	-2.0	-1.9	Lower Shintaffer
510	51.3	47.7	47.7	47.8	47.8	-3.5	-3.5	-3.51	-3.49	47.7	47.7	47.8	47.8	-3.5	-3.5	-3.51	-3.49	47.7	47.8	47.8	47.8	-3.5	-3.5	-3.5	-3.5	Lower Shintaffer
511	52.5	50.4	50.8	51.0	51.3	-2.1	-1.7	-1.53	-1.27	50.4	50.8	51.0	51.3	-2.1	-1.7	-1.53	-1.27	50.5	50.9	51.1	51.4	-2.0	-1.6	-1.4	-1.1	Lower Shintaffer
514	52.4	50.9	51.4	51.7	52.1	-1.5	-1.0	-0.67	-0.27	50.9	51.4	51.7	52.1	-1.5	-1.0	-0.67	-0.27	51.0	51.5	51.9	52.3	-1.4	-0.9	-0.5	-0.1	Lower Shintaffer
518	52.2	51.3	52.0	52.5	53.0	-0.9	-0.1	0.28	0.82	51.3	52.0	52.5	53.0	-0.9	-0.1	0.28	0.82	51.4	52.2	52.6	53.2	-0.8	0.0	0.4	1.0	Lower Shintaffer
519	52.2	51.3	52.0	52.5	53.0	-0.9	-0.1	0.30	0.84	51.3	52.0	52.5	53.0	-0.9	-0.1	0.30	0.84	51.4	52.2	52.6	53.2	-0.8	0.0	0.4	1.0	Lower Shintaffer
520	51.9	51.3	52.0	52.5	53.0	-0.6	0.2	0.60	1.14	51.3	52.0	52.5	53.0	-0.6	0.2	0.60	1.14	51.4	52.2	52.6	53.2	-0.5	0.3	0.7	1.3	Lower Shintaffer
521	52.4	51.3	52.0	52.5	53.0	-1.1	-0.4	0.03	0.57	51.3	52.0	52.5	53.0	-1.1	-0.4	0.03	0.57	51.4	52.2	52.6	53.2	-1.0	-0.3	0.2	0.7	Lower Shintaffer
522	51.7	51.3	52.1	52.5	53.0	-0.4	0.4	0.81	1.35	51.3	52.1	52.5	53.0	-0.4	0.4	0.81	1.35	51.4	52.2	52.6	53.2	-0.3	0.5	0.9	1.5	Lower Shintaffer
523	52.9	51.4	51.6	51.7	51.8	-1.6	-1.3	-1.22	-1.08	51.4	51.6	51.7	51.8	-1.6	-1.3	-1.22	-1.08	51.6	51.8	52.1	52.5	-1.4	-1.1	-0.8	-0.4	Lower Shintaffer
524	52.4	51.1	51.3	51.4	51.5	-1.3	-1.1	-1.02	-0.89	51.1	51.3	51.4	51.5	-1.3	-1.1	-1.02	-0.89	51.2	51.5	51.6	51.9	-1.2	-0.9	-0.8	-0.5	Lower Shintaffer
525	51.8	51.1	51.3	51.4	51.5	-0.8	-0.5	-0.44	-0.31	51.1	51.3	51.4	51.5	-0.8	-0.5	-0.44	-0.31	51.2	51.5	51.6	51.9	-0.6	-0.3	-0.2	0.1	Lower Shintaffer
527	51.5	50.1	50.3	50.4	50.6	-1.4	-1.2	-1.09	-0.95	50.1	50.3	50.4	50.6	-1.4	-1.2	-1.09	-0.95	50.1	50.4	50.5	50.7	-1.4	-1.1	-1.0	-0.8	Lower Shintaffer
1244	51.8	51.3	52.1	52.5	53.0	-0.5	0.3	0.68	1.22	51.3	52.1	52.5	53.0	-0.5	0.3	0.68	1.22	51.4	52.2	52.6	53.2	-0.4	0.4	0.8	1.4	Lower Shintaffer
1245	52.9	51.4	51.6	51.7	51.8	-1.6	-1.4	-1.26	-1.12	51.4	51.6	51.7	51.8	-1.6	-1.4	-1.26	-1.12	51.6	51.8	52.1	52.5	-1.4	-1.1	-0.9	-0.4	Lower Shintaffer
1246	53.3	51.7	51.9	52.0	52.2	-1.7	-1.4	-1.32	-1.17	51.7	51.9	52.0	52.2	-1.7	-1.4	-1.32	-1.17	51.9	52.3	52.7	53.2	-1.4	-1.1	-0.7	-0.2	Lower Shintaffer
BP21aPond	164.2	160.2	160.5	160.7	161.0	-4.0	-3.7	-3.48	-3.22	160.2	160.5	160.7	161.0	-4.0	-3.7	-3.48	-3.22	162.3	163.3	163.9	164.4	-1.9	-0.9	-0.3	0.2	Semiahmoo Uplands
FieldPond1	152.7	147.5	147.7	147.8	147.9	-5.2	-5.0	-4.91	-4.78	147.5	147.7	147.8	147.9	-5.2	-5.0	-4.91	-4.78	147.9	148.1	148.3	148.5	-4.8	-4.6	-4.4	-4.2	Semiahmoo Uplands
G1-1	81.8	82.6	82.7	82.7	82.8	0.8	0.9	0.92	0.98	82.6	82.7	82.7	82.8	0.8	0.9	0.92	0.98	82.6	82.7	82.8	82.8	0.8	0.9	1.0	1.0	Semiahmoo Uplands
G1-2	90.3	90.0	90.3	90.5	90.6	-0.3	0.0	0.18	0.32	90.3	90.4	90.5	90.6	0.0	0.1	0.17	0.32	90.4	90.6	90.7	90.7	0.1	0.3	0.4	0.4	Semiahmoo Uplands
G2-1	75.5	75.5	75.7	75.9	76.0	0.0	0.2	0.35	0.45	75.6	75.7	75.9	76.0	0.1	0.2	0.35	0.45	76.2	76.3	76.3	76.4	0.7	0.8	0.8	0.9	Semiahmoo Uplands
G2-2	74.0	74.8	75.0	75.0	75.1	0.8	1.0	1.02	1.11	74.8	75.0	75.0	75.1	0.8	1.0	1.02	1.11	74.9	75.1	75.1	75.2	0.9	1.1	1.1	1.2	Semiahmoo Uplands
SU-1b	229.0	226.3	226.6	226.8	227.0	-2.8	-2.4	-2.24	-2.02	226.8	227.3	227.6	227.9	-2.2	-1.7	-1.42	-1.06	227.3	227.9	228.2	228.6	-1.8	-1.2	-0.8	-0.4	Semiahmoo Uplands
TF-1	80.6	80.6	80.9	81.1	81.3	0.0	0.3	0.46	0.65	81.0	81.1	81.1	81.3	0.4	0.4	0.46	0.65	81.0	81.1	81.3	81.4	0.4	0.5	0.6	0.8	Semiahmoo Uplands
HorizonPond	32.4	32.7	33.2	33.3	33.6	0.3	0.7	0.92	1.15	32.7	33.2	33.3	33.6	0.3	0.7	0.92	1.15	33.9	34.3	34.6	34.9	1.5	1.9	2.2	2.5	Horizon Pond
PD63	33.7	31.3	32.0	32.5	33.1	-2.4	-1.6	-1.18	-0.59	31.3	32.1	32.6	33.1	-2.4	-1.6	-1.11	-0.60	31.7	32.5	33.0	33.6	-2.0	-1.1	-0.6	-0.1	Horizon Pond
Lake6	181.0	179.7	179.8	179.8	179.9	-1.3	-1.3	-1.20	-1.14	179.7	179.8	179.8	179.9	-1.3	-1.3	-1.20	-1.14	179.8	179.9	180.0	180.0	-1.2	-1.1	-1.0	-1.0	Semiahmoo Golf Course
Lake9	235.0	231.7	231.8	231.8	231.8	-3.3	-3.3	-3.22	-3.18	231.7	231.8	231.8	231.8	-3.3	-3.3	-3.22	-3.18	231.8	231.9	231.9	231.9	-3.2	-3.2	-3.1	-3.1	Semiahmoo Golf Course
Lake12	229.2	226.3	226.6	226.8	227.0	-2.9	-2.6	-2.44	-2.22	226.8	227.3	227.6	227.9	-2.4	-1.9	-1.62	-1.26	227.3	227.9	228.2	228.6	-1.9	-1.3	-1.0	-0.6	Semiahmoo Golf Course
Lake18	235.0	233.0	233.1	233.2	233.3	-2.0	-1.9	-1.80	-1.70	233.0	233.1	233.2	233.3	-2.0	-1.9	-1.80	-1.70	233.2	233.3	233.4	233.5	-1.8	-1.7	-1.6	-1.5	Semiahmoo Golf Course
Pond3Dn_In	8.4	7.4	7.7	7.9	8.2	-1.0	-0.7	-0.50	-0.25	7.7	8.1	8.4	8.6	-0.7	-0.3	-0.02	0.15	7.9	8.4	8.5	8.8	-0.5	0.0	0.1	0.4	Birch Bay Village

Table A-5
Birch Point Drainage Study - Peak Flow Summary

		Existing Conditions				ing Conditions with Rogers Slough Structure Remo				Future Conditions				
		Peak Flow (cfs)				Peak Flow (cfs)				Peak Flow (cfs)				
Conduit	Flood Elev	25 Year	100 Year	Nov-21	imate Chang	25 Year	100 Year	Nov-21	imate Chang	25 Year	100 Year	Nov-21	imate Chang	Location
C1006	1.9	2.4	2.9	3.2	3.6	2.4	2.9	3.2	3.6	2.6	3.1	3.4	3.7	Birch Point Road West of Selder
OD1752	1.7	2.4	2.9	3.2	3.5	2.4	2.9	3.2	3.5	2.5	3.0	3.3	3.7	Birch Point Road West of Selder
C1007	1.7	2.3	2.8	3.1	3.4	2.3	2.8	3.1	3.4	2.5	2.9	3.2	3.6	Birch Point Road West of Selder
OF-C1007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road West of Selder
OD1010_1	1.7	2.3	2.8	3.1	3.4	2.3	2.8	3.1	3.4	2.5	2.9	3.2	3.6	Birch Point Road West of Selder
OD1756	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	8.1	Birch Point Road West of Selder
OD1757	2.8	29.0	36.7	42.9	56.7	28.9	36.5	42.7	56.8	40.5	55.6	64.4	72.6	Birch Point Road West of Selder
C1008	2.9	29.0	36.7	42.9	47.3	28.9	36.5	42.7	47.3	40.6	47.2	47.3	47.5	Birch Point Road West of Selder
C1008-OF	0.0	0.0	0.0	0.0	19.8	0.0	0.0	0.0	19.3	0.0	17.5	36.1	56.0	Birch Point Road West of Selder
OD1010_4	1.6	2.5	2.9	4.3	6.6	3.1	3.7	4.2	6.6	3.4	4.8	6.4	8.2	Birch Point Road West of Selder
OD1010_2	1.6	2.3	2.8	3.0	3.4	2.3	2.8	3.0	3.4	2.4	2.9	3.2	3.5	Birch Point Road West of Selder
OD1010_3	1.6	2.5	3.0	4.3	6.7	3.1	3.7	4.3	6.6	3.4	4.4	6.4	8.2	Birch Point Road West of Selder
OD1753	1.9	2.4	3.0	3.2	3.6	2.4	3.0	3.2	3.6	2.6	3.1	3.4	3.8	Birch Point Road West of Selder
OD1755	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road West of Selder
GM3875	2.1	15.7	19.1	19.2	19.2	15.1	18.9	19.2	19.2	19.2	19.3	19.4	19.4	Birch Point Road West of Selder
GM3873	0.3	10.3	13.4	14.5	16.4	9.2	11.5	11.8	12.0	12.0	12.1	12.2	12.2	Birch Point Road West of Selder
GM3878	2.1	19.5	20.9	21.2	21.4	18.4	20.6	21.1	21.3	21.0	21.4	21.6	21.7	Birch Point Road West of Selder
GM3872	0.3	10.3	13.4	14.5	16.4	9.2	11.5	11.8	12.0	12.0	12.1	12.2	12.2	Birch Point Road West of Selder
C1009	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road West of Selder
OD1759	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road West of Selder
OD1031	0.3	10.3	13.4	14.5	16.5	9.2	12.7	14.7	16.7	16.7	19.0	20.1	21.5	Birch Point Road West of Selder
C1025	4.9	25.9	27.7	28.3	29.1	24.5	27.2	27.3	28.2	28.5	28.9	29.1	29.5	Birch Point Road West of Selder
C1025-OF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road West of Selder
BBVC18	4.8	20.4	21.0	21.0	20.7	20.1	21.0	21.0	20.6	21.1	21.2	20.7	21.0	Birch Point Road West of Selder
C1026	0.7	10.0	11.5	11.8	12.2	9.4	11.0	11.0	11.5	12.4	12.3	12.4	12.6	Birch Point Road West of Selder
OD1032	1.5	6.8	7.1	8.3	11.1	6.7	7.6	8.8	10.1	9.5	18.0	24.2	31.4	Birch Point Road West of Selder
OD1034	2.1	17.1	28.5	35.6	43.4	16.8	21.8	32.0	41.8	31.0	46.3	55.2	66.7	Birch Point Road West of Selder
GM3874	2.1	15.7	19.1	19.2	19.2	15.1	18.9	19.2	19.2	19.2	19.3	19.4	19.4	Birch Point Road West of Selder
GM3877	0.1	4.0	4.4	4.4	4.5	3.5	4.3	4.3	4.5	4.5	4.4	4.5	4.7	Birch Point Road West of Selder
OD1020_1	0.0	1.8	3.0	4.6	7.3	1.7	2.9	4.5	7.1	7.2	10.7	13.2	16.0	Birch Point Road West of Selder
OD1020_2	0.0	1.8	3.0	4.3	6.1	1.7	2.8	4.2	6.0	6.1	7.6	8.3	9.2	Birch Point Road West of Selder
OD1020_3	0.0	1.7	2.9	4.1	5.9	1.6	2.8	4.0	5.8	6.0	7.2	8.0	8.8	Birch Point Road West of Selder
OD1020_4	0.0	1.7	2.9	4.1	5.9	1.6	2.8	4.0	5.7	6.0	7.2	8.0	8.8	Birch Point Road West of Selder
BBVC1	2.1	19.5	21.1	21.4	21.7	18.4	20.6	21.2	21.6	21.2	21.7	21.9	22.2	Birch Point Road West of Selder
OD1761	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road West of Selder
OD1778	53.3	10.0	13.1	14.4	16.2	9.5	12.8	14.6	16.5	16.6	17.7	18.4	19.1	Birch Point Road West of Selder
OD1782	0.1	5.1	6.1	6.4	7.1	4.2	5.9	6.0	6.5	6.6	6.8	7.0	7.4	Birch Point Road West of Selder
OD1784	0.1	4.1	5.5	5.5	5.7	3.6	5.4	5.5	5.8	5.5	5.5	5.8	5.8	Birch Point Road West of Selder
CV3570	0.0	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	Bay Ridge Estates - West Shoreview Road
OD1001	0.2	4.6	5.6	6.6	8.3	4.5	5.4	6.4	8.1	8.1	9.8	10.9	11.7	Bay Ridge Estates - West Shoreview Road
CV3571	0.2	3.1	3.1	3.1	3.1	3.1	3.2	3.1	3.1	3.1	3.1	3.2	3.5	Bay Ridge Estates - West Shoreview Road
OD1002	0.3	6.8	6.8	6.9	6.9	6.8	7.2	7.3	7.0	7.0	7.1	7.1	7.2	Bay Ridge Estates - West Shoreview Road
CV3572	2.2	3.3	3.3	3.4	3.4	3.3	3.3	3.4	3.4	3.4	3.5	3.5	3.5	Bay Ridge Estates - West Shoreview Road
OD1000	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	Bay Ridge Estates - West Shoreview Road
CV3586	1.0	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	Bay Ridge Estates - West Shoreview Road
OD1762_2	0.2	2.1	3.3	4.8	7.5	2.3	3.8	4.6	7.3	7.4	10.9	13.5	16.3	Bay Ridge Estates - West Shoreview Road
GM3867	0.5	2.5	2.4	2.4	2.6	2.5	2.4	2.4	2.5	2.5	2.7	2.7	2.7	Bay Ridge Estates - West Shoreview Road
OD1762_1	0.9	7.4	7.4	7.5	7.4	7.4	7.5	7.5	7.5	7.5	7.5	7.5	7.7	Bay Ridge Estates - West Shoreview Road
GM3866	0.5	2.4	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.4	Bay Ridge Estates - West Shoreview Road
OD0985lower	2.4	4.0	4.5	4.8	5.5	3.8	4.2	4.4	8.9	8.9	8.9	9.1	9.1	Bay Ridge Estates - East Shoreview Road
CV3575	1.9	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	Bay Ridge Estates - East Shoreview Road
OD1004	1.9	2.2	2.2	2.2	3.2	2.2	2.2	2.2	3.2	3.2	3.2	3.7	4.3	Bay Ridge Estates - East Shoreview Road
CV3592.1	0.1	2.9	3.0	3.1	3.1	2.9	3.0	3.1	3.1	3.1	3.1	3.1	3.1	Bay Ridge Estates - East Shoreview Road
OD1009	1.3	7.0	7.5	9.0	12.2	6.9	7.1	8.3	11.9	12.0	13.0	13.4	13.8	Bay Ridge Estates - East Shoreview Road
SM781	2.0	2.3	2.3	2.3	2.4	2.3	2.3	2.3	2.4	2.3	2.4	2.4	2.4	Bay Ridge Estates - East Shoreview Road
SM789	1.7	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.4	Bay Ridge Estates - East Shoreview Road
SM778	2.1	2.6	2.7	2.7	2.8	2.5	2.6	2.7	2.7	2.6	2.8	2.8	2.8	Bay Ridge Estates - East Shoreview Road
SM790	1.9	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	Bay Ridge Estates - East Shoreview Road
SM782	2.1	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	Bay Ridge Estates - East Shoreview Road
SM783	4.6	13.7	15.1	16.9	19.1	13.2	14.3	15.4	18.9	19.0	19.2	19.2	19.3	Bay Ridge Estates - East Shoreview Road
SM777	2.3	2.8	3.0	3.1	3.2	2.8	2.9	3.0	3.1	3.0	3.1	3.1	3.2	Bay Ridge Estates - East Shoreview Road
SM780	2.0	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.2	2.2	Bay Ridge Estates - East Shoreview Road
SM788	1.5	3.4	3.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.5	3.4	3.3	Bay Ridge Estates - East Shoreview Road
CV3544	1.9	2.6	2.2	2.3	2.4	2.3	2.3	2.2	2.2	2.4	2.3	2.4	2.3	Bay Ridge Estates - Bay Ridge Drive South
OD994	2.1	24.5	21.7	21.8	23.3	22.5	22.1	21.8	21.8	23.0	23.2	22.9	22.8	Bay Ridge Estates - Bay Ridge Drive South
OD1015	0.1	9.8	12.8	14.2	15.9	9.3	12.6	14.4	16.3	16.4	17.5	18.2	18.8	Bay Ridge Estates - Bay Ridge Drive South
SM732	4.1	9.7	10.0	10.2	10.4	9.6	9.9	10.0	10.2	9.7	9.9	10.1	10.3	Bay Ridge Estates - Bay Ridge Drive South
SM757	0.1	0.5	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	Bay Ridge Estates - Bay Ridge Drive South
SM758	0.3	0.5	0.5	0.6	0.8	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.9	Bay Ridge Estates - Bay Ridge Drive South
SM748	1.5	2.1	1.9	1.8	1.7	2.1	2.0	1.8	1.7	1.8	1.8	1.7	1.9	Bay Ridge Estates - Bay Ridge Drive South
SM761	0.5	0.6	0.8	1.0	1.2	0.5	0.6	0.7	0.9	0.6	0.8	0.9	1.2	Bay Ridge Estates - Bay Ridge Drive South
SM749	1.7	2.4	2.2	2.0	1.9	2.3	2.2	2.1	1.9	1.9	1.9	1.9	2.1	Bay Ridge Estates - Bay Ridge Drive South
SM755	1.9	2.6	2.4	2.3	2.4	2.6	2.4	2.3	2.3	2.2	2.2	2.3	2.3	Bay Ridge Estates - Bay Ridge Drive South
OD984	2.0	8.2	6.5	7.4	7.8	7.4	6.7	6.6	7.6	8.0	8.1	7.4	7.4	Bay Ridge Estates - Bay Ridge Drive South
SM743	1.3	1.9	1.7	1.6	1.6	1.9	1.8	1.6	1.5	1.6	1.6	1.6	1.8	Bay Ridge Estates - Bay Ridge Drive South
SM753	0.2	1.4	1.8	1.9	2.2	1.2	1.5	1.7	1.9	1.4	1.8	1.9	2.3	Bay Ridge Estates - Bay Ridge Drive South
OD985Upper	0.6	0.9	1.2	1.3	1.6	0.6	0.9	1.1	5.8	5.8	6.5	8.4	7.1	Bay Ridge Estates - Bay Ridge Drive South
CV3346	0.3	1.0	1.3	1.4	1.5	0.8	1.0	1.1	1.2	1.1	1.4	1.5	1.7	Bay Ridge Estates - Seawan Place
CV3357	0.5	1.5	1.9	2.0	2.3	1.2	1.5	1.6	1.8	1.7	2.0	2.2	2.5	Bay Ridge Estates - Seawan Place
OD907	0.5	1.5	1.9	2.0	2.3	1.2	1.5	1.6	1.8	1.7	2.0	2.1	2.6	Bay Ridge Estates - Seawan Place
CV3377	0.7	1.8	2.1	2.3	2.6	1.4	1.7	1.9	2.1	1.9	2.3	2.4	3.2	Bay Ridge Estates - Seawan Place
OD918	0.7	1.8	2.1	2.3	2.6	1.4	1.8	1.9	2.1	1.9	2.2	2.4	3.6	Bay Ridge Estates - Seawan Place
CV3399	0.9	2.0	2.4	2.6	2.9	1.7	2.0	2.2	2.4	2.1	2.5	2.7	4.4	Bay Ridge Estates - Seawan Place
OD935	0.9	2.0	2.4	2.6	2.9	1.7	2.0	2.2	2.4	2.1	2.5	2.7	5.0	Bay Ridge Estates - Seawan Place
CV3434	1.1	2.3	2.7	2.9	3.2	1.9	2.3	2.5	2.8	2.4	2.7	3.0	5.3	Bay Ridge Estates - Seawan Place
OD950	1.1	2.3	2.7	2.9	3.2	1.9	2.3	2.5	2.8	2.4	2.7	3.0	5.3	Bay Ridge Estates - Seawan Place
SM704	0.6	1.3	1.5	1.7	1.9	1.1	1.3	1.4	1.6	1.4	1.7	1.9	2.0	Bay Ridge Estates - Seawan Place
SM714	1.3	2.6	3.0	3.3	3.6	2.2	2.6	2.8	3.1	2.6	3.0	3.3	4.5	Bay Ridge Estates - Seawan Place
SM702	0.8	2.2	2.7	3.0	3.3	1.9	2.4	2.6	2.9	2.2	2.6	2.9	3.4	Bay Ridge Estates - Bay Ridge Drive Middle
SM705	1.2	2.1	2.5	2.7	2.9	1.8	2.2	2.4	2.6	2.2	2.5	2.7	2.9	Bay Ridge Estates - Bay Ridge Drive Middle
SM715	1.0	1.9	2.3	2.4	2.6	1.6	2.1	2.2	2.3	2.0	2.3	2.4	2.6	Bay Ridge Estates - Bay Ridge Drive Middle
SM7201	0.4	1.7	2.1	2.3	2.6	1.5	1.8	2.0	2.3	1.7	2.1	2.3	2.6	Bay Ridge Estates - Bay Ridge Drive Middle
SM695	1.6	2.6	3.1	3.4	3.6	2.3	2.8	3.0	3.3	2.6	3.1	3.3	3.5	Bay Ridge Estates - Bay Ridge Drive Middle
OD967	0.6	1.3	1.6	1.8	2.1	1.1	1.5	1.5	1.7	1.5	1.8	1.9	2.2	Bay Ridge Estates - Bay Ridge Drive Middle
OD938	1.4	2.4	2.8	3.0	3.3	2.1	2.5	2.7	3.0	2.4	2.8	3.0	3.2	Bay Ridge Estates - Bay Ridge Drive Middle
SM710	0.6	1.9	2.4	2.6	3.0	1.7	2.1	2.3	2.6	1.9	2.3	2.6	3.1	Bay Ridge Estates - Bay Ridge Drive Middle
OD954	0.6	2.0	2.4	2.6	3.0	1.7	2.1	2.3	2.6	1.9	2.3	2.6	3.2	Bay Ridge Estates - Bay Ridge Drive Middle
SM720	0.4	1.7	2.1	2.3	2.6	1.5	1.8	2.0	2.3	1.7	2.1	2.3	2.6	Bay Ridge Estates - Bay Ridge Drive Middle
SM724	0.8	1.7	2.1	2.2	2.3	1.3	2.0	2.0	2.1	1.9	2.1	2.2	2.3	Bay Ridge Estates - Bay Ridge Drive Middle

Table A-5
Birch Point Drainage Study - Peak Flow Summary

		Existing Conditions				ing Conditions with Rogers Slough Structure Remo				Future Conditions				
		Peak Flow (cfs)				Peak Flow (cfs)				Peak Flow (cfs)				
Conduit	Flood Elev	25 Year	100 Year	Nov-21	imate Chang	25 Year	100 Year	Nov-21	imate Chang	25 Year	100 Year	Nov-21	imate Chang	Location
SM740	5.4	13.4	14.9	15.4	16.0	12.8	14.1	14.9	15.7	13.3	14.7	15.4	16.0	Bay Ridge Estates - Bay Ridge Drive West
SM734	1.2	2.8	3.5	3.5	3.5	2.4	3.1	3.4	3.5	2.7	3.4	3.5	3.5	Bay Ridge Estates - Bay Ridge Drive West
SM707	2.2	3.0	3.0	3.1	3.1	2.9	3.0	3.0	3.1	2.9	3.0	3.1	3.1	Bay Ridge Estates - Bay Ridge Drive West
SM697	2.0	2.7	2.7	2.7	2.7	2.6	2.7	2.7	2.7	2.7	2.7	2.7	2.7	Bay Ridge Estates - Bay Ridge Drive West
SM701	2.2	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	Bay Ridge Estates - Bay Ridge Drive West
SM727	2.4	3.3	3.5	3.6	3.7	3.1	3.3	3.4	3.6	3.2	3.4	3.5	3.6	Bay Ridge Estates - Bay Ridge Drive West
SM731	2.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	Bay Ridge Estates - Bay Ridge Drive West
SM738	1.4	3.1	3.8	3.9	4.0	2.7	3.4	3.7	3.9	2.9	3.7	3.9	3.9	Bay Ridge Estates - Bay Ridge Drive West
OD958	2.4	3.3	3.5	3.5	3.7	3.1	3.3	3.4	3.5	3.2	3.4	3.5	3.6	Bay Ridge Estates - Bay Ridge Drive West
SM694	1.8	2.9	3.4	3.7	3.9	2.5	3.1	3.3	3.6	2.9	3.3	3.6	3.8	Bay Ridge Estates - Bay Ridge Drive West
SM703	1.0	2.5	3.0	3.3	3.7	2.2	2.7	2.9	3.3	2.4	2.9	3.2	3.7	Bay Ridge Estates - Bay Ridge Drive West
C1156-OF_2	2.1	10.6	14.9	18.5	22.2	10.3	14.5	18.0	21.7	12.1	16.6	20.4	24.3	
OD939	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Bay Ridge Estates
BBVC27	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	Birch Bay Village
BBVC22	2.3	20.0	29.0	31.1	31.4	18.9	24.9	30.7	31.3	29.7	31.6	31.7	31.8	Birch Bay Village
BBVC29	0.0	0.1	1.1	1.6	1.7	0.1	0.1	1.6	1.7	1.3	1.7	1.7	1.7	Birch Bay Village
3	3.1	32.7	38.5	44.4	56.8	32.5	38.3	44.2	56.6	42.0	56.4	64.2	70.8	
BBV_Canal_chnl	6.2	40.7	49.1	54.5	64.7	40.6	49.0	54.4	64.4	50.5	63.2	72.4	81.9	Birch Bay Drive at Birch Loop
BBV_CHNL_POND9	25.5	64.9	77.6	85.3	93.4	64.8	77.5	85.2	93.2	73.7	88.5	96.5	109.6	Birch Bay Village
BBVC4_1	0.8	4.3	6.2	5.2	5.2	5.7	6.3	6.6	5.1	6.3	6.6	5.2	5.1	Birch Bay Village
BBVC4_2	0.8	4.3	5.5	5.8	6.4	4.1	5.4	5.7	6.2	5.5	6.1	6.6	6.7	Birch Bay Village
BBVC16	5.2	12.9	12.7	12.3	12.3	12.9	12.8	12.4	12.3	12.6	12.3	12.3	12.3	Birch Bay Village
BBVC15	5.2	21.3	22.3	22.6	22.7	20.9	22.1	22.5	22.7	22.1	22.6	22.7	22.7	Birch Bay Village
BBVC13	5.2	21.3	22.3	22.6	22.7	20.9	22.1	22.5	22.7	22.1	22.6	22.7	22.7	Birch Bay Village
BBVC17	4.8	20.4	21.0	21.0	20.7	20.1	21.0	21.0	20.6	21.1	21.2	20.7	21.0	Birch Bay Village
BBVC14	5.2	21.3	22.3	22.6	22.7	20.9	22.1	22.5	22.7	22.1	22.6	22.7	22.7	Birch Bay Village
BBVC20	1.9	17.5	27.5	33.0	34.9	16.4	22.0	30.5	34.6	29.2	35.3	36.0	36.4	Birch Bay Village
BBVC21	1.9	17.5	27.5	36.9	44.7	16.4	22.0	30.9	43.1	29.2	45.6	48.5	50.1	Birch Bay Village
BBVC23	1.7	16.8	26.9	35.6	43.1	15.8	21.4	30.2	41.5	28.7	44.2	51.2	60.0	Birch Bay Village
BBVC24	0.7	3.2	3.7	4.1	4.4	3.2	3.5	3.9	4.4	3.7	4.3	4.6	4.9	Birch Bay Village
BBVC26	1.5	10.9	13.8	13.9	15.0	15.2	18.3	19.8	21.6	16.6	19.6	21.1	22.8	Birch Bay Village
BBVC28	0.0	4.3	4.4	4.4	4.5	0.3	4.1	4.2	4.3	4.5	4.6	4.7	4.6	Birch Bay Village
Thunderbird_Pond	0.7	10.9	13.8	13.8	15.0	15.2	18.3	19.8	21.6	16.6	19.6	21.1	22.8	
BBVC_1_1	5.6	6.3	6.3	6.2	6.1	6.3	6.2	6.2	6.0	6.4	6.2	6.2	6.4	
BBVC1_2	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	26.6	Birch Bay Village
BBVC2	2.5	11.7	13.6	13.7	13.7	11.2	13.4	13.5	13.6	13.9	14.1	14.3	14.3	
BBVC2_3	2.5	11.7	13.6	13.7	13.7	11.2	13.4	13.5	13.6	13.9	14.1	14.3	14.3	Birch Bay Village
BBVC2_2	2.6	11.7	13.6	13.7	13.7	11.2	13.4	13.5	13.6	13.9	14.1	14.3	14.3	Birch Bay Village
BBVC2_4	2.6	11.7	13.6	13.7	13.7	11.2	13.4	13.5	13.6	13.9	14.1	14.3	14.3	Birch Bay Village
BBVC2_1	2.7	11.7	13.6	13.7	13.7	11.2	13.4	13.5	13.6	13.9	14.1	14.3	14.3	Birch Bay Village
BBVC2_5	2.6	11.7	13.6	13.7	13.7	11.2	13.4	13.5	13.6	13.9	14.1	14.3	14.3	Birch Bay Village
BBVC11	22.4	94.7	116.0	127.8	135.3	94.7	115.9	127.8	135.3	102.6	125.9	133.4	138.8	Birch Bay Village
BBVC12	22.4	94.7	116.6	127.8	135.3	94.7	116.8	127.8	135.3	102.6	125.3	133.4	138.8	
BBVC6	0.8	4.1	4.4	4.3	4.0	3.9	4.4	6.7	4.1	4.9	6.8	6.6	3.6	Birch Bay Village
OD1904_1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Selder Road
C1157	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Selder Road
OD1793_3	41.4	60.7	71.7	77.9	85.0	60.7	71.7	77.9	85.0	94.0	112.5	123.6	137.3	Selder Road
C1156	10.2	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.4	9.3	9.2	9.1	Selder Road
C1156-OF_1	1.9	8.9	12.8	16.4	19.8	8.9	12.8	16.4	19.8	10.3	14.3	18.1	21.6	Selder Road
C1125	11.5	16.2	16.2	16.2	16.3	16.2	16.2	16.2	16.3	16.1	16.2	16.2	16.3	Selder Road
C1125-OF	0.0	2.0	5.8	9.7	13.1	2.0	5.8	9.7	13.1	2.2	5.9	9.9	13.3	Selder Road
OD1873	8.0	12.0	14.6	17.3	19.6	12.0	14.6	17.3	19.6	12.1	14.7	17.4	19.7	Selder Road
C1123	6.6	6.8	6.9	6.9	7.0	6.8	6.9	6.9	7.0	6.8	6.9	6.9	7.0	Selder Road
F-LDES2595_LDES25!	1.4	5.2	7.7	10.4	12.6	5.2	7.7	10.4	12.6	5.3	7.8	10.5	12.7	Selder Road
OD1872	8.0	12.0	14.6	17.4	19.6	12.0	14.6	17.4	19.6	12.1	14.7	17.5	19.7	Selder Road
C1122	7.1	7.6	7.8	8.0	8.1	7.6	7.8	8.0	8.1	7.6	7.8	8.0	8.1	Selder Road
F-LDES2603_LDES26(	0.9	4.4	6.8	9.4	11.5	4.4	6.8	9.4	11.5	4.5	6.8	9.5	11.5	Selder Road
OD1871	8.1	12.0	14.6	17.4	19.6	12.0	14.6	17.4	19.6	12.1	14.7	17.5	19.7	Selder Road
C1121	7.1	7.5	7.7	7.8	7.9	7.5	7.7	7.8	7.9	7.5	7.7	7.8	7.9	Selder Road
F-LDES2611_LDES26:	1.0	4.6	6.9	9.6	11.6	4.6	6.9	9.6	11.6	4.6	7.0	9.7	11.7	Selder Road
OD1870	8.7	12.0	14.6	17.4	19.6	12.0	14.6	17.4	19.6	12.1	14.7	17.5	19.7	Selder Road
C1120	8.7	12.0	14.6	15.2	15.5	12.0	14.6	15.2	15.5	12.1	14.7	15.2	15.5	Selder Road
C1120-OF	0.0	0.0	0.0	2.2	4.1	0.0	0.0	2.2	4.1	0.0	0.0	2.3	4.2	Selder Road
OD1869	4.1	5.9	8.0	8.8	9.8	5.9	8.0	8.8	9.8	6.0	8.1	8.9	9.9	Selder Road
C1119	4.1	5.9	6.4	6.5	6.6	5.9	6.4	6.5	6.6	6.0	6.4	6.5	6.6	Selder Road
C1119-OF	0.0	0.0	1.7	2.4	3.2	0.0	1.7	2.4	3.2	0.0	1.7	2.4	3.3	Selder Road
OD1868	4.1	6.6	8.0	8.8	9.9	6.6	8.0	8.8	9.9	6.6	8.1	8.9	9.9	Selder Road
C1118	4.1	4.9	5.0	5.1	5.1	4.9	5.0	5.1	5.1	4.9	5.0	5.1	5.1	Selder Road
F-LDES2635_LDES26:	0.0	1.6	3.0	3.8	4.8	1.6	3.0	3.8	4.8	1.7	3.1	3.8	4.8	Selder Road
C1038	4.9	6.7	8.1	8.9	9.9	6.7	8.1	8.9	9.9	6.7	8.2	9.0	10.0	Selder Road
OD1836	4.9	6.7	8.1	8.9	9.9	6.7	8.1	8.9	9.9	6.7	8.1	8.9	9.9	Selder Road
C1124	6.6	6.8	6.9	6.9	7.0	6.8	6.9	6.9	7.0	6.8	6.9	6.9	7.0	Selder Road
OD630	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Selder Road
RS_Creek_4	41.4	60.7	71.7	77.9	85.0	60.7	71.7	77.9	85.0	94.0	112.5	123.6	137.3	Selder Road
10_2	5.8	13.3	15.2	16.2	17.5	13.3	15.2	16.2	17.4	19.3	24.6	28.1	33.8	
OD1793_1	32.8	51.9	63.3	69.5	76.7	51.9	63.3	69.5	76.7	86.5	105.3	116.6	130.6	Selder Road
C1032	5.0	7.3	7.4	7.4	7.4	7.3	7.4	7.4	7.4	7.7	7.7	7.7	7.7	Selder Road
C1032-OF	0.0	0.0	2.5	4.1	6.2	0.0	2.5	4.1	6.2	15.6	20.6	23.5	27.0	Selder Road
C1017	4.2	4.4	4.5	4.6	4.6	4.4	4.5	4.6	4.6	4.7	4.7	4.7	4.7	Selder Road
C1017-OF	3.0	5.5	7.5	8.7	10.1	5.5	7.5	8.7	10.1	18.7	23.9	26.8	30.4	Selder Road
OD1774	7.2	9.9	12.0	13.2	14.7	9.9	12.0	13.2	14.7	23.3	28.4	31.2	34.8	Selder Road
C1022	6.2	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.5	7.5	7.5	7.5	Selder Road
C1022-OF	0.0	2.6	4.8	6.1	7.6	2.6	4.8	6.1	7.6	16.5	21.8	24.7	28.3	Selder Road
OD1776	6.1	9.7	11.9	13.0	14.5	9.7	11.9	13.0	14.5	23.2	28.2	31.0	34.5	Selder Road
C1012	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.7	4.9	Selder Road
C1012-OF	2.7	5.4	7.6	8.8	10.3	5.4	7.6	8.8	10.3	18.9	23.9	26.6	30.0	Selder Road
OD1767	7.4	10.0	12.1	13.3	14.8	10.0	12.1	13.3	14.8	23.6	28.5	31.3	34.9	Selder Road
OD1768	7.2	9.9	12.0	13.2	14.7	9.9	12.0	13.2	14.7	23.3	28.4	31.3	34.8	Selder Road
GM3879	0.0	0.4	0.6	0.6	0.9	0.2	0.5	0.6	0.6	0.6	1.0	1.2	1.3	Birch Point Road East of Selder
SM806	2.3	4.4	5.3	5.8	6.7	4.4	5.3	5.8	6.7	6.1	7.6	8.5	8.7	Birch Point Road East of Selder
SM807	4.6	8.8	10.6	11.6	12.6	8.8	10.6	11.6	12.6	12.3	13.4	14.4	14.5	Birch Point Road East of Selder
GM3880	0.0	0.4	0.6	0.6	0.9	0.2	0.5	0.6	0.6	0.6	1.0	1.2	1.3	Birch Point Road East of Selder
OD1904_2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
OF-LDES2552_2728	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road East of Selder
OF-LDES2552_2888	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road East of Selder
OD1038	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.6	Birch Point Road East of Selder
SM800	2.4	4.4	5.4	5.9	6.6	4.4	5.4	5.9	6.6	6.2	7.5	8.3	9.2	Birch Point Road East of Selder
SM802	2.4	4.4	5.4	5.9	6.6	4.4	5.4	5.9	6.6	6.2	7.5	8.3	9.2	Birch Point Road East of Selder
SM815	0.1	0.2	0.3	0.3	1.5	0.2	0.3	0.3	1.5	0.3	3.0	4.6	4.7	Birch Point Road East of Selder
OD1093_2	3.3	13.4	37.0	48.2	59.6	11.5	12.1	20.7	37.2	45.8	58.9	62.1	64.1	Birch Bay Drive at Birch Loop

Table A-5
Birch Point Drainage Study - Peak Flow Summary

		Existing Conditions				ing Conditions with Rogers Slough Structure Remo				Future Conditions				
		Peak Flow (cfs)				Peak Flow (cfs)				Peak Flow (cfs)				
Conduit	Flood Elev	25 Year	100 Year	Nov-21	imate Chang	25 Year	100 Year	Nov-21	imate Chang	25 Year	100 Year	Nov-21	imate Chang	Location
SM822	0.9	1.8	2.1	2.3	2.6	1.8	2.1	2.3	2.6	2.5	2.8	2.8	2.8	Birch Bay Drive at Birch Loop
CV3751	3.4	8.7	9.2	9.2	9.2	11.5	12.2	12.8	13.2	13.4	14.1	14.4	14.4	Birch Bay Drive at Birch Loop
11	0.7	3.0	3.1	3.1	3.1	3.0	3.1	3.1	3.1	3.1	3.1	3.2	3.2	Birch Bay Drive at Birch Loop
92608	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Birch Bay Drive at Birch Loop
CV3738	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Birch Bay Drive at Birch Loop
13	0.0	1.3	2.2	2.7	3.4	1.3	2.2	2.7	3.4	3.0	4.2	4.6	5.1	Birch Bay Drive at Birch Loop
OD1075-U_1	0.0	1.3	2.3	2.7	3.3	1.3	2.3	2.7	3.4	3.0	4.1	4.6	5.0	Birch Bay Drive at Birch Loop
5CV3714	5.1	16.2	16.5	16.6	16.6	15.9	17.0	17.1	17.2	17.3	17.4	17.4	17.4	Birch Bay Drive at Birch Loop
OD1075-L	3.0	13.0	36.4	46.8	57.1	11.7	12.0	20.3	37.3	46.6	60.3	63.8	65.7	Birch Bay Drive at Birch Loop
CV3723	0.0	8.9	6.8	4.2	5.9	3.2	2.6	3.7	1.5	1.8	2.3	1.6	1.4	Birch Bay Drive at Birch Loop
3732	30.3	33.0	33.8	34.1	34.2	42.6	43.4	44.0	44.5	44.7	45.2	45.8	47.5	Birch Bay Drive at Birch Loop
3734	9.7	10.5	10.8	10.9	10.9	15.8	16.1	16.2	16.4	16.5	16.5	16.5	16.6	Birch Bay Drive at Birch Loop
CV3732_OF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Birch Bay Drive at Birch Loop
Rogers_Slough_1	39.9	49.9	52.0	52.9	54.9	69.6	71.6	72.7	73.9	74.7	77.9	83.1	105.5	Birch Bay Drive at Birch Loop
OD1086	0.1	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	Birch Bay Drive at Birch Loop
CV3740	3.1	5.8	5.3	5.7	5.9	9.4	9.5	9.7	9.9	9.8	10.1	9.9	9.5	Birch Bay Drive at Birch Loop
OD1093_1	3.2	13.3	36.8	48.2	60.5	11.6	12.1	20.5	37.0	45.8	60.6	64.6	67.3	Birch Bay Drive at Birch Loop
5	4.6	11.8	13.7	14.7	15.7	11.8	13.7	14.7	15.7	15.4	16.6	17.5	17.7	Birch Bay Drive at Birch Loop
SM840	4.6	10.4	10.5	10.5	10.5	11.1	11.2	11.4	11.4	11.3	11.2	11.0	10.9	Birch Bay Drive at Birch Loop
SM840-OF	0.0	0.6	3.5	4.8	6.1	0.0	2.9	4.2	5.9	5.0	7.2	8.1	8.3	Birch Bay Drive at Birch Loop
OD1058_1	40.1	46.6	50.6	52.7	54.4	55.2	57.6	58.9	61.1	63.3	64.5	64.1	64.6	Birch Bay Drive at Birch Loop
OD1058_2	42.0	48.4	47.9	47.7	48.6	54.3	54.7	55.0	55.4	55.1	54.7	55.0	55.1	Birch Bay Drive at Birch Loop
7	0.0	3.6	3.8	4.0	4.1	3.6	3.9	4.0	4.1	3.8	4.0	4.1	4.3	
SM722	5.7	6.9	7.1	6.8	7.0	6.9	6.9	7.1	6.9	6.7	6.7	6.7	6.7	
OD1058_3	42.1	60.7	65.6	67.5	69.8	60.7	66.8	68.8	71.2	73.8	75.8	77.6	79.9	Birch Bay Drive at Birch Loop
RS_Creek_5	39.2	60.9	71.6	77.5	89.9	60.9	71.6	77.5	89.9	110.4	142.7	156.2	170.7	
RS_Creek_1	44.1	79.1	97.0	105.3	116.4	79.1	97.0	105.3	116.4	126.3	140.4	148.4	158.8	
OD1071_2	6.9	12.8	15.5	19.4	26.4	14.1	15.4	17.5	21.9	23.1	32.0	35.2	37.7	Birch Bay Drive at Birch Loop
OD1071_3	5.9	12.9	16.3	19.3	26.2	12.7	16.7	18.4	24.3	26.4	31.1	33.6	35.1	Birch Bay Drive at Birch Loop
OD1073	0.0	1.3	2.2	2.7	3.4	1.3	2.2	2.7	3.4	3.0	4.2	4.6	5.1	Birch Bay Drive at Birch Loop
OD1075-U_2	0.0	1.2	9.3	11.6	11.8	1.3	2.2	2.7	7.9	11.4	12.6	11.7	11.3	Birch Bay Drive at Birch Loop
OD1075-U_3	0.2	1.8	12.2	15.6	16.9	1.9	2.0	2.2	10.1	15.2	17.7	17.4	17.3	Birch Bay Drive at Birch Loop
OD1075-U_4	0.5	6.8	17.2	21.6	24.1	2.5	3.4	6.3	14.3	21.0	25.0	25.4	25.8	Birch Bay Drive at Birch Loop
OD1075-U_5	1.1	7.2	20.2	26.6	30.8	2.9	5.2	6.7	16.1	25.6	32.0	32.9	33.6	Birch Bay Drive at Birch Loop
OD1075-U_6	1.8	9.0	16.0	17.8	19.6	3.6	6.8	10.0	16.6	18.9	21.4	21.9	22.1	Birch Bay Drive at Birch Loop
OD1075-U_7	2.8	9.3	16.6	18.9	22.0	4.5	8.4	10.4	17.3	19.7	23.3	24.3	24.8	Birch Bay Drive at Birch Loop
PD46	1.2	4.3	5.3	5.8	6.5	4.3	5.3	5.8	6.5	6.2	7.3	7.8	8.3	Birch Bay Drive at Birch Loop
92971	0.0	1.3	2.2	2.7	3.4	1.3	2.2	2.7	3.4	3.0	4.2	4.6	5.1	Birch Bay Drive at Birch Loop
SM838	0.0	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	Birch Bay Drive at Birch Loop
SM839	0.7	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	Birch Bay Drive at Birch Loop
OD1071_1	6.8	14.4	15.1	15.5	15.3	15.4	16.4	16.7	18.1	16.8	18.7	18.7	15.9	Birch Bay Drive at Birch Loop
SM9799	3.4	8.7	9.2	9.3	9.2	11.5	12.2	12.8	13.2	13.4	14.1	14.4	14.4	Birch Bay Drive at Birch Loop
Rogers_Slough_2	39.9	49.9	52.0	52.9	54.9	69.6	71.6	72.7	73.9	74.7	77.9	83.1	105.5	Birch Bay Drive at Birch Loop
P-1366-1372	2.7	3.8	4.3	4.5	4.7	3.8	4.3	4.5	4.7	3.8	4.3	4.4	4.6	Pheasant - Grouse Cress
D-1367-1366	2.7	3.8	4.3	4.5	4.7	3.8	4.3	4.5	4.7	3.8	4.3	4.4	4.6	Pheasant - Grouse Cress
P-1368-1367	1.3	2.0	2.3	2.4	2.5	2.0	2.3	2.4	2.5	2.0	2.3	2.4	2.5	Pheasant - Grouse Cress
P-1372-1460	3.8	5.3	6.1	6.4	6.8	5.3	6.1	6.4	6.8	5.6	6.3	6.7	7.1	Pheasant - Grouse Cress
P-1373-1367	1.3	2.0	2.2	2.3	2.5	2.0	2.2	2.3	2.5	2.0	2.2	2.3	2.4	Pheasant - Grouse Cress
P-1374-1373	1.3	2.0	2.2	2.3	2.5	2.0	2.2	2.3	2.5	2.0	2.2	2.3	2.4	Pheasant - Grouse Cress
D-1375-1368	1.4	1.9	2.1	2.2	2.3	1.9	2.1	2.2	2.3	1.9	2.1	2.2	2.3	Pheasant - Grouse Cress
P-1376-1375	1.4	1.9	2.1	2.2	2.3	1.9	2.1	2.2	2.3	1.9	2.1	2.2	2.3	Pheasant - Grouse Cress
D-1377-1374	1.3	2.0	2.3	2.3	2.5	2.0	2.3	2.3	2.5	2.0	2.2	2.3	2.5	Pheasant - Grouse Cress
P-1378-1377	1.3	2.0	2.3	2.4	2.5	2.0	2.3	2.4	2.5	2.0	2.3	2.3	2.5	Pheasant - Grouse Cress
D-1379-1376	1.5	2.0	2.2	2.3	2.4	2.0	2.2	2.3	2.4	2.0	2.2	2.3	2.4	Pheasant - Grouse Cress
P-1380-1379	1.5	2.0	2.3	2.4	2.5	2.0	2.3	2.4	2.5	2.0	2.3	2.4	2.5	Pheasant - Grouse Cress
D-1381-1378	1.3	2.0	2.3	2.4	2.5	2.0	2.3	2.4	2.5	2.0	2.3	2.4	2.5	Pheasant - Grouse Cress
P-1382-1381	1.4	2.0	2.3	2.4	2.5	2.0	2.3	2.4	2.5	2.0	2.3	2.4	2.5	Pheasant - Grouse Cress
D-1383-1380	1.5	2.1	2.3	2.4	2.5	2.1	2.3	2.4	2.5	2.0	2.3	2.4	2.5	Pheasant - Grouse Cress
P-1384-1383	1.5	2.1	2.3	2.4	2.5	2.1	2.3	2.4	2.5	2.1	2.3	2.4	2.5	Pheasant - Grouse Cress
D-1385-1382	1.4	2.0	2.3	2.4	2.6	2.0	2.3	2.4	2.6	2.0	2.3	2.4	2.6	Pheasant - Grouse Cress
P-1386-1385	1.4	2.0	2.3	2.5	2.6	2.0	2.3	2.5	2.6	2.0	2.3	2.4	2.6	Pheasant - Grouse Cress
D-1387-1384	1.5	2.1	2.4	2.5	2.6	2.1	2.4	2.5	2.6	2.1	2.4	2.5	2.6	Pheasant - Grouse Cress
P-1388-1387	1.5	2.1	2.4	2.5	2.6	2.1	2.4	2.5	2.6	2.1	2.4	2.5	2.6	Pheasant - Grouse Cress
D-1389-1388	1.5	2.1	2.4	2.6	2.7	2.1	2.4	2.6	2.7	2.1	2.4	2.6	2.7	Pheasant - Grouse Cress
P-1390-1389	1.5	2.1	2.5	2.6	2.7	2.1	2.5	2.6	2.7	2.1	2.5	2.6	2.7	Pheasant - Grouse Cress
D-1391-1386	1.4	2.0	2.4	2.5	2.7	2.0	2.4	2.5	2.7	2.0	2.4	2.5	2.7	Pheasant - Grouse Cress
P-1392-1391	0.2	0.2	0.3	0.3	0.4	0.2	0.3	0.3	0.4	0.2	0.3	0.3	0.4	Pheasant - Grouse Cress
D-1393-1390	0.1	0.1	0.4	0.5	0.6	0.1	0.4	0.5	0.6	0.2	0.4	0.5	0.6	Pheasant - Grouse Cress
P-1394-1393	0.1	0.1	0.3	0.4	0.5	0.1	0.3	0.4	0.5	0.1	0.3	0.4	0.5	Pheasant - Grouse Cress
D-1395-1392	0.0	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1	0.2	0.2	Pheasant - Grouse Cress
P-1396-1395	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	Pheasant - Grouse Cress
D-1397-1396	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	Pheasant - Grouse Cress
P-1398-1397	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1399-1394	0.0	0.0	0.1	0.2	0.3	0.0	0.1	0.2	0.3	0.0	0.1	0.2	0.3	Pheasant - Grouse Cress
P-1400-1399	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.2	Pheasant - Grouse Cress
D-1401-1400	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	Pheasant - Grouse Cress
P-1402-1401	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2	Pheasant - Grouse Cress
D-1403-1398	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
P-1404-1403	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1405-1404	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1406-1402	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1407-1406	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1408-1409	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1409-1410	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
P-1410-1411	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1411-1412	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
P-1412-1413	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1413-1414	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
P-1414-1415	0.5	0.8	0.9	1.0	1.2	0.8	0.9	1.0	1.2	0.9	1.1	1.2	1.3	Pheasant - Grouse Cress
D-1415-1416	0.5	0.8	0.9	1.0	1.2	0.8	0.9	1.0	1.2	0.9	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1416-1417	0.5	0.8	0.9	1.0	1.2	0.8	0.9	1.0	1.2	0.9	1.1	1.2	1.3	Pheasant - Grouse Cress
D-1417-1419	0.5	0.8	0.9	1.0	1.2	0.8	0.9	1.0	1.2	0.9	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1418-1421	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
P-1419-1420	0.5	0.8	0.9	1.0	1.1	0.8	0.9	1.0	1.1	0.9	1.1	1.2	1.3	Pheasant - Grouse Cress
D-1420-1426	0.5	0.8	0.9	1.0	1.1	0.8	0.9	1.0	1.1	0.9	1.1	1.2	1.3	Pheasant - Grouse Cress
D-1421-1422	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
P-1422-1423	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1423-1424	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
P-1424-1425	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1425-1427	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress

Table A-5
Birch Point Drainage Study - Peak Flow Summary

		Existing Conditions				ing Conditions with Rogers Slough Structure Remo				Future Conditions				
		Peak Flow (cfs)				Peak Flow (cfs)				Peak Flow (cfs)				
Conduit	Flood Elev	25 Year	100 Year	Nov-21	imate Chang	25 Year	100 Year	Nov-21	imate Chang	25 Year	100 Year	Nov-21	imate Chang	Location
P-1426-1429	0.5	0.8	0.9	1.0	1.1	0.8	0.9	1.0	1.1	0.9	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1427-1428	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1428-1450	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1429-1449	0.5	0.8	0.9	1.0	1.1	0.8	0.9	1.0	1.1	0.9	1.1	1.2	1.3	Pheasant - Grouse Cress
D-1430-1441	0.7	0.9	1.0	1.0	1.1	0.9	1.0	1.0	1.1	1.0	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1431-1434	1.2	1.6	1.8	2.0	2.2	1.6	1.8	2.0	2.2	1.8	2.1	2.3	2.6	Pheasant - Grouse Cress
P-1434-1372	1.2	1.6	1.8	2.0	2.2	1.6	1.8	2.0	2.2	1.8	2.1	2.3	2.5	Pheasant - Grouse Cress
P-1436-1430	0.7	0.9	1.1	1.2	1.3	0.9	1.1	1.2	1.3	1.0	1.2	1.3	1.4	Pheasant - Grouse Cress
P-1437-1436	0.5	0.8	0.9	1.0	1.2	0.8	0.9	1.0	1.2	0.9	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1438-1437	0.5	0.8	0.9	1.0	1.2	0.8	0.9	1.0	1.2	0.9	1.1	1.2	1.3	Pheasant - Grouse Cress
D-1439-1438	0.5	0.8	0.9	1.0	1.2	0.8	0.9	1.0	1.2	0.9	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1440-1439	0.5	0.8	0.9	1.0	1.2	0.8	0.9	1.0	1.2	0.9	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1441-1442	1.2	1.6	1.9	2.0	2.2	1.6	1.9	2.0	2.2	1.8	2.1	2.3	2.6	Pheasant - Grouse Cress
D-1442-1450	1.2	1.6	1.9	2.0	2.2	1.6	1.9	2.0	2.2	1.8	2.1	2.3	2.6	Pheasant - Grouse Cress
D-1443-1440	0.5	0.8	0.9	1.0	1.2	0.8	0.9	1.0	1.2	0.9	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1446-1443	0.5	0.8	0.9	1.0	1.2	0.8	0.9	1.0	1.2	0.9	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1447-1446	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1448-1447	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1449-1441	0.5	0.8	0.9	1.0	1.1	0.8	0.9	1.0	1.1	0.9	1.1	1.2	1.3	Pheasant - Grouse Cress
D-1450-1431	1.2	1.6	1.8	2.0	2.2	1.6	1.8	2.0	2.2	1.8	2.1	2.3	2.6	Pheasant - Grouse Cress
P-1460-1457	3.8	5.3	6.1	6.4	6.8	5.3	6.1	6.4	6.8	5.5	6.3	6.7	7.1	Pheasant - Grouse Cress
D-1239-1240	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
P-1240-1241	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
D-1241-1242	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
P-1242-1243	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
P-1243-1451	0.7	0.8	1.0	1.1	1.2	0.8	1.0	1.1	1.2	0.8	1.0	1.1	1.2	Deer Trail Area
P-1451-1457	9.2	16.7	18.2	18.9	19.8	16.7	18.2	18.9	19.8	18.9	21.6	22.7	23.9	Deer Trail Area
D-1452-1451	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
P-1453-1452	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
D-1454-1453	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
D-1457-1483	10.6	22.0	24.2	25.3	26.6	22.4	24.8	26.0	27.3	24.4	28.5	30.1	31.7	Deer Trail Area
D-1463-1464	0.3	0.4	0.5	0.6	0.6	0.4	0.5	0.6	0.6	0.4	0.5	0.6	0.6	Deer Trail Area
P-1464-1467	0.3	0.4	0.5	0.6	0.6	0.4	0.5	0.6	0.6	0.4	0.5	0.6	0.6	Deer Trail Area
P-1467-1481	0.6	0.9	1.0	1.1	1.3	0.9	1.0	1.1	1.3	0.8	1.0	1.1	1.3	Deer Trail Area
D-1468-1477	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
P-1469-1472	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Deer Trail Area
P-1472-1473	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	Deer Trail Area
D-1473-1474	0.1	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	Deer Trail Area
P-1474-1475	0.1	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	Deer Trail Area
D-1475-1476	0.1	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	Deer Trail Area
P-1476-1478	0.1	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	Deer Trail Area
P-1477-1467	0.3	0.4	0.5	0.6	0.6	0.4	0.5	0.6	0.6	0.4	0.5	0.6	0.6	Deer Trail Area
P-1478-1479	0.1	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	Deer Trail Area
P-1479-1481	0.1	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	Deer Trail Area
D-1481-1356	0.7	1.1	1.3	1.4	1.6	0.6	0.7	0.7	0.8	0.5	0.7	0.7	0.8	Deer Trail Area
D-1348-1349	0.0	1.7	4.1	5.6	7.1	2.6	5.7	7.1	8.6	5.5	9.7	11.7	13.7	Birch Bay Drive East at Deer Trail
OF-1348-1354A	0.0	1.7	4.1	5.6	7.1	2.6	5.7	7.1	8.6	5.5	9.7	11.7	13.7	Birch Bay Drive East at Deer Trail
OF-1349-1350	0.0	1.1	3.2	4.6	6.1	1.8	4.7	6.0	7.5	4.5	8.6	10.5	12.5	Birch Bay Drive East at Deer Trail
P-1349-1350	0.1	0.7	0.9	1.0	1.1	0.8	1.0	1.1	1.1	1.0	1.2	1.2	1.3	Birch Bay Drive East at Deer Trail
D-1350-1351	1.1	1.3	3.4	4.6	5.9	2.1	4.7	5.9	7.3	4.4	8.3	10.0	11.7	Birch Bay Drive East at Deer Trail
OF-1351-1352	0.0	0.0	0.8	1.9	3.2	0.0	2.0	3.2	4.5	1.7	5.5	7.2	8.9	Birch Bay Drive East at Deer Trail
P-1351-1352	1.1	1.4	2.6	2.7	2.7	2.1	2.7	2.7	2.8	2.7	2.8	2.8	2.8	Birch Bay Drive East at Deer Trail
D-1352-1353	1.1	2.0	3.7	4.7	5.9	2.9	4.8	5.9	7.3	4.4	8.3	10.0	11.7	Birch Bay Drive East at Deer Trail
P-1353-1354_1	10.5	19.8	20.9	21.1	21.3	20.3	21.2	21.3	21.4	21.1	21.5	21.6	21.7	Birch Bay Drive East at Deer Trail
D-1483-1355	10.7	22.2	24.6	25.9	27.2	23.4	26.0	27.2	28.7	25.5	29.8	31.6	33.4	Birch Bay Drive East at Deer Trail
D-1355-1353	10.6	22.1	24.5	25.8	27.2	23.3	26.0	27.2	28.7	25.5	29.8	31.6	33.4	Birch Bay Drive East at Deer Trail
P-1339-1335	1.3	1.4	1.7	1.9	2.1	1.4	1.7	1.9	2.1	2.9	3.3	3.6	3.9	Birch Bay Drive East at Deer Trail
P-1340-1347	1.3	1.4	1.7	1.9	2.1	1.4	1.7	1.9	2.1	2.9	3.3	3.6	3.9	Birch Bay Drive East at Deer Trail
D-1346-1340	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	Birch Bay Drive East at Deer Trail
P-1347-1339	1.3	1.4	1.7	1.9	2.1	1.4	1.7	1.9	2.1	2.9	3.3	3.6	3.9	Birch Bay Drive East at Deer Trail
D-1356-1357	1.7	2.6	3.2	3.5	3.8	1.6	2.0	2.2	2.4	2.0	2.4	2.6	2.9	Birch Bay Drive West at Deer Trail
P-1357-1358	1.7	2.6	3.0	3.3	3.6	1.6	1.9	2.1	2.3	1.9	2.3	2.5	2.7	Birch Bay Drive West at Deer Trail
D-1358-1359	1.7	2.5	3.0	3.3	3.6	1.6	1.9	2.1	2.3	1.9	2.2	2.4	2.7	Birch Bay Drive West at Deer Trail
P-1359-1360	1.7	2.5	3.0	3.3	3.6	1.6	1.9	2.1	2.3	1.9	2.2	2.4	2.6	Birch Bay Drive West at Deer Trail
D-1360-1361	1.7	2.5	3.0	3.3	3.6	1.6	1.9	2.0	2.2	1.9	2.2	2.4	2.6	Birch Bay Drive West at Deer Trail
P-1361-1365	2.6	4.0	4.7	5.1	5.6	3.2	3.7	4.0	4.4	3.7	4.3	4.6	5.1	Birch Bay Drive West at Deer Trail
D-1362-1361	1.0	1.5	1.8	1.9	2.1	1.6	1.9	2.0	2.2	1.8	2.1	2.3	2.6	Birch Bay Drive West at Deer Trail
P-1363-1362	1.0	1.5	1.7	1.9	2.0	1.6	1.9	2.0	2.2	1.8	2.1	2.3	2.5	Birch Bay Drive West at Deer Trail
D-1364-1363	1.0	1.5	1.8	2.0	2.2	1.6	1.9	2.1	2.2	1.9	2.2	2.4	2.6	Birch Bay Drive West at Deer Trail
D-1171-1172	0.4	1.0	1.2	1.3	1.4	1.0	1.2	1.3	1.4	1.2	1.5	1.6	1.8	Richmond Park - Richmond Park Road South
P-1172-1173	0.5	1.1	1.3	1.4	1.6	1.1	1.3	1.4	1.6	1.4	1.6	1.8	2.0	Richmond Park - Richmond Park Road South
P-1173-1181	0.7	1.2	1.5	1.6	1.8	1.2	1.5	1.6	1.8	1.5	1.8	2.0	2.2	Richmond Park - Richmond Park Road South
D-1180-1184	0.9	1.5	1.8	1.9	2.2	1.5	1.8	1.9	2.2	1.7	2.1	2.3	2.5	Richmond Park - Richmond Park Road South
P-1181-1180	0.8	1.3	1.6	1.8	2.0	1.3	1.6	1.8	2.0	1.6	1.9	2.1	2.3	Richmond Park - Richmond Park Road South
P-1182-1188	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	Richmond Park - Richmond Park Road South
D-1184-1451	9.1	16.3	17.7	18.4	19.2	16.3	17.6	18.3	19.2	18.7	21.3	22.3	23.3	Richmond Park - Richmond Park Road South
P-1188-1189	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	Richmond Park - Richmond Park Road South
D-1189-1192	0.3	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.5	Richmond Park - Richmond Park Road South
P-1190-1184	9.0	14.8	16.3	17.7	18.2	14.7	16.3	17.7	18.2	18.3	19.3	20.0	20.7	Richmond Park - Richmond Park Road South
D-1191-1190	9.0	14.7	16.3	17.7	18.2	14.6	16.3	17.7	18.2	18.3	19.2	19.8	20.5	Richmond Park - Richmond Park Road South
P-1192-1191	0.5	0.6	0.7	0.8	0.9	0.6	0.7	0.8	0.9	0.6	0.7	0.8	0.9	Richmond Park - Richmond Park Road South
D-1193-1192	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	Richmond Park - Richmond Park Road South
D-1194-1191	8.9	14.0	16.2	17.6	18.1	14.0	16.2	17.6	18.1	18.2	18.9	19.2	20.2	Richmond Park - Richmond Park Road North
P-1195-1194	8.9	13.9	16.2	17.5	18.1	13.9	16.2	17.5	18.1	18.2	18.9	19.2	20.1	Richmond Park - Richmond Park Road North
P-1196-1221	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	Richmond Park - Richmond Park Road North
O-1197-1221	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Richmond Park - Richmond Park Road North
P-1197-1196	8.7	13.6	16.0	17.4	18.0	13.6	16.0	17.4	18.0	18.0	18.7	19.0	19.3	Richmond Park - Richmond Park Road North
D-1198-1197	8.7	12.3	13.6	14.0	14.6	12.3	13.5	14.0	14.6	14.7	15.3	15.2	15.2	Richmond Park - Richmond Park Road North
P-1199-1198	8.7	12.2	13.3	13.9	14.4	12.2	13.3	13.9	14.4	14.6	15.2	15.1	15.0	Richmond Park - Richmond Park Road North
D-1200-1199	8.7	12.5	13.4	13.9	14.5	12.6	13.3	13.9	14.5	14.6	15.2	15.1	14.9	Richmond Park - Richmond Park Road North
P-1201-1200	8.7	12.2	13.3	13.8	14.4	12.2	13.2	13.8	14.4	14.5	15.1	15.4	16.0	Richmond Park - Richmond Park Road North
P-1202-1205	8.6	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	Richmond Park - Richmond Park Road North
O-1203-1205	0.0	0.1	2.4	5.2	8.1	0.1	2.4	5.2	8.1	8.4	10.0	9.8	12.5	Richmond Park - Richmond Park Road North
P-1203-1202	8.6	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	Richmond Park - Richmond Park Road North
D-1204-1203	8.6	13.4	13.9	13.9	13.7	13.4	13.9	13.9	13.7	13.8	13.6	13.6	13.8	Richmond Park - Richmond Park Road North
D-1204A-1204B	0.7	2.6	2.9	3.2	3.5	2.6	3.0	3.2	3.6	4.4	5.0	4.9	26.6	
D-1204B-1204A	0.7	2.1	2.3	4.2	4.6	2.1	2.3	4.2	4.6	4.9	4.3	4.4	5.6	Richmond Park - Richmond Park Road North
OF-1204B-1207	0.0	0.0	3.0	5.0	5.0	0.0	3.0	5.0	5.0	5.1	5.3	5.3	8.0	Richmond Park - Richmond Park Road North
D-1205-1201	8.7	12.2	13.2	13.8	14.4	12.2	13.2	13.8	14.4	14.5	15.1	15.4	19.2	Richmond Park - Richmond Park Road North
P-1206-1205	0.5	1.2	1.4	1.6	1.7	1.2	1.4	1.6	1.7	1.8	1.9	1.9	2.0	Richmond Park - Richmond Park Road North

Table A-5
Birch Point Drainage Study - Peak Flow Summary

		Existing Conditions				ing Conditions with Rogers Slough Structure Remo				Future Conditions				
		Peak Flow (cfs)				Peak Flow (cfs)				Peak Flow (cfs)				
Conduit	Flood Elev	25 Year	100 Year	Nov-21	imate Chang	25 Year	100 Year	Nov-21	imate Chang	25 Year	100 Year	Nov-21	imate Chang	Location
D-1207-1206	0.4	1.9	1.8	1.7	1.8	1.9	1.8	1.7	1.8	1.8	1.8	1.9	2.0	Richmond Park - Richmond Park Road North
P-1208-1207	0.3	1.3	2.6	3.4	3.5	1.3	2.6	3.4	3.5	3.5	3.7	3.7	3.6	Richmond Park - Richmond Park Road North
D-1209-1208	0.3	1.3	2.9	3.6	3.7	1.3	2.7	3.5	3.7	3.7	3.8	3.8	3.7	Richmond Park - Richmond Park Road North
P-1210-1209	0.3	1.3	2.7	3.5	3.6	1.3	2.7	3.5	3.6	3.6	3.7	3.7	3.8	Richmond Park - Richmond Park Road North
D-1211-1210	0.2	1.3	2.7	3.5	3.6	1.3	2.7	3.5	3.6	3.6	3.7	4.5	6.2	Richmond Park - Richmond Park Road North
P-1220-1221	0.6	0.8	0.9	1.0	1.1	0.8	0.9	1.0	1.1	0.8	0.9	1.0	1.1	Richmond Park - Richmond Park Road North
D-1221-1195	8.9	13.9	16.2	17.5	18.1	13.8	16.2	17.5	18.1	18.1	18.8	19.2	19.7	Richmond Park - Richmond Park Road North
D-1222-1220	0.5	0.6	0.8	0.8	0.9	0.6	0.8	0.8	0.9	0.6	0.8	0.8	0.9	Richmond Park - Richmond Park Road North
P-1227-1228	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	Richmond Park - Richmond Crescent
P-1228-1229	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.4	Richmond Park - Richmond Crescent
D-1229-1230	0.3	0.4	0.5	0.5	0.6	0.4	0.5	0.5	0.6	0.4	0.5	0.5	0.6	Richmond Park - Richmond Crescent
D-1230-1222	0.4	0.5	0.6	0.7	0.7	0.5	0.6	0.7	0.7	0.5	0.6	0.7	0.8	Richmond Park - Richmond Crescent
D-1272-1275	5.3	12.0	13.5	14.3	15.2	12.0	13.5	14.3	15.2	12.7	14.2	15.0	15.9	Shintaffer north of Semiahmoo Parkway
D-1272A-1272	1.0	2.0	2.4	2.7	3.0	2.0	2.4	2.7	3.0	2.2	2.7	3.0	3.3	
D-1273-1272	4.8	10.1	11.3	11.9	12.5	10.1	11.3	11.9	12.5	10.7	11.8	12.4	13.0	Shintaffer north of Semiahmoo Parkway
O-1274-1273	0.0	4.0	5.0	5.5	6.1	4.0	5.0	5.5	6.1	4.5	5.5	6.0	6.5	Shintaffer north of Semiahmoo Parkway
P-1274-1273	4.6	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	Shintaffer north of Semiahmoo Parkway
O-1275-1276	0.0	6.0	7.6	8.4	9.3	6.0	7.6	8.4	9.3	6.7	8.3	9.1	10.0	Shintaffer north of Semiahmoo Parkway
P-1275-1276	5.1	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.1	6.1	6.0	Shintaffer north of Semiahmoo Parkway
D-1276-1298	5.5	13.3	15.1	16.0	17.5	13.3	15.1	16.0	17.2	14.5	16.0	17.0	18.1	Shintaffer north of Semiahmoo Parkway
D-1277A-1277	3.2	5.9	7.2	7.9	8.8	5.9	7.2	7.9	8.8	6.5	7.9	8.7	9.6	
O-1277-1278	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Shintaffer north of Semiahmoo Parkway
P-1277-1278	2.2	4.9	5.7	6.0	6.4	4.9	5.7	6.0	6.4	5.3	6.0	6.3	6.7	Shintaffer north of Semiahmoo Parkway
D-1278-1279	2.2	4.9	5.7	6.0	6.4	4.9	5.7	6.0	6.4	5.3	6.0	6.3	6.7	Shintaffer north of Semiahmoo Parkway
D-1279-1274	5.0	9.4	10.4	10.9	11.4	9.4	10.4	10.9	11.4	9.9	10.8	11.3	11.8	Shintaffer north of Semiahmoo Parkway
O-1281-1280	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Shintaffer north of Semiahmoo Parkway
P-1281-1280	2.8	4.5	4.8	4.9	5.0	4.5	4.8	4.9	5.0	4.6	4.9	5.0	5.1	Shintaffer north of Semiahmoo Parkway
P-1284-1296	11.1	20.6	23.1	24.4	27.7	17.0	19.5	20.8	23.0	25.2	28.5	33.2	33.2	Shintaffer north of Semiahmoo Parkway
D-1298-1284	5.5	13.3	15.1	16.0	16.9	13.3	15.1	16.0	16.8	20.4	22.3	22.9	22.7	Shintaffer north of Semiahmoo Parkway
D-1308-1281	2.8	5.1	5.9	6.4	7.0	5.1	5.9	6.4	7.0	5.5	6.4	6.9	7.5	Shintaffer north of Semiahmoo Parkway
O-1309-1308	0.0	2.9	4.2	4.9	5.7	2.9	4.2	4.9	5.7	3.5	4.8	5.6	6.3	Shintaffer north of Semiahmoo Parkway
P-1309-1308	2.8	4.5	4.7	4.8	4.8	4.5	4.7	4.8	4.8	4.6	4.8	4.8	4.9	Shintaffer north of Semiahmoo Parkway
D-1310-1309	0.4	0.6	0.7	0.7	0.8	0.6	0.7	0.7	0.8	0.7	0.7	0.8	0.9	Shintaffer north of Semiahmoo Parkway
P-1311-1310	0.4	0.8	0.9	1.1	1.2	0.8	0.9	1.1	1.2	0.9	1.0	1.2	1.3	Shintaffer north of Semiahmoo Parkway
P-1316-1317	0.4	0.8	1.0	1.1	1.2	0.8	1.0	1.1	1.2	0.9	1.0	1.2	1.3	Shintaffer north of Semiahmoo Parkway
D-1317-1311	0.4	0.8	0.9	1.1	1.2	0.8	0.9	1.1	1.2	0.9	1.0	1.2	1.3	Shintaffer north of Semiahmoo Parkway
D-1253-1332	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Semiahmoo Parkway
D-1254-1258	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Semiahmoo Parkway
D-1256-1330	0.0	0.0	0.0	0.0	0.0	4.6	6.3	7.2	8.4	11.9	15.3	17.3	19.6	Semiahmoo Parkway
D-1257-1329	0.0	0.0	0.0	0.0	0.0	4.6	6.3	7.2	8.4	11.9	15.3	17.2	19.5	Semiahmoo Parkway
D-1258-1256	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Semiahmoo Parkway
P-1259-1260	0.0	0.0	0.0	0.0	0.0	4.6	6.3	7.2	8.4	11.9	15.2	17.0	19.2	Semiahmoo Parkway
D-1260-1263	0.0	0.0	0.0	0.0	0.0	4.6	6.2	7.2	8.4	11.9	15.2	17.0	19.2	Semiahmoo Parkway
P-1261-1262	0.0	0.0	0.1	0.1	0.1	3.9	4.0	4.1	4.2	5.1	5.3	5.4	5.5	Semiahmoo Parkway
D-1262-1268	0.0	0.0	0.1	0.1	0.1	3.9	4.0	4.1	4.2	5.1	5.3	5.4	5.5	Semiahmoo Parkway
D-1263-1264	5.7	8.4	10.3	11.3	12.5	4.5	6.2	7.1	8.4	11.8	15.1	16.9	19.1	Semiahmoo Parkway
O-1264-1265	5.4	8.1	9.8	10.8	12.0	4.3	5.8	6.7	7.9	11.3	14.5	16.3	18.5	Semiahmoo Parkway
P-1264-1265	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.5	Semiahmoo Parkway
D-1265-1266	5.5	8.2	10.0	11.0	12.2	4.4	6.0	6.9	8.1	11.6	14.8	16.6	18.9	Semiahmoo Parkway
P-1266-1267	5.2	8.0	9.7	10.6	11.7	4.2	5.7	6.6	7.8	11.1	13.7	15.2	16.9	Semiahmoo Parkway
D-1267-1284	6.3	9.9	12.0	13.1	14.5	6.1	8.0	9.1	10.5	14.9	18.2	20.0	22.2	Semiahmoo Parkway
P-1268-1269	0.0	0.0	0.1	0.1	0.1	3.8	3.9	4.0	4.1	5.0	5.2	5.3	5.4	Semiahmoo Parkway
D-1269-1270	0.0	0.0	0.1	0.1	0.1	3.8	3.9	4.0	4.1	5.0	5.2	5.3	5.4	Semiahmoo Parkway
P-1270-1271	0.0	0.0	0.1	0.1	0.1	3.8	3.9	4.0	4.1	5.0	5.2	5.3	5.4	Semiahmoo Parkway
D-1271-1286	0.0	0.0	0.1	0.1	0.1	3.8	3.9	4.0	4.1	5.0	5.2	5.3	5.5	Semiahmoo Parkway
P-1286-1297	0.0	0.0	0.1	0.1	0.1	3.8	3.9	4.0	4.1	5.0	5.1	5.3	5.4	Semiahmoo Parkway
P-1297-1296	0.0	0.1	0.1	0.1	0.1	3.8	3.9	4.0	4.0	5.0	5.1	5.3	5.4	Semiahmoo Parkway
D-1327-1259	0.0	0.0	0.0	0.0	0.0	4.6	6.3	7.2	8.4	11.9	15.2	17.0	19.2	Semiahmoo Parkway
D-1328-1327	0.0	0.0	0.0	0.0	0.0	4.6	6.3	7.2	8.4	11.9	15.2	17.1	19.2	Semiahmoo Parkway
D-1329-1328	0.0	0.0	0.0	0.0	0.0	4.6	6.3	7.2	8.4	11.9	15.3	17.2	19.4	Semiahmoo Parkway
D-1330-1257	0.0	0.0	0.0	0.0	0.0	4.6	6.3	7.2	8.4	11.9	15.3	17.2	19.6	Semiahmoo Parkway
D-1331-1261	0.0	0.0	0.0	0.0	0.0	3.9	4.0	4.1	4.1	5.0	5.2	5.3	5.4	Semiahmoo Parkway
D-1332-1333	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Semiahmoo Parkway
D-1333-1331	0.0	0.0	0.0	0.0	0.0	3.9	4.0	4.1	4.1	5.0	5.2	5.3	5.4	Semiahmoo Parkway
D-1291-1318	10.9	21.4	23.9	25.3	28.8	21.5	24.1	25.6	37.9	33.0	35.0	36.7	36.8	Shintaffer North of Richmond Park - West Side
P-1296-1291	11.1	20.6	23.1	24.5	27.8	20.8	23.3	24.7	27.1	30.1	33.6	35.2	35.2	Shintaffer North of Richmond Park - West Side
D-1318-1326	10.9	21.2	23.7	25.1	28.4	21.4	24.0	25.4	27.6	30.5	33.7	35.2	35.0	Shintaffer North of Richmond Park - West Side
D-1326-1324_1	10.9	21.2	23.8	24.9	27.4	21.4	24.0	25.2	26.8	29.6	32.1	33.2	33.5	Shintaffer North of Richmond Park - West Side
Rich_Field_1	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	Shintaffer North of Richmond Park - West Side
D-1326-1324_2	10.3	21.0	23.3	24.3	26.7	21.2	23.5	24.6	26.1	29.0	31.4	32.3	32.7	Shintaffer North of Richmond Park - West Side
D-1326-1324_3	9.2	21.0	23.0	23.9	26.0	21.1	23.3	24.2	25.5	26.6	26.7	24.2	23.2	Shintaffer North of Richmond Park - West Side
D-1326-1324_4	7.8	12.2	12.5	12.6	12.8	12.2	12.5	12.7	12.9	12.3	11.9	12.0	12.0	Shintaffer North of Richmond Park - West Side
D-1319-1320	0.0	0.2	0.4	0.5	0.7	0.2	0.4	0.5	0.7	0.3	0.6	0.9	6.2	Middle Shintaffer
P-1320-1321	0.0	0.6	0.8	1.0	1.6	0.6	0.8	1.0	1.6	0.8	1.4	1.7	2.0	Middle Shintaffer
D-1321-1322	0.8	1.9	2.1	7.0	13.7	1.9	2.1	2.2	13.6	2.1	2.3	2.4	6.2	Middle Shintaffer
P-1322-1323	0.8	1.6	1.8	1.9	2.2	1.6	1.8	1.9	2.2	1.8	2.2	2.3	2.4	Middle Shintaffer
D-1323-1237_1	0.6	1.2	1.8	2.0	2.3	1.2	1.8	2.0	2.3	1.5	3.1	128.4	96.4	Middle Shintaffer
D-1323-1326C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.7	11.1	17.0	Middle Shintaffer
D-1323-1237_2	0.6	4.3	5.7	6.3	7.1	4.3	5.7	6.3	7.1	5.1	6.5	20.0	13.9	Middle Shintaffer
D-1324-1204	7.4	10.2	10.2	10.3	10.4	10.3	10.3	10.3	10.4	9.7	9.6	9.5	9.4	Middle Shintaffer
OF-1324-1205	0.0	0.0	0.0	0.3	1.5	0.0	0.0	0.2	1.5	1.8	4.1	4.6	6.7	Middle Shintaffer
O-1235-1238	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	Middle Shintaffer
P-1235-1238	1.5	2.4	2.5	2.5	2.6	2.4	2.5	2.5	2.6	2.5	2.9	3.1	3.4	Middle Shintaffer
D-1236-1235	1.5	2.4	2.5	2.5	2.6	2.4	2.5	2.5	2.6	2.5	2.9	3.1	3.5	Middle Shintaffer
O-1237-1236	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	Middle Shintaffer
P-1237-1236	1.5	2.4	2.5	2.5	2.6	2.4	2.5	2.5	2.6	2.5	2.9	3.1	3.3	Middle Shintaffer
D-1238-1246	1.4	2.5	2.6	2.6	2.7	2.5	2.6	2.6	2.7	2.6	2.9	3.0	3.0	Middle Shintaffer
P-1292-1293	0.1	0.5	0.6	0.7	0.7	0.5	0.6	0.7	0.8	0.8	1.0	1.1	1.2	Middle Shintaffer
D-1293-1326	0.2	0.5	0.6	0.7	0.7	0.5	0.6	0.7	0.8	0.8	1.0	1.1	1.2	Middle Shintaffer
D-1294-1325	0.1	0.6	0.7	0.8	0.9	0.6	0.7	0.8	0.9	0.9	1.1	1.2	1.4	Middle Shintaffer
P-1295-1294	0.2	0.6	0.7	0.8	0.9	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.4	Middle Shintaffer
D-1300-1295	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Middle Shintaffer
D-1325-1292	0.1	0.5	0.7	0.7	0.7	0.5	0.6	0.7	0.8	0.8	1.0	1.1	1.2	Middle Shintaffer
O-507-500A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Lower Shintaffer
P-501-500	2.7	4.4	4.8	5.0	5.2	4.4	4.8	5.0	5.2	4.6	4.9	5.2	5.4	Lower Shintaffer
P-505-501	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Lower Shintaffer
P-507-501	2.7	4.4	4.8	5.0	5.2	4.4	4.8	5.0	5.2	4.6	4.9	5.2	5.4	Lower Shintaffer
D-508-510	2.7	4.4	4.8	5.0	5.2	4.4	4.8	5.0	5.2	4.6	4.9	5.2	5.4	Lower Shintaffer
O-509-508	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Lower Shintaffer
P-509-508	2.7	4.4	4.8	5.0	5.2	4.4	4.8	5.0	5.2	4.6	4.9	5.2	5.4	Lower Shintaffer

Table A-5
Birch Point Drainage Study - Peak Flow Summary

		Existing Conditions				ing Conditions with Rogers Slough Structure Remo				Future Conditions				
		Peak Flow (cfs)				Peak Flow (cfs)				Peak Flow (cfs)				
Conduit	Flood Elev	25 Year	100 Year	Nov-21	imate Chang	25 Year	100 Year	Nov-21	imate Chang	25 Year	100 Year	Nov-21	imate Chang	Location
D-510-507	2.7	4.4	4.8	5.0	5.2	4.4	4.8	5.0	5.2	4.6	4.9	5.2	5.4	Lower Shintaffer
O-511-508	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Lower Shintaffer
P-511-509	1.6	2.3	2.7	2.9	3.2	2.3	2.7	2.9	3.2	2.3	2.7	2.9	3.2	Lower Shintaffer
P-514-511	1.6	2.3	2.7	2.9	3.2	2.3	2.7	2.9	3.2	2.3	2.7	2.9	3.2	Lower Shintaffer
P-518-514	1.6	2.3	2.7	2.9	3.2	2.3	2.7	2.9	3.2	2.3	2.7	2.9	3.2	Lower Shintaffer
D-519-518	0.6	0.9	1.1	1.3	1.5	0.9	1.1	1.3	1.5	0.9	1.1	1.3	1.5	Lower Shintaffer
P-520-519	0.6	0.8	1.1	1.2	1.4	0.8	1.1	1.2	1.4	0.8	1.1	1.2	1.4	Lower Shintaffer
D-521-520	0.5	0.6	0.8	0.9	1.1	0.6	0.8	0.9	1.1	0.6	0.8	0.9	1.1	Lower Shintaffer
P-522-521	0.3	0.4	0.5	0.6	0.7	0.4	0.5	0.6	0.7	0.4	0.5	0.6	0.7	Lower Shintaffer
O-525-524	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Lower Shintaffer
P-523-524	1.8	2.9	3.0	3.0	3.1	2.9	3.0	3.0	3.1	3.0	3.2	3.3	3.5	Lower Shintaffer
D-524-525	1.8	2.9	3.0	3.0	3.1	2.9	3.0	3.0	3.1	3.0	3.2	3.3	3.5	Lower Shintaffer
O-525-527	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Lower Shintaffer
P-525-526	1.8	2.9	3.0	3.0	3.1	2.9	3.0	3.0	3.1	3.0	3.2	3.3	3.5	Lower Shintaffer
D-527-509	1.8	2.9	3.0	3.1	3.1	2.9	3.0	3.1	3.1	3.0	3.2	3.3	3.5	Lower Shintaffer
D-1244-522	0.1	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	Lower Shintaffer
D-1245-523	1.8	2.8	2.9	3.0	3.0	2.8	2.9	3.0	3.0	2.9	3.2	3.3	3.5	Lower Shintaffer
O-1246-1245	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Lower Shintaffer
P-1246-1245	1.8	2.8	2.9	2.9	2.9	2.8	2.9	2.9	2.9	2.9	3.2	3.3	3.5	Lower Shintaffer
BP21aPond_Out	3.0	5.2	5.5	5.6	5.8	5.2	5.5	5.6	5.8	6.6	7.3	7.7	8.1	Semiahmoo Uplands
6	23.5	29.9	36.0	39.5	43.8	29.9	36.0	39.5	43.8	39.1	47.2	51.9	57.8	
FieldPond1Out	22.8	33.1	39.8	43.7	48.4	33.1	39.8	43.7	48.4	46.7	56.1	61.5	68.0	Semiahmoo Uplands
SU-1_3	0.8	2.1	2.9	3.4	4.0	2.1	2.9	3.4	4.0	7.7	9.7	10.7	12.0	
SU-1b-Oit	0.7	3.1	3.4	3.5	3.7	3.5	3.9	4.0	4.2	3.9	4.3	4.5	4.7	Semiahmoo Uplands
92603	19.4	19.4	19.6	17.2	20.0	18.9	14.6	20.3	20.0	23.8	27.7	29.9	32.4	Horizon Pond
92604	14.5	14.5	14.8	17.2	20.0	14.2	14.6	17.2	20.0	23.8	27.7	29.9	32.4	
92606	8.0	8.1	9.9	10.9	12.1	8.1	9.9	10.9	12.1	25.1	30.4	33.4	37.2	
PD63_OF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Horizon Pond
SM723	0.0	3.6	3.9	4.0	4.1	3.6	3.9	4.0	4.1	3.8	4.0	4.1	4.3	Horizon Pond
Lake6_Out	23.1	29.9	36.0	39.5	43.9	29.9	36.0	39.5	43.9	39.2	47.3	51.9	57.8	Semiahmoo Golf Course
Lake9_Out	2.6	5.7	6.7	7.3	7.9	5.7	6.7	7.3	7.9	7.2	8.4	9.1	9.9	Semiahmoo Golf Course
Lake12_Out	0.3	1.8	2.4	2.8	3.3	1.8	2.4	2.8	3.3	7.0	8.8	9.6	10.8	Semiahmoo Golf Course
Lake18_Out	0.3	3.0	3.5	3.8	4.1	3.0	3.5	3.8	4.1	3.6	4.1	4.3	4.5	Semiahmoo Golf Course
SU-2_1	5.1	12.9	15.5	16.9	18.7	12.9	15.4	16.9	18.7	20.5	24.7	27.0	29.9	Bay Ridge Estates

Table A-4
Birch Point Drainage Study - Peak Stage Summary, with Project

		Existing Land Use						Future Land Use						
		Peak HGL (feet NAVD 88)			Height Above Flood Depth (ft)			Peak HGL (feet NAVD 88)			Height Above Flood Depth (ft)			
Junction	Flood Elev	100-year	Nov-21	limate Chang	100-year	Nov-21	limate Chang	100-year	Nov-21	limate Chang	100-year	Nov-21	limate Chang	Location
LDES2448	112.1	110.38	110.44	110.52	-1.7	-1.66	-1.58	110.41	110.48	110.56	-1.7	-1.62	-1.54	Birch Point Road West of Selder
LDES2449	111.2	109.73	109.75	109.77	-1.5	-1.45	-1.43	109.74	109.76	109.78	-1.5	-1.44	-1.42	Birch Point Road West of Selder
LDES2456	80.0	76.39	76.44	76.49	-3.6	-3.56	-3.51	76.42	76.47	76.52	-3.6	-3.53	-3.48	Birch Point Road West of Selder
LDES2457	77.6	75.02	75.03	75.05	-2.6	-2.57	-2.55	75.03	75.04	75.05	-2.6	-2.56	-2.55	Birch Point Road West of Selder
LDES2463	50.3	48.20	48.20	49.61	-2.1	-2.10	-0.69	50.01	50.30	50.30	-0.3	0.00	0.00	Birch Point Road West of Selder
LDES2464	51.1	46.29	47.73	49.60	-4.8	-3.37	-1.50	50.01	50.57	50.95	-1.1	-0.53	-0.15	Birch Point Road West of Selder
LDES2470	51.1	46.58	47.87	49.75	-4.5	-3.23	-1.35	50.16	50.87	51.34	-0.9	-0.23	0.24	Birch Point Road West of Selder
Od1010_3	55.3	51.72	51.82	51.93	-3.6	-3.48	-3.37	51.82	51.92	51.99	-3.5	-3.38	-3.31	Birch Point Road West of Selder
OD1010-1	62.3	61.92	61.94	61.96	-0.4	-0.36	-0.34	61.93	61.95	61.98	-0.4	-0.35	-0.32	Birch Point Road West of Selder
OD1010-2	59.4	56.86	56.96	57.07	-2.5	-2.44	-2.33	56.97	57.06	57.13	-2.4	-2.34	-2.27	Birch Point Road West of Selder
TT1018	117.0	115.36	115.38	115.40	-1.6	-1.62	-1.60	115.37	115.39	115.41	-1.6	-1.61	-1.59	Birch Point Road West of Selder
TT1019	72.0	68.00	68.00	68.00	-4.0	-4.00	-4.00	68.00	68.00	68.00	-4.0	-4.00	-4.00	Birch Point Road West of Selder
2886	28.1	26.65	26.99	27.54	-1.5	-1.11	-0.56	27.76	27.97	28.07	-0.3	-0.13	-0.03	Birch Point Road West of Selder
2887	39.1	36.32	36.42	36.67	-2.8	-2.68	-2.43	36.91	37.11	37.34	-2.2	-1.99	-1.76	Birch Point Road West of Selder
2888	29.4	25.31	25.45	25.66	-4.1	-3.95	-3.74	25.79	26.24	26.36	-3.6	-3.16	-3.04	Birch Point Road West of Selder
LDES2482	46.3	44.25	44.30	44.41	-2.1	-2.00	-1.89	44.50	44.58	44.66	-1.8	-1.72	-1.64	Birch Point Road West of Selder
LDES2490	52.2	51.10	51.10	51.10	-1.1	-1.10	-1.10	51.10	51.10	51.10	-1.1	-1.10	-1.10	Birch Point Road West of Selder
LDES2491	52.2	50.80	50.80	50.80	-1.4	-1.40	-1.40	50.80	50.80	50.80	-1.4	-1.40	-1.40	Birch Point Road West of Selder
LDES2498	36.0	34.02	34.06	34.15	-2.0	-1.94	-1.85	34.23	34.29	34.36	-1.8	-1.71	-1.64	Birch Point Road West of Selder
LDES2502	28.7	27.27	27.59	28.20	-1.4	-1.11	-0.50	28.46	28.60	28.68	-0.2	-0.10	-0.02	Birch Point Road West of Selder
LDES2503	28.0	24.88	24.94	25.03	-3.1	-3.06	-2.97	25.07	25.14	25.34	-2.9	-2.86	-2.66	Birch Point Road West of Selder
LDES2508	30.2	27.32	27.62	28.20	-2.9	-2.58	-2.00	28.46	28.60	28.68	-1.7	-1.60	-1.52	Birch Point Road West of Selder
LDES2509	30.2	27.27	27.59	28.19	-2.9	-2.61	-2.01	28.45	28.59	28.66	-1.8	-1.61	-1.54	Birch Point Road West of Selder
LDES2516	27.8	27.10	27.50	28.16	-0.7	-0.30	0.36	28.42	28.54	28.60	0.6	0.74	0.80	Birch Point Road West of Selder
LDES2521	27.8	25.30	25.44	25.64	-2.5	-2.36	-2.16	25.76	26.24	26.36	-2.0	-1.56	-1.44	Birch Point Road West of Selder
OD1020-1	53.4	53.09	53.17	53.27	-0.3	-0.23	-0.13	53.35	53.40	53.45	0.0	0.00	0.05	Birch Point Road West of Selder
OD1020-2	53.4	53.19	53.29	53.39	-0.2	-0.11	-0.01	53.47	53.51	53.55	0.1	0.11	0.15	Birch Point Road West of Selder
OD1020-3	53.3	52.50	52.57	52.69	-0.8	-0.73	-0.61	52.80	52.86	52.92	-0.5	-0.44	-0.38	Birch Point Road West of Selder
OF-TT6	29.4	23.66	23.67	23.69	-5.7	-5.73	-5.71	23.70	23.72	23.73	-5.7	-5.68	-5.67	Birch Point Road West of Selder
TT1020	52.2	50.46	50.55	50.71	-1.7	-1.65	-1.49	50.87	50.99	51.12	-1.3	-1.21	-1.08	Birch Point Road West of Selder
TT1021	52.2	51.60	51.60	51.60	-0.6	-0.60	-0.60	51.60	51.60	51.60	-0.6	-0.60	-0.60	Birch Point Road West of Selder
TT1022	52.2	48.99	49.07	49.25	-3.2	-3.13	-2.95	49.40	49.50	49.61	-2.8	-2.70	-2.59	Birch Point Road West of Selder
TT1023	28.0	25.15	25.27	25.42	-2.9	-2.73	-2.58	25.49	25.67	25.72	-2.5	-2.33	-2.28	Birch Point Road West of Selder
35701	53.4	51.86	51.86	51.86	-1.5	-1.54	-1.54	52.02	52.15	52.25	-1.4	-1.25	-1.15	Bay Ridge Estates - West Shoreview Road
35702	53.3	52.25	52.27	52.28	-1.1	-1.03	-1.02	52.26	52.27	52.28	-1.0	-1.03	-1.02	Bay Ridge Estates - West Shoreview Road
35711	53.3	52.25	52.27	52.28	-1.1	-1.03	-1.02	52.26	52.27	52.28	-1.0	-1.03	-1.02	Bay Ridge Estates - West Shoreview Road
35712	52.8	52.25	52.26	52.26	-0.5	-0.54	-0.54	52.25	52.26	52.26	-0.5	-0.54	-0.54	Bay Ridge Estates - West Shoreview Road
35721	52.2	52.25	52.26	52.26	0.0	0.06	0.06	52.25	52.26	52.26	0.0	0.06	0.06	Bay Ridge Estates - West Shoreview Road
10001	53.8	53.55	53.55	53.55	-0.2	-0.20	-0.20	53.55	53.55	53.55	-0.2	-0.20	-0.20	Bay Ridge Estates - West Shoreview Road
35861	52.1	51.02	51.09	51.25	-1.1	-1.01	-0.85	51.27	51.28	51.39	-0.8	-0.82	-0.71	Bay Ridge Estates - West Shoreview Road
6365	52.8	51.61	51.63	51.73	-1.2	-1.17	-1.07	51.86	52.01	52.31	-0.9	-0.79	-0.49	Bay Ridge Estates - West Shoreview Road
LDES2476	52.1	51.23	51.24	51.29	-0.9	-0.86	-0.81	51.34	51.42	51.56	-0.8	-0.68	-0.54	Bay Ridge Estates - West Shoreview Road
LDES2478	52.7	51.84	51.86	52.00	-0.9	-0.84	-0.70	52.19	52.41	53.09	-0.5	-0.29	0.39	Bay Ridge Estates - West Shoreview Road
35722	52.4	51.39	51.40	51.40	-1.0	-1.00	-1.00	51.40	51.40	51.40	-1.0	-1.00	-1.00	Bay Ridge Estates - East Shoreview Road
35751	51.5	51.39	51.39	51.39	-0.1	-0.11	-0.11	51.39	51.39	51.40	-0.1	-0.11	-0.10	Bay Ridge Estates - East Shoreview Road
35752	52.5	50.88	50.88	50.88	-1.6	-1.62	-1.62	50.88	50.88	50.88	-1.6	-1.62	-1.62	Bay Ridge Estates - East Shoreview Road
35862	51.9	50.90	50.94	50.96	-1.0	-0.96	-0.94	50.94	50.97	50.99	-1.0	-0.93	-0.91	Bay Ridge Estates - East Shoreview Road
6399	50.1	50.06	50.07	50.10	-0.1	-0.05	-0.02	50.06	50.08	50.10	-0.1	-0.04	-0.02	Bay Ridge Estates - East Shoreview Road
6501	49.8	50.22	50.33	50.37	0.4	0.53	0.57	50.33	50.37	50.40	0.5	0.57	0.60	Bay Ridge Estates - East Shoreview Road
6502	49.5	48.56	48.57	48.58	-0.9	-0.89	-0.88	48.56	48.57	48.58	-0.9	-0.89	-0.88	Bay Ridge Estates - East Shoreview Road
6503	49.0	49.61	49.75	49.79	0.6	0.71	0.75	49.75	49.79	49.82	0.7	0.75	0.78	Bay Ridge Estates - East Shoreview Road
6504	49.6	48.08	48.45	48.80	-1.6	-1.19	-0.84	48.46	48.80	49.22	-1.2	-0.84	-0.42	Bay Ridge Estates - East Shoreview Road
6505	48.8	47.29	47.33	47.38	-1.5	-1.42	-1.37	47.33	47.37	47.42	-1.4	-1.38	-1.33	Bay Ridge Estates - East Shoreview Road
6506	50.3	47.71	47.73	47.75	-2.6	-2.58	-2.56	47.71	47.73	47.75	-2.6	-2.58	-2.56	Bay Ridge Estates - East Shoreview Road
7801	50.4	50.88	50.88	50.88	0.5	0.48	0.48	50.88	50.88	50.88	0.5	0.48	0.48	Bay Ridge Estates - East Shoreview Road
7881	50.6	50.90	50.93	50.95	0.3	0.33	0.35	50.94	50.96	50.98	0.3	0.36	0.38	Bay Ridge Estates - East Shoreview Road
35441	52.7	52.74	52.74	52.74	0.0	0.04	0.04	52.74	52.74	52.74	0.0	0.04	0.04	Bay Ridge Estates - Bay Ridge Drive South
35442	52.7	52.25	52.26	52.26	-0.5	-0.46	-0.46	52.25	52.26	52.26	-0.5	-0.46	-0.46	Bay Ridge Estates - Bay Ridge Drive South
35962	51.8	50.68	50.69	50.69	-1.1	-1.11	-1.11	50.69	50.69	50.69	-1.1	-1.11	-1.11	Bay Ridge Estates - Bay Ridge Drive South
6370	34.2	31.48	31.51	31.54	-2.7	-2.65	-2.62	31.54	31.58	31.62	-2.6	-2.58	-2.54	Bay Ridge Estates - Bay Ridge Drive South
6387	52.5	51.46	51.49	51.55	-1.0	-1.01	-0.95	51.50	51.54	51.67	-1.0	-0.96	-0.83	Bay Ridge Estates - Bay Ridge Drive South
6388	52.9	53.42	53.44	53.41	0.5	0.53	0.50	53.43	53.40	53.47	0.5	0.49	0.56	Bay Ridge Estates - Bay Ridge Drive South
6389	52.5	51.45	51.48	51.53	-1.1	-1.04	-0.99	51.48	51.52	51.62	-1.0	-1.00	-0.90	Bay Ridge Estates - Bay Ridge Drive South
6390	53.2	53.25	53.27	53.22	0.0	0.03	-0.02	53.26	53.20	53.32	0.0	-0.04	0.08	Bay Ridge Estates - Bay Ridge Drive South
6398	53.1	53.14	53.17	53.10	0.0	0.07	0.00	53.15	53.08	53.21	0.0	-0.02	0.11	Bay Ridge Estates - Bay Ridge Drive South
7552	52.8	52.78	52.78	52.78	0.0	-0.02	-0.02	52.78	52.78	52.78	0.0	-0.02	-0.02	Bay Ridge Estates - Bay Ridge Drive South
6386	52.8	53.50	53.51	53.51	0.7	0.67	0.67	53.51	53.52	53.53	0.7	0.68	0.69	Bay Ridge Estates - Bay Ridge Drive South
757753	52.8	51.45	51.49	51.55	-1.3	-1.31	-1.25	51.50	51.54	51.69	-1.3	-1.26	-1.11	Bay Ridge Estates - Bay Ridge Drive South
7612	52.8	51.39	51.40	51.40	-1.4	-1.40	-1.40	51.40	51.40	51.40	-1.4	-1.40	-1.40	Bay Ridge Estates - Bay Ridge Drive South
33461	60.6	56.05	56.07	56.10	-4.6	-4.55	-4.52	56.13	56.16	56.20	-4.5	-4.46	-4.42	Bay Ridge Estates - Seawan Place
33571	61.5	59.99	60.02	60.07	-1.5	-1.48	-1.43	60.11	60.19	60.56	-1.4	-1.31	-0.94	Bay Ridge Estates - Seawan Place
33572	61.0	59.44	59.49	59.62	-1.6	-1.51	-1.38	59.65	59.88	60.28	-1.4	-1.12	-0.72	Bay Ridge Estates - Seawan Place
33771	60.8	59.43	59.48	59.61	-1.4	-1.32	-1.19	59.64	59.88	60.27	-1.2	-0.92	-0.53	Bay Ridge Estates - Seawan Place
33772	60.5	58.91	59.04	59.29	-1.6	-1.46	-1.21	59.33	59.57	59.88	-1.2	-0.93	-0.62	Bay Ridge Estates - Seawan Place
33991	60.0	58.91	59.04	59.29	-1.1	-0.96	-0.71	59.33	59.56	59.88	-0.7	-0.44	-0.12	Bay Ridge Estates - Seawan Place
33992	59.2	57.34	57.35	57.36	-1.9	-1.85	-1.84	57.36	57.36	58.15	-1.8	-1.84	-1.05	Bay Ridge Estates - Seawan Place
34341	57.5	56.45	56.61	56.87	-1.1	-0.89	-0.63	56.85	57.08	58.14	-0.6	-0.42	0.64	Bay Ridge Estates - Seawan Place
34342	55.6	54.98	54.99	55.00	-0.6	-0.56	-0.55	55.00	55.01	55.60	-0.5	-0.54	0.05	Bay Ridge Estates - Seawan Place
6385	57.0	54.37	54.38	54.41	-2.6	-2.62	-2.59	54.42	54.45	54.46	-2.6	-2.55	-2.54	Bay Ridge Estates - Seawan Place
7141	56.1	54.67	54.71	54.77	-1.4	-1.40	-1.34	54.76	54.81	55.59	-1.4	-1.30	-0.52	Bay Ridge Estates - Seawan Place
6380	49.8	48.60	48.63	48.67	-1.2	-1.14	-1.10	48.62	48.65	48.71	-1.2	-1.12	-1.06	Bay Ridge Estates - Bay Ridge Drive Middle
6381	51.2	50.27	50.53	50.85	-1.0	-0.70	-0.38	50.69	50.96	51.20	-0.5	-0.27	-0.03	Bay Ridge Estates - Bay Ridge Drive Middle
6383	51.1	50.44	50.73	51.10	-0.6	-0.35	0.02	50.92	51.23	51.49	-0.2	0.15	0.41	Bay Ridge Estates - Bay Ridge Drive Middle
6384	52.5	51.12	51.17	51.24	-1.4	-1.35	-1.28	51.17	51.22	51.38	-1.4	-1.30	-1.14	Bay Ridge Estates - Bay Ridge Drive Middle
6951	50.1	48.37	48.53	48.80	-1.7	-1.54	-1.27	48.59	48.77	49.00	-1.5	-1.30	-1.07	Bay Ridge Estates - Bay Ridge Drive Middle
7042	52.3	51.13	51.14	51.42	-1.2	-1.16	-0.88	51.24	51.59	51.84	-1.1	-0.71	-0.46	Bay Ridge Estates - Bay Ridge Drive Middle
7052	50.8	48.45	48.55	48.81	-2.3	-2.24	-1.98	48.60	48.78	49.01	-2.2	-2.01	-1.78	Bay Ridge Estates - Bay Ridge Drive Middle
7102	51.0	48.79	48.84	48.92	-2.2	-2.16	-2.08	48.83	48.89	49.05	-2.2	-2.11	-1.95	Bay Ridge Estates - Bay Ridge Drive Middle
7201	52.1	48.80	48.84	48.93	-3.3	-3.26	-3.17	48.84	48.90	49.05	-3.3	-3.20	-3.05	Bay Ridge Estates - Bay Ridge Drive Middle
72011	51.6	50.38	50.43	50.49	-1.2	-1.14	-1.08	50.43	50.47	50.57	-1.1	-1.10	-1.00	Bay Ridge Estates - Bay Ridge Drive Middle
7242	51.8	50.70	50.96	51.41	-1.1	-0.84	-0.39	51.22	51.58	51.83	-0.6	-0.22	0.03	Bay Ridge Estates - Bay Ridge Drive Middle
6371	34.1	30.95	30.98	31.02	-3.2	-3.14	-3.10	31.00	31.04	31.07	-3.1	-3.08	-3.05	Bay Ridge Estates - Bay Ridge Drive West

Table A-4
Birch Point Drainage Study - Peak Stage Summary, with Project

		Existing Land Use						Future Land Use						
		Peak HGL (feet NAVD 88)			Height Above Flood Depth (ft)			Peak HGL (feet NAVD 88)			Height Above Flood Depth (ft)			
Junction	Flood Elev	100-year	Nov-21	limate Chang	100-year	Nov-21	limate Chang	100-year	Nov-21	limate Chang	100-year	Nov-21	limate Chang	Location
6372	35.2	35.47	36.16	36.42	0.3	1.01	1.27	35.98	36.41	36.43	0.8	1.26	1.28	Bay Ridge Estates - Bay Ridge Drive West
6373	39.6	38.20	38.20	38.21	-1.4	-1.43	-1.42	38.20	38.21	38.21	-1.4	-1.42	-1.42	Bay Ridge Estates - Bay Ridge Drive West
6374	46.5	47.31	47.31	47.32	0.8	0.84	0.85	47.31	47.32	47.32	0.8	0.85	0.85	Bay Ridge Estates - Bay Ridge Drive West
6972	43.8	43.64	43.64	43.64	-0.2	-0.16	-0.16	43.64	43.64	43.64	-0.2	-0.16	-0.16	Bay Ridge Estates - Bay Ridge Drive West
7271	35.5	33.08	33.09	33.11	-2.4	-2.42	-2.40	33.09	33.10	33.12	-2.4	-2.41	-2.39	Bay Ridge Estates - Bay Ridge Drive West
7311	34.2	32.60	32.64	32.69	-1.6	-1.56	-1.51	32.74	32.80	32.92	-1.5	-1.40	-1.28	Bay Ridge Estates - Bay Ridge Drive West
734738	34.4	32.33	32.38	32.41	-2.1	-2.02	-1.99	32.36	32.40	32.41	-2.0	-2.00	-1.99	Bay Ridge Estates - Bay Ridge Drive West
9581	36.6	35.38	35.39	35.39	-1.2	-1.21	-1.21	35.39	35.39	35.40	-1.2	-1.21	-1.20	Bay Ridge Estates - Bay Ridge Drive West
6375	49.1	47.94	48.04	48.21	-1.1	-1.03	-0.86	48.07	48.19	48.33	-1.0	-0.88	-0.74	Bay Ridge Estates - Bay Ridge Drive West
6376	48.9	46.52	46.54	46.57	-2.3	-2.31	-2.28	46.53	46.56	46.60	-2.3	-2.29	-2.25	Bay Ridge Estates - Bay Ridge Drive West
9391	43.1	43.16	43.18	43.20	0.1	0.08	0.10	43.22	43.25	43.28	0.1	0.15	0.18	Bay Ridge Estates
BayRidgePond	30.5	29.48	29.50	29.53	-1.0	-1.00	-0.97	29.52	29.55	29.58	-1.0	-0.95	-0.92	Bay Ridge Estates
9391	43.1	43.16	43.18	43.20	0.1	0.08	0.10	43.22	43.25	43.28	0.1	0.15	0.18	Bay Ridge Estates
BBV-0009	8.7	7.49	7.55	7.62	-1.2	-1.14	-1.07	7.53	7.59	7.66	-1.2	-1.10	-1.03	Birch Bay Village
BBVJ-005	12.6	11.34	11.36	11.39	-1.2	-1.21	-1.18	11.40	11.59	11.75	-1.2	-0.98	-0.82	Birch Bay Village
BBVJ-007	45.0	39.58	39.61	39.64	-5.4	-5.39	-5.36	39.65	39.67	39.69	-5.4	-5.33	-5.31	Birch Bay Village
BBVJ-008	35.0	28.62	29.18	29.75	-6.4	-5.82	-5.25	29.48	29.88	30.33	-5.5	-5.12	-4.67	Birch Bay Village
BBVJ-009	7.8	7.35	7.51	7.70	-0.4	-0.24	-0.05	7.50	7.66	7.79	-0.3	-0.09	0.04	Birch Bay Village
BBVJ-009a	7.6	7.41	7.60	7.82	-0.2	-0.03	0.19	7.62	7.81	7.97	0.0	0.18	0.34	Birch Bay Village
BBVJ-20	10.8	11.55	12.35	12.39	0.7	1.50	1.54	12.40	12.42	12.43	1.6	1.57	1.58	Birch Bay Village
BBVJ-21	21.9	17.52	17.59	17.73	-4.3	-4.26	-4.12	17.78	17.91	17.99	-4.1	-3.94	-3.86	Birch Bay Village
BBVJ-22	22.2	20.04	20.12	20.26	-2.2	-2.12	-1.98	20.31	20.92	21.44	-1.9	-1.32	-0.80	Birch Bay Village
BBVJ-23	28.0	23.85	23.93	24.07	-4.2	-4.07	-3.93	24.14	24.27	24.96	-3.9	-3.73	-3.04	Birch Bay Village
BBVJ-24	18.8	18.48	18.63	18.87	-0.3	-0.14	0.10	18.92	19.30	19.57	0.1	0.53	0.80	Birch Bay Village
BBVJ-26	9.0	8.66	8.71	8.76	-0.3	-0.26	-0.21	8.74	8.89	9.07	-0.2	-0.08	0.10	Birch Bay Village
BBVJ-27	9.9	8.83	8.88	8.93	-1.1	-1.03	-0.98	8.91	9.10	9.32	-1.0	-0.81	-0.59	Birch Bay Village
BBVJ-28	11.5	8.95	8.99	9.03	-2.6	-2.54	-2.50	9.03	9.24	9.48	-2.5	-2.29	-2.05	Birch Bay Village
BBVJ-29	15.8	9.16	9.63	8.39	-6.6	-6.14	-7.38	8.48	9.41	8.39	-7.3	-6.36	-7.38	Birch Bay Village
BBVJ-30	7.9	7.26	7.36	7.47	-0.6	-0.51	-0.40	7.31	7.40	7.52	-0.6	-0.47	-0.35	Birch Bay Village
BBVJ-31	9.7	7.41	7.59	7.82	-2.3	-2.10	-1.87	7.61	7.80	8.02	-2.1	-1.89	-1.67	Birch Bay Village
BBVJ-32	8.6	7.40	7.58	7.80	-1.2	-1.02	-0.80	7.59	7.78	7.99	-1.0	-0.82	-0.61	Birch Bay Village
BBVJ-33	8.6	7.37	7.54	7.74	-1.2	-1.06	-0.86	7.54	7.71	7.91	-1.1	-0.89	-0.69	Birch Bay Village
BBVJ-34	8.6	7.35	7.51	7.70	-1.2	-1.09	-0.90	7.51	7.67	7.85	-1.1	-0.93	-0.75	Birch Bay Village
BBVJ-35	8.2	7.35	7.50	7.69	-0.9	-0.70	-0.51	7.49	7.65	7.83	-0.7	-0.55	-0.37	Birch Bay Village
BBVJ-36	23.7	21.69	21.56	22.05	-2.0	-2.13	-1.64	21.82	21.89	22.40	-1.9	-1.80	-1.29	Birch Bay Village
BBVJ-37	10.0	7.87	8.42	9.08	-2.1	-1.58	-0.92	8.28	8.03	10.09	-1.7	-1.97	0.09	
BBVJ-39	12.6	11.34	11.37	11.40	-1.3	-1.23	-1.20	11.40	11.59	11.75	-1.2	-1.01	-0.85	
BBVS_Pond1	8.4	8.53	8.57	8.61	0.1	0.17	0.21	8.59	8.64	8.69	0.2	0.24	0.29	Birch Bay Village
BBVS_Pond2	8.4	7.54	7.78	8.10	-0.9	-0.62	-0.30	7.84	8.12	8.41	-0.6	-0.28	0.01	Birch Bay Village
BBVS_Pond3	8.4	7.30	7.43	7.59	-1.1	-0.97	-0.81	7.39	7.53	7.71	-1.0	-0.87	-0.69	Birch Bay Village
Kwan_Pond	12.0	7.69	7.75	7.82	-4.3	-4.25	-4.18	7.72	7.78	7.86	-4.3	-4.22	-4.14	Birch Bay Village
underbird_Poi	11.5	7.25	7.34	7.46	-4.3	-4.16	-4.04	7.29	7.39	7.51	-4.2	-4.11	-3.99	Birch Bay Village
Kwan_Pond	12.0	7.69	7.75	7.82	-4.3	-4.25	-4.18	7.72	7.78	7.86	-4.3	-4.22	-4.14	Birch Bay Village
V_BeaverCree	26.3	25.13	25.25	25.47	-1.2	-1.05	-0.83	25.23	25.41	25.68	-1.1	-0.89	-0.62	Birch Bay Village
LDES2569	42.9	39.70	39.70	39.70	-3.2	-3.20	-3.20	39.70	39.70	39.70	-3.2	-3.20	-3.20	Selder Road
LDES2570	44.0	40.60	40.60	40.60	-3.4	-3.40	-3.40	40.60	40.60	40.60	-3.4	-3.40	-3.40	Selder Road
LDES2578	66.1	63.32	63.37	63.43	-2.8	-2.73	-2.67	63.58	63.65	63.74	-2.5	-2.45	-2.36	Selder Road
LDES2586	66.0	64.45	64.65	64.82	-1.6	-1.35	-1.18	64.49	64.71	64.90	-1.5	-1.29	-1.10	Selder Road
LDES2587	67.5	67.62	67.65	67.68	0.1	0.15	0.18	67.62	67.65	67.68	0.1	0.15	0.18	Selder Road
LDES2594	74.5	73.01	73.06	73.10	-1.5	-1.44	-1.40	73.01	73.06	73.10	-1.5	-1.44	-1.40	Selder Road
LDES2595	79.6	79.77	79.81	79.83	0.2	0.21	0.23	79.78	79.81	79.83	0.2	0.21	0.23	Selder Road
LDES2602	81.7	81.01	81.05	81.09	-0.7	-0.65	-0.61	81.01	81.06	81.09	-0.7	-0.64	-0.61	Selder Road
LDES2603	85.8	85.95	85.98	86.00	0.2	0.18	0.20	85.95	85.98	86.00	0.2	0.18	0.20	Selder Road
LDES2610	86.8	86.48	86.52	86.56	-0.3	-0.28	-0.24	86.48	86.53	86.56	-0.3	-0.27	-0.24	Selder Road
LDES2611	93.0	93.15	93.18	93.21	0.2	0.18	0.21	93.15	93.18	93.21	0.2	0.18	0.21	Selder Road
LDES2618	99.9	98.13	98.18	98.21	-1.8	-1.72	-1.69	98.13	98.18	98.21	-1.8	-1.72	-1.69	Selder Road
LDES2619	102.5	102.43	102.55	102.57	-0.1	0.05	0.07	102.46	102.55	102.58	0.0	0.05	0.08	Selder Road
LDES2626	111.0	108.97	108.98	109.01	-2.0	-2.02	-1.99	108.97	108.99	109.01	-2.0	-2.01	-1.99	Selder Road
LDES2627	112.4	112.47	112.48	112.50	0.1	0.08	0.10	112.47	112.48	112.50	0.1	0.08	0.10	Selder Road
LDES2634	116.8	115.87	115.89	115.91	-0.9	-0.91	-0.89	115.87	115.89	115.92	-0.9	-0.91	-0.88	Selder Road
LDES2635	118.9	119.01	119.03	119.04	0.1	0.13	0.14	119.01	119.03	119.04	0.1	0.13	0.14	Selder Road
LDES2639	126.3	124.58	124.66	124.75	-1.7	-1.64	-1.55	124.59	124.66	124.75	-1.7	-1.64	-1.55	Selder Road
LDES2646	124.0	122.19	122.21	122.24	-1.8	-1.79	-1.76	122.19	122.21	122.24	-1.8	-1.79	-1.76	Selder Road
TT1009	80.0	76.90	76.90	76.90	-3.1	-3.10	-3.10	76.89	76.90	76.89	-3.1	-3.10	-3.11	Selder Road
TT9	47.0	43.22	43.27	43.32	-3.8	-3.73	-3.68	43.45	43.52	43.60	-3.6	-3.48	-3.40	Selder Road
LDES2674	144.3	142.91	142.95	142.99	-1.4	-1.35	-1.31	143.14	143.20	143.26	-1.2	-1.10	-1.04	Selder Road
LDES2675	144.7	144.87	144.90	144.93	0.2	0.20	0.23	145.10	145.12	145.15	0.4	0.42	0.45	Selder Road
LDES4214	160.7	160.92	160.94	160.96	0.2	0.24	0.26	161.12	161.15	161.18	0.4	0.45	0.48	Selder Road
LDES4215	160.1	159.62	159.66	159.70	-0.5	-0.44	-0.40	160.01	160.06	160.12	-0.1	-0.04	0.02	Selder Road
LDES4222	155.6	155.71	155.73	155.74	0.1	0.13	0.14	155.86	155.88	155.90	0.3	0.28	0.30	Selder Road
LDES4223	154.8	153.41	153.46	153.51	-1.4	-1.34	-1.29	153.88	153.95	154.02	-0.9	-0.85	-0.78	Selder Road
LDES4278	170.5	170.88	170.90	170.93	0.4	0.40	0.43	171.36	171.48	171.64	0.9	0.98	1.14	Selder Road
LDES4279	174.2	173.77	173.81	173.86	-0.4	-0.39	-0.34	174.22	174.28	174.35	0.0	0.08	0.15	Selder Road
TT1007	170.7	169.46	169.50	169.55	-1.2	-1.20	-1.15	169.87	169.92	169.99	-0.8	-0.78	-0.71	Selder Road
2728	29.7	25.31	25.45	25.66	-4.4	-4.25	-4.04	25.79	26.24	26.39	-3.9	-3.46	-3.31	Birch Point Road East of Selder
3897	28.0	24.62	24.71	25.50	-3.4	-3.29	-2.50	26.82	28.02	28.02	-1.2	0.02	0.02	Birch Point Road East of Selder
5382	29.2	24.05	24.15	24.92	-5.2	-5.05	-4.28	26.15	27.40	27.58	-3.1	-1.80	-1.62	Birch Point Road East of Selder
LDES2552	30.0	25.31	25.45	25.66	-4.7	-4.55	-4.34	25.79	26.24	26.36	-4.2	-3.76	-3.64	Birch Point Road East of Selder
OD1038_In	29.7	27.80	27.80	27.80	-1.9	-1.90	-1.90	27.80	28.05	28.08	-1.9	-1.65	-1.62	Birch Point Road East of Selder
SM800_In	28.0	25.63	25.67	25.87	-2.4	-2.33	-2.13	27.07	28.37	28.48	-0.9	0.37	0.48	Birch Point Road East of Selder
SM802_In	29.2	25.41	25.44	25.55	-3.8	-3.76	-3.65	26.35	27.68	27.93	-2.9	-1.52	-1.27	Birch Point Road East of Selder
TR19	28.0	24.62	24.71	25.50	-3.4	-3.29	-2.50	26.82	28.04	28.06	-1.2	0.04	0.06	Birch Point Road East of Selder
1	12.0	8.23	8.44	8.61	-3.8	-3.56	-3.39	8.71	8.77	8.84	-3.3	-3.23	-3.16	Birch Bay Drive at Birch Loop
5380	36.5	34.54	34.59	34.66	-2.0	-1.92	-1.85	36.51	36.51	36.51	0.0	0.00	0.00	Birch Bay Drive at Birch Loop
7851	9.8	8.23	8.44	8.61	-1.6	-1.36	-1.19	8.71	8.77	8.83	-1.1	-1.03	-0.97	Birch Bay Drive at Birch Loop
CS52	25.9	22.74	22.77	22.81	-3.2	-3.13	-3.09	22.85	22.86	22.88	-3.1	-3.04	-3.02	Birch Bay Drive at Birch Loop
CS52-D	25.9	22.89	22.90	22.92	-3.0	-3.00	-2.98	22.94	22.95	22.97	-3.0	-2.95	-2.93	Birch Bay Drive at Birch Loop
CV2738-1	12.0	11.85	11.85	11.85	-0.2	-0.15	-0.15	11.85	11.85	11.85	-0.2	-0.15	-0.15	Birch Bay Drive at Birch Loop
CV3690-1	19.0	15.36	15.39	15.42	-3.6	-3.61	-3.58	15.46	15.48	15.50	-3.5	-3.52	-3.50	Birch Bay Drive at Birch Loop
CV3690-2	11.2	10.08	10.11	10.15	-1.1	-1.09	-1.05	10.20	10.22	10.25	-1.0	-0.98	-0.95	Birch Bay Drive at Birch Loop
CV3714-1	12.1	10.21	10.50	10.79	-1.9	-1.60	-1.31	10.81	11.00	11.14	-1.3	-1.10	-0.96	Birch Bay Drive at Birch Loop
CV3714-2	9.2	8.26	8.46	8.66	-1.0	-0.75	-0.55	8.77	8.84	8.91	-0.4	-0.37	-0.30	Birch Bay Drive at Birch Loop
CV3723-1	12.0	10.20	10.49	10.77	-1.8	-1.51	-1.23	10.79	10.98	11.12	-1.2	-1.02	-0.88	Birch Bay Drive at Birch Loop

Table A-4
Birch Point Drainage Study - Peak Stage Summary, with Project

		Existing Land Use						Future Land Use						
		Peak HGL (feet NAVD 88)			Height Above Flood Depth (ft)			Peak HGL (feet NAVD 88)			Height Above Flood Depth (ft)			
Junction	Flood Elev	100-year	Nov-21	imate Chang	100-year	Nov-21	imate Chang	100-year	Nov-21	imate Chang	100-year	Nov-21	imate Chang	Location
CV3723-2	12.0	10.20	10.49	10.78	-1.8	-1.51	-1.22	10.79	10.98	11.12	-1.2	-1.02	-0.88	Birch Bay Drive at Birch Loop
CV3732-1	11.2	9.93	10.14	10.31	-1.3	-1.06	-0.89	10.28	10.40	10.50	-0.9	-0.80	-0.70	Birch Bay Drive at Birch Loop
CV3732-2	12.2	8.94	8.94	8.94	-3.3	-3.26	-3.26	8.95	8.95	8.95	-3.3	-3.25	-3.25	Birch Bay Drive at Birch Loop
CV3738-2	11.9	11.40	11.40	11.40	-0.5	-0.50	-0.50	11.40	11.40	11.40	-0.5	-0.50	-0.50	Birch Bay Drive at Birch Loop
CV3740-1	9.2	8.26	8.46	8.66	-1.0	-0.75	-0.55	8.77	8.84	8.91	-0.4	-0.37	-0.30	Birch Bay Drive at Birch Loop
CV3740-2	9.8	8.23	8.44	8.62	-1.6	-1.36	-1.18	8.71	8.77	8.84	-1.1	-1.03	-0.96	Birch Bay Drive at Birch Loop
DP-77	19.3	17.34	17.35	17.36	-2.0	-1.95	-1.94	17.37	17.38	17.38	-1.9	-1.92	-1.92	Birch Bay Drive at Birch Loop
DP-78	15.0	14.97	15.06	15.12	0.0	0.06	0.12	15.16	15.19	15.20	0.2	0.19	0.20	Birch Bay Drive at Birch Loop
OD1058-1	11.2	10.00	10.20	10.36	-1.2	-1.00	-0.84	10.31	10.43	10.54	-0.9	-0.77	-0.66	Birch Bay Drive at Birch Loop
OD1058-2	11.8	11.09	11.14	11.17	-0.7	-0.66	-0.63	10.63	10.71	10.80	-1.2	-1.09	-1.00	Birch Bay Drive at Birch Loop
OD1058-3	13.0	13.07	13.23	13.31	0.1	0.26	0.34	13.35	13.42	13.48	0.4	0.45	0.51	Birch Bay Drive at Birch Loop
OD1071_2	12.2	10.24	10.52	10.81	-2.0	-1.68	-1.39	10.83	11.01	11.15	-1.4	-1.19	-1.05	Birch Bay Drive at Birch Loop
OD1071_3	12.2	10.22	10.51	10.80	-2.0	-1.69	-1.40	10.82	11.01	11.15	-1.4	-1.19	-1.05	Birch Bay Drive at Birch Loop
OD1073-up	23.6	19.75	19.77	19.79	-3.9	-3.83	-3.81	19.82	19.83	19.85	-3.8	-3.77	-3.75	Birch Bay Drive at Birch Loop
OD1075-1	11.1	9.91	9.93	9.95	-1.2	-1.17	-1.15	9.99	10.01	10.03	-1.1	-1.09	-1.07	Birch Bay Drive at Birch Loop
OD1075-2	11.0	9.26	9.28	9.29	-1.7	-1.72	-1.71	9.32	9.33	9.35	-1.7	-1.67	-1.65	Birch Bay Drive at Birch Loop
OD1075-3	11.1	8.86	8.87	8.89	-2.2	-2.23	-2.21	8.93	8.95	9.00	-2.2	-2.15	-2.10	Birch Bay Drive at Birch Loop
OD1075-4	11.4	8.54	8.56	8.69	-2.9	-2.84	-2.71	8.79	8.86	8.94	-2.6	-2.54	-2.46	Birch Bay Drive at Birch Loop
OD1075-5	10.6	8.27	8.46	8.66	-2.3	-2.14	-1.94	8.77	8.84	8.92	-1.8	-1.76	-1.68	Birch Bay Drive at Birch Loop
OD1075-6	11.1	8.26	8.46	8.66	-2.8	-2.64	-2.44	8.77	8.84	8.91	-2.3	-2.26	-2.19	Birch Bay Drive at Birch Loop
PD46_In	28.0	23.12	23.13	23.15	-4.9	-4.87	-4.85	23.17	23.18	23.19	-4.8	-4.82	-4.81	Birch Bay Drive at Birch Loop
PD46_Out	28.0	23.12	23.13	23.15	-4.9	-4.87	-4.85	23.17	23.18	23.19	-4.8	-4.82	-4.81	Birch Bay Drive at Birch Loop
SM840-2	12.2	10.43	10.69	11.01	-1.8	-1.51	-1.19	11.04	11.23	11.35	-1.2	-0.97	-0.85	Birch Bay Drive at Birch Loop
SM9799	9.8	8.23	8.44	8.61	-1.6	-1.36	-1.19	8.71	8.77	8.84	-1.1	-1.03	-0.96	Birch Bay Drive at Birch Loop
TG-1	12.0	8.94	8.94	8.94	-3.1	-3.06	-3.06	8.94	8.95	8.95	-3.1	-3.05	-3.05	Birch Bay Drive at Birch Loop
1366	52.5	50.75	50.90	51.08	-1.7	-1.56	-1.38	50.74	50.90	51.08	-1.7	-1.56	-1.38	Pheasant - Grouse Cress
1367	52.3	50.75	50.90	51.09	-1.5	-1.36	-1.17	50.74	50.90	51.08	-1.5	-1.36	-1.18	Pheasant - Grouse Cress
1368	53.1	51.43	51.64	51.89	-1.6	-1.42	-1.17	51.42	51.63	51.88	-1.6	-1.43	-1.18	Pheasant - Grouse Cress
1372	53.0	45.34	45.45	45.69	-7.6	-7.50	-7.26	45.43	45.63	45.91	-7.5	-7.32	-7.04	Pheasant - Grouse Cress
1373	52.7	51.21	51.40	51.64	-1.5	-1.27	-1.03	51.20	51.39	51.66	-1.5	-1.28	-1.01	Pheasant - Grouse Cress
1374	53.3	51.50	51.71	51.98	-1.8	-1.62	-1.35	51.49	51.70	51.96	-1.8	-1.63	-1.37	Pheasant - Grouse Cress
1375	52.5	51.43	51.64	51.89	-1.0	-0.84	-0.59	51.42	51.63	51.88	-1.1	-0.85	-0.60	Pheasant - Grouse Cress
1376	52.7	51.66	51.90	52.17	-1.0	-0.80	-0.53	51.65	51.89	52.16	-1.1	-0.81	-0.54	Pheasant - Grouse Cress
1377	53.3	51.50	51.71	51.98	-1.8	-1.58	-1.31	51.49	51.70	51.97	-1.8	-1.59	-1.32	Pheasant - Grouse Cress
1378	52.8	51.79	52.03	52.32	-1.0	-0.81	-0.52	51.78	52.02	52.31	-1.1	-0.82	-0.53	Pheasant - Grouse Cress
1379	53.7	51.67	51.91	52.17	-2.0	-1.79	-1.53	51.66	51.89	52.16	-2.0	-1.81	-1.54	Pheasant - Grouse Cress
1380	53.6	51.95	52.22	52.52	-1.7	-1.39	-1.09	51.94	52.21	52.50	-1.7	-1.40	-1.11	Pheasant - Grouse Cress
1381	53.3	51.80	52.04	52.33	-1.5	-1.26	-0.97	51.79	52.02	52.31	-1.5	-1.28	-0.99	Pheasant - Grouse Cress
1382	54.4	52.11	52.37	52.70	-2.3	-2.02	-1.69	52.10	52.36	52.68	-2.3	-2.03	-1.71	Pheasant - Grouse Cress
1383	53.8	51.95	52.22	52.52	-1.9	-1.61	-1.31	51.94	52.21	52.51	-1.9	-1.62	-1.32	Pheasant - Grouse Cress
1384	53.9	52.25	52.56	52.89	-1.6	-1.31	-0.98	52.24	52.54	52.88	-1.6	-1.33	-0.99	Pheasant - Grouse Cress
1385	54.2	52.12	52.37	52.70	-2.0	-1.80	-1.47	52.11	52.36	52.68	-2.1	-1.81	-1.49	Pheasant - Grouse Cress
1386	54.9	52.39	52.67	53.03	-2.5	-2.25	-1.89	52.38	52.66	53.02	-2.5	-2.26	-1.90	Pheasant - Grouse Cress
1387	53.7	52.26	52.56	52.89	-1.4	-1.11	-0.78	52.24	52.54	52.88	-1.4	-1.13	-0.79	Pheasant - Grouse Cress
1388	53.5	52.64	52.99	53.37	-0.9	-0.53	-0.15	52.62	52.97	53.36	-0.9	-0.55	-0.16	Pheasant - Grouse Cress
1389	54.2	52.64	52.99	53.38	-1.6	-1.20	-0.81	52.63	52.97	53.36	-1.6	-1.22	-0.83	Pheasant - Grouse Cress
1390	53.6	53.10	53.52	53.97	-0.5	-0.12	0.33	53.08	53.50	53.95	-0.6	-0.14	0.31	Pheasant - Grouse Cress
1391	53.7	52.40	52.67	53.04	-1.3	-1.07	-0.70	52.39	52.66	53.02	-1.3	-1.08	-0.72	Pheasant - Grouse Cress
1392	53.5	52.40	52.68	53.04	-1.1	-0.82	-0.46	52.39	52.66	53.02	-1.1	-0.84	-0.48	Pheasant - Grouse Cress
1393	54.1	53.10	53.52	53.97	-1.0	-0.63	-0.18	53.08	53.50	53.95	-1.1	-0.65	-0.20	Pheasant - Grouse Cress
1394	54.5	53.10	53.52	53.98	-1.4	-0.93	-0.47	53.08	53.50	53.96	-1.4	-0.95	-0.49	Pheasant - Grouse Cress
1395	55.6	52.40	52.68	53.04	-3.2	-2.95	-2.59	52.39	52.66	53.02	-3.2	-2.97	-2.61	Pheasant - Grouse Cress
1396	55.5	52.40	52.68	53.04	-3.1	-2.84	-2.48	52.39	52.66	53.02	-3.1	-2.86	-2.50	Pheasant - Grouse Cress
1397	55.6	52.40	52.68	53.04	-3.2	-2.87	-2.51	52.39	52.66	53.02	-3.2	-2.89	-2.53	Pheasant - Grouse Cress
1398	55.9	52.40	52.68	53.04	-3.5	-3.27	-2.91	52.39	52.66	53.02	-3.6	-3.29	-2.93	Pheasant - Grouse Cress
1399	54.8	53.10	53.52	53.98	-1.7	-1.29	-0.83	53.08	53.50	53.96	-1.7	-1.31	-0.85	Pheasant - Grouse Cress
1400	55.8	53.10	53.52	53.98	-2.7	-2.33	-1.87	53.08	53.50	53.96	-2.8	-2.35	-1.89	Pheasant - Grouse Cress
1401	56.2	53.66	53.66	53.98	-2.6	-2.56	-2.24	53.66	53.66	53.96	-2.6	-2.56	-2.26	Pheasant - Grouse Cress
1402	56.3	53.43	53.43	53.98	-2.9	-2.85	-2.30	53.43	53.43	53.96	-2.9	-2.85	-2.32	Pheasant - Grouse Cress
1403	55.7	53.33	53.33	53.33	-2.4	-2.39	-2.39	53.33	53.33	53.33	-2.4	-2.39	-2.39	Pheasant - Grouse Cress
1404	55.5	53.42	53.42	53.42	-2.1	-2.06	-2.06	53.42	53.42	53.42	-2.1	-2.06	-2.06	Pheasant - Grouse Cress
1405	55.0	53.67	53.67	53.67	-1.4	-1.35	-1.35	53.67	53.67	53.67	-1.4	-1.35	-1.35	Pheasant - Grouse Cress
1406	55.9	54.15	54.15	54.15	-1.8	-1.76	-1.76	54.15	54.15	54.15	-1.8	-1.76	-1.76	Pheasant - Grouse Cress
1407	57.1	55.56	55.56	55.56	-1.5	-1.52	-1.52	55.56	55.56	55.56	-1.5	-1.52	-1.52	Pheasant - Grouse Cress
1408	58.4	57.19	57.19	57.19	-1.2	-1.17	-1.17	57.19	57.19	57.19	-1.2	-1.17	-1.17	Pheasant - Grouse Cress
1409	57.9	55.10	55.10	55.10	-2.8	-2.79	-2.79	55.10	55.10	55.10	-2.8	-2.79	-2.79	Pheasant - Grouse Cress
1410	57.7	54.68	54.68	54.68	-3.0	-3.02	-3.02	54.68	54.68	54.68	-3.0	-3.02	-3.02	Pheasant - Grouse Cress
1411	57.5	54.75	54.75	54.75	-2.7	-2.75	-2.75	54.75	54.75	54.75	-2.7	-2.75	-2.75	Pheasant - Grouse Cress
1412	57.1	54.37	54.37	54.39	-2.7	-2.69	-2.67	54.38	54.39	54.41	-2.7	-2.67	-2.65	Pheasant - Grouse Cress
1413	57.1	54.35	54.37	54.38	-2.8	-2.76	-2.75	54.38	54.39	54.41	-2.8	-2.74	-2.72	Pheasant - Grouse Cress
1414	56.9	54.35	54.37	54.38	-2.6	-2.57	-2.56	54.38	54.39	54.41	-2.6	-2.55	-2.53	Pheasant - Grouse Cress
1415	56.7	53.53	53.56	53.60	-3.1	-3.10	-3.06	53.58	53.61	53.65	-3.1	-3.05	-3.01	Pheasant - Grouse Cress
1416	56.0	53.53	53.56	53.60	-2.5	-2.47	-2.43	53.58	53.61	53.65	-2.4	-2.42	-2.38	Pheasant - Grouse Cress
1417	56.1	53.18	53.19	53.21	-3.0	-2.96	-2.94	53.20	53.22	53.24	-2.9	-2.93	-2.91	Pheasant - Grouse Cress
1418	56.6	52.51	52.51	52.51	-4.1	-4.08	-4.08	52.51	52.51	52.51	-4.1	-4.08	-4.08	Pheasant - Grouse Cress
1419	54.6	53.00	53.03	53.07	-1.6	-1.52	-1.48	53.05	53.08	53.12	-1.5	-1.47	-1.43	Pheasant - Grouse Cress
1420	54.9	52.57	52.59	52.60	-2.4	-2.36	-2.35	52.59	52.61	52.62	-2.4	-2.34	-2.33	Pheasant - Grouse Cress
1421	56.7	52.42	52.42	52.42	-4.3	-4.29	-4.29	52.42	52.42	52.42	-4.3	-4.29	-4.29	Pheasant - Grouse Cress
1422	54.9	52.50	52.50	52.50	-2.4	-2.40	-2.40	52.50	52.50	52.50	-2.4	-2.40	-2.40	Pheasant - Grouse Cress
1423	54.5	52.53	52.53	52.53	-2.0	-2.00	-2.00	52.53	52.53	52.53	-2.0	-2.00	-2.00	Pheasant - Grouse Cress
1424	54.4	51.78	51.78	51.78	-2.6	-2.60	-2.60	51.78	51.78	51.78	-2.6	-2.60	-2.60	Pheasant - Grouse Cress
1425	54.7	51.75	51.75	51.75	-2.9	-2.94	-2.94	51.75	51.75	51.75	-2.9	-2.94	-2.94	Pheasant - Grouse Cress
1426	54.5	51.79	51.81	51.84	-2.7	-2.64	-2.61	51.82	51.84	51.87	-2.6	-2.61	-2.58	Pheasant - Grouse Cress
1427	53.3	49.59	49.59	49.59	-3.8	-3.76	-3.76	49.59	49.59	49.59	-3.8	-3.76	-3.76	Pheasant - Grouse Cress
1428	51.4	48.18	48.18	48.18	-3.3	-3.26	-3.26	48.18	48.18	48.18	-3.3	-3.26	-3.26	Pheasant - Grouse Cress
1429	51.9	48.97	48.97	48.98	-2.9	-2.91	-2.90	48.98	48.98	48.99	-2.9	-2.90	-2.89	Pheasant - Grouse Cress
1430	49.6	47.45	47.61	47.79	-2.2	-1.99	-1.81	47.70	47.87	48.07	-1.9	-1.73	-1.53	Pheasant - Grouse Cress
1431	49.2	46.51	46.54	46.58	-2.7	-2.69	-2.65	46.56	46.59	46.70	-2.7	-2.64	-2.53	Pheasant - Grouse Cress
1434	50.2	46.00	46.04	46.17	-4.2	-4.12	-3.99	46.07	46.16	46.46	-4.1	-4.00	-3.70	Pheasant - Grouse Cress
1436	49.4	48.16	48.17	48.18	-1.2	-1.21	-1.20	48.18	48.18	48.19	-1.2	-1.20	-1.19	Pheasant - Grouse Cress
1437	50.8	48.29	48.31	48.34	-2.6	-2.53	-2.50	48.32	48.35	48.39	-2.5	-2.49	-2.45	Pheasant - Grouse Cress
1438	52.2	49.60	49.62	49.64	-2.6	-2.61	-2.59	49.63	49.65	49.67	-2.6	-2.58	-2.56	Pheasant - Grouse Cress
1439	52.1	49.76	49.78	49.80	-2.4	-2.34	-2.32	49.79	49.81	49.83	-2.3	-2.31	-2.29	Pheasant - Grouse Cress

Table A-4
Birch Point Drainage Study - Peak Stage Summary, with Project

		Existing Land Use						Future Land Use						
		Peak HGL (feet NAVD 88)			Height Above Flood Depth (ft)			Peak HGL (feet NAVD 88)			Height Above Flood Depth (ft)			
Junction	Flood Elev	100-year	Nov-21	limate Chang	100-year	Nov-21	limate Chang	100-year	Nov-21	limate Chang	100-year	Nov-21	limate Chang	Location
1440	51.8	50.18	50.20	50.24	-1.6	-1.61	-1.57	50.22	50.25	50.29	-1.6	-1.56	-1.52	Pheasant - Grouse Cress
1441	50.4	47.45	47.61	47.79	-2.9	-2.78	-2.60	47.70	47.87	48.07	-2.7	-2.52	-2.32	Pheasant - Grouse Cress
1442	48.9	46.52	46.55	46.59	-2.4	-2.36	-2.32	46.57	46.60	46.70	-2.3	-2.31	-2.21	Pheasant - Grouse Cress
1443	52.3	50.30	50.33	50.36	-2.0	-1.96	-1.93	50.35	50.37	50.41	-1.9	-1.92	-1.88	Pheasant - Grouse Cress
1446	51.3	50.43	50.47	50.52	-0.9	-0.84	-0.79	50.50	50.55	50.61	-0.8	-0.76	-0.70	Pheasant - Grouse Cress
1447	52.5	50.43	50.47	50.53	-2.1	-2.03	-1.97	50.50	50.55	50.61	-2.0	-1.95	-1.89	Pheasant - Grouse Cress
1448	53.1	51.36	51.36	51.36	-1.8	-1.78	-1.78	51.36	51.36	51.36	-1.8	-1.78	-1.78	Pheasant - Grouse Cress
1449	49.6	47.45	47.61	47.79	-2.2	-1.99	-1.81	47.70	47.87	48.07	-1.9	-1.73	-1.53	Pheasant - Grouse Cress
1450	48.6	46.51	46.54	46.58	-2.1	-2.09	-2.05	46.56	46.59	46.70	-2.1	-2.04	-1.93	Pheasant - Grouse Cress
1460	53.4	43.63	43.67	43.72	-9.7	-9.70	-9.65	43.66	43.71	43.77	-9.7	-9.66	-9.60	Pheasant - Grouse Cress
1239	52.4	50.85	50.85	50.85	-1.5	-1.54	-1.54	50.85	50.85	50.85	-1.5	-1.54	-1.54	Deer Trail Area
1240	52.4	50.60	50.60	50.60	-1.8	-1.80	-1.80	50.60	50.60	50.60	-1.8	-1.80	-1.80	Deer Trail Area
1241	52.1	50.57	50.57	50.57	-1.5	-1.54	-1.54	50.57	50.57	50.57	-1.5	-1.54	-1.54	Deer Trail Area
1242	52.0	49.84	49.84	49.84	-2.1	-2.13	-2.13	49.84	49.84	49.84	-2.1	-2.13	-2.13	Deer Trail Area
1243	50.6	50.00	50.00	50.01	-0.6	-0.58	-0.57	50.00	50.00	50.01	-0.6	-0.58	-0.57	Deer Trail Area
1451	42.7	36.98	37.13	37.31	-5.7	-5.60	-5.42	37.12	37.28	37.46	-5.6	-5.45	-5.27	Deer Trail Area
1452	46.2	45.01	45.01	45.01	-1.1	-1.15	-1.15	45.01	45.01	45.01	-1.1	-1.15	-1.15	Deer Trail Area
1453	49.1	46.30	46.30	46.30	-2.8	-2.75	-2.75	46.30	46.30	46.30	-2.8	-2.75	-2.75	Deer Trail Area
1454	49.3	47.01	47.01	47.01	-2.3	-2.28	-2.28	47.01	47.01	47.01	-2.3	-2.28	-2.28	Deer Trail Area
1457	47.9	35.91	35.95	36.01	-12.0	-11.99	-11.93	35.95	35.99	36.05	-12.0	-11.95	-11.89	Deer Trail Area
1463	51.8	50.44	50.45	50.46	-1.3	-1.31	-1.30	50.44	50.45	50.46	-1.3	-1.31	-1.30	Deer Trail Area
1464	52.0	49.98	49.99	50.00	-2.0	-2.00	-1.99	49.98	49.99	50.00	-2.0	-2.00	-1.99	Deer Trail Area
1467	51.1	49.71	49.74	49.78	-1.4	-1.36	-1.32	49.71	49.74	49.78	-1.4	-1.36	-1.32	Deer Trail Area
1468	52.3	50.67	50.69	50.70	-1.6	-1.63	-1.62	50.67	50.68	50.70	-1.6	-1.64	-1.62	Deer Trail Area
1469	52.5	51.01	51.03	51.05	-1.5	-1.45	-1.43	51.01	51.01	51.03	-1.5	-1.47	-1.45	Deer Trail Area
1472	50.4	51.02	51.01	51.03	0.6	0.61	0.63	51.00	51.02	51.04	0.6	0.62	0.64	Deer Trail Area
1473	51.4	50.98	50.99	51.01	-0.5	-0.45	-0.43	50.98	50.99	51.01	-0.5	-0.45	-0.43	Deer Trail Area
1474	51.7	50.98	50.99	51.01	-0.7	-0.73	-0.71	50.98	50.99	51.01	-0.7	-0.73	-0.71	Deer Trail Area
1475	52.6	50.96	50.98	50.99	-1.6	-1.60	-1.59	50.96	50.98	50.99	-1.6	-1.60	-1.59	Deer Trail Area
1476	52.5	50.94	50.96	50.97	-1.5	-1.51	-1.50	50.94	50.96	50.97	-1.5	-1.51	-1.50	Deer Trail Area
1477	52.8	50.67	50.69	50.70	-2.2	-2.13	-2.12	50.67	50.68	50.70	-2.2	-2.14	-2.12	Deer Trail Area
1478	52.7	50.54	50.55	50.56	-2.1	-2.13	-2.12	50.54	50.55	50.56	-2.1	-2.13	-2.12	Deer Trail Area
1479	52.7	49.99	50.00	50.01	-2.7	-2.68	-2.67	49.99	50.00	50.00	-2.7	-2.68	-2.68	Deer Trail Area
1481	50.1	47.59	47.60	47.61	-2.6	-2.55	-2.54	47.59	47.60	47.61	-2.6	-2.55	-2.54	Deer Trail Area
1348	12.8	12.16	12.38	12.65	-0.6	-0.38	-0.11	12.06	12.08	12.15	-0.7	-0.68	-0.61	Birch Bay Drive East at Deer Trail
1349	12.9	12.16	12.38	12.65	-0.7	-0.51	-0.24	12.06	12.08	12.15	-0.8	-0.81	-0.74	Birch Bay Drive East at Deer Trail
1350	13.2	12.16	12.38	12.65	-1.0	-0.79	-0.52	12.06	12.08	12.15	-1.1	-1.09	-1.02	Birch Bay Drive East at Deer Trail
1351	13.0	12.16	12.38	12.65	-0.9	-0.64	-0.37	12.00	12.05	12.12	-1.0	-0.97	-0.90	Birch Bay Drive East at Deer Trail
1352	13.9	12.12	12.34	12.61	-1.8	-1.56	-1.29	11.25	11.26	11.28	-2.7	-2.64	-2.62	Birch Bay Drive East at Deer Trail
1353	12.9	12.12	12.34	12.61	-0.8	-0.58	-0.31	10.89	10.96	11.05	-2.0	-1.96	-1.87	Birch Bay Drive East at Deer Trail
1483	18.0	12.15	12.36	12.62	-5.9	-5.64	-5.38	11.31	11.35	11.41	-6.7	-6.65	-6.59	Birch Bay Drive East at Deer Trail
1355	15.4	12.12	12.34	12.61	-3.2	-3.01	-2.74	10.93	11.00	11.08	-4.4	-4.35	-4.27	Birch Bay Drive East at Deer Trail
1339	13.2	10.19	10.22	10.25	-3.0	-3.00	-2.97	10.46	10.50	10.55	-2.8	-2.72	-2.67	Birch Bay Drive East at Deer Trail
1340	12.6	11.20	11.25	11.32	-1.4	-1.36	-1.29	12.58	12.91	13.34	0.0	0.30	0.73	Birch Bay Drive East at Deer Trail
1346	12.9	11.98	11.98	11.98	-0.9	-0.95	-0.95	12.58	12.91	13.34	-0.4	-0.02	0.41	Birch Bay Drive East at Deer Trail
1347	12.6	10.89	10.94	11.00	-1.7	-1.65	-1.59	11.86	12.09	12.37	-0.7	-0.50	-0.22	Birch Bay Drive East at Deer Trail
1356	14.0	12.70	12.72	12.74	-1.3	-1.28	-1.26	12.74	12.75	12.88	-1.3	-1.25	-1.12	Birch Bay Drive West at Deer Trail
1357	12.4	11.38	11.68	12.05	-1.1	-0.75	-0.38	11.97	12.35	12.87	-0.5	-0.08	0.44	Birch Bay Drive West at Deer Trail
1358	12.3	10.99	11.19	11.46	-1.3	-1.15	-0.88	11.40	11.68	12.06	-0.9	-0.66	-0.28	Birch Bay Drive West at Deer Trail
1359	12.2	10.99	11.19	11.46	-1.2	-1.04	-0.77	11.40	11.68	12.06	-0.8	-0.55	-0.17	Birch Bay Drive West at Deer Trail
1360	11.8	10.80	10.97	11.20	-1.0	-0.86	-0.63	11.15	11.39	11.71	-0.7	-0.44	-0.12	Birch Bay Drive West at Deer Trail
1361	11.6	10.80	10.97	11.20	-0.8	-0.64	-0.41	11.15	11.39	11.71	-0.5	-0.22	0.10	Birch Bay Drive West at Deer Trail
1362	11.4	10.80	10.97	11.20	-0.6	-0.40	-0.17	11.15	11.39	11.71	-0.2	0.02	0.34	Birch Bay Drive West at Deer Trail
1363	11.9	10.99	11.19	11.45	-0.9	-0.71	-0.45	11.39	11.67	12.05	-0.5	-0.23	0.15	Birch Bay Drive West at Deer Trail
1364	11.9	11.07	11.23	11.47	-0.8	-0.64	-0.40	11.42	11.68	12.05	-0.4	-0.19	0.18	Birch Bay Drive West at Deer Trail
1171	52.0	50.61	50.63	50.65	-1.4	-1.35	-1.33	50.65	50.67	50.70	-1.3	-1.31	-1.28	Richmond Park - Richmond Park Road South
1172	51.5	49.89	49.91	49.95	-1.6	-1.63	-1.59	49.95	50.00	50.16	-1.6	-1.54	-1.38	Richmond Park - Richmond Park Road South
1173	50.7	48.92	48.99	49.26	-1.8	-1.74	-1.47	49.23	49.46	49.76	-1.5	-1.27	-0.97	Richmond Park - Richmond Park Road South
1180	50.6	47.91	47.93	47.95	-2.7	-2.63	-2.61	47.94	47.96	47.98	-2.6	-2.60	-2.58	Richmond Park - Richmond Park Road South
1181	50.7	48.72	48.81	49.03	-1.9	-1.84	-1.62	49.01	49.19	49.43	-1.6	-1.46	-1.22	Richmond Park - Richmond Park Road South
1182	49.3	47.51	47.52	47.53	-1.8	-1.81	-1.80	47.51	47.52	47.53	-1.8	-1.81	-1.80	Richmond Park - Richmond Park Road South
1184	51.7	44.23	44.25	44.27	-7.5	-7.44	-7.42	44.25	44.26	44.28	-7.4	-7.43	-7.41	Richmond Park - Richmond Park Road South
1188	49.2	47.26	47.27	47.28	-2.0	-1.97	-1.96	47.26	47.27	47.28	-2.0	-1.97	-1.96	Richmond Park - Richmond Park Road South
1189	50.1	47.02	47.06	47.10	-3.1	-3.05	-3.01	47.05	47.08	47.13	-3.1	-3.03	-2.98	Richmond Park - Richmond Park Road South
1190	50.5	46.87	46.91	46.96	-3.6	-3.59	-3.54	46.90	46.94	46.99	-3.6	-3.56	-3.51	Richmond Park - Richmond Park Road South
1191	50.2	46.98	47.01	47.05	-3.2	-3.18	-3.14	47.00	47.04	47.07	-3.2	-3.15	-3.12	Richmond Park - Richmond Park Road South
1192	50.7	47.01	47.05	47.10	-3.7	-3.64	-3.59	47.04	47.08	47.12	-3.6	-3.61	-3.57	Richmond Park - Richmond Park Road South
1193	50.7	48.27	48.28	48.28	-2.5	-2.46	-2.46	48.27	48.28	48.28	-2.5	-2.46	-2.46	Richmond Park - Richmond Park Road South
1194	51.1	48.08	48.10	48.11	-3.0	-2.95	-2.94	48.09	48.11	48.13	-3.0	-2.94	-2.92	Richmond Park - Richmond Park Road North
1195	50.9	49.39	49.43	49.48	-1.5	-1.51	-1.46	49.42	49.46	49.51	-1.5	-1.48	-1.43	Richmond Park - Richmond Park Road North
1196	51.9	49.40	49.44	49.48	-2.5	-2.44	-2.40	49.43	49.47	49.52	-2.5	-2.41	-2.36	Richmond Park - Richmond Park Road North
1197	51.2	50.11	50.16	50.22	-1.1	-1.04	-0.98	50.15	50.21	50.27	-1.0	-0.99	-0.93	Richmond Park - Richmond Park Road North
1198	51.1	50.11	50.16	50.22	-1.0	-0.91	-0.85	50.15	50.21	50.28	-0.9	-0.86	-0.79	Richmond Park - Richmond Park Road North
1199	52.0	50.56	50.61	50.69	-1.4	-1.36	-1.28	50.59	50.66	50.73	-1.4	-1.31	-1.24	Richmond Park - Richmond Park Road North
1200	51.6	50.55	50.60	50.68	-1.1	-1.04	-0.96	50.60	50.66	50.73	-1.0	-0.98	-0.91	Richmond Park - Richmond Park Road North
1201	52.5	51.18	51.27	51.37	-1.3	-1.22	-1.12	51.20	51.28	51.36	-1.3	-1.21	-1.13	Richmond Park - Richmond Park Road North
1202	52.3	51.57	51.69	51.81	-0.7	-0.58	-0.46	51.56	51.65	51.77	-0.7	-0.62	-0.50	Richmond Park - Richmond Park Road North
1203	52.4	52.14	52.28	52.44	-0.3	-0.13	0.03	52.09	52.21	52.33	-0.3	-0.20	-0.08	Richmond Park - Richmond Park Road North
1204	52.4	52.15	52.29	52.45	-0.3	-0.11	0.05	52.10	52.22	52.33	-0.3	-0.18	-0.07	Richmond Park - Richmond Park Road North
1204B	52.0	52.16	52.30	52.45	0.2	0.30	0.45	52.17	52.29	52.41	0.2	0.29	0.41	Richmond Park - Richmond Park Road North
1205	52.2	51.18	51.27	51.37	-1.1	-0.96	-0.86	51.21	51.28	51.36	-1.0	-0.95	-0.87	Richmond Park - Richmond Park Road North
1206	53.2	51.18	51.23	51.31	-2.0	-1.94	-1.86	51.18	51.24	51.30	-2.0	-1.93	-1.87	Richmond Park - Richmond Park Road North
1207	53.1	51.15	51.21	51.28	-1.9	-1.85	-1.78	51.18	51.24	51.30	-1.9	-1.82	-1.76	Richmond Park - Richmond Park Road North
1208	52.6	51.12	51.16	51.20	-1.5	-1.44	-1.40	51.15	51.19	51.24	-1.4	-1.41	-1.36	Richmond Park - Richmond Park Road North
1209	52.6	51.12	51.16	51.20	-1.5	-1.49	-1.45	51.15	51.19	51.24	-1.5	-1.46	-1.41	Richmond Park - Richmond Park Road North
1210	52.8	51.07	51.09	51.10	-1.7	-1.67	-1.66	51.08	51.09	51.10	-1.7	-1.67	-1.66	Richmond Park - Richmond Park Road North
1211	51.8	51.07	51.09	51.10	-0.7	-0.72	-0.71	51.08	51.09	51.10	-0.7	-0.72	-0.71	Richmond Park - Richmond Park Road North
1220	51.9	49.44	49.50	49.56	-2.5	-2.41	-2.35	49.49	49.54	49.60	-2.4	-2.37	-2.31	Richmond Park - Richmond Park Road North
1221	51.0	49.40	49.44	49.48	-1.6	-1.52	-1.48	49.43	49.47	49.52	-1.5	-1.49	-1.44	Richmond Park - Richmond Park Road North
1222	51.4	50.06	50.07	50.08	-1.4	-1.34	-1.33	50.06	50.07	50.08	-1.4	-1.34	-1.33	Richmond Park - Richmond Park Road North
1227	52.1	51.04	51.05	51.07	-1.0	-1.03	-1.01	51.04	51.05	51.07	-1.0	-1.03	-1.01	Richmond Park - Richmond Crescent
1228	53.5	51.04	51.05	51.07	-2.5	-2.44	-2.42	51.04	51.05	51.07	-2.5	-2.44	-2.42	Richmond Park - Richmond Crescent
1229	52.4	51.02	51.04	51.05	-1.4	-1.36	-1.35	51.02	51.04	51.06	-1.4	-1.36	-1.34	Richmond Park - Richmond Crescent

Table A-4
Birch Point Drainage Study - Peak Stage Summary, with Project

		Existing Land Use						Future Land Use						
		Peak HGL (feet NAVD 88)			Height Above Flood Depth (ft)			Peak HGL (feet NAVD 88)			Height Above Flood Depth (ft)			
Junction	Flood Elev	100-year	Nov-21	imate Chang	100-year	Nov-21	imate Chang	100-year	Nov-21	imate Chang	100-year	Nov-21	imate Chang	Location
1230	51.8	50.98	51.00	51.01	-0.8	-0.81	-0.80	50.98	51.00	51.01	-0.8	-0.81	-0.80	Richmond Park - Richmond Crescent
1272	61.1	59.70	59.73	59.75	-1.4	-1.37	-1.35	59.72	59.75	59.77	-1.4	-1.35	-1.33	Shintaffer north of Semiahmoo Parkway
1273	60.3	59.71	59.73	59.76	-0.6	-0.56	-0.53	59.73	59.76	59.78	-0.6	-0.53	-0.51	Shintaffer north of Semiahmoo Parkway
1274	63.2	61.18	61.18	61.19	-2.0	-2.02	-2.01	61.18	61.19	61.19	-2.0	-2.01	-2.01	Shintaffer north of Semiahmoo Parkway
1275	59.7	59.65	59.67	59.70	0.0	0.01	0.04	59.67	59.69	59.71	0.0	0.03	0.05	Shintaffer north of Semiahmoo Parkway
1276	59.3	57.88	57.92	57.96	-1.4	-1.39	-1.35	57.86	57.89	57.93	-1.4	-1.42	-1.38	Shintaffer north of Semiahmoo Parkway
1277	64.1	63.35	63.55	63.79	-0.7	-0.55	-0.31	63.54	63.76	64.02	-0.6	-0.34	-0.08	Shintaffer north of Semiahmoo Parkway
1278	64.3	61.76	61.78	61.80	-2.5	-2.47	-2.45	61.78	61.80	61.82	-2.5	-2.45	-2.43	Shintaffer north of Semiahmoo Parkway
1280	63.7	61.65	61.66	61.68	-2.0	-2.00	-1.98	61.66	61.67	61.69	-2.0	-1.99	-1.97	Shintaffer north of Semiahmoo Parkway
1281	64.8	63.41	63.51	63.60	-1.4	-1.29	-1.20	63.50	63.59	63.69	-1.3	-1.21	-1.11	Shintaffer north of Semiahmoo Parkway
1284	58.2	54.48	54.75	55.09	-3.7	-3.40	-3.06	57.28	57.23	57.28	-0.9	-0.92	-0.87	Shintaffer north of Semiahmoo Parkway
1298	56.9	54.86	54.88	55.12	-2.1	-2.05	-1.81	56.59	57.23	57.28	-0.3	0.30	0.35	Shintaffer north of Semiahmoo Parkway
1308	65.7	63.41	63.51	63.60	-2.2	-2.14	-2.05	63.50	63.59	63.70	-2.2	-2.06	-1.95	Shintaffer north of Semiahmoo Parkway
1309	64.7	63.42	63.51	63.61	-1.3	-1.19	-1.09	63.51	63.60	63.70	-1.2	-1.10	-1.00	Shintaffer north of Semiahmoo Parkway
1310	65.5	63.42	63.51	63.61	-2.1	-2.04	-1.94	63.51	63.60	63.70	-2.0	-1.95	-1.85	Shintaffer north of Semiahmoo Parkway
1311	66.3	63.82	63.84	63.86	-2.5	-2.45	-2.43	63.84	63.86	63.87	-2.4	-2.43	-2.42	Shintaffer north of Semiahmoo Parkway
1316	67.0	64.48	64.50	64.53	-2.6	-2.54	-2.51	64.50	64.53	64.55	-2.5	-2.51	-2.49	Shintaffer north of Semiahmoo Parkway
1317	65.5	64.37	64.38	64.40	-1.1	-1.09	-1.07	64.38	64.40	64.41	-1.1	-1.07	-1.06	Shintaffer north of Semiahmoo Parkway
1253	78.6	77.17	77.17	77.17	-1.5	-1.47	-1.47	77.17	77.17	77.17	-1.5	-1.47	-1.47	Semiahmoo Parkway
1254	82.3	80.43	80.43	80.43	-1.9	-1.86	-1.86	80.43	80.43	80.43	-1.9	-1.86	-1.86	Semiahmoo Parkway
1256	66.6	65.62	65.69	65.78	-1.0	-0.95	-0.86	66.19	66.29	66.44	-0.4	-0.35	-0.20	Semiahmoo Parkway
1257	67.0	65.44	65.51	65.59	-1.6	-1.54	-1.46	66.00	66.11	66.29	-1.0	-0.94	-0.76	Semiahmoo Parkway
1258	80.8	77.45	77.45	77.45	-3.4	-3.36	-3.36	77.45	77.45	77.45	-3.4	-3.36	-3.36	Semiahmoo Parkway
1259	67.0	63.87	63.98	64.11	-3.2	-3.04	-2.91	65.07	65.43	65.89	-2.0	-1.59	-1.13	Semiahmoo Parkway
1260	68.6	62.96	62.98	63.01	-5.7	-5.66	-5.63	63.17	63.20	63.24	-5.5	-5.44	-5.40	Semiahmoo Parkway
1261	64.7	63.53	63.54	63.55	-1.1	-1.12	-1.11	63.60	63.61	63.63	-1.1	-1.05	-1.03	Semiahmoo Parkway
1262	64.0	62.77	62.77	62.78	-1.3	-1.26	-1.25	62.79	62.80	62.80	-1.2	-1.23	-1.23	Semiahmoo Parkway
1263	64.9	61.79	61.83	61.87	-3.1	-3.07	-3.03	62.01	62.04	62.07	-2.9	-2.86	-2.83	Semiahmoo Parkway
1264	65.8	61.41	61.45	61.49	-4.4	-4.35	-4.31	61.69	61.74	61.79	-4.1	-4.06	-4.01	Semiahmoo Parkway
1265	64.5	61.40	61.44	61.48	-3.1	-3.02	-2.98	61.69	61.73	61.78	-2.8	-2.73	-2.68	Semiahmoo Parkway
1266	60.0	57.67	57.75	57.86	-2.3	-2.26	-2.15	58.42	58.55	58.71	-1.6	-1.46	-1.30	Semiahmoo Parkway
1267	60.1	56.99	57.03	57.08	-3.2	-3.12	-3.07	57.32	57.53	57.69	-2.8	-2.62	-2.46	Semiahmoo Parkway
1268	59.8	58.26	58.27	58.29	-1.5	-1.51	-1.49	58.35	58.37	58.38	-1.4	-1.41	-1.40	Semiahmoo Parkway
1269	60.2	58.04	58.05	58.06	-2.2	-2.17	-2.16	58.12	58.13	58.14	-2.1	-2.09	-2.08	Semiahmoo Parkway
1270	60.2	58.04	58.05	58.06	-2.2	-2.16	-2.15	58.11	58.12	58.14	-2.1	-2.09	-2.07	Semiahmoo Parkway
1271	60.0	57.54	57.55	57.56	-2.5	-2.48	-2.47	57.59	57.60	57.61	-2.4	-2.43	-2.42	Semiahmoo Parkway
1286	56.8	55.84	55.85	55.85	-0.9	-0.92	-0.92	56.06	56.47	56.48	-0.7	-0.30	-0.29	Semiahmoo Parkway
1297	56.4	54.21	54.43	54.70	-2.2	-1.95	-1.68	56.38	56.35	56.38	0.0	-0.03	0.00	Semiahmoo Parkway
1327	67.8	64.43	64.49	64.56	-3.3	-3.27	-3.20	65.14	65.47	65.91	-2.6	-2.29	-1.85	Semiahmoo Parkway
1328	67.7	65.00	65.07	65.14	-2.7	-2.62	-2.55	65.56	65.73	66.03	-2.1	-1.96	-1.66	Semiahmoo Parkway
1329	66.7	65.27	65.34	65.41	-1.5	-1.40	-1.33	65.82	65.95	66.17	-0.9	-0.79	-0.57	Semiahmoo Parkway
1330	67.5	65.58	65.66	65.74	-1.9	-1.82	-1.74	66.14	66.24	66.40	-1.3	-1.24	-1.08	Semiahmoo Parkway
1331	64.5	63.67	63.68	63.69	-0.8	-0.84	-0.83	63.74	63.75	63.77	-0.8	-0.77	-0.75	Semiahmoo Parkway
1332	65.5	64.06	64.06	64.06	-1.4	-1.42	-1.42	64.06	64.06	64.06	-1.4	-1.42	-1.42	Semiahmoo Parkway
1333	64.8	63.68	63.69	63.70	-1.1	-1.07	-1.06	63.75	63.76	63.78	-1.0	-1.00	-0.98	Semiahmoo Parkway
1291	55.0	52.94	53.00	53.07	-2.1	-2.00	-1.93	53.18	53.26	53.29	-1.8	-1.74	-1.71	Shintaffer North of Richmond Park - West Side
1296	56.3	54.18	54.39	54.66	-2.1	-1.91	-1.64	56.30	56.30	56.30	0.0	0.00	0.00	Shintaffer North of Richmond Park - West Side
1318	54.3	52.94	53.00	53.07	-1.4	-1.30	-1.23	53.18	53.25	53.28	-1.1	-1.05	-1.02	Shintaffer North of Richmond Park - West Side
1326	55.2	52.59	52.68	52.78	-2.6	-2.52	-2.42	52.74	52.91	53.01	-2.5	-2.29	-2.19	Shintaffer North of Richmond Park - West Side
1326A	54.4	52.52	52.60	52.68	-1.9	-1.80	-1.72	52.58	52.74	52.82	-1.8	-1.66	-1.58	Shintaffer North of Richmond Park - West Side
1326B	53.1	52.46	52.52	52.59	-0.6	-0.53	-0.46	52.43	52.56	52.64	-0.6	-0.49	-0.41	Shintaffer North of Richmond Park - West Side
1326C	52.8	52.39	52.45	52.51	-0.4	-0.30	-0.24	52.27	52.39	52.46	-0.5	-0.36	-0.29	Shintaffer North of Richmond Park - West Side
1319	54.2	52.33	52.49	52.71	-1.9	-1.70	-1.48	52.75	52.96	53.36	-1.4	-1.23	-0.83	Middle Shintaffer
1320	53.0	52.33	52.49	52.71	-0.7	-0.51	-0.29	52.75	52.96	53.36	-0.3	-0.04	0.36	Middle Shintaffer
1321	53.2	52.33	52.49	52.71	-0.9	-0.74	-0.52	52.75	53.00	53.41	-0.5	-0.23	0.18	Middle Shintaffer
1322	52.4	52.33	52.49	52.71	-0.1	0.05	0.27	52.78	53.00	53.42	0.3	0.56	0.98	Middle Shintaffer
1323	52.7	52.04	52.17	52.32	-0.6	-0.51	-0.36	52.34	52.56	52.95	-0.3	-0.12	0.27	Middle Shintaffer
1323	52.7	52.04	52.17	52.32	-0.6	-0.51	-0.36	52.34	52.56	52.95	-0.3	-0.12	0.27	Middle Shintaffer
1323A	52.7	52.04	52.17	52.32	-0.7	-0.53	-0.38	52.34	52.56	52.96	-0.4	-0.14	0.26	Middle Shintaffer
1324	52.4	52.34	52.39	52.47	-0.1	-0.01	0.07	52.11	52.23	52.32	-0.3	-0.17	-0.08	Middle Shintaffer
1235	53.2	51.82	51.93	52.07	-1.4	-1.30	-1.16	52.10	52.27	52.58	-1.1	-0.96	-0.65	Middle Shintaffer
1236	53.6	51.82	51.93	52.07	-1.8	-1.67	-1.53	52.10	52.27	52.58	-1.5	-1.33	-1.02	Middle Shintaffer
1237	52.9	52.04	52.17	52.32	-0.8	-0.68	-0.53	52.34	52.56	52.95	-0.5	-0.29	0.10	Middle Shintaffer
1238	53.9	51.81	51.92	52.06	-2.1	-1.96	-1.82	52.09	52.26	52.56	-1.8	-1.62	-1.32	Middle Shintaffer
1292	54.6	52.60	52.70	52.79	-2.0	-1.90	-1.81	52.76	52.94	53.05	-1.8	-1.66	-1.55	Middle Shintaffer
1293	55.4	52.59	52.68	52.78	-2.8	-2.68	-2.58	52.74	52.91	53.01	-2.6	-2.45	-2.35	Middle Shintaffer
1294	54.9	53.45	53.47	53.48	-1.5	-1.47	-1.46	53.52	53.54	53.56	-1.4	-1.40	-1.38	Middle Shintaffer
1295	55.9	53.94	53.96	53.98	-1.9	-1.90	-1.88	54.06	54.09	54.13	-1.8	-1.77	-1.73	Middle Shintaffer
1300	54.9	53.96	53.96	53.98	-1.0	-0.97	-0.95	54.06	54.09	54.13	-0.9	-0.84	-0.80	Middle Shintaffer
1325	54.8	52.60	52.70	52.79	-2.2	-2.10	-2.01	52.76	52.94	53.05	-2.0	-1.86	-1.75	Middle Shintaffer
501	26.5	23.17	23.18	23.19	-3.4	-3.36	-3.35	23.59	23.61	23.63	-2.9	-2.93	-2.91	Lower Shintaffer
505	30.0	27.11	27.11	27.11	-2.9	-2.92	-2.92	27.11	27.11	27.11	-2.9	-2.92	-2.92	Lower Shintaffer
507	48.9	45.23	45.24	45.25	-3.7	-3.67	-3.66	45.55	45.56	45.58	-3.4	-3.35	-3.33	Lower Shintaffer
508	51.7	47.62	47.63	47.64	-4.1	-4.04	-4.03	48.10	48.12	48.15	-3.6	-3.55	-3.52	Lower Shintaffer
509	52.5	47.94	47.94	47.94	-4.6	-4.59	-4.59	48.08	48.11	48.12	-4.5	-4.42	-4.41	Lower Shintaffer
511	52.5	48.11	48.12	48.15	-4.4	-4.43	-4.40	48.78	48.84	48.89	-3.8	-3.71	-3.66	Lower Shintaffer
514	52.4	48.49	48.52	48.56	-3.9	-3.88	-3.84	49.06	49.12	49.20	-3.3	-3.28	-3.20	Lower Shintaffer
518	52.2	48.85	48.90	48.96	-3.3	-3.29	-3.23	49.43	49.45	49.56	-2.8	-2.74	-2.63	Lower Shintaffer
519	52.2	48.89	48.93	49.00	-3.3	-3.24	-3.17	49.47	49.52	49.61	-2.7	-2.65	-2.56	Lower Shintaffer
520	51.9	49.00	49.05	49.14	-2.9	-2.82	-2.73	49.58	49.65	49.72	-2.3	-2.22	-2.15	Lower Shintaffer
521	52.4	49.23	49.29	49.39	-3.2	-3.15	-3.05	49.78	49.87	49.93	-2.7	-2.57	-2.51	Lower Shintaffer
522	51.7	49.35	49.43	49.53	-2.3	-2.23	-2.13	49.89	50.00	50.05	-1.8	-1.66	-1.61	Lower Shintaffer
523	52.9	51.33	51.42	51.53	-1.6	-1.48	-1.37	51.56	51.69	51.94	-1.3	-1.21	-0.96	Lower Shintaffer
524	52.4	50.88	50.95	51.04	-1.5	-1.44	-1.35	51.05	51.16	51.35	-1.3	-1.23	-1.04	Lower Shintaffer
525	51.8	50.88	50.95	51.04	-0.9	-0.86	-0.77	51.05	51.16	51.35	-0.8	-0.65	-0.46	Lower Shintaffer
527	51.5	49.28	49.29	49.29	-2.2	-2.21	-2.21	49.33	49.33	49.34	-2.2	-2.17	-2.16	Lower Shintaffer
1244	51.8	49.61	49.71	49.80	-2.2	-2.08	-1.99	50.10	50.23	50.27	-1.7	-1.56	-1.52	Lower Shintaffer
1245	52.9	51.33	51.42	51.54	-1.6	-1.52	-1.40	51.56	51.70	51.94	-1.4	-1.24	-1.00	Lower Shintaffer
1246	53.3	51.81	51.92	52.06	-1.5	-1.42	-1.28	52.09	52.26	52.56	-1.3	-1.08	-0.78	Lower Shintaffer
BP21aPond	164.2	160.51	160.72	160.98	-3.7	-3.48	-3.22	163.32	163.85	164.43	-0.9	-0.35	0.23	Semiahmoo Uplands
FieldPond1	152.7	147.65	147.75	147.87	-5.0	-4.95	-4.83	148.08	148.23	148.45	-4.6	-4.47	-4.25	Semiahmoo Uplands
G1-1	81.8	82.66	82.71	82.77	0.9	0.92	0.98	82.70	82.75	82.81	0.9	0.96	1.02	Semiahmoo Uplands
G1-2	90.3	90.33	90.48	90.62	0.0	0.18	0.32	90.57	90.66	90.72	0.3	0.36	0.42	Semiahmoo Uplands

Table A-4
Birch Point Drainage Study - Peak Stage Summary, with Project

		Existing Land Use						Future Land Use						
		Peak HGL (feet NAVD 88)			Height Above Flood Depth (ft)			Peak HGL (feet NAVD 88)			Height Above Flood Depth (ft)			
Junction	Flood Elev	100-year	Nov-21	limate Chang	100-year	Nov-21	limate Chang	100-year	Nov-21	limate Chang	100-year	Nov-21	limate Chang	Location
G2-1	75.5	75.69	75.85	75.95	0.2	0.35	0.45	76.25	76.31	76.39	0.8	0.81	0.89	Semiahmoo Uplands
G2-2	74.0	74.95	75.02	75.11	1.0	1.02	1.11	75.05	75.13	75.22	1.1	1.13	1.22	Semiahmoo Uplands
SU-1b	229.0	226.57	226.76	226.98	-2.4	-2.24	-2.02	227.21	227.45	227.74	-1.8	-1.55	-1.26	Semiahmoo Uplands
TF-1	80.6	80.92	81.10	81.29	0.3	0.46	0.65	81.11	81.28	81.43	0.5	0.64	0.79	Semiahmoo Uplands
HorizonPond	32.4	33.15	33.34	33.58	0.7	0.92	1.16	34.35	34.59	34.92	1.9	2.17	2.50	Horizon Pond
PD63	33.7	32.08	32.56	33.12	-1.6	-1.11	-0.55	32.59	33.07	33.70	-1.1	-0.60	0.03	Horizon Pond
Lake6	181.0	179.75	179.80	179.86	-1.3	-1.20	-1.14	179.90	179.96	180.04	-1.1	-1.04	-0.96	Semiahmoo Golf Course
Lake9	235.0	231.75	231.78	231.82	-3.3	-3.22	-3.18	231.85	231.88	231.93	-3.2	-3.12	-3.07	Semiahmoo Golf Course
Lake12	229.2	226.58	226.76	226.98	-2.6	-2.44	-2.22	227.21	227.45	227.74	-2.0	-1.75	-1.46	Semiahmoo Golf Course
Lake18	235.0	233.13	233.20	233.30	-1.9	-1.80	-1.70	233.32	233.41	233.53	-1.7	-1.59	-1.47	Semiahmoo Golf Course
Pond3Dn_In	8.4	7.30	7.43	7.59	-1.1	-0.97	-0.81	7.39	7.53	7.71	-1.0	-0.87	-0.69	Birch Bay Village

Table A-6
Birch Point Drainage Study - Peak Flow Summary, with Project

	Existing Condition with Project			Future Condition with Project			
	Peak Flow (cfs)			Peak Flow (cfs)			
Conduit	100 Year	Nov-21	Climate Change	100 Year	Nov-21	Climate Change	Location
C1006	2.9	3.2	3.6	3.1	3.4	3.7	Birch Point Road West of Selder
OD1752	2.9	3.2	3.5	3.0	3.3	3.7	Birch Point Road West of Selder
C1007	2.8	3.1	3.4	2.9	3.2	3.6	Birch Point Road West of Selder
OF-C1007	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road West of Selder
OD1010_1	2.8	3.1	3.4	2.9	3.2	3.6	Birch Point Road West of Selder
OD1756	0.0	0.0	2.9	4.1	25.5	39.8	Birch Point Road West of Selder
OD1757	53.2	59.9	67.7	69.9	77.9	78.4	Birch Point Road West of Selder
C1008	55.1	64.5	78.0	64.6	66.7	68.8	Birch Point Road West of Selder
C1008-OF	0.0	0.0	0.0	31.3	54.6	71.9	Birch Point Road West of Selder
OD1010_4	2.9	4.3	6.7	4.6	6.5	8.3	Birch Point Road West of Selder
OD1010_2	2.8	3.0	3.4	2.9	3.2	3.5	Birch Point Road West of Selder
OD1010_3	3.0	4.3	6.7	4.4	6.4	8.3	Birch Point Road West of Selder
OD1753	3.0	3.2	3.6	3.1	3.4	3.8	Birch Point Road West of Selder
OD1755	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road West of Selder
GM3875	17.7	19.0	20.9	21.7	21.8	22.0	Birch Point Road West of Selder
GM3873	4.6	6.0	9.8	14.0	18.2	23.9	Birch Point Road West of Selder
GM3878	16.2	16.8	17.7	18.2	20.1	20.5	Birch Point Road West of Selder
GM3872	4.6	6.0	9.8	14.0	18.2	23.9	Birch Point Road West of Selder
C1009	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road West of Selder
OD1759	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road West of Selder
OD1031	0.8	1.2	2.3	3.7	5.1	7.1	Birch Point Road West of Selder
C1025	8.0	9.2	11.1	11.9	12.4	12.7	Birch Point Road West of Selder
C1025-OF	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road West of Selder
BBVC18	9.4	11.3	14.2	15.5	17.8	19.1	Birch Point Road West of Selder
C1026	9.9	11.3	13.8	15.2	20.6	28.1	Birch Point Road West of Selder
OD1032	6.0	6.2	7.2	6.1	6.4	6.6	Birch Point Road West of Selder
OD1034	18.3	20.0	23.2	24.2	31.2	39.7	Birch Point Road West of Selder
GM3874	17.7	19.0	20.9	21.7	21.8	22.0	Birch Point Road West of Selder
GM3877	1.5	2.2	3.2	3.5	3.5	3.6	Birch Point Road West of Selder
OD1020_1	3.4	5.2	8.5	12.3	15.8	20.2	Birch Point Road West of Selder
OD1020_2	3.5	4.3	5.1	5.7	6.5	7.0	Birch Point Road West of Selder
OD1020_3	18.2	22.1	26.5	30.3	32.0	34.3	Birch Point Road West of Selder
OD1020_4	19.1	23.5	28.6	33.2	35.6	39.1	Birch Point Road West of Selder
BBVC1	16.2	16.8	17.7	18.3	20.2	20.7	Birch Point Road West of Selder
OD1761	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road West of Selder
OD1782	1.5	2.1	3.1	3.7	5.5	5.9	Birch Point Road West of Selder
OD1784	1.5	2.2	3.1	3.8	5.5	5.9	Birch Point Road West of Selder
CV3570	0.0	0.0	0.0	0.0	0.0	0.0	Bay Ridge Estates - West Shoreview Road
OD1001	0.6	0.6	0.4	0.6	0.6	0.7	Bay Ridge Estates - West Shoreview Road
CV3571	1.0	1.0	0.9	1.0	1.0	1.1	Bay Ridge Estates - West Shoreview Road
OD1002	6.2	6.2	5.8	6.2	6.2	6.2	Bay Ridge Estates - West Shoreview Road
CV3572	3.1	3.1	3.1	3.1	3.1	3.1	Bay Ridge Estates - West Shoreview Road
OD1000	0.0	0.0	0.0	0.0	0.0	0.0	Bay Ridge Estates - West Shoreview Road
CV3586	1.3	1.5	1.9	2.0	2.0	2.3	Bay Ridge Estates - West Shoreview Road
OD1762_2	0.0	0.3	3.1	0.8	1.4	2.5	Bay Ridge Estates - West Shoreview Road
GM3867	0.7	0.8	1.1	1.5	1.9	2.6	Bay Ridge Estates - West Shoreview Road
OD1762_1	1.0	1.1	1.4	2.1	3.0	4.1	Bay Ridge Estates - West Shoreview Road
GM3866	0.4	0.5	0.8	1.2	1.6	2.3	Bay Ridge Estates - West Shoreview Road
OD0985lower	3.9	4.2	4.4	4.1	4.3	4.5	Bay Ridge Estates - East Shoreview Road
CV3575	2.1	2.1	2.1	2.1	2.1	2.1	Bay Ridge Estates - East Shoreview Road
OD1004	2.2	2.2	2.2	2.2	2.2	2.2	Bay Ridge Estates - East Shoreview Road
CV3592.1	0.5	0.5	0.6	0.6	0.6	0.6	Bay Ridge Estates - East Shoreview Road
OD1009	1.6	1.8	1.9	2.2	2.2	2.3	Bay Ridge Estates - East Shoreview Road
SM781	2.3	2.3	2.3	2.3	2.3	2.3	Bay Ridge Estates - East Shoreview Road
SM789	3.1	3.1	3.1	3.2	3.2	3.2	Bay Ridge Estates - East Shoreview Road
SM778	2.6	2.6	2.7	2.6	2.7	2.7	Bay Ridge Estates - East Shoreview Road
SM790	4.0	4.1	4.1	4.1	4.1	4.1	Bay Ridge Estates - East Shoreview Road
SM782	4.3	5.1	5.8	5.1	5.8	6.6	Bay Ridge Estates - East Shoreview Road
SM783	7.4	8.3	9.2	8.3	9.0	10.0	Bay Ridge Estates - East Shoreview Road
SM777	2.9	3.0	3.1	2.9	3.0	3.1	Bay Ridge Estates - East Shoreview Road
SM780	2.1	2.1	2.1	2.1	2.1	2.1	Bay Ridge Estates - East Shoreview Road
SM788	2.9	2.9	3.0	3.1	3.1	3.1	Bay Ridge Estates - East Shoreview Road
CV3544	3.0	3.0	2.8	3.0	3.0	3.0	Bay Ridge Estates - Bay Ridge Drive South
OD994	24.5	24.6	24.1	24.6	24.7	24.9	Bay Ridge Estates - Bay Ridge Drive South
OD1015	0.5	0.5	0.6	0.6	0.6	0.6	Bay Ridge Estates - Bay Ridge Drive South
SM732	6.3	6.7	7.2	7.3	7.7	8.3	Bay Ridge Estates - Bay Ridge Drive South
SM757	0.5	0.5	0.5	0.5	0.5	0.5	Bay Ridge Estates - Bay Ridge Drive South
SM758	0.5	0.5	0.6	0.5	0.6	0.9	Bay Ridge Estates - Bay Ridge Drive South
SM748	2.2	2.2	2.1	2.2	2.2	2.2	Bay Ridge Estates - Bay Ridge Drive South
SM761	0.8	0.8	0.9	0.8	0.9	1.2	Bay Ridge Estates - Bay Ridge Drive South
SM749	2.4	2.4	2.4	2.5	2.4	2.4	Bay Ridge Estates - Bay Ridge Drive South
SM755	2.7	2.7	2.7	2.7	2.7	2.7	Bay Ridge Estates - Bay Ridge Drive South
OD984	8.1	8.2	7.3	8.2	8.3	8.4	Bay Ridge Estates - Bay Ridge Drive South
SM743	1.9	1.9	1.9	2.1	2.0	2.0	Bay Ridge Estates - Bay Ridge Drive South
SM753	1.5	1.6	1.9	1.7	1.8	2.3	Bay Ridge Estates - Bay Ridge Drive South
OD985Upper	1.1	1.3	1.3	1.3	1.4	1.6	Bay Ridge Estates - Bay Ridge Drive South
CV3346	1.0	1.1	1.2	1.4	1.5	1.7	Bay Ridge Estates - Seawan Place
CV3357	1.5	1.6	1.8	2.0	2.2	2.5	Bay Ridge Estates - Seawan Place
OD907	1.5	1.6	1.8	2.0	2.1	2.6	Bay Ridge Estates - Seawan Place
CV3377	1.7	1.9	2.1	2.3	2.4	3.2	Bay Ridge Estates - Seawan Place
OD918	1.8	1.9	2.1	2.2	2.4	3.6	Bay Ridge Estates - Seawan Place
CV3399	2.0	2.2	2.4	2.5	2.7	4.4	Bay Ridge Estates - Seawan Place
OD935	2.0	2.2	2.4	2.5	2.7	5.0	Bay Ridge Estates - Seawan Place
CV3434	2.3	2.5	2.8	2.7	3.0	5.3	Bay Ridge Estates - Seawan Place
OD950	2.3	2.5	2.8	2.7	3.0	5.3	Bay Ridge Estates - Seawan Place

Table A-6
Birch Point Drainage Study - Peak Flow Summary, with Project

	Existing Condition with Project			Future Condition with Project			
	Peak Flow (cfs)			Peak Flow (cfs)			
Conduit	100 Year	Nov-21	Climate Change	100 Year	Nov-21	Climate Change	Location
SM704	1.3	1.4	1.6	1.7	1.9	2.1	Bay Ridge Estates - Seawan Place
SM714	2.6	2.8	3.1	3.0	3.3	4.5	Bay Ridge Estates - Seawan Place
SM702	2.4	2.6	2.9	2.5	2.8	3.3	Bay Ridge Estates - Bay Ridge Drive Middle
SM705	2.2	2.4	2.6	2.5	2.7	2.9	Bay Ridge Estates - Bay Ridge Drive Middle
SM715	1.9	2.2	2.3	2.3	2.4	2.6	Bay Ridge Estates - Bay Ridge Drive Middle
SM7201	1.8	2.0	2.2	2.0	2.2	2.6	Bay Ridge Estates - Bay Ridge Drive Middle
SM695	2.8	3.0	3.3	3.1	3.3	3.5	Bay Ridge Estates - Bay Ridge Drive Middle
OD967	1.4	1.5	1.7	1.7	1.9	2.2	Bay Ridge Estates - Bay Ridge Drive Middle
OD938	2.5	2.7	2.9	2.8	3.0	3.2	Bay Ridge Estates - Bay Ridge Drive Middle
SM710	2.1	2.3	2.6	2.2	2.5	3.0	Bay Ridge Estates - Bay Ridge Drive Middle
OD954	2.1	2.3	2.6	2.3	2.5	3.1	Bay Ridge Estates - Bay Ridge Drive Middle
SM720	1.8	2.0	2.2	2.0	2.2	2.5	Bay Ridge Estates - Bay Ridge Drive Middle
SM724	1.8	2.0	2.1	2.1	2.2	2.3	Bay Ridge Estates - Bay Ridge Drive Middle
SM740	9.9	10.7	11.4	11.1	11.9	12.6	Bay Ridge Estates - Bay Ridge Drive West
SM734	3.1	3.4	3.5	3.3	3.5	3.5	Bay Ridge Estates - Bay Ridge Drive West
SM707	3.0	3.0	3.1	3.0	3.0	3.1	Bay Ridge Estates - Bay Ridge Drive West
SM697	2.7	2.7	2.7	2.7	2.7	2.7	Bay Ridge Estates - Bay Ridge Drive West
SM701	2.9	2.9	2.9	2.9	2.9	2.9	Bay Ridge Estates - Bay Ridge Drive West
SM727	3.3	3.4	3.6	3.4	3.5	3.6	Bay Ridge Estates - Bay Ridge Drive West
SM731	2.7	3.0	3.3	3.6	4.0	4.4	Bay Ridge Estates - Bay Ridge Drive West
SM738	3.3	3.7	3.9	3.6	3.8	3.9	Bay Ridge Estates - Bay Ridge Drive West
OD958	3.3	3.4	3.5	3.4	3.5	3.6	Bay Ridge Estates - Bay Ridge Drive West
SM694	3.0	3.3	3.6	3.3	3.6	3.8	Bay Ridge Estates - Bay Ridge Drive West
SM703	2.7	2.9	3.3	2.8	3.1	3.6	Bay Ridge Estates - Bay Ridge Drive West
C1156-OF_2	1.7	1.9	2.1	2.3	2.6	2.9	
OD939	2.5	2.7	3.0	3.3	3.6	4.0	Bay Ridge Estates
BBVC27	9.4	11.0	12.9	10.2	11.9	14.1	Birch Bay Village
BBVC22	17.3	18.0	18.9	19.0	25.1	31.4	Birch Bay Village
BBVC29	0.0	0.0	0.0	0.0	0.1	0.2	Birch Bay Village
3	55.0	61.0	68.1	69.2	71.6	73.1	
BBV_Canal_chnl	65.9	70.9	77.9	75.4	82.5	88.3	Birch Bay Drive at Birch Loop
BBV_CHNL_POND9	92.6	96.8	108.9	96.6	108.0	118.4	Birch Bay Village
BBVC4_1	2.6	3.2	6.2	3.6	6.1	6.4	Birch Bay Village
BBVC4_2	2.6	3.2	4.2	3.6	4.5	5.3	Birch Bay Village
BBVC16	10.8	12.1	12.1	12.3	12.2	12.2	Birch Bay Village
BBVC15	10.8	12.6	15.4	16.4	19.0	20.4	Birch Bay Village
BBVC13	10.8	12.6	15.4	16.4	19.0	20.4	Birch Bay Village
BBVC17	9.4	11.3	14.2	15.5	17.8	19.3	Birch Bay Village
BBVC14	10.8	12.6	15.9	17.0	19.0	20.4	Birch Bay Village
BBVC20	10.2	10.5	11.1	11.1	14.6	20.2	Birch Bay Village
BBVC21	10.2	10.6	11.1	11.1	14.6	20.2	Birch Bay Village
BBVC23	8.8	9.1	9.4	9.8	13.5	19.2	Birch Bay Village
BBVC24	8.4	8.9	9.5	9.3	11.6	14.4	Birch Bay Village
BBVC26	11.1	12.4	13.8	12.1	13.7	13.8	Birch Bay Village
BBVC28	1.5	1.6	1.8	2.0	2.0	2.0	Birch Bay Village
Thunderbird_Pond	10.9	12.3	13.8	12.1	13.7	13.8	
BBVC_1_1	5.9	5.8	5.8	6.0	5.9	5.9	
BBVC1_2	5.9	5.8	5.8	6.0	5.9	5.8	Birch Bay Village
BBVC2	7.3	8.7	10.1	9.7	10.8	12.1	
BBVC2_3	7.3	8.7	10.1	9.7	10.8	12.1	Birch Bay Village
BBVC2_2	7.3	8.7	10.1	9.7	10.8	12.1	Birch Bay Village
BBVC2_4	7.3	8.7	10.1	9.7	10.8	12.1	Birch Bay Village
BBVC2_1	7.3	8.7	10.1	9.7	10.8	12.1	Birch Bay Village
BBVC2_5	7.3	8.7	10.1	9.7	10.8	12.1	Birch Bay Village
BBVC11	130.5	134.8	139.8	132.9	137.3	141.7	Birch Bay Village
BBVC12	130.5	134.8	139.8	132.9	137.3	141.7	
BBVC6	2.6	3.0	3.6	3.4	4.7	3.8	Birch Bay Village
OD1904_1	0.0	0.0	0.0	0.0	0.0	0.0	Selder Road
C1157	0.0	0.0	0.0	0.0	0.0	0.0	Selder Road
OD1793_3	85.0	92.4	102.2	126.3	140.1	156.8	Selder Road
C1156	21.9	25.8	29.2	22.0	26.0	29.3	Selder Road
C1156-OF_1	0.0	0.0	0.0	0.0	0.0	0.0	Selder Road
C1125	15.3	16.2	16.6	15.5	16.3	16.6	Selder Road
C1125-OF	6.6	9.7	12.7	6.5	9.7	12.8	Selder Road
OD1873	14.6	17.3	19.6	14.7	17.4	19.7	Selder Road
C1123	6.9	6.9	7.0	6.9	6.9	7.0	Selder Road
F-LDES2595_LDES25	7.7	10.4	12.6	7.8	10.5	12.7	Selder Road
OD1872	14.6	17.4	19.6	14.7	17.5	19.7	Selder Road
C1122	7.8	8.0	8.1	7.8	8.0	8.1	Selder Road
F-LDES2603_LDES26	6.8	9.4	11.5	6.8	9.5	11.5	Selder Road
OD1871	14.6	17.4	19.6	14.7	17.5	19.7	Selder Road
C1121	7.7	7.8	7.9	7.7	7.8	7.9	Selder Road
F-LDES2611_LDES26	6.9	9.6	11.6	7.0	9.7	11.7	Selder Road
OD1870	14.6	17.4	19.6	14.7	17.5	19.7	Selder Road
C1120	14.6	15.2	15.5	14.7	15.2	15.5	Selder Road
C1120-OF	0.0	2.2	4.1	0.0	2.3	4.2	Selder Road
OD1869	8.0	8.8	9.8	8.1	8.9	9.9	Selder Road
C1119	6.4	6.5	6.6	6.4	6.5	6.6	Selder Road
C1119-OF	1.7	2.4	3.2	1.7	2.4	3.3	Selder Road
OD1868	8.0	8.8	9.9	8.1	8.9	9.9	Selder Road
C1118	5.0	5.1	5.1	5.0	5.1	5.1	Selder Road
F-LDES2635_LDES26	3.0	3.8	4.8	3.1	3.8	4.8	Selder Road
C1038	8.1	8.9	9.9	8.2	9.0	10.0	Selder Road
OD1836	8.1	8.9	9.9	8.1	8.9	9.9	Selder Road
C1124	6.9	6.9	7.0	6.9	6.9	7.0	Selder Road
OD630	0.0	0.0	0.0	0.0	0.0	0.0	Selder Road

Table A-6
Birch Point Drainage Study - Peak Flow Summary, with Project

	Existing Condition with Project			Future Condition with Project			
	Peak Flow (cfs)			Peak Flow (cfs)			
Conduit	100 Year	Nov-21	Climate Change	100 Year	Nov-21	Climate Change	Location
RS_Creek_4	85.0	92.4	102.2	126.3	140.1	156.8	Selder Road
10_2	15.2	16.2	17.5	24.6	28.1	33.8	
OD1793_1	64.0	69.8	76.9	105.3	116.6	130.5	Selder Road
C1032	6.1	6.1	6.1	6.4	6.4	6.4	Selder Road
C1032-OF	4.8	6.4	8.2	22.0	24.8	28.4	Selder Road
C1017	4.5	4.6	4.6	4.7	4.7	4.7	Selder Road
C1017-OF	7.5	8.7	10.1	23.9	26.8	30.4	Selder Road
OD1774	12.0	13.2	14.7	28.4	31.2	34.8	Selder Road
C1022	7.4	7.4	7.4	7.5	7.5	7.5	Selder Road
C1022-OF	4.8	6.1	7.6	21.8	24.7	28.3	Selder Road
OD1776	11.8	13.0	14.5	28.2	31.0	34.5	Selder Road
C1012	4.6	4.6	4.6	4.6	4.7	4.9	Selder Road
C1012-OF	7.6	8.8	10.3	23.9	26.6	30.0	Selder Road
OD1767	12.1	13.3	14.8	28.5	31.3	34.9	Selder Road
OD1768	12.0	13.2	14.7	28.4	31.3	34.8	Selder Road
GM3879	0.1	0.1	0.3	0.5	0.5	0.9	Birch Point Road East of Selder
SM806	5.3	5.8	6.7	7.6	8.5	8.7	Birch Point Road East of Selder
SM807	10.6	11.6	12.6	13.4	14.4	14.5	Birch Point Road East of Selder
GM3880	0.0	0.0	0.3	0.5	0.5	0.9	Birch Point Road East of Selder
OD1904_2	0.0	0.0	0.0	0.0	0.0	0.0	
OF-LDES2552_2728	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road East of Selder
OF-LDES2552_2888	0.0	0.0	0.0	0.0	0.0	0.0	Birch Point Road East of Selder
OD1038	0.0	0.0	0.0	0.0	0.7	2.6	Birch Point Road East of Selder
SM800	5.4	5.9	6.6	7.5	8.3	9.2	Birch Point Road East of Selder
SM802	5.4	5.9	6.6	7.5	8.3	9.2	Birch Point Road East of Selder
SM815	0.3	0.3	1.5	3.0	4.6	4.7	Birch Point Road East of Selder
OD1093_2	0.2	0.2	0.8	1.3	1.7	2.1	Birch Bay Drive at Birch Loop
SM822	2.1	2.3	2.6	2.8	2.8	2.8	Birch Bay Drive at Birch Loop
CV3751	0.0	0.1	0.8	1.3	1.7	2.1	Birch Bay Drive at Birch Loop
11	3.1	3.1	3.1	3.1	3.2	3.2	Birch Bay Drive at Birch Loop
92608	0.0	0.0	0.0	0.0	0.0	0.0	Birch Bay Drive at Birch Loop
CV3738	0.0	0.0	0.0	0.0	0.0	0.0	Birch Bay Drive at Birch Loop
13	2.2	2.7	3.4	4.2	4.6	5.1	Birch Bay Drive at Birch Loop
OD1075-U_1	2.2	2.7	3.4	4.2	4.6	5.1	Birch Bay Drive at Birch Loop
5CV3714	0.0	0.0	0.0	0.0	0.0	0.0	Birch Bay Drive at Birch Loop
OD1075-L	1.7	1.9	2.7	3.3	3.8	4.2	Birch Bay Drive at Birch Loop
CV3723	27.1	26.3	16.2	19.8	29.9	30.4	Birch Bay Drive at Birch Loop
Rogers_Slough_1	122.5	134.8	145.3	163.5	172.3	180.2	Birch Bay Drive at Birch Loop
OD1086	0.0	0.0	0.0	0.0	0.0	0.0	Birch Bay Drive at Birch Loop
CV3740	1.7	1.8	2.7	3.3	3.8	4.2	Birch Bay Drive at Birch Loop
OD1093_1	0.4	0.4	0.9	1.3	1.7	2.1	Birch Bay Drive at Birch Loop
5	13.7	14.7	15.7	16.6	17.5	17.7	Birch Bay Drive at Birch Loop
SM840	11.9	12.1	12.1	12.0	12.0	11.9	Birch Bay Drive at Birch Loop
SM840-OF	1.1	2.7	4.2	5.2	6.4	6.6	Birch Bay Drive at Birch Loop
OD1058_1	107.1	115.5	121.1	138.7	144.5	151.8	Birch Bay Drive at Birch Loop
OD1058_2	107.1	111.2	113.5	128.8	131.3	134.2	Birch Bay Drive at Birch Loop
OD1058_3	106.5	109.5	110.9	125.5	125.8	126.0	Birch Bay Drive at Birch Loop
RS_Creek_1	108.3	120.3	129.9	148.7	158.0	169.5	
OD1071_2	17.4	19.0	20.3	21.8	23.2	23.7	Birch Bay Drive at Birch Loop
OD1071_3	16.7	19.8	21.7	20.2	21.3	21.3	Birch Bay Drive at Birch Loop
OD1073	2.2	2.7	3.4	4.2	4.6	5.1	Birch Bay Drive at Birch Loop
OD1075-U_2	2.2	2.7	3.4	4.1	4.6	5.1	Birch Bay Drive at Birch Loop
OD1075-U_3	2.5	2.8	3.4	4.1	4.6	5.1	Birch Bay Drive at Birch Loop
OD1075-U_4	2.6	2.9	3.4	4.1	4.6	5.1	Birch Bay Drive at Birch Loop
OD1075-U_5	2.6	3.0	3.4	4.2	4.7	5.1	Birch Bay Drive at Birch Loop
OD1075-U_6	2.9	3.3	3.7	4.0	4.3	4.6	Birch Bay Drive at Birch Loop
OD1075-U_7	2.8	2.9	3.2	3.4	3.9	4.3	Birch Bay Drive at Birch Loop
PD46	5.3	5.8	6.5	7.3	7.8	8.3	Birch Bay Drive at Birch Loop
92971	2.2	2.7	3.4	4.2	4.6	5.1	Birch Bay Drive at Birch Loop
SM838	1.8	1.8	1.9	1.9	1.9	1.9	Birch Bay Drive at Birch Loop
SM839	1.3	1.3	1.3	1.3	1.3	1.3	Birch Bay Drive at Birch Loop
OD1071_1	17.7	19.6	21.3	23.0	24.8	25.5	Birch Bay Drive at Birch Loop
SM9799	0.2	0.2	0.8	1.3	1.7	2.1	Birch Bay Drive at Birch Loop
Rogers_Slough_2	122.5	134.8	145.3	163.5	172.2	180.1	Birch Bay Drive at Birch Loop
P-1366-1372	4.3	4.5	4.7	4.3	4.4	4.6	Pheasant - Grouse Cress
D-1367-1366	4.3	4.5	4.7	4.3	4.4	4.6	Pheasant - Grouse Cress
P-1368-1367	2.3	2.4	2.5	2.3	2.4	2.5	Pheasant - Grouse Cress
P-1372-1460	6.1	6.4	6.8	6.3	6.7	7.1	Pheasant - Grouse Cress
P-1373-1367	2.2	2.3	2.5	2.2	2.3	2.4	Pheasant - Grouse Cress
P-1374-1373	2.2	2.3	2.5	2.2	2.3	2.4	Pheasant - Grouse Cress
D-1375-1368	2.1	2.2	2.3	2.1	2.2	2.3	Pheasant - Grouse Cress
P-1376-1375	2.1	2.2	2.3	2.1	2.2	2.3	Pheasant - Grouse Cress
D-1377-1374	2.3	2.3	2.5	2.2	2.3	2.5	Pheasant - Grouse Cress
P-1378-1377	2.3	2.4	2.5	2.3	2.3	2.5	Pheasant - Grouse Cress
D-1379-1376	2.2	2.3	2.4	2.2	2.3	2.4	Pheasant - Grouse Cress
P-1380-1379	2.3	2.4	2.5	2.3	2.4	2.5	Pheasant - Grouse Cress
D-1381-1378	2.3	2.4	2.5	2.3	2.4	2.5	Pheasant - Grouse Cress
P-1382-1381	2.3	2.4	2.5	2.3	2.4	2.5	Pheasant - Grouse Cress
D-1383-1380	2.3	2.4	2.5	2.3	2.4	2.5	Pheasant - Grouse Cress
P-1384-1383	2.3	2.4	2.5	2.3	2.4	2.5	Pheasant - Grouse Cress
D-1385-1382	2.3	2.4	2.6	2.3	2.4	2.6	Pheasant - Grouse Cress
P-1386-1385	2.3	2.5	2.6	2.3	2.4	2.6	Pheasant - Grouse Cress
D-1387-1384	2.4	2.5	2.6	2.4	2.5	2.6	Pheasant - Grouse Cress
P-1388-1387	2.4	2.5	2.6	2.4	2.5	2.6	Pheasant - Grouse Cress
D-1389-1388	2.4	2.6	2.7	2.4	2.6	2.7	Pheasant - Grouse Cress
P-1390-1389	2.5	2.6	2.7	2.5	2.6	2.7	Pheasant - Grouse Cress

Table A-6
Birch Point Drainage Study - Peak Flow Summary, with Project

	Existing Condition with Project			Future Condition with Project			
	Peak Flow (cfs)			Peak Flow (cfs)			
Conduit	100 Year	Nov-21	Climate Change	100 Year	Nov-21	Climate Change	Location
D-1391-1386	2.4	2.5	2.7	2.4	2.5	2.7	Pheasant - Grouse Cress
P-1392-1391	0.3	0.3	0.4	0.3	0.3	0.4	Pheasant - Grouse Cress
D-1393-1390	0.4	0.5	0.6	0.4	0.5	0.6	Pheasant - Grouse Cress
P-1394-1393	0.3	0.4	0.5	0.3	0.4	0.5	Pheasant - Grouse Cress
D-1395-1392	0.2	0.2	0.2	0.1	0.2	0.2	Pheasant - Grouse Cress
P-1396-1395	0.1	0.1	0.1	0.1	0.1	0.1	Pheasant - Grouse Cress
D-1397-1396	0.0	0.1	0.1	0.0	0.1	0.1	Pheasant - Grouse Cress
P-1398-1397	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1399-1394	0.1	0.2	0.3	0.1	0.2	0.3	Pheasant - Grouse Cress
P-1400-1399	0.0	0.1	0.2	0.0	0.1	0.2	Pheasant - Grouse Cress
D-1401-1400	0.0	0.0	0.2	0.0	0.0	0.2	Pheasant - Grouse Cress
P-1402-1401	0.0	0.0	0.2	0.0	0.0	0.2	Pheasant - Grouse Cress
D-1403-1398	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
P-1404-1403	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1405-1404	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1406-1402	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1407-1406	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1408-1409	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1409-1410	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
P-1410-1411	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1411-1412	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
P-1412-1413	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1413-1414	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
P-1414-1415	0.9	1.0	1.2	1.1	1.2	1.3	Pheasant - Grouse Cress
D-1415-1416	0.9	1.0	1.2	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1416-1417	0.9	1.0	1.2	1.1	1.2	1.3	Pheasant - Grouse Cress
D-1417-1419	0.9	1.0	1.2	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1418-1421	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
P-1419-1420	0.9	1.0	1.1	1.1	1.2	1.3	Pheasant - Grouse Cress
D-1420-1426	0.9	1.0	1.1	1.1	1.2	1.3	Pheasant - Grouse Cress
D-1421-1422	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
P-1422-1423	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1423-1424	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
P-1424-1425	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1425-1427	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
P-1426-1429	0.9	1.0	1.1	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1427-1428	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1428-1450	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1429-1449	0.9	1.0	1.1	1.1	1.2	1.3	Pheasant - Grouse Cress
D-1430-1441	1.0	1.0	1.1	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1431-1434	1.8	2.0	2.2	2.1	2.3	2.6	Pheasant - Grouse Cress
P-1434-1372	1.8	2.0	2.2	2.1	2.3	2.5	Pheasant - Grouse Cress
P-1436-1430	1.1	1.2	1.3	1.2	1.3	1.4	Pheasant - Grouse Cress
P-1437-1436	0.9	1.0	1.2	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1438-1437	0.9	1.0	1.2	1.1	1.2	1.3	Pheasant - Grouse Cress
D-1439-1438	0.9	1.0	1.2	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1440-1439	0.9	1.0	1.2	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1441-1442	1.9	2.0	2.2	2.1	2.3	2.6	Pheasant - Grouse Cress
D-1442-1450	1.9	2.0	2.2	2.1	2.3	2.6	Pheasant - Grouse Cress
D-1443-1440	0.9	1.0	1.2	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1446-1443	0.9	1.0	1.2	1.1	1.2	1.3	Pheasant - Grouse Cress
P-1447-1446	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1448-1447	0.0	0.0	0.0	0.0	0.0	0.0	Pheasant - Grouse Cress
D-1449-1441	0.9	1.0	1.1	1.1	1.2	1.3	Pheasant - Grouse Cress
D-1450-1431	1.8	2.0	2.2	2.1	2.3	2.6	Pheasant - Grouse Cress
P-1460-1457	6.1	6.4	6.8	6.3	6.7	7.1	Pheasant - Grouse Cress
D-1239-1240	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
P-1240-1241	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
D-1241-1242	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
P-1242-1243	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
P-1243-1451	1.0	1.1	1.2	1.0	1.1	1.2	Deer Trail Area
P-1451-1457	17.0	17.8	18.7	17.7	18.5	19.5	Deer Trail Area
D-1452-1451	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
P-1453-1452	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
D-1454-1453	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
D-1457-1483	23.6	24.9	26.3	24.7	25.9	27.3	Deer Trail Area
D-1463-1464	0.5	0.6	0.6	0.5	0.6	0.6	Deer Trail Area
P-1464-1467	0.5	0.6	0.6	0.5	0.6	0.6	Deer Trail Area
P-1467-1481	1.0	1.1	1.3	1.0	1.1	1.3	Deer Trail Area
D-1468-1477	0.0	0.0	0.0	0.0	0.0	0.0	Deer Trail Area
P-1469-1472	0.1	0.1	0.1	0.1	0.1	0.1	Deer Trail Area
P-1472-1473	0.3	0.3	0.3	0.3	0.3	0.3	Deer Trail Area
D-1473-1474	0.3	0.3	0.3	0.3	0.3	0.3	Deer Trail Area
P-1474-1475	0.3	0.3	0.3	0.3	0.3	0.3	Deer Trail Area
D-1475-1476	0.3	0.3	0.3	0.3	0.3	0.3	Deer Trail Area
P-1476-1478	0.3	0.3	0.3	0.3	0.3	0.3	Deer Trail Area
P-1477-1467	0.5	0.6	0.6	0.5	0.6	0.6	Deer Trail Area
P-1478-1479	0.3	0.3	0.3	0.3	0.3	0.3	Deer Trail Area
P-1479-1481	0.3	0.3	0.3	0.3	0.3	0.3	Deer Trail Area
D-1481-1356	0.7	0.7	0.8	0.6	0.7	0.8	Deer Trail Area
D-1348-1349	0.1	0.1	0.1	0.0	0.0	0.0	Birch Bay Drive East at Deer Trail
OF-1348-1354A	0.0	0.0	0.0	0.0	0.0	0.0	Birch Bay Drive East at Deer Trail
OF-1349-1350	0.0	0.0	0.0	0.0	0.0	0.0	Birch Bay Drive East at Deer Trail
P-1349-1350	0.1	0.2	0.2	0.1	0.1	0.1	Birch Bay Drive East at Deer Trail
D-1350-1351	1.5	1.7	1.8	2.2	2.3	2.6	Birch Bay Drive East at Deer Trail
OF-1351-1352	0.0	0.0	0.0	0.0	0.0	0.0	Birch Bay Drive East at Deer Trail

Table A-6
Birch Point Drainage Study - Peak Flow Summary, with Project

	Existing Condition with Project			Future Condition with Project			
	Peak Flow (cfs)			Peak Flow (cfs)			
Conduit	100 Year	Nov-21	Climate Change	100 Year	Nov-21	Climate Change	Location
P-1351-1352	1.5	1.7	1.9	2.1	2.3	2.5	Birch Bay Drive East at Deer Trail
D-1352-1353	1.5	1.9	2.3	2.1	2.3	2.5	Birch Bay Drive East at Deer Trail
P-1353-1354_1	24.9	26.0	27.4	27.8	29.4	31.2	Birch Bay Drive East at Deer Trail
D-1483-1355	24.7	26.1	27.6	26.1	27.4	29.0	Birch Bay Drive East at Deer Trail
D-1355-1353	24.7	26.0	27.5	26.1	27.4	29.0	Birch Bay Drive East at Deer Trail
P-1339-1335	1.7	1.9	2.1	3.3	3.6	3.9	Birch Bay Drive East at Deer Trail
P-1340-1347	1.7	1.9	2.1	3.3	3.6	3.9	Birch Bay Drive East at Deer Trail
D-1346-1340	0.0	0.0	0.0	0.2	0.2	0.3	Birch Bay Drive East at Deer Trail
P-1347-1339	1.7	1.9	2.1	3.3	3.6	3.9	Birch Bay Drive East at Deer Trail
D-1356-1357	2.0	2.2	2.4	2.4	2.6	2.9	Birch Bay Drive West at Deer Trail
P-1357-1358	1.9	2.1	2.3	2.3	2.5	2.7	Birch Bay Drive West at Deer Trail
D-1358-1359	1.9	2.1	2.3	2.2	2.4	2.7	Birch Bay Drive West at Deer Trail
P-1359-1360	1.9	2.1	2.3	2.2	2.4	2.6	Birch Bay Drive West at Deer Trail
D-1360-1361	1.9	2.0	2.2	2.2	2.4	2.6	Birch Bay Drive West at Deer Trail
P-1361-1365	3.7	4.0	4.4	4.3	4.6	5.1	Birch Bay Drive West at Deer Trail
D-1362-1361	1.9	2.0	2.2	2.1	2.3	2.6	Birch Bay Drive West at Deer Trail
P-1363-1362	1.9	2.0	2.2	2.1	2.3	2.5	Birch Bay Drive West at Deer Trail
D-1364-1363	1.9	2.1	2.2	2.2	2.4	2.6	Birch Bay Drive West at Deer Trail
D-1171-1172	1.2	1.3	1.4	1.5	1.6	1.8	Richmond Park - Richmond Park Road South
P-1172-1173	1.3	1.4	1.6	1.6	1.8	2.0	Richmond Park - Richmond Park Road South
P-1173-1181	1.5	1.6	1.8	1.8	2.0	2.2	Richmond Park - Richmond Park Road South
D-1180-1184	1.8	1.9	2.2	2.1	2.3	2.5	Richmond Park - Richmond Park Road South
P-1181-1180	1.6	1.8	2.0	1.9	2.1	2.3	Richmond Park - Richmond Park Road South
P-1182-1188	0.2	0.2	0.2	0.2	0.2	0.2	Richmond Park - Richmond Park Road South
D-1184-1451	16.5	17.3	18.2	17.3	18.0	18.9	Richmond Park - Richmond Park Road South
P-1188-1189	0.3	0.3	0.4	0.3	0.3	0.4	Richmond Park - Richmond Park Road South
D-1189-1192	0.5	0.5	0.6	0.5	0.5	0.6	Richmond Park - Richmond Park Road South
P-1190-1184	14.7	15.3	15.9	15.1	15.7	16.3	Richmond Park - Richmond Park Road South
D-1191-1190	14.6	15.1	15.8	15.0	15.6	16.2	Richmond Park - Richmond Park Road South
P-1192-1191	0.7	0.8	0.9	0.7	0.8	0.9	Richmond Park - Richmond Park Road South
D-1193-1192	0.2	0.2	0.2	0.2	0.2	0.2	Richmond Park - Richmond Park Road South
D-1194-1191	13.8	14.3	14.8	14.2	14.6	15.2	Richmond Park - Richmond Park Road North
P-1195-1194	13.7	14.1	14.6	14.1	14.5	15.0	Richmond Park - Richmond Park Road North
P-1196-1221	0.2	0.2	0.2	0.2	0.2	0.2	Richmond Park - Richmond Park Road North
O-1197-1221	0.0	0.0	0.0	0.0	0.0	0.0	Richmond Park - Richmond Park Road North
P-1197-1196	12.7	13.0	13.4	12.9	13.2	13.6	Richmond Park - Richmond Park Road North
D-1198-1197	11.8	11.9	12.1	11.7	11.8	12.0	Richmond Park - Richmond Park Road North
P-1199-1198	11.8	11.9	12.1	11.7	11.8	11.9	Richmond Park - Richmond Park Road North
D-1200-1199	12.4	12.3	12.3	11.7	12.4	12.4	Richmond Park - Richmond Park Road North
P-1201-1200	11.7	11.9	12.0	11.6	11.7	11.9	Richmond Park - Richmond Park Road North
P-1202-1205	12.3	12.7	13.0	12.1	12.4	12.7	Richmond Park - Richmond Park Road North
O-1203-1205	0.0	0.0	0.0	0.0	0.0	0.0	Richmond Park - Richmond Park Road North
P-1203-1202	12.3	12.6	13.0	12.1	12.4	12.7	Richmond Park - Richmond Park Road North
D-1204-1203	12.3	12.6	13.0	12.0	12.3	12.6	Richmond Park - Richmond Park Road North
D-1204A-1204B	3.4	3.7	4.1	5.9	6.5	7.2	
D-1204B-1204A	2.9	3.1	3.3	5.3	5.8	6.5	Richmond Park - Richmond Park Road North
OF-1204B-1207	0.0	0.0	0.0	0.0	0.0	0.0	Richmond Park - Richmond Park Road North
D-1205-1201	11.7	11.8	12.0	11.6	11.7	11.8	Richmond Park - Richmond Park Road North
P-1206-1205	0.7	0.9	1.1	0.8	0.9	0.9	Richmond Park - Richmond Park Road North
D-1207-1206	1.9	1.8	1.7	0.7	0.8	1.3	Richmond Park - Richmond Park Road North
P-1208-1207	0.8	0.9	1.2	0.7	0.9	1.1	Richmond Park - Richmond Park Road North
D-1209-1208	0.8	1.0	1.2	0.8	1.0	1.2	Richmond Park - Richmond Park Road North
P-1210-1209	0.8	1.0	1.2	1.0	1.1	1.3	Richmond Park - Richmond Park Road North
D-1211-1210	0.9	1.1	1.3	1.1	1.3	1.5	Richmond Park - Richmond Park Road North
P-1220-1221	0.9	1.0	1.1	0.9	1.0	1.1	Richmond Park - Richmond Park Road North
D-1221-1195	13.6	14.0	14.5	13.9	14.3	14.8	Richmond Park - Richmond Park Road North
D-1222-1220	0.8	0.8	0.9	0.8	0.8	0.9	Richmond Park - Richmond Park Road North
P-1227-1228	0.2	0.2	0.2	0.2	0.2	0.2	Richmond Park - Richmond Crescent
P-1228-1229	0.3	0.3	0.4	0.3	0.3	0.4	Richmond Park - Richmond Crescent
D-1229-1230	0.5	0.5	0.6	0.5	0.5	0.6	Richmond Park - Richmond Crescent
D-1230-1222	0.6	0.7	0.7	0.6	0.7	0.7	Richmond Park - Richmond Crescent
D-1272-1275	13.5	14.3	15.2	14.2	15.0	15.9	Shintaffer north of Semiahmoo Parkway
D-1272A-1272	2.4	2.7	3.0	2.7	3.0	3.3	
D-1273-1272	11.3	11.9	12.5	11.8	12.4	13.0	Shintaffer north of Semiahmoo Parkway
O-1274-1273	5.0	5.5	6.1	5.5	6.0	6.5	Shintaffer north of Semiahmoo Parkway
P-1274-1273	5.8	5.8	5.8	5.8	5.8	5.8	Shintaffer north of Semiahmoo Parkway
O-1275-1276	7.6	8.4	9.3	8.3	9.1	10.0	Shintaffer north of Semiahmoo Parkway
P-1275-1276	6.0	6.0	6.0	6.0	6.0	6.0	Shintaffer north of Semiahmoo Parkway
D-1276-1298	15.1	16.0	17.1	16.0	17.0	18.1	Shintaffer north of Semiahmoo Parkway
D-1277A-1277	7.2	7.9	8.8	7.9	8.7	9.6	
O-1277-1278	0.0	0.0	0.0	0.0	0.0	0.0	Shintaffer north of Semiahmoo Parkway
P-1277-1278	5.7	6.0	6.4	6.0	6.3	6.7	Shintaffer north of Semiahmoo Parkway
D-1278-1279	5.7	6.0	6.4	6.0	6.3	6.7	Shintaffer north of Semiahmoo Parkway
D-1279-1274	10.4	10.9	11.4	10.8	11.3	11.8	Shintaffer north of Semiahmoo Parkway
O-1281-1280	0.0	0.0	0.0	0.0	0.0	0.0	Shintaffer north of Semiahmoo Parkway
P-1281-1280	4.8	4.9	5.0	4.9	5.0	5.1	Shintaffer north of Semiahmoo Parkway
P-1284-1296	19.1	20.4	22.1	29.2	32.1	33.2	Shintaffer north of Semiahmoo Parkway
D-1298-1284	15.1	16.0	16.9	47.1	34.8	24.6	Shintaffer north of Semiahmoo Parkway
D-1308-1281	5.9	6.4	7.0	6.4	6.9	7.5	Shintaffer north of Semiahmoo Parkway
O-1309-1308	4.2	4.9	5.7	4.8	5.6	6.3	Shintaffer north of Semiahmoo Parkway
P-1309-1308	4.7	4.8	4.8	4.8	4.8	4.9	Shintaffer north of Semiahmoo Parkway
D-1310-1309	0.7	0.7	0.8	0.7	0.8	0.9	Shintaffer north of Semiahmoo Parkway
P-1311-1310	0.9	1.1	1.2	1.0	1.2	1.3	Shintaffer north of Semiahmoo Parkway
P-1316-1317	1.0	1.1	1.2	1.0	1.2	1.3	Shintaffer north of Semiahmoo Parkway
D-1317-1311	0.9	1.1	1.2	1.0	1.2	1.3	Shintaffer north of Semiahmoo Parkway
D-1253-1332	0.0	0.0	0.0	0.0	0.0	0.0	Semiahmoo Parkway

Table A-6
Birch Point Drainage Study - Peak Flow Summary, with Project

	Existing Condition with Project			Future Condition with Project			
	Peak Flow (cfs)			Peak Flow (cfs)			
Conduit	100 Year	Nov-21	Climate Change	100 Year	Nov-21	Climate Change	Location
D-1254-1258	0.0	0.0	0.0	0.0	0.0	0.0	Semiahmoo Parkway
D-1256-1330	5.7	6.6	7.8	15.3	17.3	19.6	Semiahmoo Parkway
D-1257-1329	5.6	6.6	7.8	15.3	17.2	19.5	Semiahmoo Parkway
D-1258-1256	0.0	0.0	0.0	0.0	0.0	0.0	Semiahmoo Parkway
P-1259-1260	5.6	6.6	7.8	15.2	17.0	19.2	Semiahmoo Parkway
D-1260-1263	5.6	6.6	7.8	15.2	17.0	19.2	Semiahmoo Parkway
P-1261-1262	4.7	4.7	4.8	5.3	5.4	5.5	Semiahmoo Parkway
D-1262-1268	4.6	4.7	4.8	5.3	5.4	5.5	Semiahmoo Parkway
D-1263-1264	5.6	6.5	7.7	15.1	16.9	19.1	Semiahmoo Parkway
O-1264-1265	5.2	6.1	7.3	14.5	16.3	18.5	Semiahmoo Parkway
P-1264-1265	0.2	0.2	0.2	0.3	0.4	0.5	Semiahmoo Parkway
D-1265-1266	5.4	6.2	7.4	14.8	16.6	18.9	Semiahmoo Parkway
P-1266-1267	5.1	6.0	7.1	13.7	15.2	16.9	Semiahmoo Parkway
D-1267-1284	7.4	8.5	9.9	18.2	20.0	22.2	Semiahmoo Parkway
P-1268-1269	4.5	4.6	4.7	5.2	5.3	5.4	Semiahmoo Parkway
D-1269-1270	4.5	4.6	4.7	5.2	5.3	5.4	Semiahmoo Parkway
P-1270-1271	4.5	4.6	4.7	5.2	5.3	5.4	Semiahmoo Parkway
D-1271-1286	4.5	4.6	4.7	5.2	5.3	5.4	Semiahmoo Parkway
P-1286-1297	4.5	4.6	4.7	5.1	5.3	5.4	Semiahmoo Parkway
P-1297-1296	4.5	4.6	4.7	5.2	5.3	5.4	Semiahmoo Parkway
D-1327-1259	5.6	6.6	7.8	15.2	17.0	19.2	Semiahmoo Parkway
D-1328-1327	5.6	6.6	7.8	15.2	17.1	19.2	Semiahmoo Parkway
D-1329-1328	5.6	6.6	7.8	15.3	17.2	19.4	Semiahmoo Parkway
D-1330-1257	5.6	6.6	7.8	15.3	17.2	19.6	Semiahmoo Parkway
D-1331-1261	4.6	4.7	4.8	5.2	5.3	5.4	Semiahmoo Parkway
D-1332-1333	0.0	0.0	0.0	0.0	0.0	0.0	Semiahmoo Parkway
D-1333-1331	4.6	4.7	4.8	5.2	5.3	5.4	Semiahmoo Parkway
D-1291-1318	24.4	25.8	27.6	35.3	38.2	38.7	Shintaffer North of Richmond Park - West Side
P-1296-1291	23.6	25.0	26.7	34.3	36.9	37.0	Shintaffer North of Richmond Park - West Side
D-1318-1326	24.2	25.7	27.5	35.3	37.9	38.6	Shintaffer North of Richmond Park - West Side
D-1326-1324_1	23.7	25.6	27.7	35.5	37.7	38.4	Shintaffer North of Richmond Park - West Side
Rich_Field_1	0.3	0.3	0.3	0.3	0.4	0.5	Shintaffer North of Richmond Park - West Side
D-1326-1324_2	23.0	25.3	27.5	35.0	37.3	37.9	Shintaffer North of Richmond Park - West Side
D-1326-1324_3	22.8	25.2	27.5	34.9	37.3	37.9	Shintaffer North of Richmond Park - West Side
D-1326-1324_4	20.9	21.1	21.1	34.9	35.6	35.1	Shintaffer North of Richmond Park - West Side
D-1319-1320	0.4	0.4	0.7	0.6	0.7	1.9	Middle Shintaffer
P-1320-1321	0.8	1.0	1.6	1.4	1.6	2.0	Middle Shintaffer
D-1321-1322	2.1	2.2	2.8	13.5	2.4	2.6	Middle Shintaffer
P-1322-1323	1.8	2.0	2.2	2.2	2.3	2.5	Middle Shintaffer
D-1323-1237_1	1.5	1.7	2.1	2.0	2.4	4.9	Middle Shintaffer
D-1323-1326C	0.0	0.0	0.0	0.0	0.0	0.0	Middle Shintaffer
D-1323-1237_2	5.2	5.8	6.5	6.2	7.0	7.8	Middle Shintaffer
D-1324-1204	7.8	7.9	7.9	5.3	5.9	6.4	Middle Shintaffer
OF-1324-1205	0.0	0.0	0.0	0.0	0.0	0.0	Middle Shintaffer
O-1235-1238	0.0	0.0	0.0	0.0	0.0	0.0	Middle Shintaffer
P-1235-1238	2.5	2.5	2.6	2.6	2.7	2.7	Middle Shintaffer
D-1236-1235	2.5	2.5	2.6	2.6	2.6	2.7	Middle Shintaffer
O-1237-1236	0.0	0.0	0.0	0.0	0.0	0.0	Middle Shintaffer
P-1237-1236	2.5	2.5	2.6	2.6	2.6	2.7	Middle Shintaffer
D-1238-1246	2.5	2.6	2.7	2.7	2.8	2.8	Middle Shintaffer
P-1292-1293	0.7	0.7	0.8	1.1	1.2	1.4	Middle Shintaffer
D-1293-1326	0.7	0.7	0.8	1.1	1.2	1.4	Middle Shintaffer
D-1294-1325	0.7	0.8	0.9	1.1	1.2	1.4	Middle Shintaffer
P-1295-1294	0.7	0.8	0.9	1.1	1.3	1.4	Middle Shintaffer
D-1300-1295	0.0	0.0	0.0	0.0	0.0	0.0	Middle Shintaffer
D-1325-1292	0.7	0.7	0.8	1.1	1.2	1.4	Middle Shintaffer
O-507-500A	0.0	0.0	0.0	0.0	0.0	0.0	Lower Shintaffer
P-501-500	17.8	18.2	18.8	38.9	40.2	41.1	Lower Shintaffer
P-505-501	0.0	0.0	0.0	0.0	0.0	0.0	Lower Shintaffer
P-507-501	17.8	18.2	18.8	39.1	40.4	41.2	Lower Shintaffer
O-509-508	0.0	0.0	0.0	0.0	0.0	0.0	Lower Shintaffer
P-509-508	3.0	3.0	3.1	5.2	5.0	5.3	Lower Shintaffer
D-510-507	18.0	18.4	18.9	39.6	40.9	42.3	Lower Shintaffer
P-511-509	16.5	16.9	17.5	41.7	43.1	45.5	Lower Shintaffer
P-514-511	15.0	15.4	15.9	36.5	37.3	38.7	Lower Shintaffer
P-518-514	15.0	15.4	15.9	36.4	37.5	38.1	Lower Shintaffer
D-519-518	12.9	12.9	13.0	36.3	36.9	36.5	Lower Shintaffer
P-520-519	12.9	12.9	13.0	35.6	36.0	35.5	Lower Shintaffer
D-521-520	12.9	12.9	13.0	34.5	35.1	35.2	Lower Shintaffer
P-522-521	12.9	12.9	13.0	34.7	35.0	35.0	Lower Shintaffer
O-525-524	0.0	0.0	0.0	0.0	0.0	0.0	Lower Shintaffer
P-523-524	3.0	3.0	3.1	3.1	3.2	3.4	Lower Shintaffer
D-524-525	3.0	3.0	3.1	3.1	3.2	3.4	Lower Shintaffer
O-525-527	0.0	0.0	0.0	0.0	0.0	0.0	Lower Shintaffer
P-525-526	3.0	3.0	3.1	3.1	3.2	3.4	Lower Shintaffer
D-527-509	3.0	3.0	3.1	3.2	3.3	3.5	Lower Shintaffer
D-1244-522	12.9	12.9	13.0	34.2	35.0	35.1	Lower Shintaffer
D-1245-523	3.0	3.1	3.2	3.2	3.3	3.4	Lower Shintaffer
O-1246-1245	0.0	0.0	0.0	0.0	0.0	0.0	Lower Shintaffer
P-1246-1245	3.1	3.2	3.3	3.3	3.4	3.6	Lower Shintaffer
BP21aPond_Out	5.5	5.6	5.8	7.3	7.7	8.1	Semiahmoo Uplands
6	36.0	39.5	43.8	47.2	51.9	57.8	
FieldPond1Out	40.0	43.8	48.5	56.4	61.6	68.0	Semiahmoo Uplands
SU-1_3	2.9	3.4	4.0	9.7	10.7	12.0	
SU-1b-Oit	3.4	3.5	3.7	3.8	4.0	4.2	Semiahmoo Uplands
92603	14.6	17.1	19.9	27.7	29.8	31.5	Horizon Pond

Table A-6
Birch Point Drainage Study - Peak Flow Summary, with Project

	Existing Condition with Project			Future Condition with Project			
	Peak Flow (cfs)			Peak Flow (cfs)			
Conduit	100 Year	Nov-21	Climate Change	100 Year	Nov-21	Climate Change	Location
92606	9.9	10.9	12.1	30.4	33.4	37.2	
PD63_OF	0.0	0.0	0.0	0.0	0.0	0.0	Horizon Pond
SM723	3.9	4.0	4.1	4.0	4.2	4.3	Horizon Pond
Lake6_Out	36.0	39.5	43.9	47.3	51.9	57.8	Semiahmoo Golf Course
Lake9_Out	6.7	7.3	7.9	8.4	9.1	9.9	Semiahmoo Golf Course
Lake12_Out	2.4	2.8	3.3	8.8	9.6	10.8	Semiahmoo Golf Course
Lake18_Out	3.5	3.8	4.1	4.1	4.3	4.5	Semiahmoo Golf Course
SU-2_1	15.5	16.9	18.7	24.7	27.0	29.9	

APPENDIX B.
CAPITAL IMPROVEMENT PROJECT DESCRIPTION

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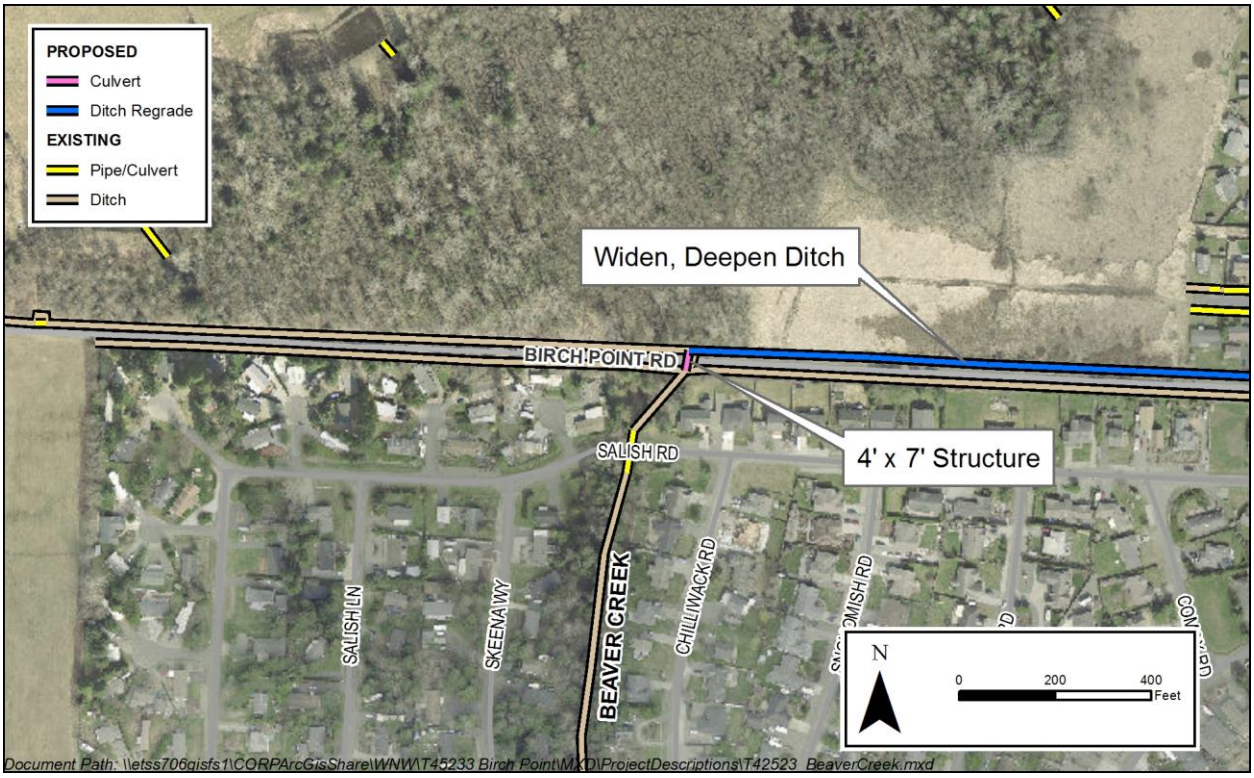
Birch Point Drainage Study

Project: Beaver Creek Drainage Improvements Project

Location:	Beaver Creek
Description:	Culverts and roadside ditches along Birch Point Road, Salish Road, and Quinault Road overflow during November 2021 and larger existing conditions storm event. The new culvert will be designed for fish passage.
Estimated Total Project Cost:	$1,250,000

Project Description:

- Replace existing culvert along Birch Point Road with a 4’ high by 7’ wide fish passable culvert.
- Regrade 1,170 lineal feet of existing ditch along Birch Point Road.



BIRCH POINT DRAINAGE STUDY
CAPITAL PROJECT PLANNING LEVEL CONSTRUCTION COST OPINION

PROJECT:	**Beaver Creek Drainage Improvements**	**BY:**	**ZMS**
DESCRIPTION:	**Incall fish passable culverts**	**CHECKED BY:**	**GMS**
SUBBASIN:	**Birch Point Subwatershed**	**DATE:**	**7/19/2023**

BID ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
REMOVE ASPHALT CONC. PAVEMENT	2470	SY	$40	$ 98,800
STRUCTURE EXCAVATION CLASS B INCL. HAUL	830	CY	$ 40	$ 33,200
REGRADE EXISTING DITCH	1,170	CY	$ 40	$ 46,800
GRAVEL BACKFILL FOR PIPE ZONE BEDDING	16	CY	$ 65	$ 1,040
COMMON BORROW INCL. HAUL	740	CY	$ 60	$ 44,400
CONTRACTOR DESIGNED BURIED STRUCTURE	44	LF	$ 3,000	$ 132,000
CHECK DAM	120	LF	$ 30	$ 3,600
ASPHALT CONC. PAVEMENT	40	TN	$ 500	$ 20,000
CRUSHED SURFACING BASE COURSE	110	TN	$ 120	$ 13,200
CRUSHED SURFACING TOP COURSE	30	TN	$ 90	$ 2,700
			Material Subtotal	$ 395,740
CONTINGENCY	50%			$ 197,870
			Material Subtotal with Contingency	$ 593,610
CLEAR AND GRUB	5%			$ 29,690
DEWATERING	5%			$ 29,690
ARCHEOLOGICAL MONITORING 2	2%			$ 11,880
TRAFFIC CONTROL	2%			$ 11,880
SITE RESTORATION 2	5%			$ 29,690
MOBILIZATION (GENERAL REQUIREMENT)	10%			$ 70,650
			Construction Subtotal (Rounded)	$ 777,000
STATE SALES TAX	8.6%			$ 66,830
ENGINEERING	33%			$ 278,470
CONSTRUCTION MANAGEMENT	7.5%			$ 63,290
PERMITTING	7.5%			$ 63,290
2023 Dollars			**Total Estimated Project Cost (Rounded)**	**$ 1,250,000**

Notes:

1. The above cost opinion is in 2023 dollars and does not include future escalation, financing, or O&M costs.
2. The order-of-magnitude cost opinion has been prepared for guidance in project evaluation from the information available at the time of preparation and for assumptions stated. The final costs of the project will depend on actual labor and material costs, actual site conditions, productivity, competitive market conditions, final project scope and schedule, and other variable factors. As a result, the final project costs will vary from those presented above. Because of these factors, funding needs for individual projects must be scrutinized prior to establishing the final project budgets.

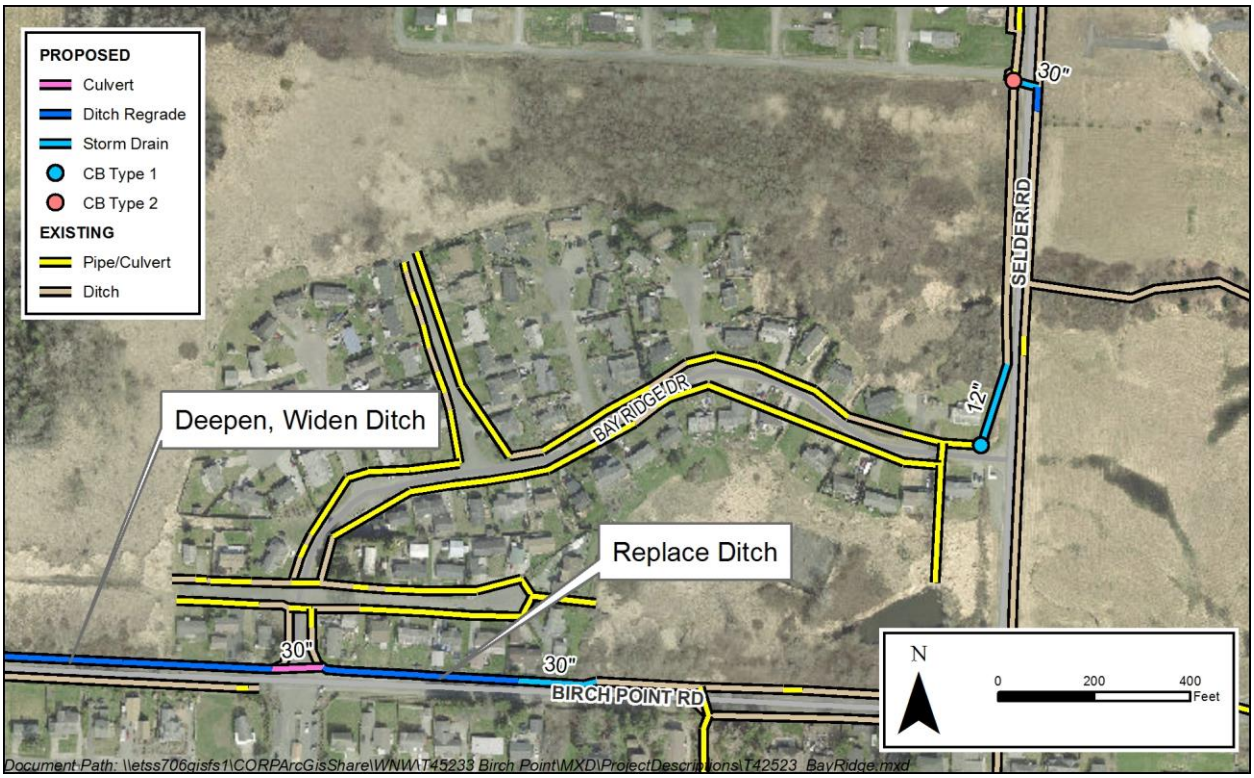
Birch Point Drainage Study

Project: Bay Ridge Estates Stormwater Improvements Project

Location:	Bay Ridge Estates
Description:	Culverts and roadside ditches along Birch Point Road and Selder Road capacity and overflow during the 2-year and larger existing and future conditions storm event.
Cost Estimate:	$770,000

Project Description:

- Replace 52 lineal feet of 18-inch diameter pipe with 30-inch diameter PVC pipe on Selder Road at Skyvue Road.
- Install 200 lineal feet of new 12-inch diameter ductile iron pipe along Selder Road.
- Install 108 lineal feet of new 30-inch diameter PVC pipe on Birch Point Road.
- Install 1 new CB Type 1 structures on Selder Road and 1 new CB Type 2 structure on Birch Point Road.
- Regrade 50 lineal feet of existing ditch on Selder Road to lower an invert.
- Regrade 960 feet of existing ditch on Birch Point.
- Install 135 lineal feet of new 30-inch diameter PVC pipe along Birch Point Road



BIRCH POINT DRAINAGE STUDY
CAPITAL PROJECT PLANNING LEVEL CONSTRUCTION COST OPINION

PROJECT:	**Bay Ridge Estates Stormwater Improvements**	**BY:**	**ZMS**
DESCRIPTION:	**Install cross culvert**	**CHECKED BY:**	**GMS**
SUBBASIN:	**Birch Point Subwatershed**	**DATE:**	**7/19/2023**

BID ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
REMOVE ASPHALT CONC. PAVEMENT	110	SY	$40	$ 4,400
STRUCTURE EXCAVATION CLASS B INCL. HAUL	270	CY	$ 40	$ 10,800
REMOVE STORM SEWER PIPE 18 IN. DIAM.	52	LF	$ 15	$ 780
REGRADE EXISTING DITCH	1010	CY	$ 50	$ 50,500
DUCTILE IRON SEWER PIPE 12 IN. DIAM.	200	LF	$ 115	$ 23,000
SCHEDULE A STORM SEWER PIPE 30 IN. DIAM.	300	LF	$ 240	$ 72,000
CATCH BASIN TYPE 1	1	EA	$ 3,200	$ 3,200
CATCH BASIN TYPE 2, 48 IN. DIAM.	1	EA	$ 4,500	$ 4,500
GRAVEL BACKFILL FOR PIPE ZONE BEDDING	160	CY	$ 65	$ 10,400
COMMON BORROW INCL. HAUL	100	CY	$ 60	$ 6,000
CHECK DAM	920	LF	$ 30	$ 27,600
INLET PROTECTION	2	EA	$ 220	$ 440
ASPHALT CONC. PAVEMENT	15	TN	$ 500	$ 7,500
CRUSHED SURFACING BASE COURSE	45	TN	$ 120	$ 5,400
CRUSHED SURFACING TOP COURSE	10	TN	$ 90	$ 900
			Material Subtotal	$ 227,420
CONTINGENCY	50%			$ 113,710
			Material Subtotal with Contingency	$ 341,130
CLEAR AND GRUB	5%			$ 17,060
DEWATERING	5%			$ 17,060
ARCHEOLOGICAL MONITORING	5%			$ 17,060
TRAFFIC CONTROL	2%			$ 6,830
SITE RESTORATION	10%			$ 34,120
MOBILIZATION (GENERAL REQUIREMENT)	10%			$ 43,330
			Construction Subtotal (Rounded)	$ 477,000
STATE SALES TAX	8.6%			$ 41,030
ENGINEERING	33%			$ 170,950
CONSTRUCTION MANAGEMENT	7.5%			$ 38,860
PERMITTING	7.5%			$ 38,860
2023 Dollars			**Total Estimated Project Cost (Rounded)**	**$ 770,000**

Notes:

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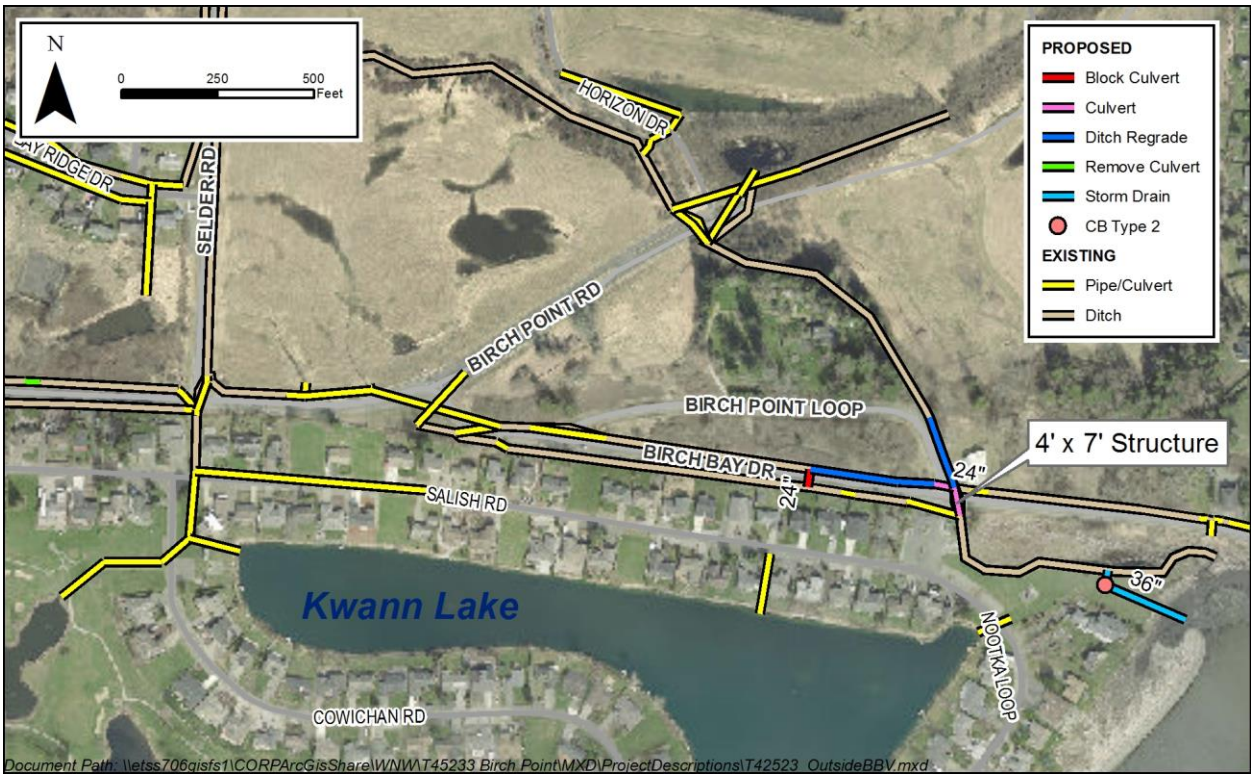
Birch Point Drainage Study

Project: Rogers Slough Drainage Improvements – Existing Conditions

Location:	Birch Bay Village - Birch Bay Drive and Birch Point Loop
Description:	Driveway culverts and roadside ditches along Birch Point Road are undersized and flooding for the 2-year and larger storm existing and future conditions storm events.
Cost Estimate:	$2,444,000

Project Description:

- Block an existing 24-inch diameter culvert with CDF.
- Install 55 lineal feet of 24-inch diameter PVC pipe under Birch Point Loop.
- Replace 144 lineal feet of existing twin 30-inch diameter culvert with a 4-foot by 7-foot rectangular concrete culvert.
- Remove existing 18-inch culvert under Birch Bay Drive between east and west intersection of Birch Point Loop.
- Regrade 319 feet of existing roadside ditch along Birch Point Road.
- Regrade 185 feet of channel along Birch Point Loop to establish positive drainage over entire length roadside ditch along north side of Birch Bay Drive.
- Install one new Type 2 CB near Nootka Loop.
- Install 230 lineal feet of new 36-inch diameter PVC pipe.



BIRCH POINT DRAINAGE STUDY
CAPITAL PROJECT PLANNING LEVEL CONSTRUCTION COST OPINION

PROJECT:	**Rogers Slough Drainage Improvements Project**	**BY:**	**ZMS**
DESCRIPTION:	**Install fish passable culvert under Birch Bay Drive**	**CHECKED BY:**	**GMS**
SUBBASIN:	**Birch Point Subwatershed**	**DATE:**	**7/19/2023**

BID ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
REMOVE ASPHALT CONC. PAVEMENT	140	SY	$40	$ 5,600
REMOVE STORM SEWER PIPE 30 IN. DIAM.	144	LF	$ 25	$ 3,600
SCHEDULE A STORM SEWER PIPE 24 IN. DIAM.	60	LF	$ 100	$ 6,000
SCHEDULE A STORM SEWER PIPE 36 IN. DIAM.	230	LF	$ 285	$ 65,550
STRUCTURE EXCAVATION CLASS A INCL. HAUL	1,010	CY	$ 55	$ 55,550
STRUCTURE EXCAVATION CLASS B INCL. HAUL	420	CY	$ 40	$ 16,800
CHECK DAM	360	LF	$ 30	$ 10,800
CONTRACTOR DESIGNED BURIED STRUCTURE	144	LF	$ 3,000	$ 432,000
CATCH BASIN TYPE 2, 54 IN. DIAM.	1	EA	$ 4,750	$ 4,750
4 FOOT X 7 FOOT TRASH RACK	1	LS	$ 1,500	$ 1,500
CONTROL DENSITY FILL EXISTING CULVERT	4	CY	$ 235	$ 941
GRAVEL BACKFILL FOR FOUNDATIONS CLASS A	230	CY	$ 70	$ 16,100
COMMON BORROW INCL. HAUL	950	CY	$ 60	$ 57,000
ASPHALT CONC. PAVEMENT	20	TN	$ 200	$ 4,000
CRUSHED SURFACING BASE COURSE	58	TN	$ 120	$ 6,960
CRUSHED SURFACING TOP COURSE	15	TN	$ 90	$ 1,350
REGRADE EXISTING DITCH	504	CY	$ 40	$ 20,160
			Material Subtotal	$ 708,661
CONTINGENCY	50%			$ 354,340
			Material Subtotal with Contingency	$ 1,063,001
CLEAR AND GRUB	5%			$ 53,160
DEWATERING	5%			$ 53,160
ARCHEOLOGICAL MONITORING	5%			$ 53,160
TRAFFIC CONTROL 3	5%			$ 53,160
SITE RESTORATION	10%			$ 106,310
MOBILIZATION (GENERAL REQUIREMENT)	10%			$ 138,200
			Construction Subtotal (Rounded)	$ 1,520,000
STATE SALES TAX	8.6%			$ 130,720
ENGINEERING	33%			$ 544,740
CONSTRUCTION MANAGEMENT	7.5%			$ 123,810
PERMITTING	7.5%			$ 123,810
2023 Dollars			**Total Estimated Project Cost (Rounded)**	**$ 2,444,000**

Notes:

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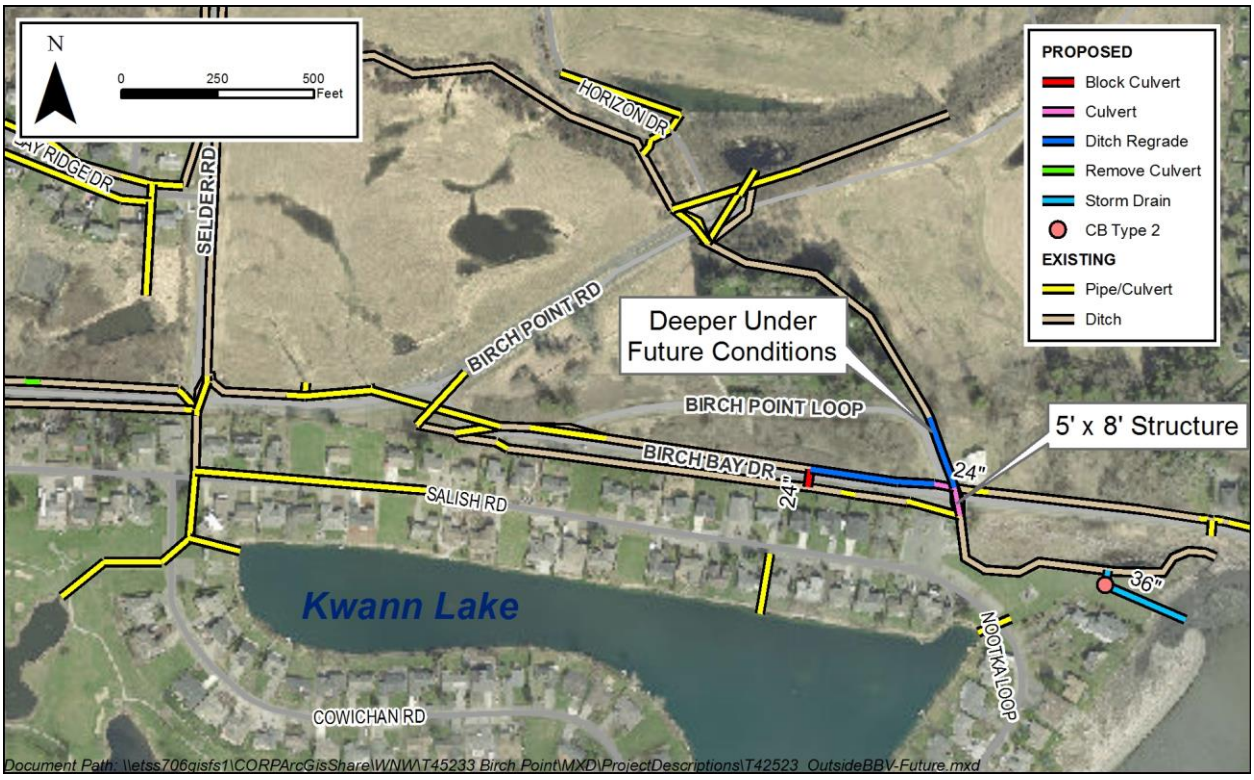
Birch Point Drainage Study

Project: Rogers Slough Drainage Improvements – Future Conditions

Location:	Birch Bay Village - Birch Bay Drive and Birch Point Loop
Description:	Driveway culverts and roadside ditches along Birch Point Road are undersized and flooding for the 2-year and larger storm existing and future conditions storm events.
Cost Estimate:	$2,850,000

Project Description:

- Block an existing 24-inch diameter culvert with CDF.
- Install 55 lineal feet of 24-inch diameter PVC pipe on Birch Point Loop.
- Replace 144 lineal feet of existing twin 30-inch diameter culvert with a 5-foot by 8-foot rectangular concrete culvert.
- Remove existing 18-inch culvert under Birch Bay Drive between east and west intersection of Birch Point Loop.
- Regrade 319 feet of existing roadside ditch along Birch Point Road.
- Regrade 185 feet of channel along Birch Point Loop to establish positive drainage over entire length roadside ditch along north side of Birch Bay Drive.
- Install one new Type 2 CB near Nootka Loop
- Install 230 lineal feet of new 36-inch diameter PVC pipe near Nootka Loop



BIRCH POINT DRAINAGE STUDY
CAPITAL PROJECT PLANNING LEVEL CONSTRUCTION COST OPINION

PROJECT:	**Rogers Slough Drainage Improvements Project - Future**	**BY:**	**ZMS**
DESCRIPTION:	**Install fish passable culvert under Birch Bay Drive**	**CHECKED BY:**	**GMS**
SUBBASIN:	**Birch Point Subwatershed**	**DATE:**	**7/19/2023**

BID ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
REMOVE ASPHALT CONC. PAVEMENT	200	SY	$40	$ 8,000
REMOVE STORM SEWER PIPE 30 IN. DIAM.	144	LF	$ 25	$ 3,600
SCHEDULE A STORM SEWER PIPE 24 IN. DIAM.	60	LF	$ 100	$ 6,000
SCHEDULE A STORM SEWER PIPE 36 IN. DIAM.	230	LF	$ 285	$ 65,550
STRUCTURE EXCAVATION CLASS A INCL. HAUL	1,390	CY	$ 55	$ 76,450
STRUCTURE EXCAVATION CLASS B INCL. HAUL	420	CY	$ 40	$ 16,800
CHECK DAM	360	LF	$ 30	$ 10,800
CONTRACTOR DESIGNED BURIED STRUCTURE	144	LF	$ 3,500	$ 504,000
CATCH BASIN TYPE 2, 54 IN. DIAM.	1	EA	$ 4,750	$ 4,750
5 FOOT X 8 FOOT TRASH RACK	1	LS	$ 1,500	$ 1,500
CONTROL DENSITY FILL EXISTING CULVERT	4	CY	$ 235	$ 941
GRAVEL BACKFILL FOR FOUNDATIONS CLASS A	230	CY	$ 70	$ 16,100
COMMON BORROW INCL. HAUL	1,250	CY	$ 60	$ 75,000
ASPHALT CONC. PAVEMENT	30	TN	$ 200	$ 6,000
CRUSHED SURFACING BASE COURSE	81	TN	$ 120	$ 9,720
CRUSHED SURFACING TOP COURSE	20	TN	$ 90	$ 1,800
REGRADE EXISTING DITCH	504	CY	$ 40	$ 20,160
			Material Subtotal	$ 827,171
CONTINGENCY	50%			$ 413,590
			Material Subtotal with Contingency	$ 1,240,761
CLEAR AND GRUB	5%			$ 62,040
DEWATERING	5%			$ 62,040
ARCHEOLOGICAL MONITORING	5%			$ 62,040
TRAFFIC CONTROL 3	5%			$ 62,040
SITE RESTORATION	10%			$ 124,080
MOBILIZATION (GENERAL REQUIREMENT)	10%			$ 161,310
			Construction Subtotal (Rounded)	$ 1,774,000
STATE SALES TAX	8.6%			$ 152,570
ENGINEERING	33%			$ 635,770
CONSTRUCTION MANAGEMENT	7.5%			$ 144,500
PERMITTING	7.5%			$ 144,500
2023 Dollars			**Total Estimated Project Cost (Rounded)**	**$ 2,850,000**

Notes:

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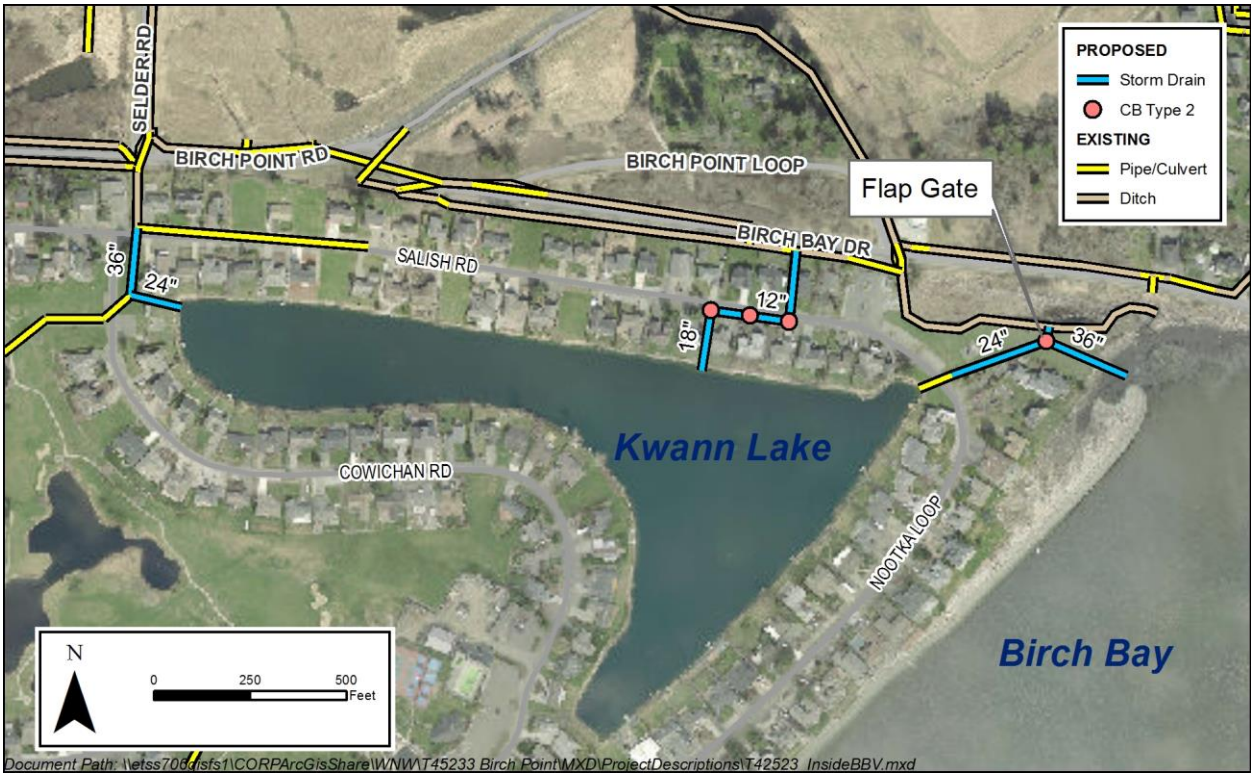
Birch Point Drainage Study

Project: Birch Bay Village Stormwater Improvements Project

Location:	Birch Bay Village at Kwann Lake
Description:	Roadway flooding predicted at multiple areas in the vicinity of Kwann Lake at the 10-year and larger existing conditions storm event.
Cost Estimate:	$1,260,000

Project Description:

- Replace 140 lineal feet of 12-inch diameter pipe with 24-inch diameter corrugated polyethylene pipe from Cowichan Road to Kwann Lake.
- Replace 160 lineal feet of 12-inch diameter pipe with 18-inch-inch diameter PVC pipe from Salish Road to Kwann Lake.
- Replace 176 lineal feet of 24-inch diameter pipe with 36-inch diameter PVC pipe along Cowichan Road.
- Install 390 lineal feet of new 12-inch diameter PVC pipe along Salish Road.
- Install 3 new CB Type 2, 48-inch diameter structures along Salish Road.
- Install one new CB Type 2, 54-inch diameter structure near Nootka Loop.
- Install new 36-inch diameter flap gate near Nootka Loop
- Install 290 lineal feet of 24-inch diameter PVC pipe near Nootka Loop
- Install 230 lineal feet of new 36-inch diameter PVC pipe near Nootka Loop



PROJECT:	**Birch Point Village Stormwater Improvements**	**BY:**	**ZMS**
DESCRIPTION:	**Birch Point Village Stormwater Improvements**	**CHECKED BY:**	**GMS**
SUBBASIN:	**Birch Point Subwatershed**	**DATE:**	**7/19/2023**

BID ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
REMOVE ASPHALT CONC. PAVEMENT	690	SY	$4.50	$ 3,105
STRUCTURE EXCAVATION CLASS B INCL. HAUL	957	CY	$ 40	$ 38,280
REMOVE STORM SEWER PIPE 12 IN. DIAM.	300	LF	$ 12	$ 3,600
REMOVE STORM SEWER PIPE 24 IN. DIAM.	176	LF	$ 12	$ 2,112
REMOVE CULVERT 18 IN. DIAM.	41	LF	$ 12	$ 492
SCHEDULE A STORM SEWER PIPE 12 IN. DIAM.	390	LF	$ 75	$ 29,250
SCHEDULE A STORM SEWER PIPE 18 IN. DIAM.	160	LF	$ 90	$ 14,400
SCHEDULE A STORM SEWER PIPE 24 IN. DIAM.	290	LF	$ 100	$ 29,000
SCHEDULE A STORM SEWER PIPE 36 IN. DIAM.	406	LF	$ 285	$ 115,710
CORRUGATED POLYETHYLENE STORM SEWER PIPE 24 IN. DIAM.	140	LF	$ 130	$ 18,200
CATCH BASIN TYPE 2, 48 IN. DIAM.	3	EA	$ 4,500	$ 13,500
CATCH BASIN TYPE 2, 54 IN. DIAM.	1	EA	$ 4,750	$ 4,750
INLINE CHECK VALVE	1	EA	$ 5,000	$ 5,000
CHECK DAM	860	LF	$ 30	$ 25,800
INLET PROTECTION	3	EA	$ 205	$ 615
GRAVEL BACKFILL FOR FOUNDATIONS CLASS A	392	CY	$ 70	$ 27,440
COMMON BORROW INCL. HAUL	534	CY	$ 60	$ 32,065
ASPHALT CONC. PAVEMENT	11	TN	$ 200	$ 2,200
CRUSHED SURFACING BASE COURSE	32	TN	$ 120	$ 3,840
CRUSHED SURFACING TOP COURSE	8	TN	$ 345	$ 2,760
			Material Subtotal	$ 372,119
CONTINGENCY	50%			$ 186,060
			Material Subtotal with Contingency	$ 558,179
CLEAR AND GRUB	5%			$ 27,910
DEWATERING	5%			$ 27,910
ARCHEOLOGICAL MONITORING	5%			$ 27,910
TRAFFIC CONTROL	2%			$ 11,170
SITE RESTORATION	10%			$ 55,820
MOBILIZATION (GENERAL REQUIREMENT)	10%			$ 70,890
			Construction Subtotal (Rounded)	$ 780,000
STATE SALES TAX	8.6%			$ 67,080
ENGINEERING	33%			$ 279,540
CONSTRUCTION MANAGEMENT	7.5%			$ 63,540
PERMITTING	7.5%			$ 63,540
2023 Dollars			**Total Estimated Project Cost (Rounded)**	**$ 1,260,000**

Notes:

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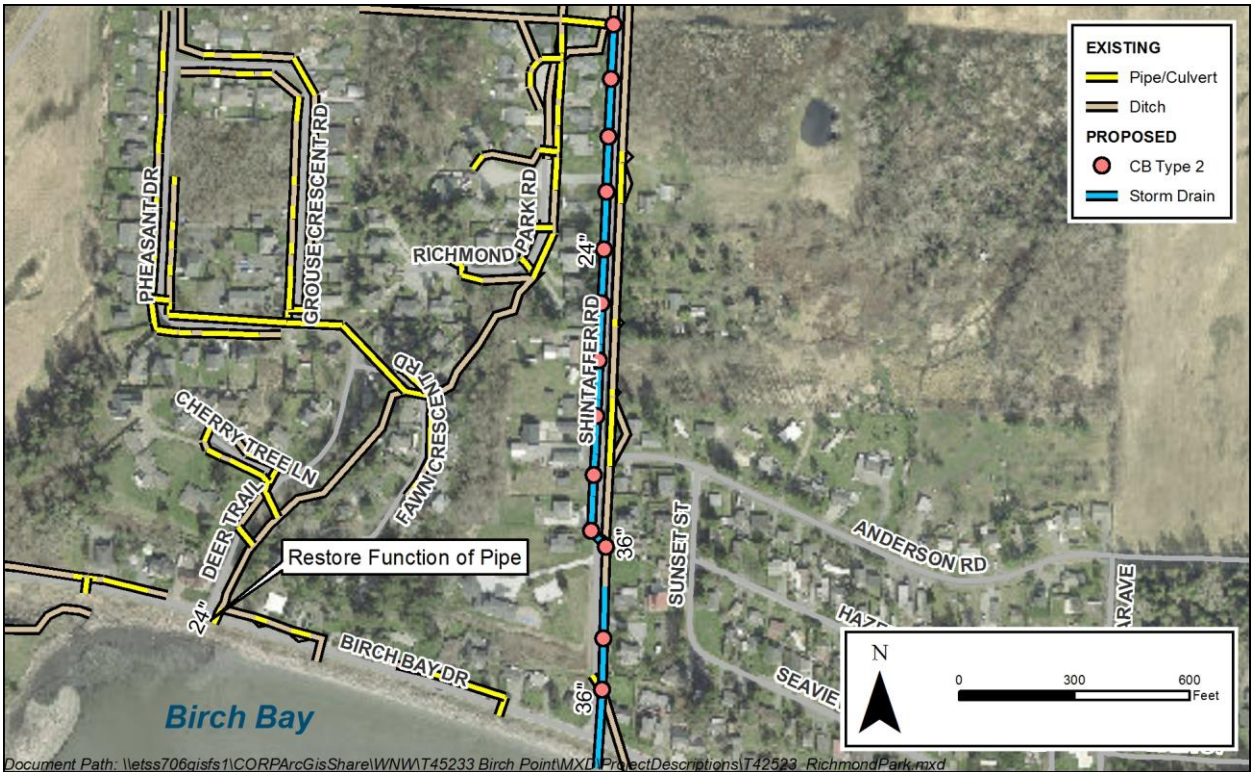
Birch Point Drainage Study

Project: Richmond Park Stormwater Improvements Project – Existing Conditions

Location:	Shintaffer Road, Birch Bay Drive at Birch Bay
Description:	Ditches and existing culverts and pipe network in Richmond Park and along Shintaffer Road overflow during the 25-year and larger existing and future conditions storm events.
Cost Estimate:	$1,770,000

Project Description:

- Replace 810 lineal feet of 12-inch diameter pipe with 24-, and 36-inch diameter PVC pipe, and 36-inch diameter corrugated polyethylene pipe along Shintaffer Road.
- Replace 560 lineal feet of existing ditch with new 24-inch diameter PVC pipe along Shintaffer Road.
- Replace 24 lineal feet of 24-inch diameter pipe at Deer Trail and Birch Bay to restore conveyance function.
- Install 11 new CB Type 2, 48-inch diameter structures and 2 new CB Type 2, 54-inch diameter structures along Shintaffer Road.



BIRCH POINT DRAINAGE STUDY
CAPITAL PROJECT PLANNING LEVEL CONSTRUCTION COST OPINION

PROJECT:	**Richmond Park Stormwater Improvements - Existing**	**BY:**	**ZMS**
DESCRIPTION:	**Install 24 inch pipeline along Shintaffer Road**	**CHECKED BY:**	**GMS**
SUBBASIN:	**Birch Point Subwatershed**	**DATE:**	**7/19/2023**

BID ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
REMOVE ASPHALT CONC. PAVEMENT	180	SY	$40	$ 7,200
REMOVE STORM SEWER PIPE 12 IN. DIAM.	810	LF	$ 12	$ 9,720
STRUCTURE EXCAVATION CLASS B INCL. HAUL	2,100	CY	$ 40	$ 84,000
CHECK DAM	280	LF	$ 30	$ 8,400
INLET PROTECTION	13	EA	$ 205	$ 2,665
SCHEDULE A STORM SEWER PIPE 24 IN. DIAM.	1,370	LF	$ 100	$ 137,000
SCHEDULE A STORM SEWER PIPE 36 IN. DIAM.	270	LF	$ 285	$ 76,950
CORRUGATED POLYETHYLENE STORM SEWER PIPE 36 IN. DIAM.	210	LF	$ 130	$ 27,300
CATCH BASIN TYPE 2, 48 IN. DIAM.	11	EA	$ 4,500	$ 49,500
CATCH BASIN TYPE 2, 54 IN. DIAM.	2	EA	$ 4,750	$ 9,500
GRAVEL BACKFILL FOR PIPE ZONE BEDDING	830	CY	$ 65	$ 53,950
COMMON BORROW INCL. HAUL	950	CY	$ 60	$ 57,000
ASPHALT CONC. PAVEMENT	2.9	TN	$ 200	$ 580
CRUSHED SURFACING BASE COURSE	8.3	TN	$ 120	$ 996
CRUSHED SURFACING TOP COURSE	2.1	TN	$ 345	$ 725
			Material Subtotal	$ 525,486
CONTINGENCY	50%			$ 262,750
			Material Subtotal with Contingency	$ 788,236
CLEAR AND GRUB	5%			$ 39,420
DEWATERING	5%			$ 39,420
ARCHEOLOGICAL MONITORING	5%			$ 39,420
TRAFFIC CONTROL	2%			$ 15,770
SITE RESTORATION	10%			$ 78,830
MOBILIZATION (GENERAL REQUIREMENT)	10%			$ 100,110
			Construction Subtotal (Rounded)	$ 1,101,000
STATE SALES TAX	8.6%			$ 94,690
ENGINEERING	33%			$ 394,580
CONSTRUCTION MANAGEMENT	7.5%			$ 89,680
PERMITTING	7.5%			$ 89,680
2023 Dollars			**Total Estimated Project Cost (Rounded)**	**$1,770,000**

Notes:

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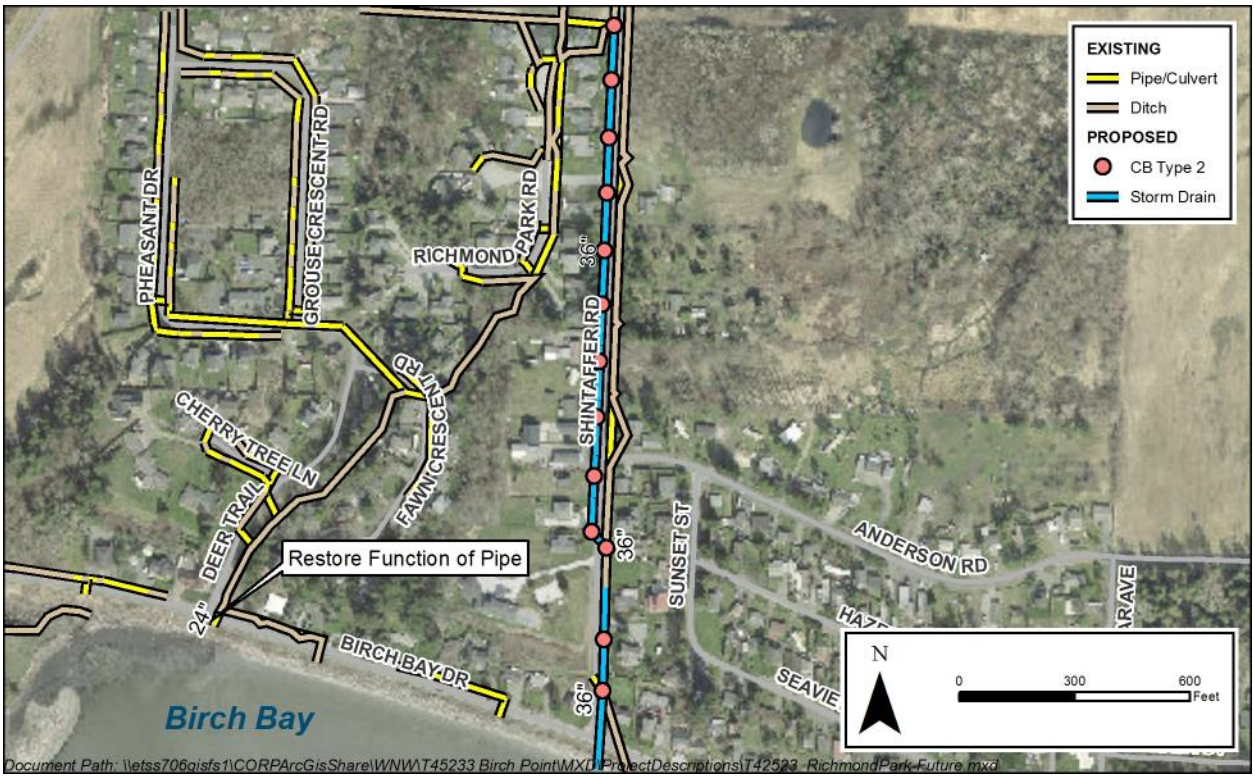
Birch Point Drainage Study

Project: Richmond Park Stormwater Improvements Project – Future Conditions

Location:	Shintaffer Road, Birch Bay Drive at Birch Bay
Description:	Ditches and existing culverts and pipe network in Richmond Park and along Shintaffer Road overflow during the 25-year and larger existing and future conditions storm events.
Cost Estimate:	$2,605,000

Project Description:

- Replace 1640 lineal feet of 12-inch diameter pipe with 36-inch diameter PVC pipe, and 36-inch diameter corrugated polyethylene pipe along Shintaffer Road.
- Replace 24 lineal feet of 24-inch diameter pipe at Deer Trail and Birch Bay to restore conveyance function.
- Install 11 new CB Type 2, 48-inch diameter structures and 2 new CB Type 2, 54-inch diameter structures along Shintaffer Road.



BIRCH POINT DRAINAGE STUDY
CAPITAL PROJECT PLANNING LEVEL CONSTRUCTION COST OPINION

PROJECT:	**Richmond Park Stormwater Improvements - Future**	**BY:**	**ZMS**
DESCRIPTION:	**Install 36 inch pipeline along Shintaffer Road**	**CHECKED BY:**	**GMS**
SUBBASIN:	**Birch Point Subwatershed**	**DATE:**	**7/19/2023**

BID ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
REMOVE ASPHALT CONC. PAVEMENT	180	SY	$40	$ 7,200
REMOVE STORM SEWER PIPE 12 IN. DIAM.	810	LF	$ 12	$ 9,720
CLASS B EXCAVATION INCL. HAUL	2,100	CY	$ 40	$ 84,000
CHECK DAM	280	LF	$ 30	$ 8,400
INLET PROTECTION	13	EA	$ 205	$ 2,665
SCHEDULE A STORM SEWER PIPE 36 IN. DIAM.	1,640	LF	$ 285	$ 467,400
CORRUGATED POLYETHYLENE STORM SEWER PIPE 36 IN. DIAM.	210	LF	$ 130	$ 27,300
CATCH BASIN TYPE 2, 48 IN. DIAM.	11	EA	$ 4,000	$ 44,000
CATCH BASIN TYPE 2, 54 IN. DIAM.	2	EA	$ 4,750	$ 9,500
GRAVEL BACKFILL FOR PIPE ZONE BEDDING	830	CY	$ 65	$ 53,950
COMMON BORROW INCL. HAUL	950	CY	$ 60	$ 57,000
ASPHALT CONC. PAVEMENT	2.9	TN	$ 200	$ 580
CRUSHED SURFACING BASE COURSE	8.3	TN	$ 120	$ 996
CRUSHED SURFACING TOP COURSE	2.1	TN	$ 345	$ 725
			Material Subtotal	$ 773,436
CONTINGENCY	50%			$ 386,718
			Material Subtotal with Contingency	$ 1,160,153
CLEAR AND GRUB	5%			$ 58,010
DEWATERING	5%			$ 58,010
ARCHEOLOGICAL MONITORING	5%			$ 58,010
TRAFFIC CONTROL	2%			$ 23,210
SITE RESTORATION	10%			$ 116,020
MOBILIZATION (GENERAL REQUIREMENT)	10%			$ 147,350
			Construction Subtotal (Rounded)	$ 1,620,800
STATE SALES TAX	8.6%			$ 139,390
ENGINEERING	33%			$ 580,860
CONSTRUCTION MANAGEMENT	7.5%			$ 132,010
PERMITTING	7.5%			$ 132,010
2023 Dollars			**Total Estimated Project Cost (Rounded)**	**$ 2,605,000**

Notes:

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